

TSUBAKI DRIVE CHAINS



Tsubaki: Recognized Provider for



Basic Environmental Policy of the Tsubaki Chain Group

Philosophy

The Tsubaki Chain Group recognizes that the protection of the global environment is one of the chief responsibilities of all mankind. It is our goal to show consideration for the environment in all of our business activities in order to contribute to a better tomorrow.

Policy

- Always be aware of the environmental effects of business activities, products and services, and strive to reduce the related environmental load from the perspective of global environmental protection.
- Streamline our organization for environmental protection and continually improve our environmental management systems.
- Comply with environmental laws, regulations and agreements.
- Help the entire workforce understand our basic environmental policy, and enhance their awareness of global environmental protection via environmental education, internal publication activities, etc.



Worldwide as a Solutions Manufacturing Environments

ALL FOR THE GLOBAL CUSTOMER'S DELIGHT

Kyotanabe Plant Concepts

Kind consideration towards the global environment

Harmony and coexistence with the global environment

Pursuit of high efficiency and high quality

Courage to look to the future

Tsubakimoto Chain's Kyotanabe Plant is a state-of-the-art facility outfitted with the latest environmental systems to produce environment-friendly products that meet the needs of the times and our customers.

Internationally Accredited Plant

Tsubakimoto Chain aims to make products that are people-friendly, environmentally friendly, and reliable. The Chain Division acquired ISO9001 accreditation in 1995 and ISO14001 accreditation in 2003.



JQA-0911
Chain Division



JQA-EM3392
Kyotanabe Plant



Kyotanabe Plant

The Powerful "Tsubaki" Line

Because it's Tsubaki, customers can select the best products for their production environment from amongst our powerful lineup. Companies looking to improve their productivity shouldn't miss trying Tsubaki's drive chains.

LINE-UP



RS® Roller Chain "G7"

General Purpose Standard Roller Chains

Tsubaki's roller chains greatly improve transmission power and deliver performance tailored to size.

RS Roller Chain
BS Roller Chain



Lube-Free Lube-Free Drive Chains

Tsubaki's lube-free drive chains contribute to lower maintenance, cleaner work environments, and increased productivity.

* Lambda chains are also available for conveyor applications.

Lambda Chain
X-Lambda Chain
Surface Treated Lambda Chain
Heavy Duty Lambda Chain
Curved Lambda Chain
BS Lambda Chain



Heavy Duty Heavy Duty Drive Chains

Tsubaki's heavy-duty drive chains offer higher transmission capacity and greater allowable load and tensile strength than RS Roller Chains, thus enabling the use of chains 1 or 2 sizes smaller.

Heavy Duty Roller Chain
SUPER Roller Chain
SUPER-H Roller Chain
ULTRA SUPER Roller Chain

for Boosting Productivity

Corrosion Resistant


Corrosion Resistant Drive Chains

Tsubaki's corrosion resistant drive chains can be used in a variety of environments.

Stainless Steel Drive Chains



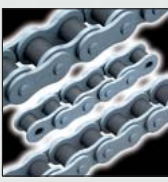
Stainless Steel Roller Chain
SS Specification



Stainless Steel Roller Chain
AS Specification

SS Specification
□NS Specification
□AS Specification

Surface Treated Drive Chains



Surface Treated Drive Chain (NEP)



Poly Steel Chain



Low Noise Roller Chain

NP Specification
NEP Specification
APP Specification

Titanium Roller Chain
Poly Steel Chain
Low Noise Roller Chain
Cold Resistant Roller Chain

Specialty Chain

Specialty Chains

Tsubaki also has chains for special applications.



Curved Roller Chain



Leaf Chain

Leaf Chain
Pin Gear Attachment Chain

Accessories

Accessories

Tsubaki's chain accessories meet user demands for chain maintenance.



Chain Elongation Scale

Chain Tensioner
Chain Cutting Tools
Chain Coupling Tools
End Fittings
Chain Elongation Scale

TSUBAKI DRIVE CHAIN

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**Roller
CHAIN**





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WARNING

Japan Chain Association

The chains, sprockets and other products appearing in this catalog are manufactured with care. However, if not properly selected, handled, or maintained, chains may break, resulting in serious accident. Use design materials, selection criteria, and instruction manuals as reference for selecting, handling, and maintaining chains and sprockets, and confirm any uncertainties with the manufacturer before proceeding.

1. The specifications, dimensions and other particulars specified in this catalog are subject to change for improvement. Before designing your system, please consult with Tsubakimoto Chain Co.
 2. © The contents of this catalog are copyrighted by Tsubakimoto Chain Co. with all rights reserved. No part of it may be copied without the written consent of Tsubakimoto Chain Co.
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Before Use

NOTE

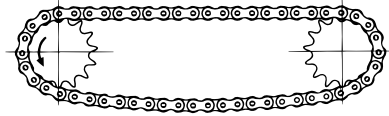
With the exception of endless chains, the transmission power tables in this catalog are based on use with connecting parts (connecting links or offset links).

See page 12 for details on connecting parts.

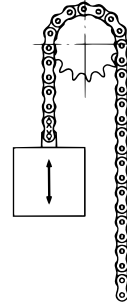
This drive chain catalog explains how to select, install and maintain all listed Tsubaki Roller Chains. Numerical figures are indicated in both SI and gravimetric units.

Read through this catalog before use to ensure proper selection and usage. Also, carefully inform persons involved in installation and maintenance of all pertinent matters.

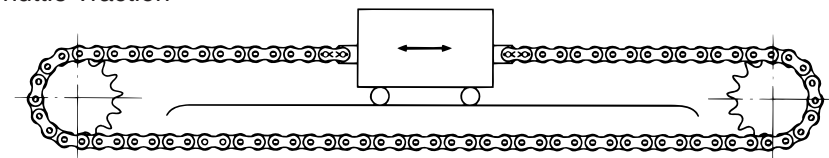
Ordinary Transmission



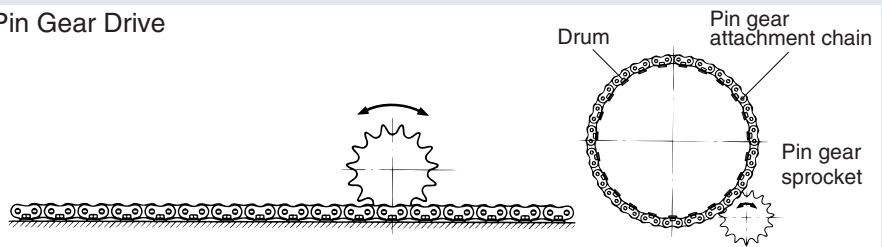
Lifting Applications



Shuttle Traction

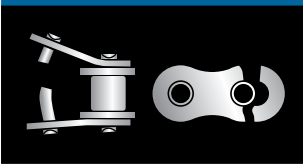


Pin Gear Drive



⚠ Notes on Using Roller Chains

NOTE



- When using a roller chain in lifting applications, keep clear from underneath the load.
- If there is the possibility of serious accident or death in the event of roller chain breakage during lifting or other applications, install reliable safety devices to prevent accidents.
- Inspect and replace worn roller chain periodically.
- Roller chains can break and climb up on the sprocket from wear elongation. (Lubrication can extend service life against wear elongation. Tsubaki also offers lube-free drive chains that deliver long-lasting service without lubrication.)
- Overload may cause roller chain to break. (Avoid breakage by properly selecting products with consideration to inertia, etc. Tsubaki offers heavy-duty drive chains in identical sizes that deliver the high strength of larger chains.)
- Roller chains can break due to corrosion and other environmental conditions. (Avoid breakage superior by preventing exposure to corrosive liquids, atmospheres, etc. Tsubaki offers corrosion-resistant drive chains.)
- Correctly install roller chain to avoid misalignment or uneven wear and possible breakage.



General Comparison of Transmission Elements

The following table compares roller chains to other power transmission mechanisms such as toothed belts, V-belts and gears. Generally speaking, roller chains are often used as economical power transmission suited to low speed and high loads. However, it is also possible to use chain in high-speed applications such as camshaft drives for automobiles.

Transmission Mechanism		Roller Chain	Toothed Belt	V-belt	Gear
Synchronicity		◎	◎	×	◎
Transmission Efficiency		◎	◎	△	◎
Anti-shock		△	○	◎	×
Noise & Vibration		△	◎	◎	×
Ambient Conditions		Avoid water and dust. (Corrosion-resistant drive chains available.)	Avoid heat, oil, water and dust.	Avoid heat, oil, water and dust.	Avoid water and dust.
Space Weight	High speed, light load	×	◎	○	○
	Low speed, heavy load	◎ Compact, lightweight	△ Slightly heavy pulleys	×	○ Needs high strength due to low number of engaging teeth.
Lubrication		×	◎	◎	×
		Required	Not required	Not required	Required
Layout Freedom		◎	○	△	×
Excess Load on Shaft		◎	○	×	◎

◎Excellent ○Good △Fair ×Poor

Features and Precautions of Roller Chain Transmissions

■ Features

1. Accommodates large speed reductions/increases (usually up to 1:7).
2. Chain can accommodate long shaft center distances (normally less than 4 m), and is more versatile.
3. It is possible to use chain with multiple shafts or drives with both sides of the chain.
4. Easy installation and replacement (easy to cut and connect chains).
5. Drive use is possible even when shafts are vertical, as long as the chain receives support in short distances between the shafts.
6. Standardization of chains under the American National Standards Institute (ANSI), the International Standardization Organization (ISO), and the Japanese Industrial Standards (JIS) allow ease of selection.
7. The sprocket diameter for a chain system may be smaller than a belt pulley while transmitting the same torque.
8. Sprockets are subject to less wear than gears because sprockets distribute the load over their many teeth.
9. High shock absorbency compared with gears.

■ Precautions

1. Chain has speed variation, called chordal action, which is caused by the polygonal effect of the sprockets.
(Shock can be reduced under the same speed ratio by either reducing the chain pitch or increasing the number of sprocket teeth.)
2. During transmission, a method of lubrication suitable to the chain's speed is necessary.
3. Chain wears and elongates. Measures for adjusting chain slack need to be considered.
4. Chain is weak when subjected to loads from the side. It needs proper alignment.



Glossary

1. JIS Minimum Tensile Strength (Tensile Breakage Strength)

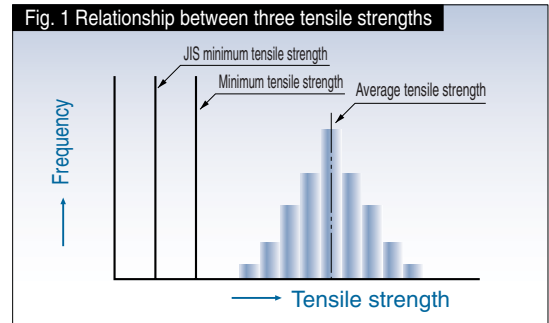
This is the minimum tensile strength determined by JIS. If a roller chain breaks by a tensile load below this value, then it is non-compliant. In the case of multi-strand roller chain, the single strand value is multiplied by the number of strands. (JIS B 1801-1997)

2. Average Tensile Strength

This is a fracture load reading obtained after a long period of actual tensile strength testing of a large number of chain strands. Naturally, a roller chain may actually break at a higher or lower value than this, so it does not represent a guaranteed value. This value varies depending on the manufacturer.

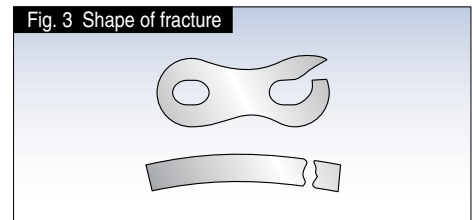
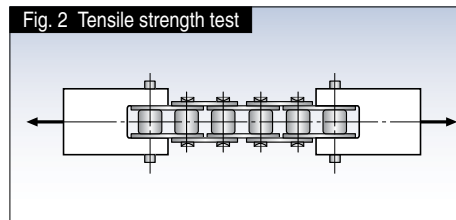
3. Minimum Tensile Strength

This is a minimum value determined by statistical processing at Tsubaki. If any roller chain fractures by a tensile load below this value, then it is non-compliant. This value varies depending on the manufacturer.



Testing Method

As shown in Fig. 2, roller chain with over five links is fixed at both ends by clevises and is stretched until breakage occurs (JIS B 1801-1997). The type of fracture is indicated by breakage of the roller chain or failure of its parts (Fig. 3.)



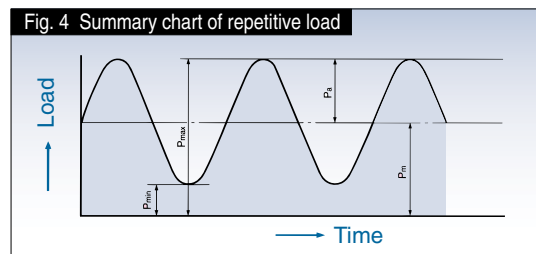
4. Maximum Allowable Load

The maximum allowable load of roller chain (excluding Stainless Steel Chain and Engineering Plastic Chain*) is the value derived from the lowest fatigue limit. When a load lower than this value is repetitively applied to the roller chain, fatigue failure will never occur.

According to JIS B 1801-1997, the maximum allowable load indicates a breakage load of $P_{max} = (P_m + P_a) = 2.2P_a$ at a frequency of 5×10^6 , when a new roller chain with over five links receives a repetitive load in linear operation. (Fig. 4)

Tsubaki standards and catalog values are for 10^7 repetitions, or $2P_a$. In other words, if Tsubaki's maximum allowable load is indicated as maximum load (P_{max}), then values in this catalog would increase 10%.

* Stainless steel and engineered plastic chains
Maximum allowable load is determined from specifying the surface pressure between pins and bushes based on wear performance.



Note that the strength of one-pitch offset links is lower than the chain itself. (Refer to Slow Speed Selection Method: 65% of the maximum allowable load of the chain.) However, the strength of two-pitch offset links is identical to that of the main chain.



5. Kilowatt Ratings Table

RS Roller Chain, SUPER Roller Chain, Heavy Duty Chain, and Low Noise Drive Chain kilowatt ratings tables show kW values for 15,000 hours of operation using a two-shaft drive and 100 pitches of roller chain under conditions 1 - 5 below.

The kW ratings table of Lambda Chain is based on conditions 1 - 4 and shows kW rating values when Lambda Chain is used with two shafts. Lambda Chain has more than seven times the wear elongation of Standard RS Roller Chain operated without lubrication (#120 and #140 are over 2.5 times). X-LAMBDA has more than five times the wear elongation life of Lambda Roller Chain.

- 1) The chains are operated under ordinary conditions where the ambient temperature is -10°C – +60°C (+14°F – +140°F) and there is no abrasive dust.
- 2) There are no negative effects from corrosive gasses or high humidity.
- 3) The two shafts are level and the chains are properly installed. (See item 4 on pg. 153.)
- 4) There is minimal fluctuation in load during transmission.
- 5) The recommended lubrication system and lubricant shown in the kW ratings tables is used for RS Roller Chain and SUPER Roller Chain. (See pgs. 151 - 152.)

6. Moment of Inertia (I / J / GD²)

Moment of inertia is used to show the degree of inertia in rotational movement; in other words, "rotation difficulty", or "rotation ease." This is equivalent to the mass (weight) of the object being used for straight-line transmission.

Moment of inertia is shown in the SI units table as:

$$I = mk^2 \text{ (kg} \cdot \text{m}^2 \text{ m: mass of rotating body k: turning radius)}$$

It is shown in the Gravimetric units table as:

$$J = \frac{G \cdot K^2}{G} \text{ (kgf} \cdot \text{m} \cdot \text{s}^2 \text{ G: mass of rotating body } \underline{G}: \text{ gravitational acceleration).}$$

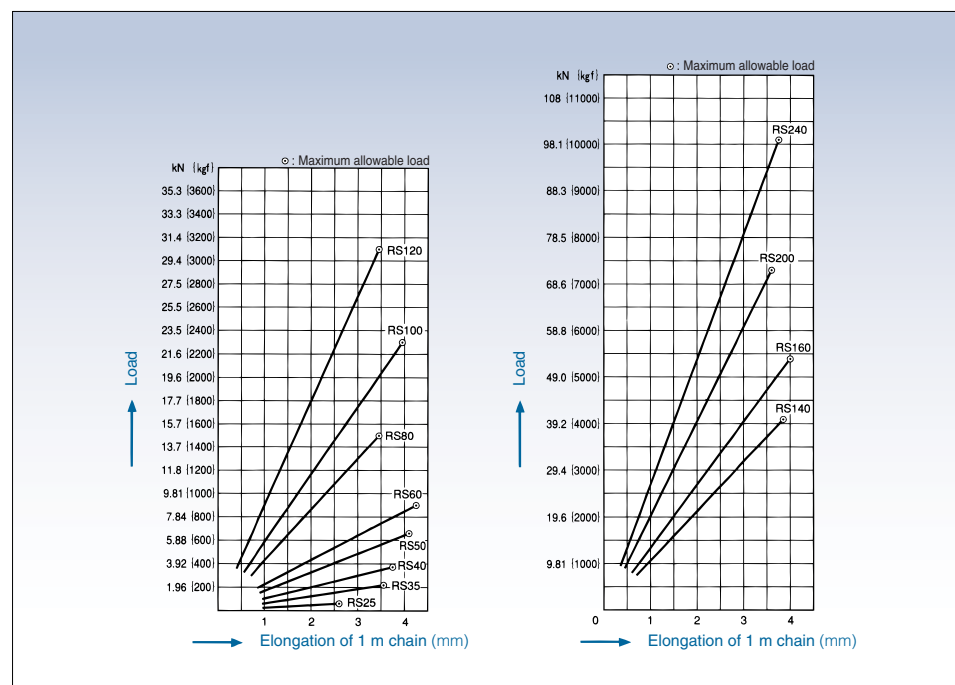
Although, $GD^2 = 4\underline{G}J$ (D: diameter of rotating body) is generally being used now in place of moment of inertia.

7. Total Length Tolerance of Roller Chain

Length test method and length tolerance are specified in JIS B 1801-1997. The length tolerance of any individual size when subjected to a measured load (e.g. 500 N [50.99 kgf] for RS 80) specified in JIS is 0 to +0.15% of the reference length. The reference length is calculated by multiplying the reference pitch (P) by the number of links. (Applicable to products bearing a JIS identification number.)

8. Elastic Elongation of Chain under Load

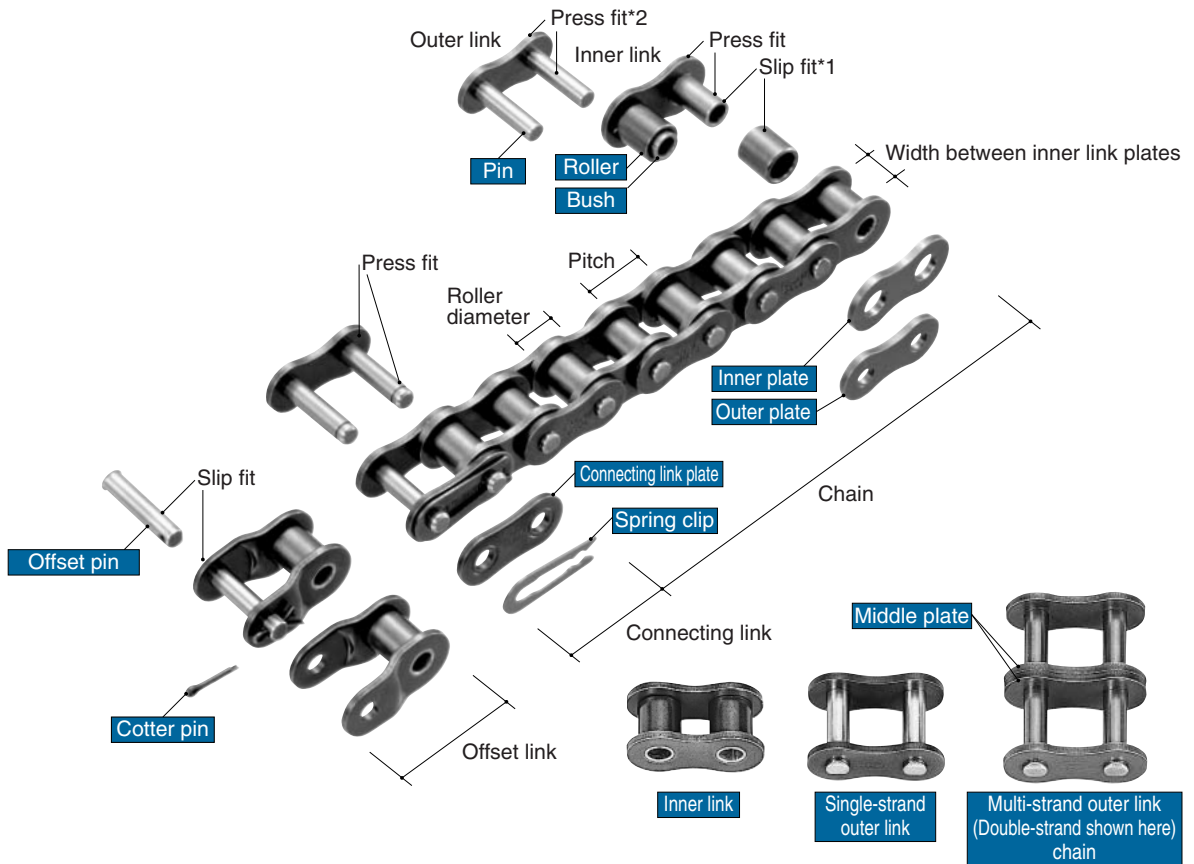
An elastic elongation curve of a chain under load looks as shown below. Values shown here are the standard references for single-strand RS Roller Chains. Actual values may slightly differ. Do not apply loads greater than the maximum allowable load to roller chains.





Roller Chain Construction

1. Basic Structure (Photo: RS Roller Chain)



Basic Three Dimensions

The pitch, roller diameter, and inner width of the inner link are considered the basic three dimensions of a roller chain. When these dimensions are identical, a roller chain and sprocket are dimensionally compatible.



Spring clips, cotter pins and spring pins are essential parts that prevent connecting plates from falling off, maintaining the strength of the chain itself. Always install these parts.

*Slip Fit

When the shafts and holes are fitted together, there is a continuous loose fit. This is a fit where the range of tolerance for the hole is larger than the range of tolerance for the shaft (pin or bush).

*Press Fit

When the shafts and holes are fitted together, there is a continuous interferential fit. This is a fit where the range of tolerance for the hole is smaller than the range of tolerance for the shaft (pin or bush).

■ Plate

The plate bears the tension placed on the chain. Usually this is a repetitive load, but sometimes it is accompanied by shock. Therefore, the plate must have not only great static tensile strength, but also must hold up to the dynamic forces of load and shock.

■ Pin

The pin is subject to shearing and bending forces transmitted by the plate. At the same time, it forms a load-bearing part, together with the bush, when the chain flexes during sprocket engagement. Therefore, the pin needs high tensile and shear strength, resistance to bending, and sufficient endurance against shock and wear.

■ Bush

The bush is subject to complex forces from all parts, especially from the repetition of shock loads when the chain engages the sprocket. Therefore, the bush needs extremely high shock resistance. In addition, the bush forms a load-bearing part together with the pin, and as such requires great wear resistance.

■ Roller

The roller is subject to impact load as it strikes the sprocket teeth during chain engagement with the sprocket. After engagement, the roller changes its point of contact and balance. It is held between the sprocket teeth and bush, and moves on the tooth face while receiving a compression load. Therefore, it must be resistant to wear and still have strength against shock, fatigue and compression. RS11 / 15 / 25 / 35 do not have rollers.

■ Roller link

Two bushes are press fit into two inner plates, and rollers are inserted to allow rotation around the outside of the bush. This is the same for single-strand and multi-strand chain.

■ Outer Link and Middle Plate

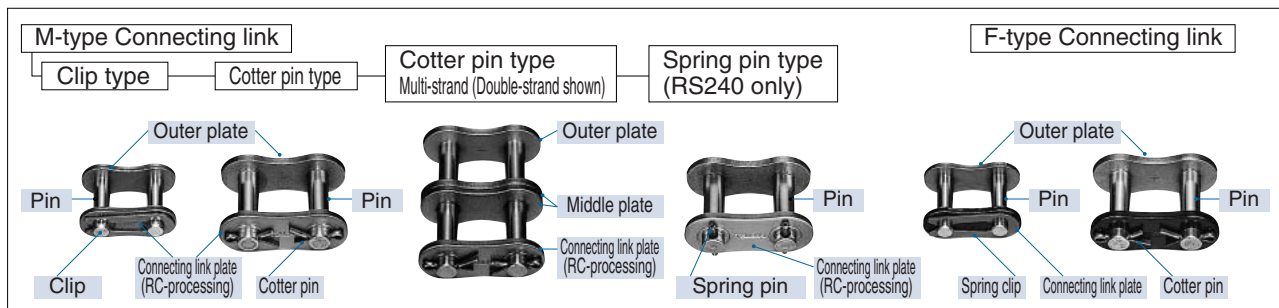
The pin link consists of two pins that have been press fit into two outer plates. With multi-strand roller chain, a middle plate is added to the pin link. The middle plate is slip fit for Standard RS Roller Chain and press fit for SUPER Roller Chain.



2. Assembly Parts

Roller Chains are usually made up of a number of connected links in an endless formation, or used by fixing the chain ends, but the need for connecting links will eventually arise. Although offset links can be used when there are an odd number of links in the roller chain, please use a design that requires an even number of links as much as possible.

2.1 Connecting Links



Chain type	Connecting link type	Pin / Connecting link plate fitting	Connecting link plate fastening	Note
RS Roller Chain	M-type connecting link Code: CL	Slip fit (M)	Spring clip Cotter pin Spring pin	<ul style="list-style-type: none"> For multi-strand chain, make sure the plate with *RC processing is on the outermost side when assembling. Operating speed is indicated by the white area in the kW ratings table.
	F-type connecting link * Code: FCL	Press fit	Spring clip, Cotter pin Spring pin T-pin	<ul style="list-style-type: none"> Make sure to use the chain according to the specified applications on page 123 and within the speed region of the colored area in the kW rating tables.
Lambda Chain	M-type connecting link Code: CL	Slip fit (M)	Spring clip Cotter pin	<ul style="list-style-type: none"> Can be used in all areas of the kW ratings table for Lambda Chain. Connecting plates are RC-processed.
SUPER Roller Chain	M-type connecting link Code: MCL	Slip fit (M)	Spring pin	<ul style="list-style-type: none"> Connecting plates are RC-processed.
	F-type connecting link Code: FCL	Press fit	Spring pin	<ul style="list-style-type: none"> Use under extreme conditions (e.g., high shock, very high load, possible side force, etc.).
SUPER-H Roller Chain	F-type connecting link Code: CL	Press fit	Spring pin	<ul style="list-style-type: none"> Use exclusive connecting link.
Heavy Duty Roller Chain	F-type connecting link Code: CL	Press fit	Cotter pin Spring pin	<ul style="list-style-type: none"> Use exclusive connecting link.
Other roller chains in catalog	M-type connecting link Code: CL	Slip fit (M)	Cotter pin, Spring clip Spring pin T-pin, Z-pin	<ul style="list-style-type: none"> Refer to individual dimension diagrams. Only NP, NEP and Low Noise Roller Chains use RC-processed connecting link plates.

Note 1. The connecting link plate fastening method for each chain size is indicated in the dimension tables and the table notes.

2. The color of F-type connecting links for RS Roller Chain and RS-HT Roller Chain marked with * is black.

Remark: Ring Coin (RC) Processing

This Tsubaki original processing adds an area of plastic deformation around pin holes to generate residual stress around the holes.

2.2 Offset Link

1-Pitch Offset Link

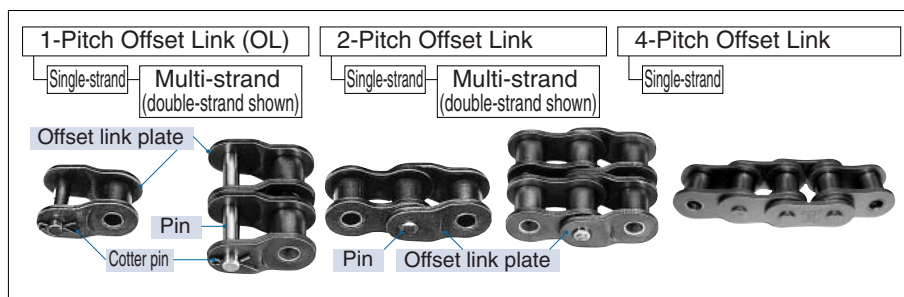
For RS35 to RS60 offset links, allow for a 20% reduction in kW (35% less for RS80 to RS240) and 35% less maximum allowable load (same for RS80 to RS240).

2-Pitch Offset Links

The pin and offset link plate of a 2POL is press fit and is fastened by a rivet. They can be used in accordance with the kW ratings tables.

4-Pitch Offset Link

4POL can be used with (single-strand) SUPER Roller Chains. Allow for a 10% reduction in maximum allowable load and kW ratings.



Note: See the dimensional tables for roller chain types and sizes suitable for offset links.



Roller Chain and Specialty Chain Lineup

Series	Product	Features/Applications	Operating temperature range (°C)
Standard Roller Chains	RS Roller Chain	JIS-, ISO-compliant, standard product	-10 to +60
	BS Roller Chain	ISO-compliant series	
Lube-Free Roller Chains	Lambda Chain	Lube-free, long-life (Special oil-impregnated bush)	-10 to +150
	Surface Treated Lambda Chain	Lube-free, long-life (Special oil-impregnated bush) Surface treated (NP and NEP)	
	X-Lambda Chain	Super long-life via special oil-impregnated bush and felt seal	
	Heavy Duty Lambda Chain	Lube-free, long-life (Special oil-impregnated bush), heavy-duty, double-strand only	
	Curved Lambda Chain	Lube-free, long-life (Special oil-impregnated bush), for curved lines	
	BS Lambda Chain	Lube-free, long-life (Special oil-impregnated bush), ISO-compliant BS Series	
Heavy Duty Roller Chains	Heavy Duty Roller Chain	High tensile strength (Approx. 19% increase over RS)	-10 to +60
	SUPER Roller Chain	High tensile strength (Approx. 30% increase over RS)	
	SUPER-H Roller Chain	High fatigue strength, high tensile strength, for heavy-duty transmissions	
	ULTRA SUPER Roller Chain	Maximum fatigue strength, maximum tensile strength, for super heavy-duty transmissions	
Corrosion Resistant Roller Chains	Stainless Steel Roller Chain	SS ... High corrosion resistance, high heat resistance	-20 to +400
		NS ... Higher corrosion resistance and higher heat resistance than SS	
		AS ... 1.5x maximum allowable load of SS, slightly less corrosion resistance	
	Surface Treated Roller Chain	NP ... Low corrosion resistance, special nickel plating	-10 to +60
		NEP ... High corrosion resistance	
		APP ... Anti-pitting	
		Titanium Roller Chain	
Cold Resistant Roller Chain	Cold resistance specification	-40 to +60	
Low Noise Roller Chain	Spring rollers, low noise	-10 to +60	
Poly Steel Chain	Corrosion resistance, wear resistance, low noise, lightweight	-10 to +80	
Specialty Roller Chains	Curved Roller Chain	Side-flexing chain, curved transmissions	-10 to +60
	Curved Stainless Steel Roller Chain	Stainless steel, curved transmissions	-20 to +400
	Leaf Chain	Plate and pin construction, for lifting applications, AL-type, BL-type (AL ...), (BL ...)	-10 to +60
	Pin Gear Attachment Chain	Used in anchored configuration, gear transmission	

Before Use
 For Safe Use
 Standard Roller Chains
 Lube-Free Roller Chains
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling



Chain No. (Pitch: mm) *2															Ref. page
11 (3.7465)	15 (4.7625)	25 (6.35)	35 (9.525)	40 (12.70)	50 (15.875)	60 (19.05)	80 (25.40)	100 (31.75)	120 (38.10)	140 (44.45)	160 (50.80)	180 (57.15)	200 (63.50)	240 (76.20)	
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	21
			RFO6B ●	RSO8B ●	RS10B ●	RS12B ●	RS16B ●	RS20B ●	RS24B ●	RS28B ●	RS32B ●		RS40B ●		
				●	●	●	●	●	●	●					55
				●	●	●	●	●	●						
				●	●	●	●	●							
			RFO6B ●	RSO8B ●	RS10B ●	RS12B ●	RS16B ●	RS20B ●	RS24B ●	RS28B ●	RS32B ●		RS40B ●		
						●	●	●	●	●	●		●	●	68
							●	●	●	●	●		●	●	
							●	●	●	●	●		●	●	
●		●	●	●	●	●	●	●	●	●	●	●	●	●	89
		●	●	●	●	●	●	●	●	●	●		●	●	
		●	●	●	●	●	●	●	●	●	●		●	●	
			●	●	●	●	●	●	●	●	●		●	●	
			●	●	●	●	●	●	●	●	●		●	●	
			●	●	●	●	●	●	●	●	●		●	●	
		●	●	●	●	●	●	●	●	●	●		●	●	
			●	●	●	●	●	●	●	●	●		●	●	
				●	●	●	●								104
				4	5	6	8	10	12	14	16				
				●	●	●	●	●	●	●	●		●	●	

*1: The operating temperature range of pre-lubricated chains (those coated with oil when delivered) is -10 to +60°C (-40 to +60°C for KT specification). Chain kW ratings do not decrease until 150°C. To use in +60 to 150°C environments, apply a high temperature lubrication. For details and precautions in usage, see "Temperature Selection Method" (page 147) and "Roller Chain Lubrication" (page 151).

*2: Sizes marked with ● are standard products shown in this catalog. For details, see the corresponding section. Blank cells are specialty items and may be specially ordered. Contact Tsubaki for details.

For Safe Use

⚠ WARNING Obey the following points in order to prevent hazardous situations.

- Do not use chains and accessories (accessories and parts) for anything other than their original purpose.
- Never perform additional processing on the chain.
 - Do not anneal the various parts of the chain.
 - Do not clean the chain with either acid or alkali, as they may cause cracking.
 - Do not electroplate the chain or its parts, as it may cause cracking due to hydrogen embrittlement.
 - Do not weld the chain, as the heat may cause cracking or a reduction in strength.
 - When heating or cutting the chain with a torch, remove the links immediately adjacent and do not use them again.
- When there is need to replace a lost or damaged portion of a chain, always replace the whole chain with a new product rather than replacing only the lost or damaged portion.
- When using a chain on suspension equipment, establish a safety perimeter and strictly prevent entry to the area directly below the suspended object.
- Always employ hazard protection devices for the chain and sprocket (safety cover, etc.).
- If a substance that can cause embrittlement cracking (acid, strong alkali, battery fluid, etc.) adheres to the chain, stop using the chain immediately and replace it with a new one.
- During installation, removal, maintenance inspection and lubrication of the chain:
 - Perform the operation according to the instruction manual or this catalog.
 - Always turn off the power switch to the device and make sure that it cannot be turned on accidentally.
 - Anchor the chain and parts so that they cannot move freely.
 - Perform cutting and connecting procedures properly using a press or other special tool.
 - Wear clothing and employ protective devices that are appropriate to the job (safety glasses, gloves, safety shoes, etc.).
 - Only allow experienced personnel to perform chain replacement procedures.
- A fail safe back up system is suggested whenever using Leaf Chain to safely support the load in the event of a chain failure.

⚠ CAUTION Obey the following points in order to prevent accidents.

- Only handle the chain after thoroughly understanding its structure and specifications.
- When installing a chain, inspect it in advance to confirm that it has not been damaged in transport.
- Be sure to perform regular maintenance inspections on the chain and sprocket.
- Chain strength varies according to manufacturer. When selecting a chain based on a Tsubaki catalog, always use the corresponding Tsubaki product.
- Minimum tensile strength refers to the failure point when the corresponding load is applied to the chain once and does not refer to the allowable operational load.

Warranty

1. LIMITED WARRANTY

Products manufactured by Seller: (a) conform to the design and specifications, if any, expressly agreed to in writing by Seller; and (b) are free of defects in workmanship and materials at the time of shipment. The warranties set forth in the preceding sentence are exclusive of all other warranties, express or implied, and extend only to Buyer and to no other person. ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXCLUDED.

2. NON-RELIANCE

Buyer is not relying upon any advice, representations or warranties (except the warranties expressly set forth above) of Seller, or upon Seller's skill or judgment regarding the Seller's products.

Buyer is solely responsible for the design and specifications of the products, including without limitation, the determination of suitability for Buyer's application of the products.

3. CLAIMS

- (a) Any claim relating to quantity or type shall be made to Seller in writing within 7 days after receipt of the products; any such claim made thereafter shall be barred.
- (b) Any claim under the above-stated Limited Warranty shall be made to Seller in writing within three (3) months after receipt of the products; any such claim made thereafter shall be barred.
- (c) Seller's liability for breach of warranty or otherwise is limited to repair or replacement, at Seller's option, of non-conforming or defective products. Buyer waives all other remedies, including, but not limited to, all rights to consequential, special or

incidental damages, including, but not limited to, damages resulting from personal injury, death or damage to or loss of use of property.

- (d) Repair, alteration, neglect or misuse of the products shall void all applicable warranties.

4. INDEMNIFICATION

Buyer will indemnify, defend and hold Seller harmless from all loss, liability, damage and expense, including attorneys' fees, arising out of any claim (a) for infringement of any patent, trademark, copyright, misappropriation of trade secrets, unfair competition or similar charge by any products supplied by Seller in accordance with the design or specifications furnished by Buyer, or (b) arising out of or connected with the products or any items into which the products are incorporated, including, but not limited to, any claim for product liability (whether or not based on negligence or strict liability of Seller), breach of warranty, breach of contract or otherwise.

5. ENTIRE AGREEMENT

These terms and conditions constitute the entire agreement between Buyer and Seller and supersede any inconsistent terms and conditions, whether contained in Buyer's purchase order or otherwise, and whether made heretofore or hereafter.

No statement or writing subsequent to the date hereof which purports to modify or add to the terms and conditions hereof shall be binding unless consented to in writing, which makes specific reference hereto, and which has been signed by the party against which enforcement thereof is sought. Seller reserves the right to change these terms and conditions without prior notice.



Ordering RS Roller Chain

The following example uses an RS Roller Chain.

Ordering is basically the same for other products, but some products are unavailable. See each section for details.

1. Ordering by unit

With the exception of special specification chains, RS Roller Chain is normally stocked by unit. The total length of one unit includes one connecting link. Please purchase additional connecting links if you intend to separate the chain into two or more sections or join chains to create a longer chain.



Order example

Ordering n units of RS80-1

Product code	Chain number	Count	Units
A110113	RS80-1-RP-U	n	U (unit)

Ordering pieces of RS80-1 CL and OL

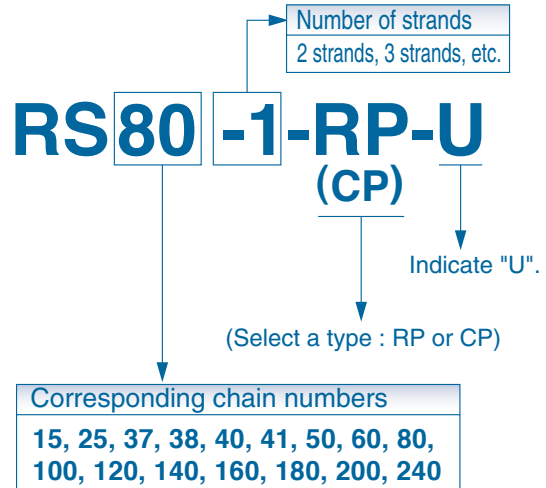
Product code	Chain number	Count	Units
A115031	RS80-1-CL	n	K (piece)
A116025	RS80-1-OL	n	K (piece)

Note: When ordering CL, note that there are two types: M-type CL and F-type CL.

- ▶ For M-type CL
Example: RS80-1-CL
- ▶ For F-type CL, write FCL.
Example: RS80-1-FCL

Length of one unit: 3048 mm (10 feet); however
RS11-SS: 502 mm, RS15: 1000 mm,
RS25: 1016 mm, RS140: 3023 mm, RS180: 3086 mm.

Example:



Note: RP (rivet pin) is when the inner plates are connected by the outer plates via riveting.
CP (cotter pin) is when the inner plates are connected by the outer plates via cotter pins.

2. Ordering an even number of links

Be sure to indicate configuration specification.

1 When the number of links is 8



8 links including the connecting link (CL)

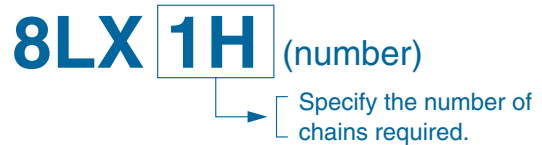
Order example

Ordering 8 links of RS50-1 Roller Chain

Product code	Chain number	Count	Units
A110018	RS50-1-RP	7	L
A115018	RS50-1-CL	1	K

- ▶ Indicate the number of links of the chain segment only.
Example: In the case of 8LX2H, the chain segment is 14L with CL2K
In the case of 8LX3H, the chain segment is 21L with CL3K

Configuration specification



2 20-link complete endless

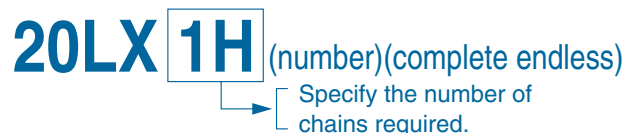


Order example

Ordering 20-link complete endless RS50-1-RP

Product code	Chain number	Count	Units
A110018	RS50-1-RP	20	L

Configuration specification





Ordering RS Roller Chain

3. Ordering an odd number of links

Be sure to indicate "configuration specification". If no specification is made for an odd number of links, both end links will be inner links (both RL) as in [4].

1 9 links (including CL and OL)



Product code	Chain number	Count	Units
A110018	RS50-1-RP	7	L
A115018	RS50-1-CL	1	K
A116013	RS50-1-OL	1	K

Configuration specification **9LX1H (CL,OL)**

Note: To specify that parts be installed, an assembly specification such as CL - OL (2POL) is required.

2 9 links (specified to include 2POL)



Product code	Chain number	Count	Units
A110018	RS50-1-RP	5	L
A115018	RS50-1-CL	2	K
A116080	RS50-1-2POL	1	K

Configuration specification **9LX1H (2POL,CL)**

Note: To specify that parts be installed, an assembly specification such as CL - OL (2POL) is required.

3 9 links (both ends with CL)



Product code	Chain number	Count	Units
A110018	RS50-1-RP	7	L
A115018	RS50-1-CL	2	K

Configuration specification **9LX1H (CL-CL)**

Note: To specify that parts be installed, an assembly specification such as CL - OL (2POL) is required.

4 9 links (both ends inner links)



Product code	Chain number	Count	Units
A110018	RS50-1-RP	9	L

Configuration specification **9LX1H (RL-RL)**

5 9 links (both ends outer links)



Product code	Chain number	Count	Units
A110018	RS50-1-RP	9	L

Configuration specification **9LX1H (PL-PL)**

After installing the equipment, use a riveting punch (see the accessories section) to fasten the pin ends of the rivets in the outer links on both ends.

The photograph in each example order shows CL and OL assembled. In an actual order, CL and OL are delivered unassembled. If you wish parts to be assembled, a configuration specification is necessary.

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Lube-Free Roller Chains
Heavy Duty Roller Chains
Corrosion Resistant Roller Chains
Specialty Roller Chains
Accessories
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4. Matched and tagged chain

Deviations in chain length exist due to the manufacturing tolerances of the parts. When chains are to be used in parallel and minimizing the relative difference in the lengths is necessary, request a "matched and tagged" chain.

Note: A separate charge is required for a length matching.

Example entry in special mention column

For example, if you need three sets of two single-strand, 120-link RS80 chains, the entry should be:

RS80-1-RP 720 links

Matched and tagged chain: 120 L x 2 H x 3 D

5. Long length formation

When a chain's total length exceeds 3.048m (10ft), it is called a long length formation. Please consult a Tsubaki representative for information regarding chains exceeding the lengths below. A separate super long length formation fee and wooden box fee applies.

6. Reel chain

Single-strand RS25 to RS80 chain (see table below) is available on long-length reels.

Example order

Ordering one reel of RS50-1-RP Roller Chain

Product code	Chain number	Count	Units
A110089	RS50-1-RP-10UR	1	R



Product code	Chain number	Units per reel	Number of links (unit: L)	Number of accessory CL (M-type connecting links)
A110083	RS25-1-RP-150UR	150	23999	150
A110084	RS35-1-RP-20UR	20	6399	20
A110085	RS37-1-RP-20UR	20	4799	20
A110086	RS38-1-RP-20UR	20	4799	20
A110087	RS41-1-RP-20UR	20	4799	20
A110088	RS40-1-RP-15UR	15	3599	15
A110089	RS50-1-RP-10UR	10	1919	10
A110090	RS60-1-RP-10UR	10	1599	10
A110091	RS80-1-RP-5UR	5	599	5

7. Replacement precautions

When you do not know the roller chain number

- 1** Verification of the roller chain specifications (strength type, material, etc.) is important. Check with the manufacturer.
- 2** Check the roller chain size and specifications that are engraved on the roller chain plate.
- 3** Measure the pitch, roller diameter, inner width of inner link, and plate thickness of the roller chain.



Standard Roller Chains

New
RS®

Roller Chain 'G7'

Before Use

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Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

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"TSUBAKI" and the "RS" brand are stamped together on the chain.
(Applicable sizes: RS40 to RS240)

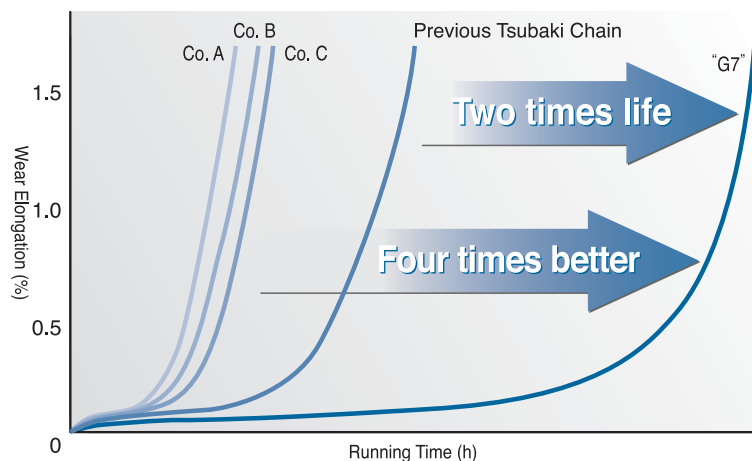


7th Generation

Our 7th model upgrade, celebrating 90 years of quality. Pursuing the ultimate in quality, Tsubaki has created the world's highest standard of roller chain.

Twice the Wear Life Wear Life Comparison

Lube Groove solid bushings retain lubrication longer



Tsubaki increased the effectiveness of its special lube groove (LG) processing, which retains lubricating oil between the pin and bushing longer than the previous series.

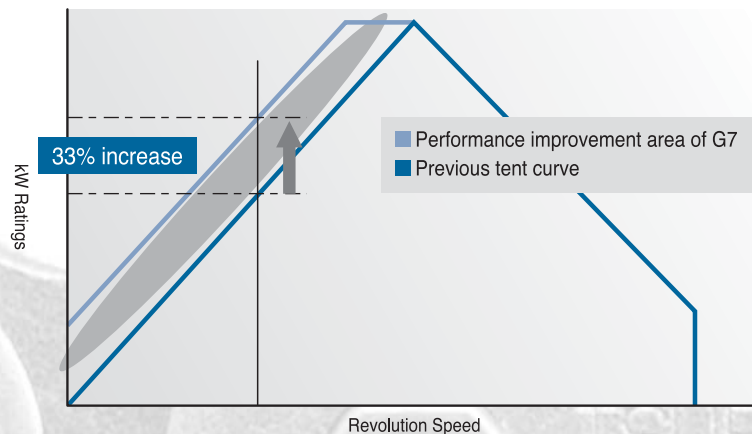
With G7, our newly-developed LG solid bushing (RS80-RS140) with seamless bushing for lasting pre-lubricating effect, we have doubled our chains' already long life. (Patent pending)



LG solid bushing

33% increase in kW Ratings Tent curve (RS80)

Realized through high technology, equipment, and quality control at Kyotanabe Plant



For the New RS Roller Chain G7 (RS80-RS140), a sophisticated integration of traditional manufacturing with the latest technology has enabled a reduction in quality fluctuations, resulting in a roughly 33% increase in kW Ratings. (In-house comparison)



Kyotanabe Plant



Tsubaki RS Roller Chain -- Defining New Eras

1953
612 series
Compliance with JIS standards

1964
NA series
Horsepower more than doubled

1969
53rd series
The world's top-level performance achieved
Tensile strength increased by 20%

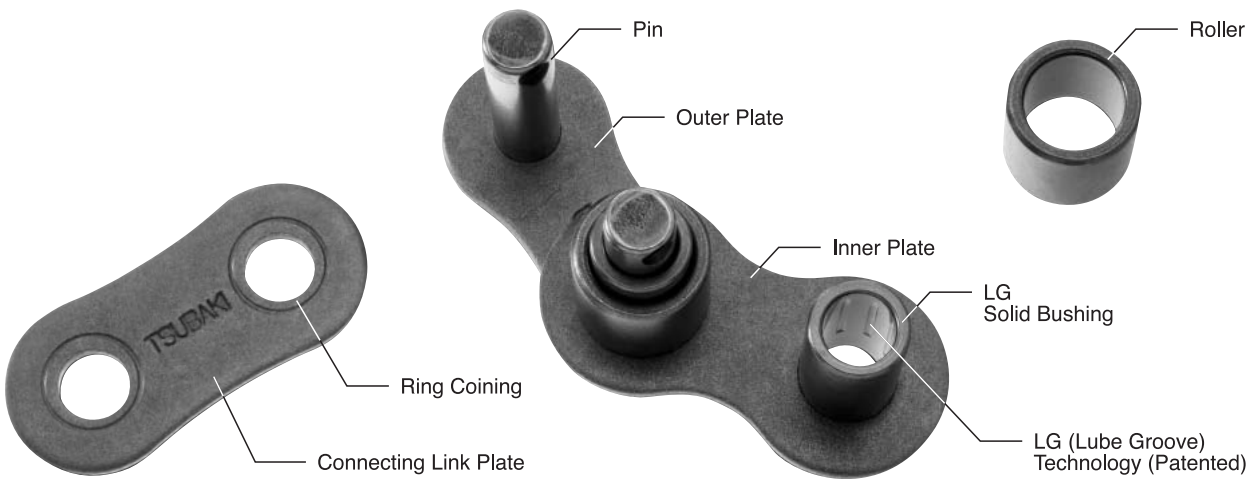
1976
60th series
"World's No. 1"
• Plate fatigue strength increased by 15%
• increased by 25%

1985
70th series
Pursuing a longer wear life with the goal of becoming "initial elongation"
• Reduces initial elongation and increases wear life by 20%

1995
80th series
Meeting needs with optional design with the goal of "zero"
• **Ring Coin** processing of the link plate boosts kilowatt ratings by 25%
• **Lube Groove** on the inside surface of the bushing increases wear life by 30%

2002
Kyotanabe Plant begins operation with the goal of being the "world's No.1 chain center"

2006
G7
Twice the wear life, 33% increase in kw ratings

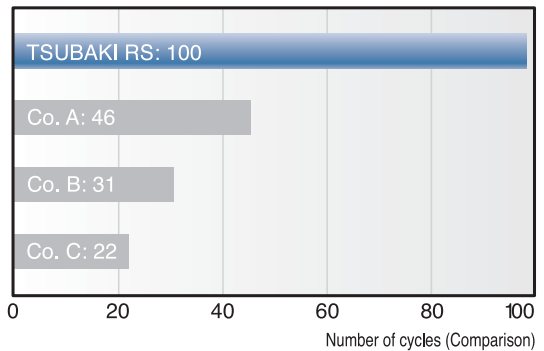


Ring Coin (RC) processing has achieved a connecting link strength far ahead of our competitors' (RC Started with the previous series)

"Residual stress" generated from a groove around the plate hole eliminates strength reduction caused by the gap between the pin and the plate necessary for connecting and disconnecting. With this groove, the connecting link achieves the same strength as the chain itself.

※ Ring Coining: A load is applied around the plate hole to form a circular groove (ring coin). A stress load is applied to the material, which then generates stress to counteract tensile strength. The stress remaining inside the material is called residual stress, which increases its fatigue strength.

Comparison of connecting link fatigue strength (In-house test value, equivalent of RS80)



Universal Design

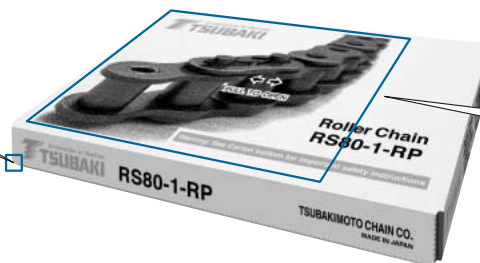
Easy to use, easy to understand, and user-friendly.

UNIVERSAL DESIGN



Wave edge

Wave edges make injuries difficult. (Applicable sizes: RS40 to RS160)



Packaging

Includes a photo of the chain. Uses environment-friendly recycled paper. + Soy ink



Standard Roller Chains

Old-New Chain Number Comparison

Product codes have been assigned to all products (except customized products) and chain numbers have been rewritten. The following clarifies the differences between old and new chain numbers.

RS Roller Chain

- ① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers. Double- and higher multi-strand chains will still use the current numbering.
- ② RP and CP type needs to be stated with new chain numbers.

RP

A chain that uses rivets to connect RL and RL with PL.

CP

A chain that uses cotter pins to connect RL and RL with PL.



New chain number	Old chain number
<p>RS80 ^①-1 ^②-RP -U or CP</p> <p>Applicable sizes 15, 25, 37, 38, 41, 40, 50, 60, 80, 100, 120, 140, 160, 180, 200, 240</p> <p>Required for standard stocked products (units). Not required for links only.</p>	<p>RS80</p> <p>Applicable sizes 15, 25, 37, 38, 41, 40, 50, 60, 80, 100, 120, 140, 160, 180, 200, 240</p>

Chain number with connecting link (CL)

RS80-1-CL (For FCL: RS80-1-FCL)

Chain number with OL/2POL

RS80-1-OL, RS80-1-2POL

Note: RS11SS, RF320T and RF400T numbers are as follows.

New chain number	Old chain number
RS11-SS-1	RS11SS
RF320-T-1	RF320T
RF400-T-1	RF400T

Note: BF25H numbers are as follows.

New chain number	Old chain number
BF25-H-1-RP-U	BF25H
BF25-H-1-RP	

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Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

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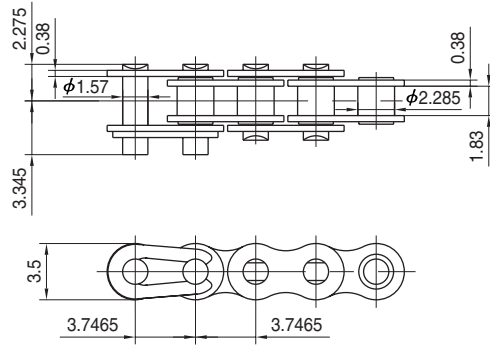


BS Roller Chain (ISO606-compliant B Series)

- ① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.
For double and higher multi-strand chains, confirm size and then simply change the strand listing.

New chain number	Old chain number
RF06B-1	RF06B
<p>RS08B-1</p>	<p>RS08B</p>
Chain number with connecting link (CL)	RS08B-1-CL
Chain number with OL/2POL	RS08B-1-OL, RS08B-1-2POL

RS11-SS-1



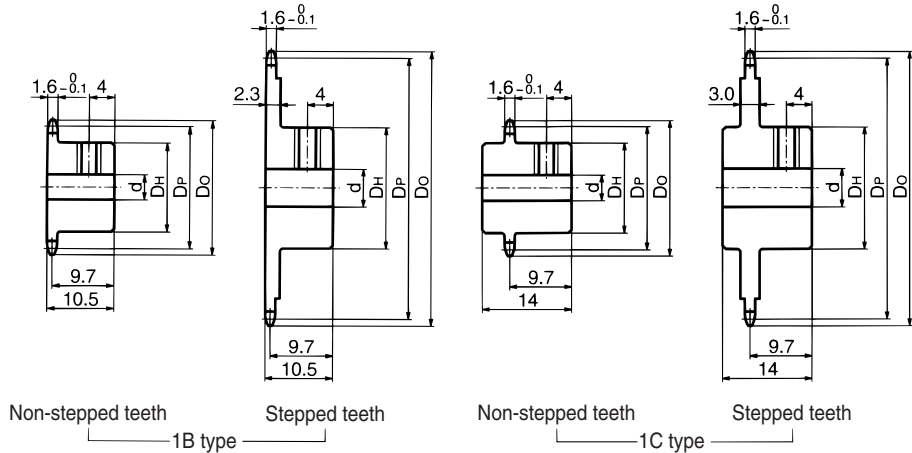
Drawing Scale 2/1

TSUBAKI Chain Number	Average Tensile Strength N{kgf}	Maximum Allowable Load N{kgf}	Approximate Mass g/m	Number of Links Per Unit
RS11-SS-1	780{80}	50{5}	52	134

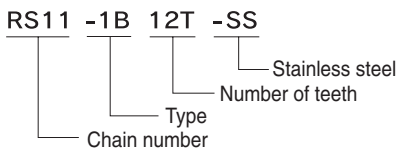
Note: 1. Made of SUS 304 stainless steel. 2. No offset links available. 3. Bushed chain.

Standard Roller Chains

RS11SS Sprocket



Sprocket Number

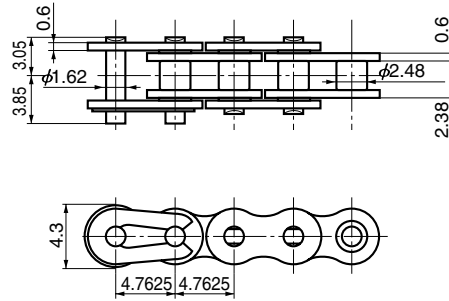


Number of teeth	Type	Pitch circular diameter (D _P)	Sprocket outer diameter (D _O)	Bore diameter (d)		Hub diameter (D _H)	Set screw hole	Approx. weight (g)		Material
				Min.	Max.			1B type	1C type	
12	B or C (non-stepped teeth)	14.475	16.2	4	6	9.4	M3 × 0.5	5.9	7.4	Stainless steel
15		18.020	19.9		9	13		11.5	14.7	
16		19.204	21.1		9	14		13.5	17.3	
18		21.575	23.5	6	11	16		17.7	22.8	
20		23.949	25.9		13	19		23.3	30.3	
24		28.703	30.7		19	M4 × 0.7		25.7	32.7	
28	33.462	35.5	6	13	19	M4 × 0.7	28.7	35.7	Stainless steel	
30	35.842	37.9					29.7	39.3		
34	40.604	42.7					37.9	48.9		
36	42.986	45.1					40.7	52.4		
40	47.751	49.8					46.5	59.9		
48	57.283	59.4					60.5	77.8		

Note: 1. Bore diameter is customizable within the above ranges. However, the finishing hole tolerance is H8 for diameters of less than φ8 and H7 for diameters of φ8 and above. 2. Unless bore diameter is specified, sprockets are made to the above minimum size with an H10 tolerance.

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RS15



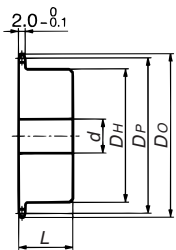
Drawing Scale 1.5/1

TSUBAKI Chain Number	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass g/m	Number of Links Per Unit
RS15-1	1.77{180}	2.26{230}	0.31{32}	75	210

Note: 1. No offset links available.
2. Bushed chain.

Standard Roller Chains

RS15 Sprocket



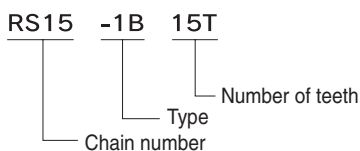
Mechanically machined 1B type



Number of teeth	Pitch circular diameter (DP)	Sprocket outer diameter (DO)	Bore diameter (d)		Hub		Approx. weight (g)	Material
			Pilot bore diameter	Maximum	Diameter (DH)	Length (L)		
11	16.90	19.0	4	7	11	10	9	Machine-structural carbon steel
12	18.40	20.5	4	8	12	10	10	
13	19.90	22.0	4	9	14	10	14	
14	21.40	23.5	6	10	15	12	17	
15	22.91	25.0	6	12	17	12	22	
16	24.41	26.5	8	12	18	12	23	
17	25.92	28.0	8	14	20	14	32	
18	27.43	29.5	8	14	22	14	40	
19	28.93	31.0	8	15	23	14	44	
20	30.44	32.5	8	15	24	14	49	
21	31.95	34.0	8	17	26	14	57	
22	33.46	35.5	8	17	27	14	62	
23	34.98	37.5	8	17	28	14	68	
24	36.49	39.0	8	20	30	16	88	
25	38.00	40.5	8	20	32	16	100	
26	39.51	42.0	10	22	33	16	104	
27	41.02	43.5	10	25	35	16	117	
28	42.54	45.0	10	25	37	16	131	
29	44.05	46.5	10	25	38	16	139	
30	45.56	48.0	10	25	39	16	147	
31	47.08	49.5	10	25	40	18	175	
32	48.59	51.0	10	25	40	18	176	
33	50.10	52.5	10	25	40	18	178	
34	51.62	54.0	10	25	40	18	180	
35	53.13	55.5	10	25	40	18	182	

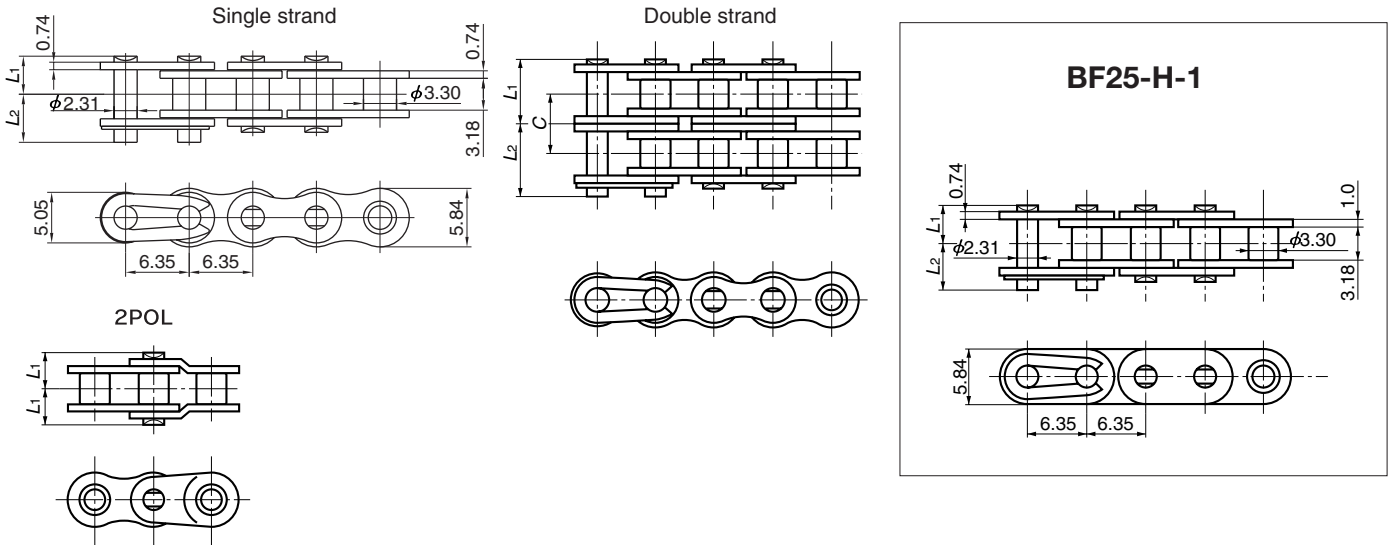
Note: 1. Bore diameter noted above is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.
2. Pilot bore diameters are finished to an H10 tolerance.

Sprocket Number



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RS25, BF25-H-1



Drawing Scale 1.25/1

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS25-1	1	8.3	3.8	4.5	-	Riveting	3.6 {367}	4.12 {420}	4.71 {480}	0.64 {65}	0.14
RS25-2	2	14.7	6.95	7.75	6.4		7.2 {734}	8.24 {840}	9.41 {960}	1.08{110}	0.27
RS25-3	3	21.1	10.15	10.95	6.4		10.8{1101}	12.4{1260}	14.1{1440}	1.57{160}	0.42
BF25-H-1	1	8.82	4.01	4.81	-		- { - }	- { - }	5.88 {600}	0.78 {80}	0.17

Note: 1. The offset link of RS25 is a two-pitch offset link only. 2. BF25H has no offset links. 3. Number of links per unit =160
4. RS25 and BF25H are both bushed chains.

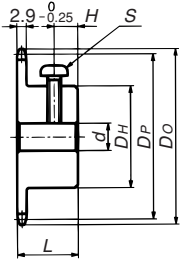
■ RS25-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min																								
	A										B														
9	0.02	0.03	0.08	0.13	0.18	0.23	0.30	0.36	0.43	0.49	0.57	0.67	0.78	0.76	0.64	0.54	0.47	0.42	0.37	0.33	0.30	0.27	0.25	0.22	0.19
10	0.02	0.04	0.10	0.15	0.20	0.26	0.33	0.41	0.48	0.55	0.64	0.76	0.87	0.89	0.75	0.64	0.55	0.48	0.43	0.39	0.35	0.31	0.29	0.26	0.22
11	0.02	0.04	0.11	0.17	0.23	0.28	0.37	0.45	0.53	0.61	0.71	0.84	0.96	1.03	0.87	0.74	0.64	0.56	0.50	0.45	0.40	0.37	0.34	0.31	0.26
12	0.02	0.04	0.12	0.18	0.25	0.31	0.40	0.49	0.58	0.67	0.78	0.92	1.06	1.17	0.98	0.84	0.72	0.64	0.57	0.51	0.46	0.42	0.38	0.35	0.30
13	0.03	0.05	0.13	0.20	0.27	0.34	0.44	0.54	0.63	0.73	0.85	1.00	1.15	1.30	1.11	0.95	0.82	0.72	0.64	0.57	0.51	0.47	0.43	0.40	0.34
14	0.03	0.05	0.14	0.22	0.29	0.37	0.48	0.58	0.69	0.79	0.92	1.09	1.25	1.41	1.24	1.06	0.92	0.81	0.72	0.64	0.57	0.52	0.48	0.44	0.37
15	0.03	0.05	0.15	0.23	0.32	0.40	0.51	0.63	0.74	0.85	0.99	1.17	1.35	1.52	1.37	1.17	1.01	0.90	0.79	0.71	0.64	0.58	0.53	0.48	0.42
16	0.03	0.06	0.16	0.25	0.34	0.43	0.55	0.67	0.79	0.91	1.07	1.26	1.44	1.63	1.51	1.29	1.12	0.98	0.87	0.78	0.70	0.64	0.58	0.54	0.46
17	0.03	0.06	0.17	0.27	0.36	0.45	0.59	0.72	0.85	0.97	1.14	1.34	1.54	1.74	1.66	1.42	1.22	1.07	0.96	0.85	0.77	0.70	0.64	0.59	0.50
18	0.04	0.07	0.18	0.28	0.39	0.48	0.63	0.76	0.90	1.03	1.21	1.43	1.64	1.85	1.81	1.54	1.34	1.17	1.04	0.93	0.84	0.76	0.69	0.64	0.54
19	0.04	0.07	0.19	0.30	0.41	0.51	0.66	0.81	0.96	1.10	1.28	1.51	1.74	1.96	1.95	1.67	1.45	1.27	1.13	1.01	0.91	0.83	0.75	0.69	0.59
20	0.04	0.07	0.20	0.32	0.43	0.54	0.70	0.86	1.01	1.16	1.36	1.60	1.84	2.07	2.11	1.81	1.57	1.37	1.22	1.09	0.98	0.90	0.81	0.75	0.64
21	0.04	0.08	0.21	0.34	0.45	0.57	0.74	0.90	1.06	1.22	1.43	1.69	1.94	2.18	2.27	1.94	1.69	1.48	1.31	1.17	1.06	0.96	0.87	0.81	0.69
22	0.04	0.08	0.22	0.35	0.48	0.60	0.78	0.95	1.12	1.29	1.50	1.77	2.04	2.30	2.44	2.08	1.81	1.58	1.40	1.26	1.13	1.03	0.94	0.87	0.74
23	0.05	0.09	0.23	0.37	0.50	0.63	0.82	1.00	1.17	1.35	1.58	1.86	2.14	2.41	2.61	2.22	1.93	1.69	1.50	1.34	1.21	1.10	1.01	0.93	0.79
24	0.05	0.09	0.25	0.39	0.53	0.66	0.85	1.04	1.23	1.41	1.65	1.95	2.24	2.52	2.78	2.37	2.06	1.81	1.60	1.43	1.29	1.17	1.07	0.98	0.84
25	0.05	0.10	0.26	0.41	0.55	0.69	0.89	1.09	1.28	1.48	1.73	2.03	2.34	2.64	2.93	2.52	2.19	1.92	1.70	1.52	1.37	1.25	1.14	1.04	0.90
26	0.05	0.10	0.27	0.42	0.57	0.72	0.93	1.14	1.34	1.54	1.80	2.12	2.44	2.75	3.06	2.68	2.32	2.04	1.81	1.61	1.45	1.32	1.21	1.11	0.95
28	0.06	0.11	0.29	0.46	0.62	0.78	1.01	1.23	1.45	1.67	1.95	2.30	2.64	2.98	3.31	2.99	2.59	2.28	2.01	1.81	1.63	1.48	1.35	1.24	1.06
30	0.06	0.12	0.31	0.49	0.67	0.84	1.09	1.33	1.56	1.80	2.10	2.48	2.85	3.21	3.57	3.32	2.87	2.52	2.24	2.00	1.81	1.64	1.50	1.37	1.17
32	0.07	0.12	0.33	0.53	0.72	0.90	1.16	1.42	1.68	1.93	2.25	2.66	3.05	3.44	3.83	3.66	3.17	2.78	2.46	2.21	1.99	1.81	1.65	1.51	1.29
35	0.07	0.14	0.37	0.58	0.79	0.99	1.28	1.57	1.85	2.12	2.48	2.93	3.36	3.79	4.21	4.18	3.62	3.18	2.82	2.52	2.28	2.07	1.89	1.73	1.48
40	0.08	0.16	0.43	0.67	0.91	1.14	1.48	1.81	2.13	2.45	2.87	3.38	3.88	4.38	4.87	5.10	4.42	3.89	3.45	3.08	2.78	2.52	2.31	2.11	1.81
45	0.10	0.18	0.48	0.77	1.04	1.30	1.68	2.06	2.42	2.78	3.26	3.84	4.41	4.97	5.53	6.08	5.28	4.63	4.11	3.68	3.32	3.01	2.75	2.52	2.16

Note: 1. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands	Multi-strand factor	Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	Double strand	1.7		B	Oil bath or slinger disc lubrication	
	Triple strand	2.5		C	Forced pump lubrication	

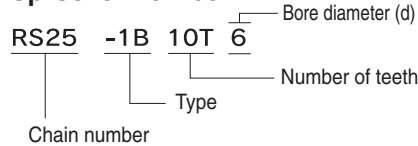
RS25, BF25-H Sprocket



Notes:
1. Bores are finished and fitted with a screw.

Sintered alloy specification (1B type)

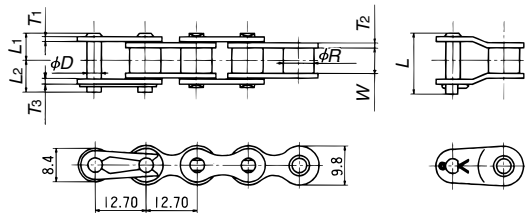
Sprocket Number



Number of Teeth	Pitch Circular Diameter (D _P)	Sprocket Outer Diameter (D _O)	Bore Diameter (d)		Hub		Cross-recessed Head Machine Screw		Approx. Mass (g)	Material
			1 type	2 type	Diameter (D _H)	Length (L)	Position (H)	S		
10	20.55	23.5	6H8	8H8	13	14	4	M3X6	13	Sintered alloy
11	22.54	25.5	6H8	8H8	15	14	4	M3X8	16	
12	24.53	27.5	8H8	10H8	17	14	4	M4X8	20	
13	26.53	29.5	8H8	10H8	18	14	4	M4X8	23	
14	28.54	31.5	8H8	10H8	19	14	4	M4X8	26	
15	30.54	33.5	8H8	10H8	20	14	4	M4X10	31	
16	32.55	35.5	8H8	10H8	21	16	5	M4X10	38	
17	34.56	37.5	8H8	10H8	23	16	5	M4X10	45	
18	36.57	39.5	8H8	10H8	25	16	5	M4X12	52	
19	38.58	41.5	8H8	10H8	26	16	5	M4X12	60	
20	40.59	43.5	8H8	10H8	28	16	5	M4X14	68	
21	42.61	45.5	8H8	10H8	30	18	7	M4X14	80	
22	44.62	48.0	8H8	10H8	30	18	7	M4X14	84	
23	46.63	50.0	8H8	10H8	30	18	7	M4X14	88	
24	48.65	52.0	8H8	10H8	30	18	7	M4X14	93	
25	50.66	54.0	8H8	10H8	30	18	7	M4X14	98	
26	52.68	56.0	10H8	12H8	30	18	7	M4X14	98	
28	56.71	60.0	10H8	12H8	30	18	7	M4X14	103	
30	60.75	64.0	10H8	12H8	30	18	7	M4X14	110	
32	64.78	68.0	10H8	12H8	30	18	7	M4X14	117	

Standard Roller Chains RS Roller Chain

RS37-1, RS38-1, RS41-1



TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins				
				T ₁	T ₂	T ₃	D	L ₁ +L ₂	L ₁	L ₂	L
RS37-1	12.70	7.80	3.40	1.0	1.0	1.2	3.63	11.0	5.1	5.9	12.45
RS38-1	12.70	7.80	4.80	1.1	1.1	1.2	3.63	13.1	6.0	7.1	14.1
RS41-1	12.70	7.77	6.38	1.25	1.25	1.25	3.59	14.7	6.75	7.95	15.1

TSUBAKI Chain Number	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	Number of Links Per Unit
RS37-1	-	8.14{830}	9.41{960}	1.67{170}	0.29	240
RS38-1	-	8.14{830}	9.41{960}	1.67{170}	0.35	240
RS41-1	7.4{755}	10.3{1050}	11.8{1200}	2.26{230}	0.41	240

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
2. Number of links per unit = 240

RS41-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

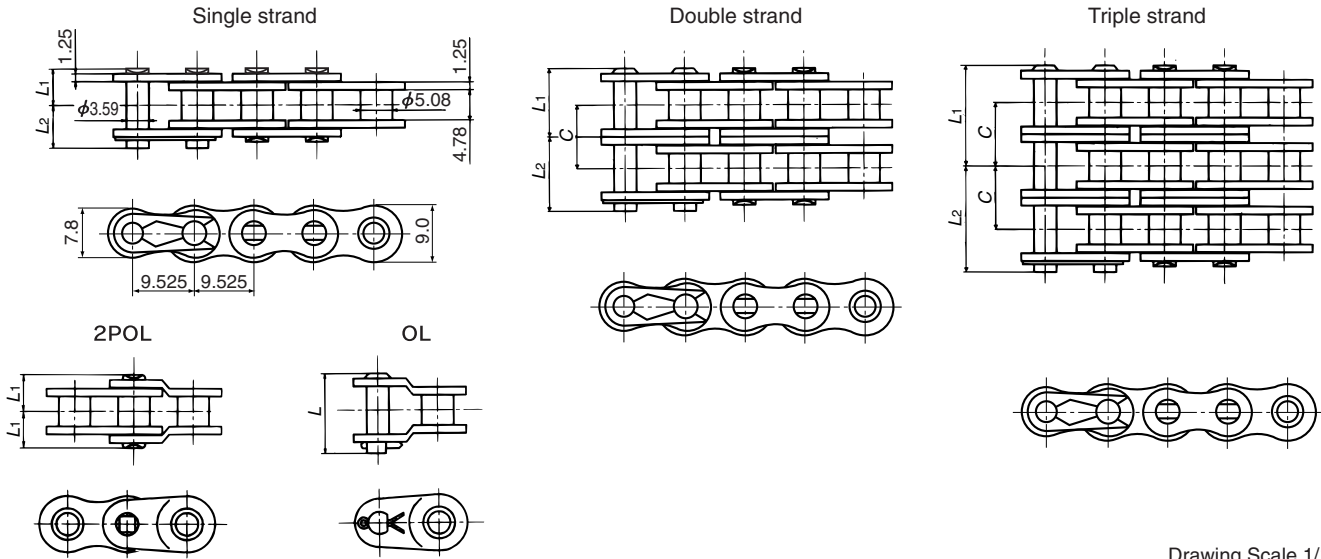
Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min																											
	10	25	50	100	200	300	400	500	700	900	1000	1200	1400	1600	1800	2100	2400	2700	3000	3500	4000	5000	6000	7000	8000			
9	0.02	0.05	0.10	0.18	0.34	0.49	0.64	0.78	1.05	1.32	1.25	0.95	0.75	0.61	0.51	0.41	0.34	0.28	0.24	0.19	0.16	0.11	0.08	0.07	0.05			
10	0.03	0.06	0.11	0.20	0.38	0.55	0.71	0.87	1.18	1.48	1.47	1.11	0.88	0.72	0.60	0.48	0.40	0.33	0.28	0.22	0.18	0.13	0.10	0.08	0.06			
11	0.03	0.07	0.12	0.23	0.43	0.61	0.79	0.97	1.31	1.64	1.69	1.28	1.01	0.83	0.69	0.55	0.46	0.38	0.32	0.25	0.21	0.15	0.11	0.09	0.07			
12	0.03	0.07	0.14	0.25	0.47	0.67	0.87	1.06	1.44	1.80	1.93	1.45	1.16	0.95	0.79	0.63	0.51	0.43	0.37	0.29	0.24	0.17	0.13	0.10	0.08			
13	0.03	0.08	0.15	0.27	0.51	0.73	0.95	1.16	1.57	1.96	2.16	1.64	1.31	1.07	0.90	0.71	0.58	0.48	0.42	0.33	0.27	0.19	0.15	0.12	0.10			
14	0.04	0.08	0.16	0.29	0.55	0.79	1.02	1.25	1.70	2.13	2.34	1.84	1.45	1.19	1.00	0.79	0.65	0.54	0.46	0.37	0.30	0.22	0.16	0.13	0.10			
15	0.04	0.09	0.17	0.32	0.59	0.85	1.10	1.35	1.83	2.29	2.52	2.04	1.62	1.32	1.11	0.88	0.72	0.60	0.51	0.41	0.34	0.24	0.18	0.14	0.12			
16	0.04	0.10	0.18	0.34	0.63	0.91	1.18	1.45	1.96	2.46	2.70	2.25	1.78	1.45	1.22	0.97	0.79	0.66	0.57	0.45	0.37	0.26	0.20	0.16	0.13			
17	0.05	0.10	0.19	0.36	0.68	0.98	1.26	1.55	2.09	2.62	2.88	2.45	1.95	1.60	1.33	1.06	0.87	0.73	0.62	0.49	0.40	0.29	0.22	0.17	0.14			
18	0.05	0.11	0.21	0.39	0.72	1.04	1.34	1.64	2.22	2.79	3.07	2.68	2.13	1.74	1.45	1.16	0.95	0.79	0.68	0.54	0.44	0.31	0.24	0.19	0			
19	0.05	0.12	0.22	0.41	0.76	1.10	1.42	1.74	2.36	2.96	3.25	2.90	2.31	1.89	1.58	1.25	1.03	0.86	0.73	0.58	0.48	0.34	0.26	0.21	0			
20	0.05	0.12	0.23	0.43	0.81	1.16	1.51	1.84	2.49	3.13	3.44	3.16	2.48	2.04	1.71	1.35	1.11	0.93	0.79	0.63	0.51	0.37	0.28	0.22	0			
21	0.06	0.13	0.24	0.46	0.85	1.23	1.59	1.94	2.63	3.29	3.62	3.40	2.68	2.19	1.83	1.45	1.19	1.00	0.85	0.68	0.55	0.40	0.30	0.24	0			
22	0.06	0.14	0.26	0.48	0.89	1.29	1.66	2.04	2.76	3.46	3.81	3.64	2.87	2.35	1.97	1.56	1.28	1.07	0.92	0.72	0.60	0.43	0.32	0.25	0			
23	0.06	0.14	0.27	0.50	0.94	1.35	1.75	2.14	2.90	3.63	4.00	3.89	3.07	2.51	2.10	1.67	1.37	1.15	0.98	0.78	0.63	0.46	0.34	0.28	0			
24	0.07	0.15	0.28	0.53	0.98	1.42	1.83	2.24	3.04	3.81	4.18	4.15	3.27	2.68	2.25	1.78	1.45	1.22	1.04	0.83	0.68	0.48	0.37	0.29	0			
25	0.07	0.16	0.30	0.55	1.03	1.48	1.92	2.34	3.17	3.98	4.37	4.41	3.48	2.84	2.39	1.90	1.55	1.30	1.11	0.88	0.72	0.51	0.40	0	0			
26	0.07	0.17	0.31	0.57	1.07	1.54	2.00	2.45	3.31	4.15	4.56	4.68	3.69	3.02	2.53	2.01	1.64	1.38	1.18	0.93	0.76	0.54	0.42	0	0			
28	0.08	0.18	0.33	0.62	1.16	1.67	2.17	2.65	3.59	4.50	4.94	5.23	4.12	3.37	2.83	2.25	1.84	1.54	1.31	1.04	0.85	0.61	0.46	0	0			
30	0.08	0.19	0.36	0.67	1.25	1.80	2.33	2.85	3.86	4.84	5.32	5.80	4.57	3.74	3.13	2.48	2.04	1.71	1.45	1.16	0.95	0.68	0.51	0	0			
32	0.09	0.21	0.38	0.72	1.34	1.93	2.51	3.06	4.14	5.19	5.71	6.39	5.04	4.12	3.45	2.74	2.25	1.88	1.60	1.28	1.04	0.75	0	0	0			
35	0.10	0.23	0.43	0.79	1.48	2.13	2.76	3.37	4.56	5.72	6.29	7.31	5.76	4.72	3.95	3.13	2.57	2.15	1.84	1.45	1.19	0.85	0	0	0			
40	0.12	0.26	0.49	0.92	1.71	2.46	3.18	3.89	5.27	6.61	7.26	8.56	7.04	5.76	4.83	3.83	3.13	2.63	2.25	1.78	1.45	1.04	0	0	0			
45	0.13	0.30	0.56	1.04	1.94	2.79	3.62	4.42	5.99	7.50	8.25	9.72	8.43	6.87	5.76	4.57	3.74	3.13	2.68	2.13	1.74	0	0	0	0			

Note: 1. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use
For Safe Use
Standard Roller Chains
Lube-Free Roller Chains
Heavy Duty Roller Chains
Corrosion Resistant Roller Chains
Specialty Roller Chains
Accessories
Selection
Handling

RS35



Drawing Scale 1/1.2

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS35-1	1	12.7	5.85	6.85	13.5			8.7 {887}	9.81{1000}	11.3{1150}	2.16{220}	0.33
RS35-2	2	22.8	10.9	11.9	24.5	10.1	Riveting	17.4{1774}	19.6{2000}	22.6{2300}	3.63{370}	0.69
RS35-3	3	32.9	16.0	16.9	34.6			26.1{2661}	29.4{3000}	33.8{3450}	5.39{550}	1.05

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 320 3. Bushed chain.

■ RS35-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

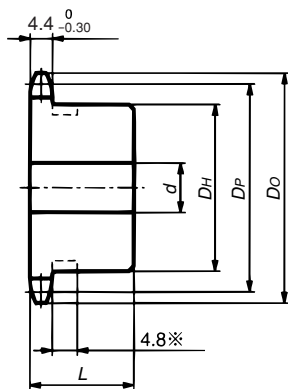
Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min																								
	50	100	300	500	700	900	1200	1500	1800	2100	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	10000
	A										B										C				
9	0.09	0.17	0.47	0.74	1.00	1.26	1.63	1.99	2.34	2.69	2.11	1.62	1.29	1.05	0.88	0.75	0.66	0.57	0.51	0.46	0.41	0.37	0.34	0.31	0.27
10	0.10	0.19	0.52	0.83	1.12	1.41	1.82	2.23	2.63	3.02	2.50	1.90	1.51	1.23	1.04	0.88	0.77	0.67	0.60	0.53	0.48	0.43	0.40	0.37	0.31
11	0.12	0.22	0.58	0.92	1.24	1.56	2.02	2.47	2.91	3.34	2.88	2.18	1.73	1.42	1.18	1.01	0.88	0.77	0.68	0.61	0.55	0.50	0.45	0.42	0.36
12	0.13	0.24	0.64	1.01	1.37	1.71	2.22	2.71	3.20	3.67	3.28	2.50	1.98	1.62	1.36	1.16	1.01	0.88	0.78	0.70	0.63	0.57	0.52	0.48	0.41
13	0.14	0.26	0.70	1.10	1.49	1.87	2.42	2.96	3.49	4.01	3.70	2.80	2.23	1.83	1.53	1.30	1.12	0.99	0.87	0.78	0.70	0.64	0.58	0.54	0.46
14	0.15	0.28	0.75	1.19	1.61	2.02	2.62	3.21	3.78	4.34	4.14	3.14	2.49	2.03	1.71	1.46	1.27	1.11	0.98	0.88	0.79	0.72	0.65	0.60	0.51
15	0.16	0.30	0.81	1.28	1.74	2.18	2.83	3.45	4.07	4.67	4.59	3.47	2.76	2.26	1.89	1.62	1.40	1.23	1.09	0.98	0.88	0.80	0.73	0.67	0.57
16	0.17	0.32	0.87	1.38	1.86	2.34	3.03	3.70	4.36	5.01	5.05	3.80	3.04	2.49	2.09	1.78	1.54	1.36	1.20	1.07	0.97	0.88	0.80	0.74	0.62
17	0.19	0.35	0.93	1.47	1.99	2.50	3.23	3.95	4.66	5.35	5.53	4.17	3.33	2.73	2.28	1.95	1.69	1.48	1.32	1.18	1.06	0.96	0.88	0.80	0.69
18	0.20	0.37	0.99	1.56	2.12	2.66	3.44	4.21	4.95	5.69	6.03	4.54	3.63	2.97	2.49	2.12	1.84	1.62	1.43	1.28	1.15	1.05	0.96	0.88	0.75
19	0.21	0.39	1.05	1.66	2.25	2.81	3.65	4.46	5.25	6.03	6.54	4.92	3.94	3.22	2.70	2.30	2.00	1.75	1.56	1.39	1.25	1.14	1.03	0.95	0.81
20	0.22	0.41	1.11	1.75	2.37	2.98	3.85	4.71	5.55	6.38	7.06	5.32	4.25	3.48	2.91	2.49	2.16	1.89	1.68	1.50	1.36	1.23	1.12	1.03	0.88
21	0.23	0.43	1.17	1.85	2.50	3.14	4.06	4.97	5.85	6.72	7.60	5.72	4.57	3.74	3.14	2.68	2.32	2.03	1.80	1.62	1.46	1.32	1.21	1.11	0.95
22	0.24	0.46	1.23	1.94	2.63	3.30	4.27	5.22	6.15	7.07	8.15	6.20	4.91	4.01	3.36	2.87	2.49	2.18	1.94	1.74	1.56	1.42	1.30	1.19	1.01
23	0.26	0.48	1.29	2.04	2.76	3.46	4.48	5.48	6.46	7.42	8.68	6.62	5.26	4.30	3.60	3.08	2.67	2.34	2.08	1.86	1.68	1.52	1.39	1.28	1.09
24	0.27	0.50	1.35	2.13	2.89	3.62	4.69	5.74	6.76	7.77	9.09	7.06	5.59	4.57	3.84	3.27	2.83	2.49	2.21	1.97	1.78	1.62	1.48	1.36	1.15
25	0.28	0.52	1.41	2.23	3.02	3.79	4.90	6.00	7.07	8.12	9.50	7.51	5.96	4.88	4.09	3.49	3.02	2.66	2.36	2.10	1.90	1.72	1.57	1.45	1.23
26	0.29	0.55	1.47	2.33	3.15	3.95	5.12	6.26	7.37	8.47	9.91	7.96	6.31	5.16	4.33	3.70	3.21	2.81	2.49	2.23	2.01	1.83	1.67	1.53	1.30
28	0.32	0.59	1.59	2.52	3.41	4.28	5.54	6.78	7.98	9.17	10.7	8.90	7.07	5.78	4.84	4.14	3.59	3.15	2.79	2.50	2.25	2.04	1.87	1.72	1.46
30	0.34	0.64	1.72	2.72	3.68	4.61	5.97	7.30	8.60	9.88	11.6	9.87	7.83	6.39	5.35	4.58	3.97	3.48	3.09	2.76	2.49	2.26	2.06	1.89	1.62
32	0.37	0.68	1.84	2.91	3.94	4.94	6.40	7.83	9.22	10.6	12.4	10.9	8.58	7.04	5.90	5.04	4.37	3.83	3.40	3.04	2.74	2.49	2.27	2.09	0
35	0.40	0.75	2.03	3.21	4.34	5.45	7.05	8.62	10.2	11.7	13.7	12.4	9.85	8.05	6.76	5.76	5.00	4.38	3.89	3.48	3.14	2.85	2.60	2.39	0
40	0.47	0.87	2.34	3.71	5.02	6.29	8.15	9.96	11.7	13.5	15.8	15.2	12.0	9.85	8.28	7.05	6.11	5.36	4.75	4.25	3.83	3.48	0	0	0
45	0.53	0.99	2.66	4.21	5.70	7.14	9.25	11.3	13.3	15.3	17.9	18.1	14.4	11.8	9.85	8.43	7.30	6.41	5.69	5.09	0	0	0	0	0

Note: 1. KW rating when using a one-pitch offset link (OL) is 80% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

RS35 Sprocket



Mechanically machined (1B type)

Sprocket Number

RS35 -1B 15T

Number of teeth
Type
Chain number

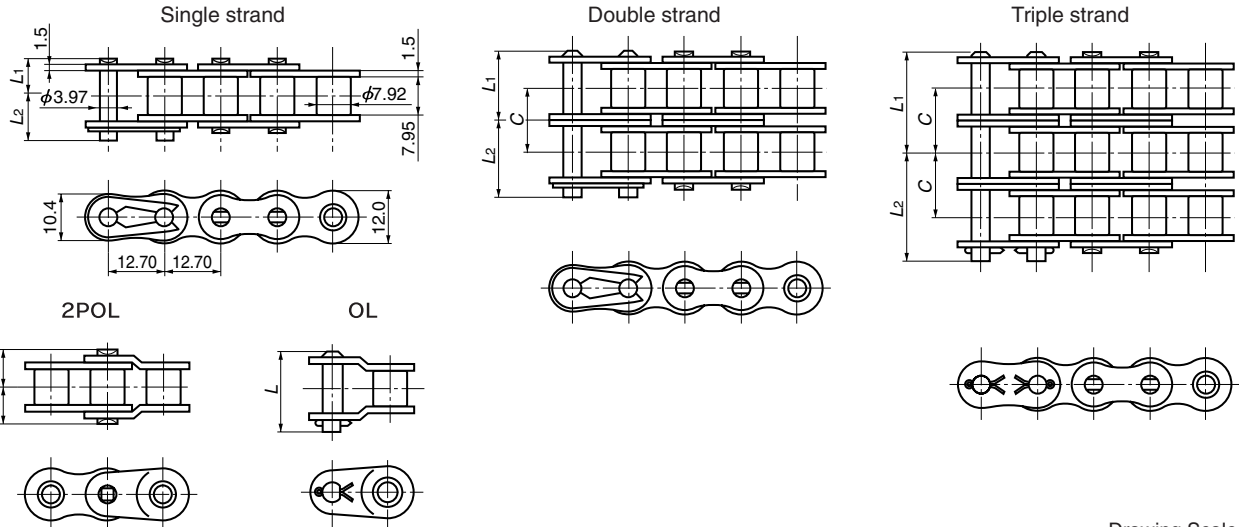
Number of Teeth	Pitch Circular Diameter (D _P)	Sprocket Outer Diameter (D _O)	1B type				Approx. Mass (kg)	Material	Number of Teeth
			Bore Diameter (d)		Hub				
			Pilot Bore Diameter	Maximum	Diameter (D _H)	Length (L)			
9	27.85	32	8	11	22	20	0.06	※	9
10	30.82	34	8	12	25	20	0.08	※	10
11	33.81	38	8	14	27	20	0.09	※	11
12	36.80	40	8	16.5	31	20	0.12	※	12
13	39.80	44	9.5	18	32	20	0.12	※	13
14	42.80	46	9.5	16.5	30	20	0.12	Mechanically machined; machine-structural carbon steel	14
15	45.81	51	9.5	19	35	20	0.16		15
16	48.82	53	9.5	20	37	20	0.19		16
17	51.84	57	9.5	24	41	20	0.22		17
18	54.85	60	12.7	24.5	44	20	0.25		18
19	57.87	63	12.7	28.5	47	20	0.28		19
20	60.89	66	12.7	30	50	20	0.32		20
21	63.91	69	12.7	32	53	20	0.36		21
22	66.93	72	12.7	32	53	20	0.37		22
23	69.95	75	12.7	32	53	20	0.40		23
24	72.97	78	12.7	32	53	22	0.43		24
25	76.00	81	12.7	32	53	22	0.44		25
26	79.02	83	12.7	32	53	22	0.45		26
27	82.05	87	12.7	32	53	22	0.46		27
28	85.07	90	12.7	32	53	22	0.48		28
30	91.12	96	12.7	32	53	22	0.51		30
32	97.18	102	12.7	32	53	22	0.54		32
34	103.23	109	12.7	32	53	22	0.57		34
35	106.26	112	12.7	32	53	22	0.59	35	
36	109.29	115	12.7	32	53	22	0.61	36	
38	115.34	121	13	42	63	25	0.82	38	
40	121.40	127	13	42	63	25	0.85	40	
42	127.46	133	13	42	63	25	0.91	42	
45	136.55	142	13	42	63	25	0.95	45	
48	145.64	151	13	42	63	25	1.0	48	
50	151.69	157	13	42	63	25	1.1	50	
54	163.82	169	13	42	63	25	1.2	54	
60	182.00	187	13	42	63	25	1.3	60	
65	197.15	203	16	45	68	25	1.5	65	
70	212.30	218	16	45	68	25	1.7	70	
75	227.46	233	16	45	68	25	1.8	75	



Example of grooved sprocket

- Note: 1. Maximum bore diameter is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.
 2. Models in shaded areas have hardened teeth.
 3. Sprockets marked with an * have an outer groove around the hub. Groove outer diameter is 16 for 9T, 22 for 10T, 24 for 12T and 28 for 13T.
 4. Sprockets with 42 or more teeth do not have hardened teeth, but the Strong Series of sprocket with hardened teeth can be made-to-order.

RS40



Drawing Scale 1/1.6

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS40-1	1	18.2	8.25	9.95	18.2	14.4	Riveting	15.2 {1550}	17.7 {1800}	19.1 {1950}	3.63 {370}	0.64
RS40-2	2	32.6	15.45	17.15	33.5			30.4 {3100}	35.3 {3600}	38.2 {3900}	6.18 {630}	1.27
RS40-3	3	46.8	22.65	24.15	47.9			45.6 {4650}	53.0 {5400}	57.4 {5850}	9.12 {930}	1.90
RS40-4	4	61.2	29.9	31.3	62.3			-	70.6 {7200}	76.5 {7800}	12.0 {1220}	2.53
RS40-5	5	75.7	37.1	38.6	76.8			-	88.3 {9000}	95.6 {9750}	14.1 {1440}	3.16
RS40-6	6	90.1	44.3	45.8	91.2			-	106 {10800}	115 {11700}	16.7 {1700}	3.79

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 240

■ RS40-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min																								
	10	25	50	100	200	300	400	500	700	900	1000	1200	1400	1600	1800	2100	2400	2700	3000	3500	4000	5000	6000	7000	8000
9	0.05	0.11	0.21	0.39	0.72	1.04	1.35	1.64	2.23	2.79	3.07	3.62	3.76	3.07	2.57	2.04	1.67	1.40	1.19	0.95	0.78	0.56	0.43	0.34	0.28
10	0.05	0.12	0.23	0.43	0.81	1.16	1.51	1.84	2.49	3.13	3.44	4.05	4.40	3.62	3.01	2.39	1.96	1.64	1.40	1.11	0.91	0.65	0.49	0.40	0.32
11	0.06	0.14	0.26	0.48	0.90	1.29	1.67	2.04	2.76	3.47	3.81	4.49	5.08	4.16	3.48	2.76	2.26	1.90	1.60	1.28	1.05	0.75	0.57	0.46	0.37
12	0.07	0.15	0.28	0.53	0.98	1.42	1.84	2.24	3.04	3.81	4.19	4.93	5.67	4.74	3.96	3.15	2.57	2.16	1.84	1.46	1.19	0.85	0.65	0.51	0.43
13	0.07	0.17	0.31	0.57	1.07	1.54	2.00	2.45	3.31	4.15	4.57	5.38	6.18	5.34	4.47	3.55	2.90	2.43	2.08	1.65	1.35	0.96	0.73	0.58	0.48
14	0.08	0.18	0.33	0.62	1.16	1.67	2.17	2.65	3.59	4.50	4.95	5.83	6.69	5.97	5.00	3.96	3.25	2.72	2.32	1.84	1.51	1.08	0.82	0.65	0.53
15	0.08	0.19	0.36	0.67	1.25	1.80	2.34	2.86	3.87	4.85	5.33	6.28	7.21	6.62	5.54	4.39	3.60	3.01	2.57	2.04	1.67	1.19	0.91	0.72	0.59
16	0.09	0.21	0.39	0.72	1.34	1.93	2.50	3.06	4.14	5.20	5.71	6.73	7.73	7.30	6.10	4.84	3.96	3.32	2.84	2.25	1.84	1.32	1.00	0.80	0.65
17	0.10	0.22	0.41	0.77	1.43	2.06	2.67	3.27	4.42	5.55	6.10	7.19	8.26	7.99	6.69	5.30	4.34	3.64	3.11	2.47	2.02	1.45	1.10	0.87	0.72
18	0.10	0.23	0.44	0.82	1.52	2.20	2.84	3.48	4.71	5.90	6.49	7.64	8.78	8.70	7.28	5.78	4.73	3.96	3.39	2.69	2.21	1.57	1.19	0.95	0
19	0.11	0.25	0.46	0.87	1.62	2.33	3.02	3.69	4.99	6.26	6.88	8.10	9.31	9.44	7.83	6.27	5.13	4.30	3.67	2.92	2.39	1.71	1.30	1.03	0
20	0.12	0.26	0.49	0.92	1.71	2.46	3.19	3.90	5.27	6.61	7.27	8.57	9.84	10.2	8.28	6.77	5.54	4.64	3.96	3.15	2.57	1.84	1.40	1.11	0
21	0.12	0.28	0.52	0.96	1.80	2.59	3.36	4.11	5.56	6.97	7.66	9.03	10.4	11.0	9.24	7.28	5.96	5.00	4.27	3.39	2.77	1.98	1.51	1.19	0
22	0.13	0.29	0.54	1.01	1.89	2.73	3.53	4.32	5.85	7.33	8.06	9.49	10.9	11.8	9.86	7.83	6.39	5.36	4.57	3.63	2.97	2.13	1.62	1.28	0
23	0.13	0.31	0.57	1.06	1.99	2.86	3.71	4.53	6.13	7.69	8.45	9.96	11.4	12.6	10.5	8.36	6.83	5.73	4.89	3.88	3.18	2.28	1.73	1.37	0
24	0.14	0.32	0.60	1.11	2.08	3.00	3.88	4.74	6.42	8.05	8.85	10.4	12.0	13.4	11.2	8.88	7.28	6.10	5.22	4.13	3.39	2.42	1.84	1.46	0
25	0.15	0.33	0.62	1.16	2.17	3.13	4.06	4.96	6.71	8.41	9.25	10.9	12.5	14.1	11.9	9.48	7.76	6.49	5.54	4.39	3.60	2.57	1.96	1.51	0
26	0.15	0.35	0.65	1.21	2.27	3.27	4.23	5.17	7.00	8.78	9.65	11.4	13.1	14.7	12.7	10.1	8.21	6.89	5.88	4.66	3.82	2.73	2.06	1.61	0
28	0.17	0.38	0.71	1.32	2.46	3.54	4.58	5.60	7.58	9.51	10.5	12.3	14.2	16.0	14.2	11.2	9.18	7.68	6.57	5.22	4.27	3.05	2.32	1.81	0
30	0.18	0.41	0.76	1.42	2.65	3.81	4.94	6.04	8.17	10.2	11.3	13.3	15.2	17.2	15.7	12.5	10.1	8.51	7.28	5.78	4.73	3.39	2.57	2.0	0
32	0.19	0.44	0.81	1.52	2.84	4.09	5.29	6.47	8.76	11.0	12.1	14.2	16.3	18.4	17.3	13.7	11.2	9.40	8.06	6.37	5.22	3.73	2.9	2.2	0
35	0.21	0.48	0.90	1.67	3.13	4.50	5.83	7.13	9.65	12.1	13.3	15.7	18.0	20.3	19.8	15.7	12.8	10.7	9.18	7.28	5.96	4.27	3.4	2.7	0
40	0.24	0.56	1.04	1.93	3.61	5.20	6.74	8.24	11.1	14.0	15.4	18.1	20.8	23.5	24.2	19.2	15.7	13.1	11.2	8.88	7.28	5.22	4.0	3.2	0
45	0.28	0.63	1.18	2.20	4.10	5.91	7.65	9.35	12.7	15.9	17.5	20.6	23.6	26.6	28.8	22.8	18.7	15.7	13.4	10.6	8.73	6.5	5.0	4.0	0

Note: 1. KW rating when using a one-pitch offset link (OL) is 80% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

RS50

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

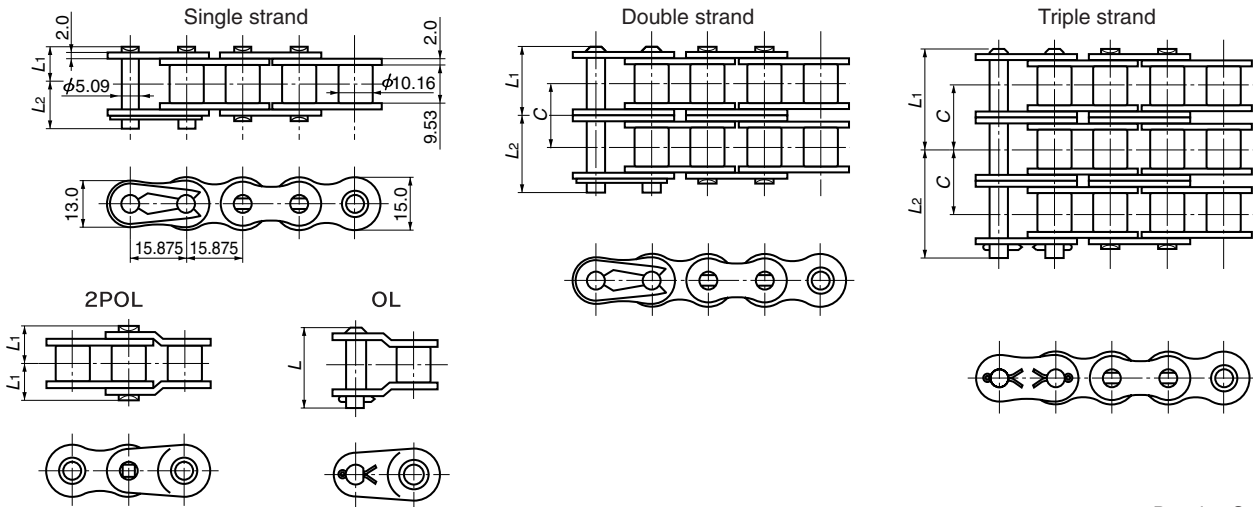
Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



Drawing Scale 1/2

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS50-1	1	22.2	10.3	11.9	22.6	18.1	Riveting	24 {2447}	28.4 {2900}	31.4 {3200}	6.37{650}	1.04
RS50-2	2	40.5	19.35	21.15	41.8			48 {4895}	56.9 {5800}	62.8 {6400}	10.7{1100}	2.07
RS50-3	3	58.6	28.4	30.2	59.9			72 {7342}	85.3 {8700}	94.1 {9600}	16.0{1630}	3.09
RS50-4	4	76.7	37.45	39.25	78.1			-	114 {11600}	126 {12800}	21.1{2150}	4.11
RS50-5	5	94.8	46.5	48.3	96.2			-	142 {14500}	157 {16000}	24.9{2540}	5.14
RS50-6	6	113.0	55.6	57.4	114.4			-	171 {17400}	188 {19200}	29.3{2990}	6.16

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 192

■ RS50-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

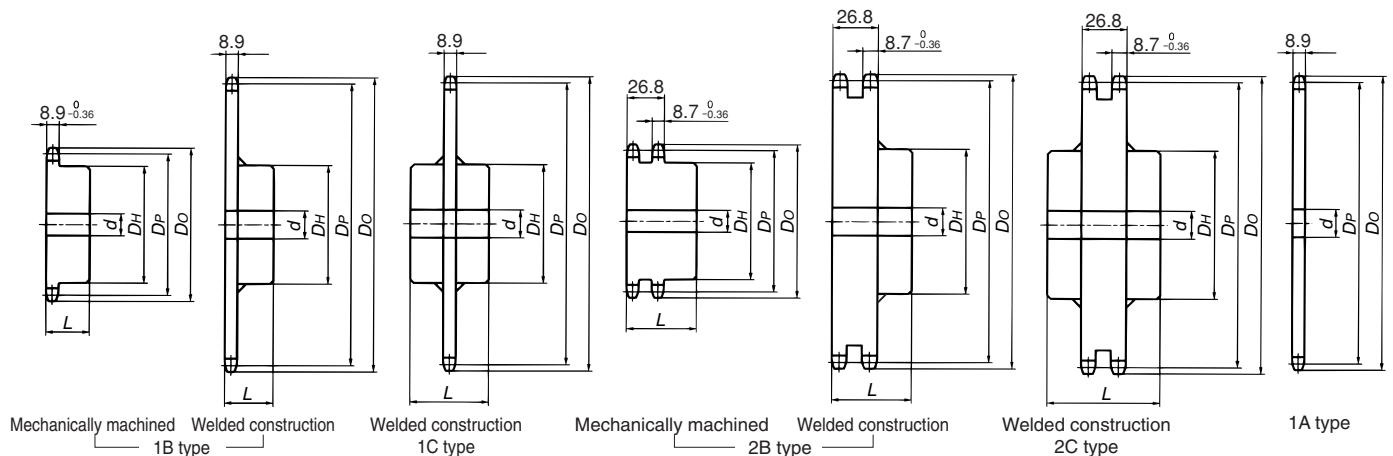
Small Sprocket No. of Teeth	Lubrication Type	Small Sprocket Max r/min																											
		A								B										C									
		10	25	50	100	200	300	400	500	700	900	1000	1200	1400	1600	1800	2100	2400	2700	3000	3500	4000	4500	5000	5500	6000			
9	0.10	0.23	0.43	0.80	1.49	2.15	2.78	3.40	4.60	5.77	6.35	5.66	4.49	3.67	3.08	2.44	2.00	1.68	1.43	1.13	0.93	0.78	0.66	0.57	0.51				
10	0.11	0.26	0.48	0.90	1.67	2.41	3.12	3.81	5.16	6.47	7.11	6.63	5.26	4.30	3.60	2.87	2.34	1.96	1.68	1.33	1.09	0.91	0.78	0.67	0.59				
11	0.12	0.28	0.53	0.99	1.85	2.67	3.46	4.22	5.72	7.17	7.88	7.65	6.07	4.96	4.16	3.30	2.70	2.27	1.93	1.54	1.25	1.05	0.90	0.78	0.69				
12	0.14	0.31	0.58	1.09	2.03	2.93	3.80	4.64	6.28	7.88	8.66	8.72	6.91	5.66	4.74	3.76	3.08	2.58	2.20	1.75	1.43	1.20	1.02	0.89	0.78				
13	0.15	0.34	0.64	1.19	2.22	3.19	4.14	5.06	6.85	8.59	9.44	9.83	7.76	6.38	5.34	4.25	3.47	2.91	2.48	1.97	1.61	1.35	1.16	1.00	0				
14	0.16	0.37	0.69	1.29	2.40	3.46	4.48	5.48	7.42	9.30	10.2	11.0	8.73	7.13	5.98	4.74	3.88	3.25	2.78	2.20	1.81	1.51	1.29	1.12	0				
15	0.17	0.40	0.74	1.39	2.59	3.73	4.83	5.91	7.99	10.0	11.0	12.2	9.72	7.91	6.63	5.26	4.30	3.60	3.08	2.44	2.00	1.68	1.43	1.24	0				
16	0.19	0.43	0.80	1.49	2.78	4.00	5.18	6.33	8.57	10.7	11.8	13.4	10.7	8.73	7.30	5.79	4.74	3.97	3.39	2.69	2.20	1.84	1.57	1.37	0				
17	0.20	0.46	0.85	1.59	2.96	4.27	5.53	6.76	9.15	11.5	12.6	14.7	11.7	9.55	7.98	6.34	5.19	4.35	3.72	2.95	2.41	2.02	1.72	1.50	0				
18	0.21	0.49	0.91	1.69	3.15	4.54	5.88	7.19	9.73	12.2	13.4	15.8	12.7	10.4	8.73	6.91	5.66	4.74	4.04	3.21	2.63	2.20	1.88	0	0				
19	0.23	0.51	0.96	1.79	3.34	4.81	6.24	7.62	10.3	12.9	14.2	16.8	13.8	11.3	9.48	7.46	6.13	5.14	4.39	3.48	2.85	2.39	2.04	0	0				
20	0.24	0.54	1.01	1.89	3.53	5.09	6.59	8.06	10.9	13.7	15.0	17.7	14.9	12.2	10.2	8.06	6.63	5.55	4.74	3.76	3.08	2.58	2.20	0	0				
21	0.25	0.57	1.07	2.00	3.72	5.36	6.95	8.49	11.5	14.4	15.8	18.7	16.0	13.1	11.0	8.73	7.14	5.98	5.10	4.04	3.31	2.78	2.37	0	0				
22	0.26	0.60	1.12	2.10	3.91	5.64	7.31	8.93	12.1	15.2	16.7	19.6	17.2	14.0	11.8	9.33	7.61	6.41	5.47	4.34	3.55	2.98	2.54	0	0				
23	0.28	0.63	1.18	2.20	4.11	5.92	7.66	9.37	12.7	15.9	17.5	20.6	18.4	15.0	12.6	10.0	8.21	6.85	5.85	4.64	3.80	3.19	0	0	0				
24	0.29	0.66	1.24	2.30	4.30	6.19	8.03	9.81	13.3	16.7	18.3	21.6	19.6	16.0	13.4	10.7	8.73	7.30	6.23	4.95	4.04	3.39	0	0	0				
25	0.30	0.69	1.29	2.41	4.49	6.47	8.39	10.3	13.9	17.4	19.1	22.5	20.8	17.0	14.3	11.3	9.25	7.76	6.63	5.26	4.30	3.60	0	0	0				
26	0.32	0.72	1.35	2.51	4.69	6.75	8.75	10.7	14.5	18.2	20.0	23.5	22.1	18.1	15.1	12.0	9.85	8.21	7.03	5.57	4.57	3.83	0	0	0				
28	0.34	0.78	1.46	2.72	5.08	7.32	9.48	11.6	15.7	19.7	21.6	25.5	24.7	20.1	16.9	13.4	11.0	9.18	7.83	6.23	5.10	4.28	0	0	0				
30	0.37	0.84	1.57	2.93	5.47	7.88	10.2	12.5	16.9	21.2	23.3	27.4	27.4	22.4	18.7	14.8	12.2	10.2	8.73	6.91	5.66	0	0	0	0				
32	0.40	0.90	1.69	3.14	5.87	8.45	10.9	13.4	18.1	22.7	25.0	29.4	30.1	24.8	20.7	16.4	13.4	11.3	9.62	7.61	6.23	0	0	0	0				
35	0.44	0.99	1.86	3.46	6.46	9.31	12.1	14.7	20.0	25.0	27.5	32.4	34.5	28.4	23.6	18.7	15.4	12.8	11.0	8.73	7.13	0	0	0	0				
40	0.50	1.15	2.14	4.00	7.47	10.8	13.9	17.0	23.1	28.9	31.8	37.5	42.1	34.6	28.9	22.9	18.7	15.7	13.4	10.7	0	0	0	0	0				
45	0.57	1.30	2.44	4.54	8.48	12.2	15.8	19.3	26.2	32.8	36.1	42.5	48.9	41.1	34.4	27.3	22.4	18.7	16.0	0	0	0	0	0	0				

Note: 1. KW rating when using a one-pitch offset link (OL) is 80% of the above.
 2. Please consult Tsubaki prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

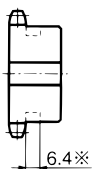
RS50 Sprocket



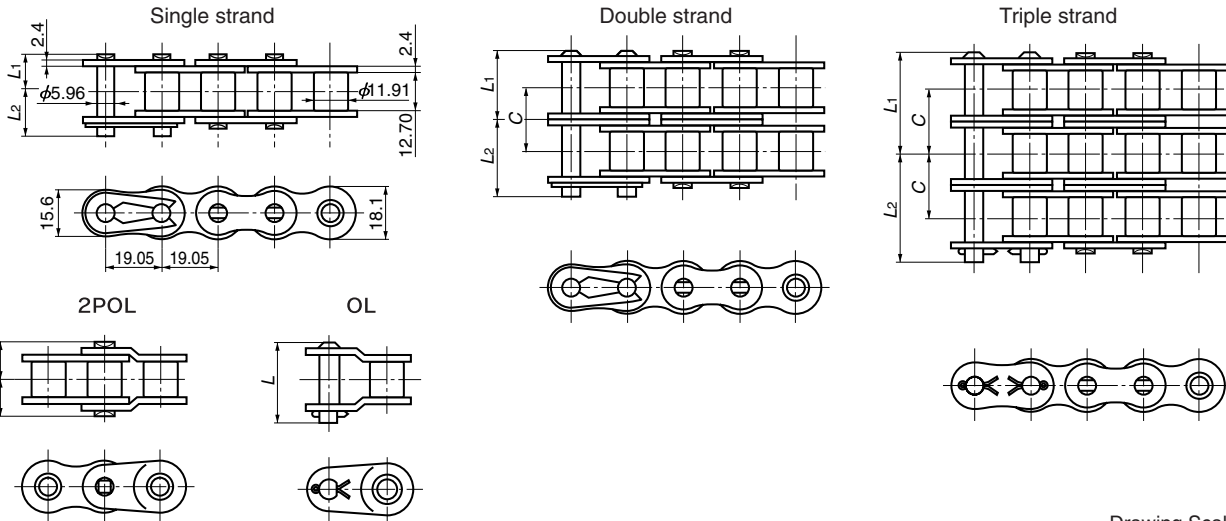
Number of Teeth	1B type							1C type							2B type							2C type							1A type			Number of Teeth
	Pitch Circular Diameter (Dp)	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material		Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material		Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material		Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material	Pitch Bore Diameter	Approx. Mass (kg)	Material					
9	46.42	53	9.5	19	34	25	0.20	*																					9			
10	51.37	58	9.5	22	40	25	0.27	*																					10			
11	56.35	63	12.7	25	46	25	0.33	*																					11			
12	61.34	68	12.7	32	51	25	0.41	*																					12			
13	66.33	73	12.7	32	51	25	0.46	*																					13			
14	71.34	79	12.7	32	52	25	0.52	*																					14			
15	76.35	84	12.7	35	57	25	0.62	*																					15			
16	81.37	89	12.7	40	62	25	0.72	*																					16			
17	86.39	94	12.7	45.5	67	25	0.83	*																					17			
18	91.42	100	12.7	47.5	72	28	1.0	*																					18			
19	96.45	105	15.9	47.5	73	28	1.1	*																					19			
20	101.48	110	15.9	47.5	73	28	1.2	*																					20			
21	106.51	115	15.9	47.5	73	28	1.2	*																					21			
22	111.55	120	15.9	47.5	73	28	1.3	*																					22			
23	116.59	125	15.9	47.5	73	28	1.3	*																					23			
24	121.62	130	15.9	47.5	73	28	1.4	*																					24			
25	126.66	135	15.9	47.5	73	28	1.5	*																					25			
26	131.70	140	18	48	73	28	1.5	*																					26			
27	136.74	145	18	48	73	28	1.5	*																					27			
28	141.79	150	18	48	73	28	1.6	*																					28			
30	151.87	161	18	48	73	28	1.8	*	18	55	83	50	2.7																30			
32	161.96	171	18	48	73	28	1.9	*	18	55	83	50	2.9																32			
34	172.05	181	18	48	73	28	2.1	*	18	55	83	50	3.2																34			
35	177.10	186	18	48	73	28	2.2	*	18	55	83	50	3.3																35			
36	182.15	191	23	55	83	35	2.7	*	23	55	83	50	3.4																36			
38	192.24	201	23	55	83	35	2.9	*	23	55	83	50	3.6																38			
40	202.33	211	23	55	83	35	3.1	*	23	55	83	50	3.8																40			
42	212.43	221	23	55	83	35	3.3	*	23	55	83	50	4.0																42			
45	227.58	237	23	55	83	35	3.6	*	23	55	83	50	4.4																45			
48	242.73	252	23	55	83	35	4.0	*	23	55	83	50	4.8																48			
50	252.82	262	23	55	83	35	4.3	*	23	55	83	50	5.0																50			
54	273.03	282	23	55	83	35	4.8	*	23	55	83	50	5.6																54			
60	303.33	312	23	55	83	35	5.6	*	23	63	93	60	7.5																60			
65	328.58	338	23	63	93	40	6.9	*	23	63	93	60	8.3																65			
70	353.84	363	23	63	93	40	7.7	*	23	63	93	60	9.3																70			
75	379.10	388	23	63	93	40	8.6	*	23	63	93	60	10.3																75			

- Note: 1. Maximum bore diameter is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.
 2. Models in shaded areas have hardened teeth.
 3. The outer diameters above are given for the 1B type. Diameters vary slightly for all other types.
 4. 1B-type sprockets marked with an * have an outer groove around the hub. Groove outer diameter is 27 for 9T, 37 for 11T, 42 for 12T and 47 for 13T.
 5. For single-strand sprockets without hardened teeth, the Strong Series of sprocket with hardened teeth can be made-to-order.
 6. Welded specification: machine-structural carbon steel (teeth) and structural rolled steel (hub).

Sprocket Number RS50 -2B 15T



RS60



Drawing Scale 1/2.4

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS60-1	1	27.6	12.85	14.75	28.2	22.8	Riveting Cotter pin	34.2 {3487}	40.2 {4100}	44.1 {4500}	8.83 {900}	1.53
RS60-2	2	50.5	24.25	26.25	52.6		Riveting	68.4 {6975}	80.4 {8200}	88.3 {9000}	15.0 {1530}	3.04
RS60-3	3	73.8	35.65	38.15	75.5			102.6 {10462}	121 {12300}	132 {13500}	22.1 {2250}	4.54
RS60-4	4	96.6	47.05	49.55	98.3			—	161 {16400}	177 {18000}	29.1 {2970}	6.04
RS60-5	5	119.5	58.5	61.0	121.2			—	201 {20500}	221 {22500}	34.4 {3510}	7.54
RS60-6	6	142.4	69.9	72.5	144.0			—	241 {24600}	265 {27000}	40.6 {4140}	9.05

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 160

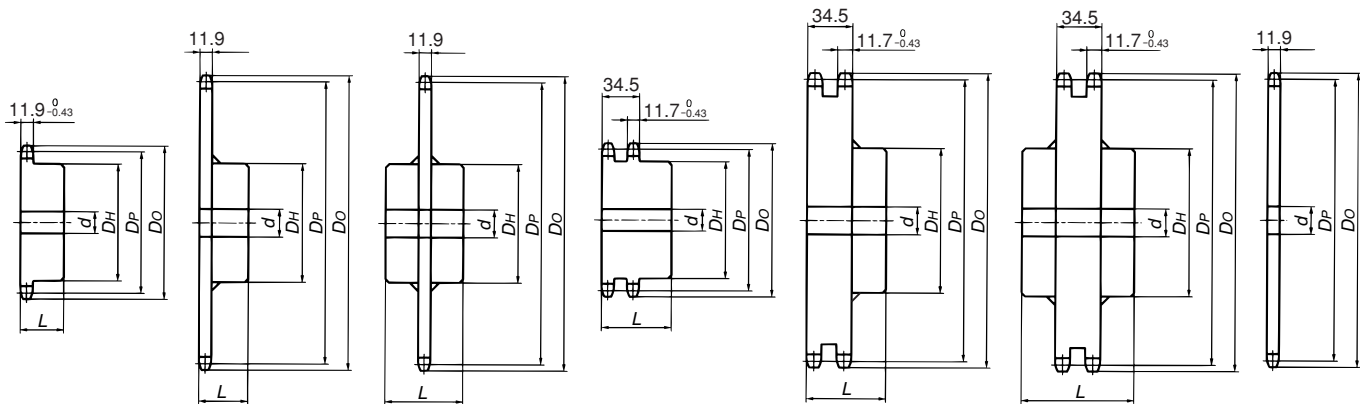
■ RS60-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Lubrication Type	Small Sprocket Max r/min																											
		10	25	50	100	150	200	300	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2500	3000	3500	4000	4500			
		A														B										C			
9	0.18	0.41	0.76	1.41	2.03	2.63	3.79	4.92	6.01	7.08	8.14	9.17	10.1	8.62	7.45	6.54	5.19	4.25	3.57	3.04	2.18	1.66	1.31	1.07	0.90				
10	0.20	0.45	0.85	1.58	2.28	2.95	4.25	5.51	6.73	7.94	9.12	10.3	11.4	10.1	8.79	7.68	6.08	4.98	4.17	3.56	2.55	1.94	1.54	1.26	1.05				
11	0.22	0.50	0.94	1.75	2.53	3.27	4.71	6.11	7.46	8.80	10.1	11.4	12.7	11.6	10.1	8.88	7.02	5.74	4.81	4.11	2.94	2.24	1.78	1.45	1.22				
12	0.24	0.55	1.03	1.93	2.77	3.59	5.18	6.71	8.20	9.66	11.1	12.5	13.9	13.3	11.6	10.1	7.98	6.54	5.48	4.69	3.35	2.55	2.02	1.66	1.39				
13	0.26	0.60	1.13	2.10	3.03	3.92	5.65	7.31	8.94	10.5	12.1	13.6	15.2	15.0	13.0	11.3	9.03	7.38	6.19	5.28	3.78	2.87	2.28	1.87	0				
14	0.29	0.65	1.22	2.28	3.28	4.25	6.12	7.92	9.69	11.4	13.1	14.8	16.4	16.7	14.5	12.7	10.1	8.28	6.91	5.90	4.22	3.22	2.55	2.09	0				
15	0.31	0.70	1.31	2.45	3.53	4.57	6.59	8.54	10.4	12.3	14.1	15.9	17.7	18.5	16.1	14.0	11.2	9.18	7.68	6.54	4.69	3.56	2.83	2.31	0				
16	0.33	0.75	1.41	2.63	3.79	4.90	7.06	9.15	11.2	13.2	15.1	17.1	19.0	20.4	17.7	15.6	12.3	10.1	8.43	7.21	5.16	3.92	3.11	2.55	0				
17	0.35	0.81	1.50	2.81	4.04	5.24	7.54	9.77	11.9	14.1	16.2	18.2	20.3	22.3	19.4	17.1	13.5	11.0	9.25	7.91	5.65	4.30	3.41	2.79	0				
18	0.38	0.86	1.60	2.98	4.30	5.57	8.02	10.4	12.7	15.0	17.2	19.4	21.6	23.7	21.1	18.6	14.7	12.0	10.1	8.58	6.16	4.69	3.72	3.04	0				
19	0.40	0.91	1.70	3.16	4.56	5.90	8.51	11.0	13.5	15.9	18.2	20.6	22.9	25.1	22.9	20.2	16.0	13.1	10.9	9.33	6.68	5.08	4.03	3.30	0				
20	0.42	0.96	1.79	3.34	4.82	6.24	8.99	11.6	14.2	16.8	19.3	21.7	24.2	26.6	24.7	21.8	17.2	14.1	11.8	10.1	7.21	5.48	4.35	0	0				
21	0.44	1.01	1.89	3.53	5.08	6.58	9.48	12.3	15.0	17.7	20.3	22.9	25.5	28.0	26.6	23.5	18.5	15.1	12.7	10.8	7.76	5.90	4.69	0	0				
22	0.47	1.06	1.99	3.71	5.34	6.92	9.96	12.9	15.8	18.6	21.4	24.1	26.8	29.4	28.5	25.2	19.8	16.3	13.6	11.6	8.28	6.33	5.02	0	0				
23	0.49	1.12	2.08	3.89	5.60	7.26	10.5	13.5	16.6	19.5	22.4	25.3	28.1	30.9	30.5	26.9	21.2	17.4	14.5	12.5	8.88	6.77	5.36	0	0				
24	0.51	1.17	2.18	4.07	5.87	7.60	10.9	14.2	17.3	20.4	23.5	26.5	29.4	32.3	32.5	28.5	22.6	18.5	15.5	13.3	9.48	7.21	5.72	0	0				
25	0.54	1.22	2.28	4.26	6.13	7.94	11.4	14.8	18.1	21.3	24.5	27.7	30.7	33.8	34.6	30.3	24.0	19.7	16.5	14.1	10.1	7.68	6.08	0	0				
26	0.56	1.28	2.38	4.44	6.40	8.29	11.9	15.5	18.9	22.3	25.6	28.9	32.1	35.3	36.7	32.2	25.5	20.9	17.5	14.9	10.7	8.13	6.45	0	0				
28	0.61	1.38	2.58	4.81	6.93	8.98	12.9	16.7	20.5	24.1	27.7	31.3	34.8	38.2	41.0	36.0	28.5	23.4	19.5	16.7	11.9	9.10	0	0	0				
30	0.65	1.49	2.78	5.18	7.46	9.67	13.9	18.0	22.1	26.0	29.9	33.7	37.4	41.2	44.9	39.9	31.6	25.9	21.7	18.5	13.3	10.1	0	0	0				
32	0.70	1.60	2.98	5.56	8.00	10.4	14.9	19.3	23.7	27.9	32.0	36.1	40.1	44.1	48.1	43.9	34.8	28.5	23.9	20.4	14.6	11.1	0	0	0				
35	0.77	1.76	3.28	6.12	8.82	11.4	16.5	21.3	26.1	30.7	35.3	39.8	44.2	48.6	53.0	50.3	39.8	32.6	27.3	23.4	16.7	12.7	0	0	0				
40	0.89	2.03	3.79	7.07	10.2	13.2	19.0	24.6	30.1	35.5	40.7	45.9	51.1	56.2	61.2	61.4	49.0	39.9	33.4	28.5	20.4	0	0	0	0				
45	1.01	2.31	4.30	8.03	11.6	15.0	21.6	28.0	34.2	40.3	46.3	52.2	58.0	63.8	69.5	73.3	58.5	47.5	39.8	34.0	24.3	0	0	0	0				

Note: 1. KW rating when using a one-pitch offset link (OL) is 80% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor	Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	Double strand	1.7	Quintuple strand	3.9		B	Oil bath or slinger disc lubrication	
	Triple strand	2.5	Sextuple strand	4.6		C	Forced pump lubrication	
	Quadruple strand	3.3	—	—				

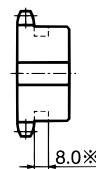
RS60 Sprocket



Mechanically machined 1B type, Welded construction 1B type, Welded construction 1C type, Mechanically machined 2B type, Welded construction 2B type, Welded construction 2C type, 1A type

Number of Teeth	1B type							1C type				2B type				2C type				1A type		Number of Teeth					
	Pitch Circular Diameter (Dp)	Sprocket Outer Diameter (Do)	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)		Material	Pitch Bore Diameter	Approx. Mass (kg)	Material	
9	55.70	63	9.5	24.5	43	32	0.40	※																		9	
10	61.65	68	12.7	30	49	32	0.49	※																			10
11	67.62	76	12.7	32	51	32	0.60	※																			11
12	73.60	82	12.7	32	51	32	0.69																				12
13	79.60	89	15.9	35	57	32	0.81																				13
14	85.61	95	15.9	39.5	62	32	0.96																				14
15	91.63	101	15.9	45.5	68	32	1.1																				15
16	97.65	107	15.9	47.5	73	32	1.3																				16
17	103.67	113	15.9	47.5	73	32	1.4																				17
18	109.70	119	15.9	55	83	40	2.0																				18
19	115.74	126	15.9	55	83	40	2.1																				19
20	121.78	132	15.9	55	83	40	2.2																				20
21	127.82	138	15.9	55	83	40	2.3																				21
22	133.86	144	15.9	55	83	40	2.5																				22
23	139.90	150	18	55	83	40	2.5																				23
24	145.95	156	18	55	83	40	2.6																				24
25	151.99	162	18	55	83	40	2.7																				25
26	158.04	168	18	55	83	40	2.9																				26
27	164.09	174	18	55	83	40	3.0																				27
28	170.14	180	18	55	83	40	3.1																				28
30	182.25	193	18	55	83	40	3.4																				30
32	194.35	205	18	55	83	40	3.7																				32
34	206.46	217	18	55	83	40	4.0																				34
35	212.52	223	18	55	83	40	4.2																				35
36	218.57	229	18	55	83	40	4.4																				36
38	230.69	241	18	55	83	40	4.8																				38
40	242.80	253	18	55	83	40	5.1																				40
42	254.92	266	23	63	93	45	6.0																				42
45	273.09	284	23	63	93	45	6.7																				45
48	291.27	302	23	63	93	45	7.4																				48
50	303.39	314	23	63	93	45	8.0																				50
54	327.63	338	23	63	93	45	8.9																				54
60	363.99	375	23	63	93	45	10.6																				60
65	394.30	405	28	75	107	45	12.8																				65
70	424.61	436	28	75	107	45	14.4																				70
75	454.92	466	28	75	107	45	16.3																				75

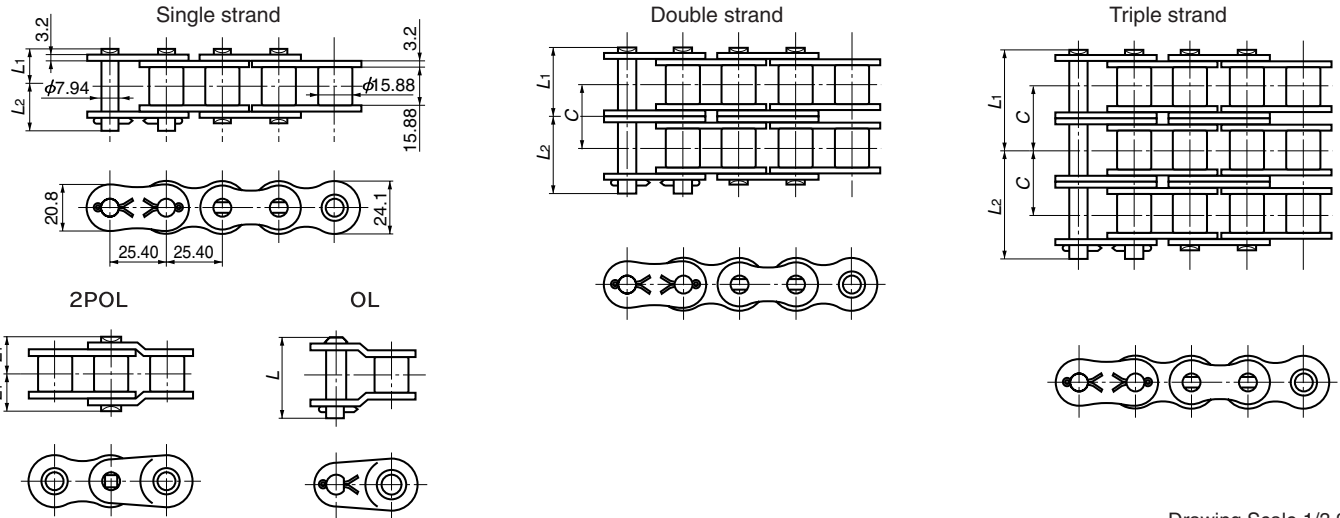
1. Maximum bore diameter is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.
2. Models in shaded areas have hardened teeth.
3. Outer diameters above are given for the 1B type. Diameters vary slightly for all other types.
4. 1B-type sprockets marked with an * have an outer groove around the hub. Groove outer diameter is 32 for 9T, 37 for 10T and 45 for 11T.
5. For single-strand sprockets without hardened teeth, the Strong Series of sprocket with hardened teeth can be made-to-order.
6. Models with approximate masses in bold typeface have one punched hole for lifting.



Sprocket Number RS60 -2B 15T

Number of teeth
Type
Chain number

RS80



Drawing Scale 1/3.2

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS80-1	1	35.5	16.25	19.25	36.6	29.3	Riveting Cotter pin	61.2 {6241}	71.6{7300}	78.5{8000}	14.7{1500}	2.66
RS80-2	2	64.8	30.9	33.9	67.5		Riveting	122.4{12481}	143 {14600}	157 {16000}	25.0{2550}	5.27
RS80-3	3	94.1	45.6	48.5	96.9			183.6{18722}	215 {21900}	235 {24000}	36.8{3750}	7.89
RS80-4	4	123.5	60.25	63.25	126.3			—	286 {29200}	314 {32000}	48.5{4950}	10.50
RS80-5	5	152.9	74.95	77.95	155.6			—	358 {36500}	392 {40000}	57.4{5850}	13.11
RS80-6	6	182.1	89.6	92.5	184.9			—	430 {43800}	471 {48000}	67.7{6900}	15.73

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 120

■ RS80-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

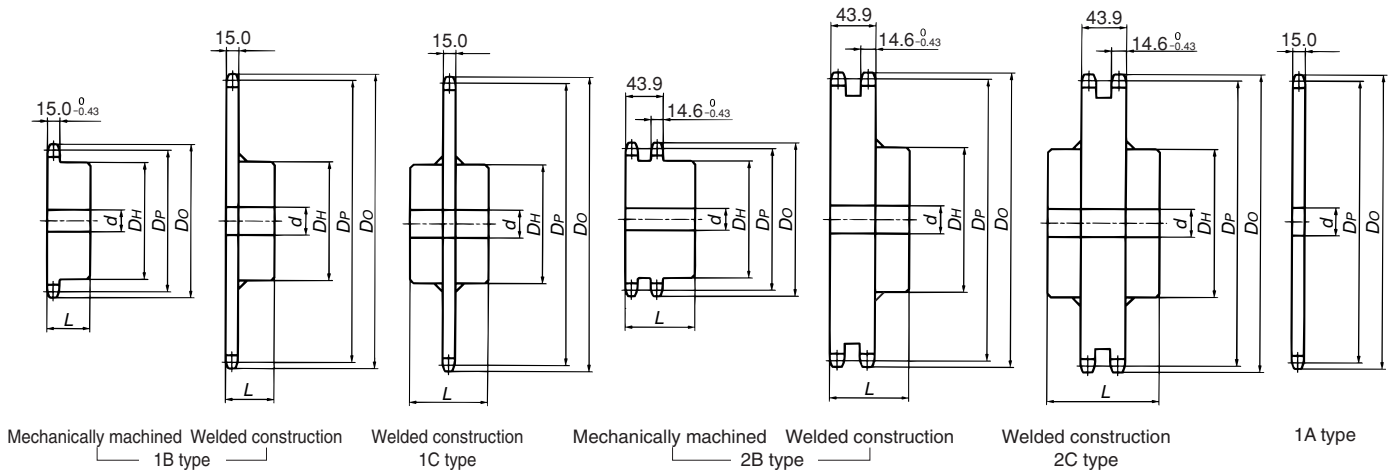
Small Sprocket No. of Teeth	Lubrication Type	Small Sprocket Max r/min																											
		A							B														C						
		10	25	50	100	150	200	300	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2700	3000	3400			
9	0.53	1.21	2.26	4.21	6.07	7.86	11.3	14.7	17.9	18.2	18.2	15.1	12.7	10.8	9.39	8.24	6.54	5.35	4.48	3.83	3.32	2.91	2.44	2.08	1.73				
10	0.59	1.36	2.53	4.72	6.80	8.81	12.7	16.4	20.1	20.4	20.4	17.7	14.9	12.7	11.0	9.65	7.66	6.27	5.25	4.48	3.89	3.41	2.86	2.44	2.02				
11	0.66	1.50	2.80	5.23	7.54	9.76	14.1	18.2	22.3	22.6	22.6	20.4	17.1	14.6	12.7	11.1	8.83	7.23	6.06	5.17	4.48	3.94	3.30	2.82	1.27				
12	0.72	1.65	3.08	5.75	8.28	10.7	15.4	20.0	24.5	24.9	24.9	23.3	19.5	16.7	14.5	12.7	10.1	8.24	6.90	5.89	5.11	4.48	3.76	3.21					
13	0.79	1.80	3.36	6.27	9.03	11.7	16.8	21.8	26.7	27.1	27.1	26.3	22.0	18.8	16.3	14.3	11.3	9.29	7.78	6.65	5.76	5.06	4.24	3.62					
14	0.85	1.95	3.64	6.79	9.78	12.7	18.2	23.6	28.9	29.4	29.4	24.6	21.0	18.2	16.0	12.7	10.4	8.70	7.43	6.44	5.65	4.74	4.04						
15	0.92	2.10	3.92	7.31	10.5	13.6	19.7	25.5	31.1	32.6	32.6	27.3	23.3	20.2	17.7	14.1	11.5	9.65	8.24	7.14	6.27	5.25	4.48						
16	0.99	2.25	4.20	7.84	11.3	14.6	21.1	27.3	33.4	35.9	35.9	30.1	25.7	22.2	19.5	15.5	12.7	10.6	9.08	7.87	6.90	5.79	4.94						
17	1.05	2.40	4.49	8.37	12.1	15.6	22.5	29.2	35.6	39.3	39.3	32.9	28.1	24.4	21.4	17.0	13.9	11.6	9.94	8.62	7.56	6.34	5.41						
18	1.12	2.56	4.77	8.91	12.8	16.6	23.9	31.0	37.9	42.8	42.8	35.9	30.6	26.5	23.3	18.5	15.1	12.7	10.8	9.39	8.24	6.90	5.89						
19	1.19	2.71	5.06	9.44	13.6	17.6	25.4	32.9	40.2	46.0	46.0	38.9	33.2	28.8	25.3	20.1	16.4	13.8	11.7	10.2	8.93	7.49	6.39						
20	1.26	2.87	5.35	9.98	14.4	18.6	26.8	34.8	42.5	48.7	48.7	42.0	35.9	31.1	27.3	21.7	17.7	14.9	12.7	11.0	9.65	8.09							
21	1.32	3.02	5.64	10.5	15.2	19.6	28.3	36.6	44.8	51.3	51.3	45.2	38.6	33.5	29.4	23.3	19.1	16.0	13.6	11.8	10.4	8.70							
22	1.39	3.18	5.93	11.1	15.9	20.6	29.7	38.5	47.1	53.9	53.9	48.5	41.4	35.9	31.5	25.0	20.4	17.1	14.6	12.7	11.1	9.33							
23	1.46	3.33	6.22	11.6	16.7	21.7	31.2	40.4	49.4	56.6	56.6	51.8	44.2	38.3	33.7	26.7	21.9	18.3	15.6	13.6	11.9	9.97							
24	1.53	3.49	6.51	12.2	17.5	22.7	32.7	42.3	51.7	59.3	59.3	55.2	47.2	40.9	35.9	28.5	23.3	19.5	16.7	14.5	12.7	10.6							
25	1.60	3.65	6.81	12.7	18.3	23.7	34.1	44.2	54.1	61.9	61.9	58.7	50.1	43.5	38.1	30.3	24.8	20.8	17.7	15.4	13.5	11.3							
26	1.67	3.80	7.10	13.2	19.1	24.7	35.6	46.1	56.4	64.6	64.6	62.3	53.2	46.1	40.5	32.1	26.3	22.0	18.8	16.3	14.3	12.0							
28	1.81	4.12	7.69	14.4	20.7	26.8	38.6	50.0	61.1	70.0	70.0	69.6	59.4	51.5	45.2	35.9	29.4	24.6	21.0	18.2	16.0								
30	1.95	4.44	8.29	15.5	22.3	28.9	41.6	53.8	65.8	77.2	77.2	77.2	65.9	57.1	50.1	39.8	32.6	27.3	23.3	20.2	17.7								
32	2.09	4.76	8.88	16.6	23.9	30.9	44.6	57.7	70.6	83.2	85.0	85.0	85.0	72.6	62.9	55.2	43.8	35.9	30.1	25.7	22.2	19.5							
35	2.30	5.24	9.79	18.3	26.3	34.1	49.1	63.6	77.7	91.6	97.3	97.3	97.3	83.0	72.0	63.2	50.1	41.0	34.4	29.4	25.5								
40	2.66	6.06	11.3	21.1	30.4	39.4	56.7	73.5	89.8	106	114	114	114	101	87.9	77.2	61.3	50.1	42.0	35.9	14.9								
45	3.02	6.88	12.8	24.0	34.5	44.7	64.4	83.4	102	120	130	130	130	121	105	92.1	73.1	59.8	50.1	40.4									

Note: 1. KW rating when using a one-pitch offset link (OL) is 65% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

RS80 Sprocket

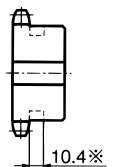
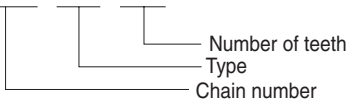


Number of Teeth	1B type							1C type							2B type							2C type							1A type		
	Pitch Circular Diameter (Dp)	Sprocket Outer Diameter (Do)	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material	Bore Diameter (d)	Hub Diameter (DH)	Hub Length (L)	Approx. Mass (kg)	Material	Pilot Bore Diameter	Approx. Mass (kg)	Material	Number of Teeth					
9	74.26	85	15.9	35	58	40	0.87																				9				
10	82.20	93	15.9	32	52	40	0.97																				10				
11	90.16	101	15.9	38	60	40	1.2																				11				
12	98.14	108	19	45	67	40	1.5																				12				
13	106.14	118	19	50	77	40	1.9																				13				
14	114.15	127	19	50	77	40	2.0																				14				
15	122.17	135	19	63	93	40	2.6																				15				
16	130.20	143	19	63	93	40	2.8																				16				
17	138.23	151	19	63	93	40	3.0																				17				
18	146.27	159	19	63	93	40	3.2																				18				
19	154.32	167	23	63	93	40	3.4											23	75	98	89	7.8		23	2.0	19					
20	162.37	176	23	63	93	40	3.6											23	75	107	94	10.7		23	2.2	20					
21	170.42	184	23	63	93	40	3.8											23	75	107	94	11.4		23	2.5	21					
22	178.48	192	28	75	107	45	4.8	28	75	107	60	5.8		28	80	117	71	9.6	28	80	117	100	11.9	28	2.7	22					
23	186.54	200	28	75	107	45	5.1	28	75	107	60	6.1		28	80	117	71	10.3	28	80	117	100	12.7	28	2.9	23					
24	194.60	208	28	75	107	45	5.4	28	75	107	60	6.4		28	80	117	80	11.8	28	80	117	100	13.4	28	3.2	24					
25	202.66	216	28	75	107	45	5.6	28	75	107	60	6.7		28	80	117	80	12.6	28	80	117	100	14.2	28	3.5	25					
26	210.72	224	28	75	107	45	5.9	28	75	107	60	7.0		28	80	117	80	13.5	28	80	117	100	15.1	28	3.8	26					
27	218.79	233	28	75	107	45	6.1	28	75	107	60	7.3		28	80	117	80	14.4	28	80	117	100	16.0	28	4.0	27					
28	226.86	241	28	75	107	45	6.5	28	75	107	65	8.0		28	80	117	80	15.3	28	80	117	100	16.9	28	4.3	28					
30	243.00	257	28	75	107	45	7.1	28	75	107	65	8.7		28	80	117	80	17.2	28	80	117	100	18.8	28	5.0	30					
32	259.14	273	28	75	107	45	7.8	28	75	107	65	9.4		28	80	117	80	19.3	28	80	117	100	20.9	28	5.8	32					
34	275.28	289	28	75	107	45	8.5	28	75	107	65	10.2		28	80	117	80	21.5	28	80	117	100	23.1	28	6.4	34					
35	283.36	297	28	75	107	45	8.9	28	75	107	65	10.7		28	80	117	80	22.7	28	89	127	105	25.6	28	6.9	35					
36	291.43	306	33	80	117	50	10.1	33	80	117	65	11.6		28	80	117	80	23.9	28	89	127	105	26.8	33	7.3	36					
38	307.58	322	33	80	117	50	10.9	33	80	117	80	13.7		28	80	117	80	26.4	28	89	127	105	29.3	33	8.0	38					
40	323.74	338	33	80	117	50	11.8	33	80	117	80	14.6		33	89	127	90	30.4	28	89	127	105	31.8	33	9.0	40					
42	339.89	354	33	80	117	50	12.7	33	80	117	80	15.6		33	89	127	90	33.2	28	89	127	105	34.6	33	9.8	42					
45	364.12	378	33	80	117	50	14.2	33	80	117	80	17.2		33	89	127	90	37.6	28	89	127	105	39.0	33	11.0	45					
48	388.36	403	33	80	117	50	15.8	33	80	117	80	18.9		33	89	127	90	42.3	28	89	127	105	43.7	33	13.0	48					
50	404.52	419	33	80	117	50	16.8	33	80	117	80	20.1		33	89	127	90	45.7	28	89	127	105	47.1	33	14.0	50					
54	436.84	451	33	80	117	50	19.2	33	80	117	80	22.6		33	89	127	90	52.8	28	89	127	105	54.2	33	16.0	54					
60	485.33	500	33	80	117	50	23.1	33	80	117	80	26.7		33	89	127	90	64.5	28	89	127	105	65.9	33	20.0	60					
65	525.73	540	33	89	127	63	28.5	33	89	127	90	32.4		33	89	127	90							33	24.6	65					
70	566.15	581	33	89	127	63	32.1	33	89	127	90	36.5		33	89	127	90							33	28.5	70					
75	606.56	621	33	89	127	63	36.2	33	89	127	90	40.9		33	89	127	90							33	32.8	75					

Note: 1. Maximum bore diameter is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.

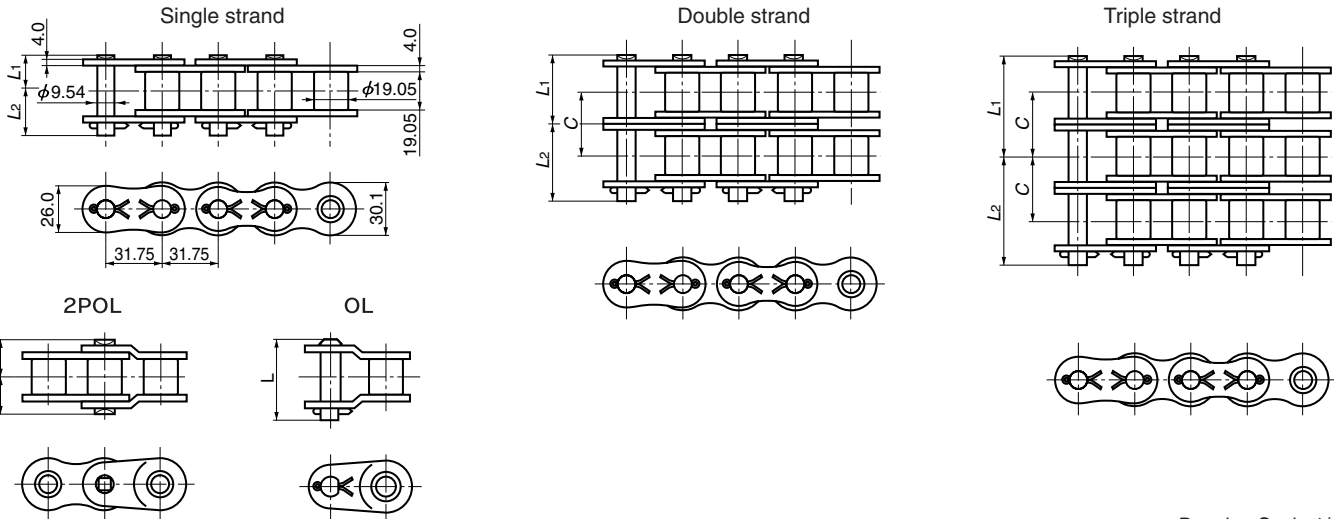
- 2. Models in shaded areas have hardened teeth.
- 3. Outer diameters above are given for the 1B type. Diameters vary slightly for all other types.
- 4. 1B-type sprockets marked with an * have an outer groove around the hub. Groove outer diameter is 44 for 9T.
- 5. For single-strand sprockets without hardened teeth, the Strong Series of sprocket with hardened teeth can be made-to-order.
- 6. Models with approximate masses in bold typeface have one punched hole for lifting.
- 7. Welded specification and structural rolled steel (teeth and hub).

Sprocket Number RS80 -2B 15T



Before Use
 For Safe Use
 Standard Roller Chains
 Lubrication
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling

RS100



Drawing Scale 1/4

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	
RS100-1	1	42.6	19.75	22.85	43.7	35.8	Cotter pin Riveting	95.4 {9728}	107{10900}	118{12000}	22.6 {2300}	3.99	
RS100-2	2	78.5	37.7	40.8	81.5		Cotter pin	190.8{19456}	214{21800}	235{24000}	38.3 {3910}	7.85	
RS100-3	3	114.4	55.65	58.75	117.3		-	-	-	321{32700}	353{36000}	56.4 {5750}	11.77
RS100-4	4	150.2	73.55	76.65	153.1					428{43600}	471{48000}	74.4 {7590}	15.70
RS100-5	5	186.1	91.5	94.6	188.9		Riveting	-	534{54500}	588{60000}	88.0 {8970}	19.53	
RS100-6	6	222.0	109.45	112.55	224.7		-	-	641{65400}	706{72000}	104{10580}	23.48	

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 96

■ RS100-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

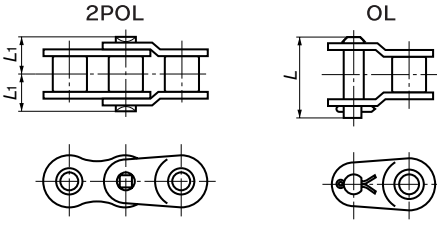
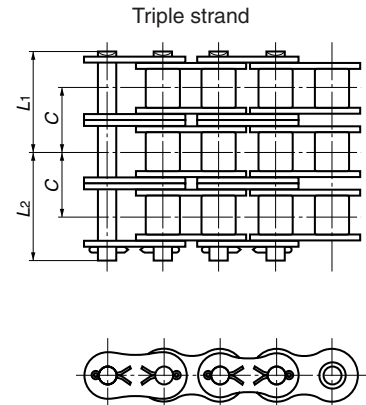
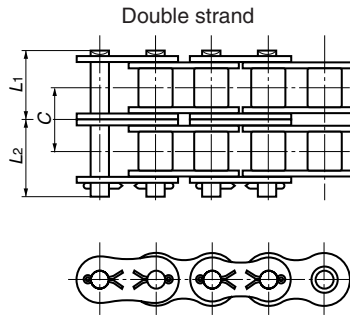
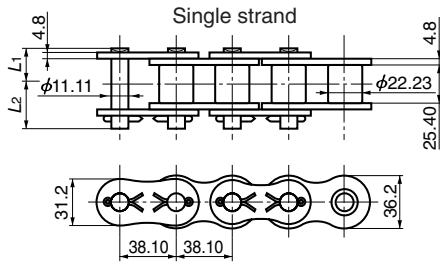
Small Sprocket No. of Teeth	Lubrication Type	Small Sprocket Max r/min																									
		A										B										C					
		10	25	50	100	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000	2200	2400	2600		
9		1.02	2.33	4.34	8.10	11.7	15.1	21.8	26.4	26.4	26.4	22.1	18.1	15.2	12.9	11.2	9.85	8.73	7.82	6.40	5.36	4.58	3.97	3.48	3.09		
10		1.14	2.61	4.86	9.07	13.1	16.9	24.4	29.6	29.6	29.6	25.9	21.2	17.8	15.2	13.1	11.5	10.2	9.15	7.49	6.28	5.36	4.65	4.08	3.62		
11		1.27	2.89	5.39	10.1	14.5	18.8	27.0	32.8	32.8	32.8	29.9	24.4	20.5	17.5	15.2	13.3	11.8	10.6	8.64	7.24	6.18	5.36	4.70	0.96		
12		1.39	3.17	5.92	11.0	15.9	20.6	29.7	36.1	36.1	36.1	34.0	27.9	23.3	19.9	17.3	15.2	13.4	12.0	9.85	8.25	7.05	6.11	5.36			
13		1.52	3.46	6.45	12.0	17.3	22.5	32.4	39.3	39.3	39.3	38.4	31.4	26.3	22.5	19.5	17.1	15.2	13.6	11.1	9.31	7.95	6.89	6.04			
14		1.64	3.75	6.99	13.0	18.8	24.3	35.1	42.9	42.9	42.9	42.9	35.1	29.4	25.1	21.8	19.1	16.9	15.2	12.4	10.4	8.88	7.70	6.76			
15		1.77	4.04	7.53	14.1	20.2	26.2	37.8	47.6	47.6	47.6	47.6	38.9	32.6	27.9	24.1	21.2	18.8	16.8	13.8	11.5	9.85	8.54	7.49			
16		1.90	4.33	8.08	15.1	21.7	28.1	40.5	52.4	52.4	52.4	52.4	42.9	35.9	30.7	26.6	23.3	20.7	18.5	15.2	12.7	10.8	9.40	8.25			
17		2.03	4.62	8.62	16.1	23.2	30.0	43.3	56.0	57.4	57.4	57.4	47.0	39.4	33.6	29.1	25.6	22.7	20.3	16.6	13.9	11.9	10.3				
18		2.15	4.92	9.17	17.1	24.7	31.9	46.0	59.6	62.5	62.5	62.5	51.2	42.9	36.6	31.7	27.9	24.7	22.1	18.1	15.2	12.9	11.2				
19		2.28	5.21	9.72	18.1	26.1	33.9	48.8	63.2	67.8	67.8	67.8	55.5	46.5	39.7	34.4	30.2	26.8	24.0	19.6	16.4	14.0	12.2				
20		2.41	5.51	10.3	19.2	27.6	35.8	51.5	66.8	71.9	71.9	71.9	59.9	50.2	42.9	37.2	32.6	28.9	25.9	21.2	17.8	15.2	13.1				
21		2.55	5.81	10.8	20.2	29.1	37.7	54.3	70.4	75.8	75.8	75.8	64.5	54.0	46.1	40.0	35.1	31.1	27.9	22.8	19.1	16.3	14.1				
22		2.68	6.10	11.4	21.3	30.6	39.7	57.1	74.0	79.7	79.7	79.7	69.1	57.9	49.5	42.9	37.6	33.4	29.9	24.4	20.5	17.5	15.2				
23		2.81	6.40	12.0	22.3	32.1	41.6	59.9	77.7	83.7	83.7	83.7	73.9	61.9	52.9	45.8	40.2	35.7	31.9	26.1	21.9	18.7	5.77				
24		2.94	6.71	12.5	23.4	33.6	43.6	62.8	81.3	87.6	87.6	87.6	78.8	66.0	56.4	48.9	42.9	38.0	34.0	27.9	23.3	19.9					
25		3.07	7.01	13.1	24.4	35.2	45.5	65.6	85.0	91.5	91.5	91.5	83.8	70.2	59.9	51.9	45.6	40.4	36.2	29.6	24.8	21.2					
26		3.21	7.31	13.6	25.5	36.7	47.5	68.4	88.7	95.5	95.5	95.5	88.8	74.4	63.6	55.1	48.4	42.9	38.4	31.4	26.3	22.5					
28		3.47	7.92	14.8	27.6	39.7	51.5	74.1	96.0	103	103	103	99.3	83.2	71.0	61.6	54.0	47.9	42.9	35.1	29.4	25.1					
30		3.74	8.53	15.9	29.7	42.8	55.5	79.9	103	111	111	111	110	92.3	78.8	68.3	59.9	53.2	47.6	38.9	32.6	7.5					
32		4.01	9.15	17.1	31.9	45.9	59.5	85.6	111	121	121	121	121	102	86.8	75.2	66.0	58.6	52.4	42.9	33.7						
35		4.42	10.1	18.8	35.1	50.6	65.5	94.3	122	139	139	139	139	116	99.3	86.1	75.5	67.0	59.9	49.1	41.1						
40		5.10	11.6	21.7	40.5	58.4	75.7	109	141	170	170	170	170	142	121	105	92.3	81.8	73.2	59.9							
45		5.80	13.2	24.7	46.0	66.3	85.9	124	160	196	196	196	195	170	145	125	110	97.6	87.4	33.8							

Note: 1. KW rating when using a one-pitch offset link (OL) is 65% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

RS120



Drawing Scale 1/4.8

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS120-1	1	53.8	24.9	28.9	55.0	45.4	Cotter pin Riveting	137.1{13980}	148{15100}	167 {17000}	30.4 {3100}	5.93
RS120-2	2	99.2	47.6	51.6	103.2		Cotter pin	274.2{27961}	296{30200}	333 {34000}	51.7 {5270}	11.70
RS120-3	3	144.8	70.4	74.4	148.6		Riveting	411.3{41941}	444{45300}	500 {51000}	76.0 {7750}	17.53
RS120-4	4	190.2	93.1	97.1	194.0			-	592{60400}	667 {68000}	100{10230}	23.36
RS120-5	5	235.7	115.85	119.85	239.4		-	-	740{75500}	834 {85000}	119{12090}	29.16
RS120-6	6	281.1	138.55	142.55	284.8		-	-	888{90600}	1000{102000}	140{14260}	34.96

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 80

■ RS120-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

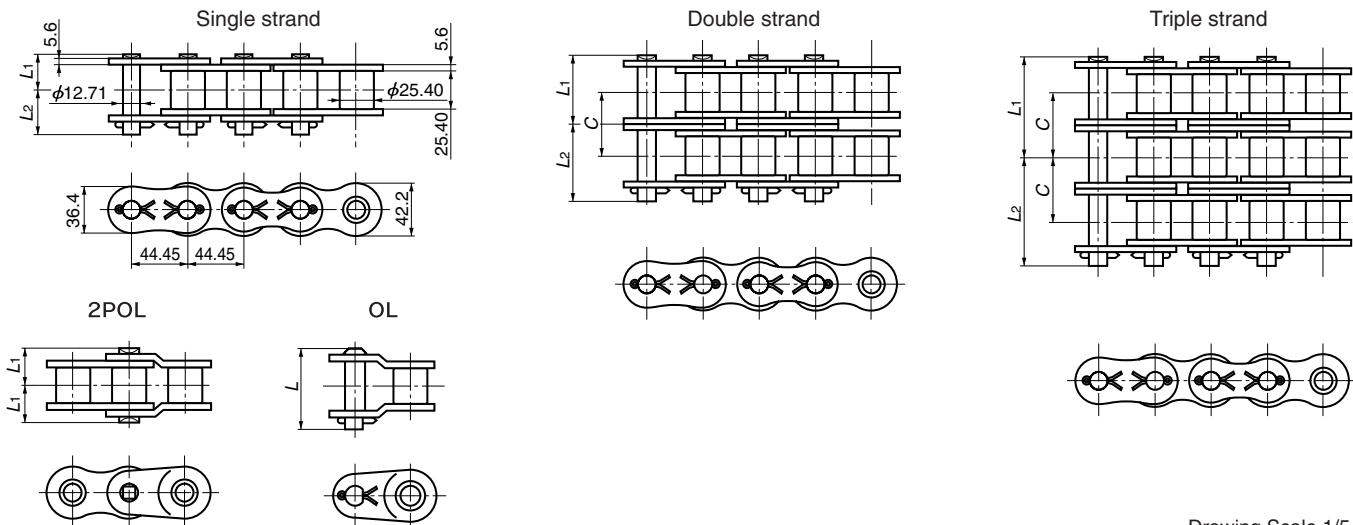
Small Sprocket No. of Teeth	Small Sprocket Max r/min																								
	A							B							C										
	10	25	50	100	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
9	1.65	3.75	7.00	13.1	18.8	24.4	35.1	41.1	41.1	32.2	25.6	20.9	17.5	15.0	13.0	11.4	10.1	9.04	8.15	7.40	6.76	6.20	5.72	5.30	4.92
10	1.84	4.21	7.85	14.6	21.1	27.3	39.4	46.1	46.0	37.7	30.0	24.5	20.5	17.5	15.2	13.3	11.8	10.6	9.55	8.67	7.91	7.26	6.70	6.20	5.76
11	2.04	4.66	8.70	16.2	23.4	30.3	43.6	51.0	51.0	43.5	34.6	28.3	23.7	20.2	17.5	15.4	13.7	12.2	11.0	10.0	9.13	8.38	7.73	7.16	6.71
12	2.24	5.12	9.56	17.8	25.7	33.3	47.9	56.1	56.1	49.6	39.4	32.2	27.0	23.1	20.0	17.5	15.6	13.9	12.6	11.4	10.4	9.55	8.81	8.15	7.70
13	2.45	5.58	10.4	19.4	28.0	36.3	52.3	61.1	61.1	55.9	44.4	36.3	30.5	26.0	22.5	19.8	17.5	15.7	14.2	12.8	11.7	10.8	9.93	9.19	8.74
14	2.65	6.05	11.3	21.1	30.3	39.3	56.6	66.2	66.2	62.5	49.6	40.6	34.0	29.1	25.2	22.1	19.6	17.5	15.8	14.4	13.1	12.0	11.1	10.3	9.87
15	2.86	6.52	12.2	22.7	32.7	42.3	61.0	71.3	71.3	69.3	55.0	45.0	37.7	32.2	27.9	24.5	21.7	19.5	17.5	15.9	14.5	13.3	12.3	11.5	11.0
16	3.06	6.99	13.0	24.3	35.0	45.4	65.4	76.5	76.5	76.4	60.6	49.6	41.6	35.5	30.8	27.0	24.0	21.4	19.3	17.5	16.0	14.7	13.6	12.7	12.2
17	3.27	7.46	13.9	26.0	37.4	48.5	69.8	83.7	83.7	83.7	66.4	54.3	45.5	38.9	33.7	29.6	26.2	23.5	21.2	19.2	17.5	16.1	14.8	13.8	13.3
18	3.48	7.93	14.8	27.6	39.8	51.6	74.3	91.2	91.2	91.2	72.3	59.2	49.6	42.4	36.7	32.2	28.6	25.6	23.1	20.9	19.1	17.5	16.1	14.8	14.3
19	3.69	8.41	15.7	29.3	42.2	54.7	78.7	98.9	98.9	98.9	78.4	64.2	53.8	45.9	39.8	35.0	31.0	27.7	25.0	22.7	20.7	19.0	17.5	16.1	14.8
20	3.90	8.89	16.6	31.0	44.6	57.8	83.2	107	107	107	84.7	69.3	58.1	49.6	43.0	37.7	33.5	30.0	27.0	24.5	22.4	20.5	19.0	17.5	16.1
21	4.11	9.37	17.5	32.6	47.0	60.9	87.7	114	115	115	91.2	74.6	62.5	53.4	46.3	40.6	36.0	32.2	29.1	26.4	24.1	22.1	20.5	19.0	17.5
22	4.32	9.85	18.4	34.3	49.4	64.0	92.2	119	123	123	97.7	80.0	67.0	57.2	49.6	43.5	38.6	34.6	31.2	28.3	25.8	23.4	21.7	20.1	18.6
23	4.53	10.3	19.3	36.0	51.9	67.2	96.8	125	132	132	104	85.5	71.7	61.2	53.0	46.6	41.3	36.9	33.3	30.2	27.6	25.5	23.6	21.9	20.2
24	4.75	10.8	20.2	37.7	54.3	70.3	101	131	140	140	111	91.2	76.4	65.2	56.5	49.6	44.0	39.4	35.5	32.2	29.4	27.0	24.9	23.0	21.2
25	4.96	11.3	21.1	39.4	56.7	73.5	106	137	146	146	118	96.9	81.2	69.3	60.1	52.8	46.8	41.9	37.7	34.3	30.8	28.1	25.7	23.5	21.6
26	5.17	11.8	22.0	41.1	59.2	76.7	110	143	152	152	126	103	86.1	73.5	63.7	55.9	49.6	44.4	40.0	36.3	32.5	29.5	26.9	24.5	22.3
28	5.61	12.8	23.9	44.5	64.1	83.1	120	155	165	165	140	115	96.3	82.2	71.2	62.5	55.5	49.6	44.7	40.6	37.0	33.7	30.8	28.1	25.6
30	6.04	13.8	25.7	48.0	69.1	89.5	129	167	178	178	156	127	107	91.2	79.0	69.3	61.5	55.0	49.6	45.6	41.9	38.5	35.3	32.3	29.5
32	6.47	14.8	27.6	51.4	74.1	96.0	138	179	191	191	171	140	118	100	87.0	76.4	67.8	60.6	54.7	50.0	46.1	42.4	39.0	35.9	32.8
35	7.13	16.3	30.4	56.7	81.6	106	152	197	210	210	196	161	135	115	99.6	87.4	77.5	69.3	63.6	59.0	54.9	50.7	46.9	43.2	39.7
40	8.24	18.8	35.1	65.4	94.3	122	176	228	242	242	240	196	164	140	122	107	94.7	84.4	78.0	73.0	68.0	63.0	58.0	54.0	50.0
45	9.36	21.3	39.8	74.3	107	139	200	259	286	286	286	234	196	167	145	127	111	101	94.0	88.0	82.0	77.0	72.0	67.0	63.0

Note: 1. KW rating when using a one-pitch offset link (OL) is 65% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

RS140



Drawing Scale 1/5.6

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS140-1	1	58.6	26.9	31.7	59.5	48.9	Cotter pin	185.9{18957}	193{19700}	216{22000}	40.2{4100}	7.49
RS140-2	2	107.5	51.35	56.15	112.3			371.8{37913}	386{39400}	431{44000}	68.4{6970}	14.83
RS140-3	3	156.6	75.85	80.75	161.3			557.7{56870}	580{59100}	647{66000}	101{10250}	22.20
RS140-4	4	205.5	100.3	105.2	210.2		-	773{78800}	863{88000}	133{13530}	28.52	
RS140-5	5	254.4	124.8	129.6	259.1		-	966{98500}	1080{110000}	157{15990}	36.97	
RS140-6	6	303.5	149.3	154.2	308.0		-	1160{118200}	1290{132000}	185{18860}	44.30	

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 80

■ RS140-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

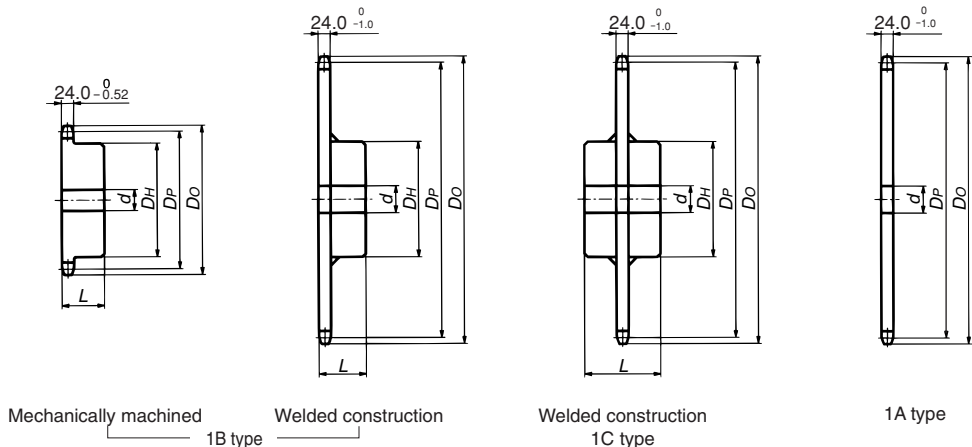
Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min																								
	10	25	50	100	150	200	250	300	350	400	450	500	550	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700
	A			B											C										
9	2.54	5.79	10.8	20.2	29.0	37.6	46.0	54.2	56.1	56.1	56.1	47.9	41.5	36.5	28.9	23.7	19.8	16.9	14.7	12.9	11.4	10.2	9.22	8.37	7.64
10	2.84	6.49	12.1	22.6	32.5	42.2	51.5	60.7	65.6	65.6	65.6	56.1	48.7	42.7	33.9	27.7	23.2	19.8	17.2	15.1	13.4	12.0	10.8	9.81	
11	3.15	7.19	13.4	25.0	36.1	46.7	57.1	67.3	72.7	72.7	72.7	64.8	56.1	49.3	39.1	32.0	26.8	22.9	19.8	17.4	15.4	13.8	12.5	11.3	
12	3.46	7.90	14.7	27.5	39.6	51.3	62.7	73.9	79.9	79.9	79.9	73.8	64.0	56.1	44.5	36.5	30.6	26.1	22.6	19.8	17.6	15.7	14.2	12.9	
13	3.78	8.61	16.1	30.0	43.2	56.0	68.4	80.6	87.1	87.1	87.1	83.2	72.1	63.3	50.2	41.1	34.5	29.4	25.5	22.4	19.8	17.8	16.0	14.5	
14	4.09	9.33	17.4	32.5	46.8	60.6	74.1	87.3	94.4	94.4	94.4	93.0	80.6	70.7	56.1	45.9	38.5	32.9	28.5	25.0	22.2	19.8	17.9	16.2	
15	4.41	10.1	18.8	35.0	50.4	65.3	79.8	94.1	103	103	103	103	89.4	78.4	62.3	51.0	42.7	36.5	31.6	27.7	24.6	22.0	19.8		
16	4.72	10.8	20.1	37.5	54.1	70.0	85.6	101	114	114	114	114	98.5	86.4	68.6	56.1	47.0	40.2	34.8	30.6	27.1	24.2	21.9		
17	5.04	11.5	21.5	40.1	57.7	74.8	91.4	108	124	124	124	124	108	94.6	75.1	61.5	51.5	44.0	38.1	33.5	29.7	26.6	23.9		
18	5.37	12.2	22.8	42.6	61.4	79.5	97.2	115	132	136	136	136	117	103	81.8	67.0	56.1	47.9	41.5	36.5	32.3	28.9	26.1		
19	5.69	13.0	24.2	45.2	65.1	84.3	103	121	140	144	144	144	127	112	88.7	72.6	60.9	52.0	45.1	39.5	35.1	31.4	28.3		
20	6.01	13.7	25.6	47.8	68.8	89.1	109	128	147	152	152	152	138	121	95.8	78.4	65.7	56.1	48.7	42.7	37.9	33.9			
21	6.34	14.5	27.0	50.3	72.5	93.9	115	135	155	161	161	161	148	130	103	84.4	70.7	60.4	52.3	45.9	40.7	36.5			
22	6.66	15.2	28.4	52.9	76.3	98.8	121	142	163	169	169	169	159	139	111	90.5	75.8	64.8	56.1	49.3	43.7	39.1			
23	6.99	15.9	29.8	55.5	80.0	104	127	149	172	177	177	177	170	149	118	96.7	81.1	69.2	60.0	52.7	46.7	41.8			
24	7.32	16.7	31.2	58.2	83.8	109	133	156	180	186	186	186	181	159	126	103	86.4	73.8	64.0	56.1	49.8	44.5			
25	7.65	17.5	32.6	60.8	87.5	113	139	163	188	194	194	194	192	169	134	110	91.9	78.4	68.0	59.7	52.9	47.4			
26	7.98	18.2	34.0	63.4	91.3	118	145	170	196	204	204	204	204	179	142	116	97.4	83.2	72.1	63.3	56.1				
28	8.65	19.7	36.8	68.7	98.9	128	157	185	212	228	228	228	228	200	159	130	109	93.0	80.6	70.7	62.7				
30	9.32	21.3	39.7	74.0	107	138	169	199	229	253	253	253	253	222	176	144	121	103	89.4	78.4	69.6				
32	9.99	22.8	42.5	79.3	114	148	181	213	245	276	276	276	276	244	194	159	133	114	98.5	86.4					
35	11.0	25.1	46.8	87.4	126	163	199	235	270	304	304	304	304	280	222	182	152	130	113	98.9					
40	12.7	29.0	54.1	101	145	188	230	271	312	351	351	351	351	342	271	222	186	159	133						
45	14.4	32.9	61.4	115	165	214	262	308	354	399	408	408	408	408	323	265	222	177	169.2						

Note: 1. KW rating when using a one-pitch offset link (OL) is 65% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

RS140 Sprocket

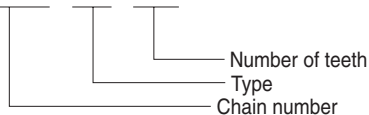


Number of Teeth	Pitch Circular Diameter (DP)	Sprocket Outer Diameter (DO)	1B type					1C type					1A type		Number of Teeth														
			Bore Diameter (d)		Hub		Approx. Mass (kg)	Material	Bore Diameter (d)		Hub		Approx. Mass (kg)	Material		Pilot Bore Diameter (d)	Approx. Mass (kg)	Material											
			Pilot Bore Diameter	Maximum	Diameter (DH)	Length (L)			Pilot Bore Diameter	Maximum	Diameter (DH)	Length (L)																	
10	143.84	163	28	60	91	56	4.4	Mechanically machined: machine-structural carbon steel	33	103	147	115	24.0	33	103	147	115	28	2.8	10									
11	157.77	178	33	73	106	56	5.5											33	103	147	115	25.3	33	103	147	115	33	3.3	11
12	171.74	193	33	80	117	56	6.6											33	103	147	115	26.6	33	103	147	115	33	4.0	12
13	185.74	207	33	80	117	63	7.9											33	103	147	115	29.4	33	103	147	115	33	4.6	13
14	199.76	221	33	89	127	63	9.3											33	103	147	115	30.5	33	103	147	115	33	5.4	14
15	213.79	236	33	89	127	63	10.1											33	103	147	115	32.4	33	103	147	115	33	6.2	15
16	227.84	250	33	89	127	63	11.0											33	103	147	115	34.0	33	103	147	115	33	7.0	16
17	241.91	264	33	89	127	63	12.0											33	103	147	115	37.0	33	103	147	115	33	8.0	17
18	255.98	279	33	95	137	63	13.0											33	103	147	115	41.0	33	103	147	115	33	8.9	18
19	270.06	293	33	95	137	71	15.6											33	103	147	115	44.8	33	103	147	115	33	10.0	19
20	284.14	307	33	95	137	71	16.7	Welded construction: machine-structural carbon steel (teeth) and structural rolled steel (hub)	38	103	147	115	29.4	38	103	147	115	33	11.0	20									
21	298.24	322	33	95	137	71	18.4											38	103	147	115	30.5	38	103	147	115	33	12.2	21
22	312.34	336	33	103	147	71	20.5											38	103	147	115	32.4	38	103	147	115	33	13.4	22
23	326.44	350	33	103	147	71	20.9											38	103	147	115	34.0	38	103	147	115	33	14.6	23
24	340.54	364	33	103	147	71	24.1											38	103	147	115	37.0	38	103	147	115	33	15.9	24
25	354.65	379	38	103	147	80	25.5											38	103	147	115	41.0	38	103	147	115	38	17.2	25
26	368.77	393	38	103	147	80	28.1											38	103	147	115	44.8	38	103	147	115	38	19.3	26
27	382.88	407	38	103	147	80	29.7											38	103	147	115	49.5	38	103	147	115	38	21.0	27
28	397.00	421	38	103	147	80	31.5											38	103	147	115	52.0	38	103	147	115	38	22.6	28
30	425.24	450	38	103	147	80	36.6											38	103	147	115	56.3	38	103	147	115	38	25.8	30
32	453.49	478	38	103	147	80	40.4	38	103	147	115	61.1	38	103	147	115	38	29.6	32										
34	481.75	506	38	103	147	80	42.9	38	103	147	115	66.3	38	103	147	115	38	33.4	34										
35	495.88	521	38	110	157	90	47.0	38	110	157	125	67.0	38	110	157	125	38	35.1	35										
36	510.01	535	38	110	157	90	51.3	38	110	157	125	76.0	38	110	157	125	38	37.5	36										
38	538.27	563	38	110	157	90	53.1	38	110	157	125	83.7	38	110	157	125	38	41.8	38										
40	566.54	591	38	110	157	90	56.4	38	118	167	130	89.8	38	118	167	130	38	45.9	40										
42	594.81	620	38	118	167	94	63.2	38	118	167	130	101.8	38	118	167	130	38	51.1	42										
45	637.22	662	38	118	167	94	70.8	38	118	167	130	103.6	38	118	167	130	38	58.2	45										
48	679.63	705	38	118	167	94	79.0	38	118	167	130	117.0	38	118	167	130	38	66.2	48										
50	707.91	733	38	118	167	94	84.8	38	118	167	130	125.2	38	118	167	130	38	72.4	50										
54	764.47	790	38	118	167	94	97.1	38	118	167	130		38	118	167	130	38	84.5	54										
60	849.32	875	38	118	167	94	117.0	38	118	167	155		38	118	167	155	38	103.6	60										

- Note: 1. Maximum bore diameter is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.
 2. Models in shaded areas have hardened teeth.
 3. For sprockets without hardened teeth, the Strong Series of sprocket with hardened teeth can be made-to-order.
 4. Models with approximate masses in bold typeface have one punched hole for lifting.

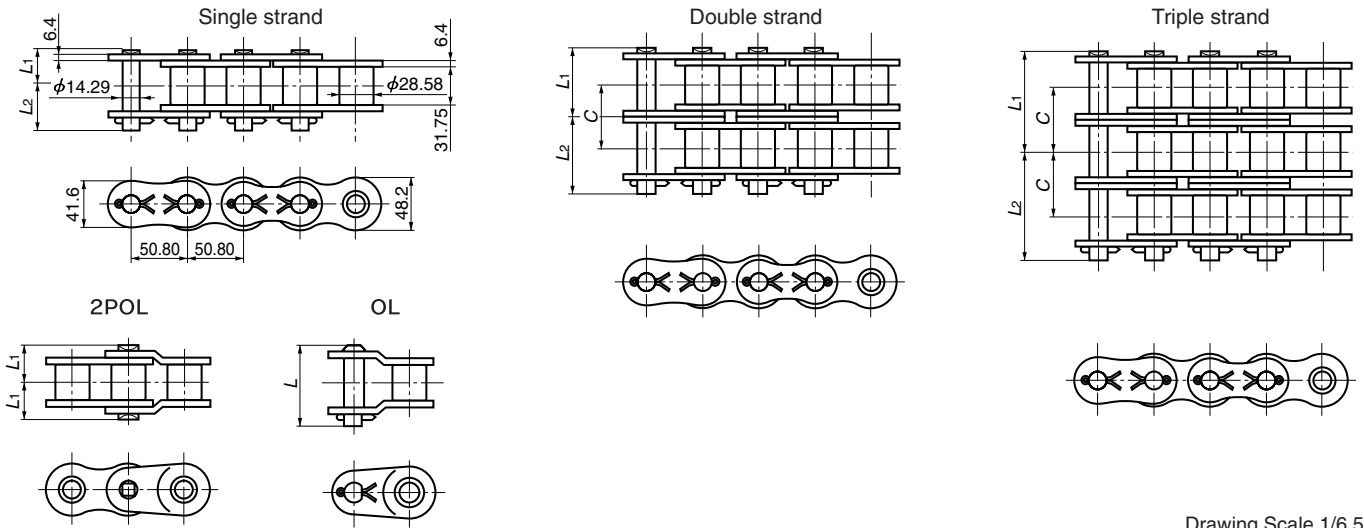
Sprocket Number

RS140 -1B 15T



Before Use
 For Safe Use
 Standard Roller Chains
 Lubrication
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling

RS160



Drawing Scale 1/6.5

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS160-1	1	68.7	31.85	36.85	70.2	58.5	Cotter pin	244.6{24942}	255 {26000}	279 {28500}	53.0{5400}	10.10
RS160-2	2	127.3	61.15	66.15	132.2			489.2{49885}	510 {52000}	559 {57000}	90.0{9180}	20.04
RS160-3	3	185.9	90.45	95.45	190.7			733.8{74827}	765 {78000}	838 {85500}	132{13500}	30.02
RS160-4	4	244.4	119.75	124.65	249.2		—	1020{104000}	1120{114000}	175{17820}	40.06	
RS160-5	5	303.0	149.05	153.95	307.7		—	1270{130000}	1400{142500}	207{21060}	49.89	
RS160-6	6	361.6	178.3	183.3	366.2		—	1530{156000}	1680{171000}	244{24840}	59.93	

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 60

■ RS160-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

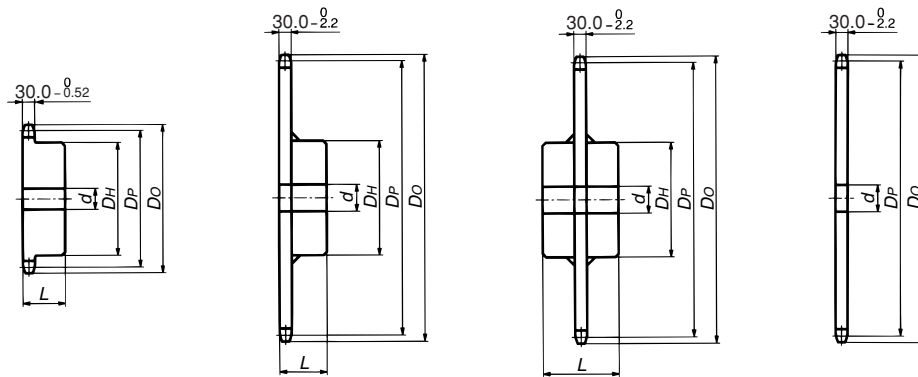
Small Sprocket No. of Teeth	Small Sprocket Max r/min																							
	10	25	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300
9	3.82	8.72	16.3	30.4	43.8	56.7	69.3	74.5	74.5	74.5	62.5	53.3	46.2	40.6	36.0	32.2	29.0	26.4	24.1	22.1	18.9	16.3	14.3	12.7
10	4.29	9.78	18.2	34.0	49.0	63.5	77.6	87.3	87.3	87.3	73.2	62.5	54.1	47.5	42.1	37.7	34.0	30.9	28.2	25.9	22.1	19.1	16.8	14.9
11	4.75	10.8	20.2	37.7	54.3	70.4	86.1	98.5	98.5	98.5	84.4	72.1	62.5	54.8	48.6	43.5	39.2	35.6	32.5	29.8	25.5	22.1	19.4	17.2
12	5.22	11.9	22.2	41.4	59.7	77.3	94.5	108	108	108	96.2	82.1	71.2	62.5	55.4	49.6	44.7	40.6	37.0	34.0	29.0	25.2	22.1	19.6
13	5.69	13.0	24.2	45.2	65.1	84.3	103	118	118	118	108	92.6	80.2	70.4	62.5	55.9	50.4	45.7	41.8	38.3	32.7	28.4	24.9	22.1
14	6.16	14.1	26.2	49.0	70.5	91.4	112	128	128	128	121	103	89.7	78.7	69.8	62.5	56.3	51.1	46.7	42.8	36.6	31.7	27.8	24.7
15	6.64	15.1	28.3	52.7	76.0	98.4	120	138	138	138	134	115	99.5	87.3	77.4	69.3	62.5	56.7	51.8	47.5	40.6	35.2	30.9	
16	7.12	16.2	30.3	56.6	81.5	106	129	148	148	148	148	148	126	110	96.2	85.3	76.3	68.8	62.5	57.0	52.3	44.7	38.7	34.0
17	7.60	17.3	32.4	60.4	87.0	113	138	162	162	162	162	162	138	120	105	93.4	83.6	75.4	68.4	62.5	57.3	48.9	42.4	37.2
18	8.09	18.4	34.4	64.2	92.5	120	146	173	177	177	177	177	151	131	115	102	91.1	82.1	74.5	68.1	62.5	53.3	46.2	40.6
19	8.57	19.6	36.5	68.1	98.1	127	155	183	192	192	192	192	164	142	124	110	98.8	89.0	80.8	73.8	67.7	57.8	50.1	44.0
20	9.06	20.7	38.6	72.0	104	134	164	193	207	207	207	207	177	153	134	119	107	96.2	87.3	79.7	73.2	62.5	54.1	47.5
21	9.55	21.8	40.6	75.9	109	142	173	204	220	220	220	220	190	165	145	128	115	103	93.9	85.8	78.7	67.2	58.3	51.1
22	10.0	22.9	42.7	79.8	115	149	182	214	231	231	231	231	204	177	155	138	123	111	101	92.0	84.4	72.1	62.5	
23	10.5	24.0	44.8	83.7	121	156	191	225	243	243	243	243	218	189	166	147	132	119	108	98.3	90.2	77.0	66.8	
24	11.0	25.2	47.0	87.6	126	164	200	236	254	254	254	254	232	201	177	157	140	126	115	105	96.2	82.1	71.2	
25	11.5	26.3	49.1	91.6	132	171	209	246	266	266	266	266	247	214	188	167	149	134	122	111	102	87.3	75.4	
26	12.0	27.4	51.2	95.5	138	178	218	257	277	277	277	277	262	227	199	177	158	143	129	118	108	92.6	80.2	
28	13.0	29.7	55.5	103	149	193	236	278	300	300	300	300	293	254	223	197	177	159	145	132	121	103	89.7	
30	14.0	32.0	59.8	112	161	208	254	300	325	325	325	325	325	281	247	219	196	177	160	146	134	115		
32	15.1	34.3	64.1	120	172	223	273	321	358	358	358	358	358	310	272	241	216	195	177	161	148	126		
35	16.6	37.8	70.6	132	190	246	300	354	407	409	409	409	409	354	311	276	247	223	202	185	169	134		
40	19.2	43.7	81.5	152	219	284	347	409	470	485	485	485	485	433	380	337	302	272	247	225	192			
45	21.7	49.6	92.6	173	249	322	394	464	533	551	551	551	551	517	454	402	360	312	260	202	141			

Note: 1. KW rating when using a one-pitch offset link (OL) is 65% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

RS160 Sprocket



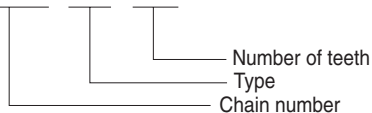
Mechanically machined 1B type Welded construction 1B type Welded construction 1C type 1A type

Number of Teeth	Pitch Circular Diameter (D _p)	Sprocket Outer Diameter (D _o)	1B type					1C type					1A type		Number of Teeth			
			Bore Diameter (d)		Hub		Approx. Mass (kg)	Material	Bore Diameter (d)		Hub		Approx. Mass (kg)	Material		Pilot Bore Diameter (d)	Approx. Mass (kg)	Material
			Pilot Bore Diameter	Maximum	Diameter (D _H)	Length (L)			Pilot Bore Diameter	Maximum	Diameter (D _H)	Length (L)						
10	164.39	187	33	70	105	63	6.8	Mechanically machined: machine-structural carbon steel							33	4.6	Machine-structural carbon steel	10
11	180.31	204	33	80	117	63	8.3								33	5.5		11
12	196.28	220	33	89	127	63	9.9								33	6.6		12
13	212.27	237	33	95	137	71	12.5								33	7.7		13
14	228.29	253	33	95	137	71	13.8								33	8.9		14
15	244.33	269	33	95	137	71	15.2								33	10.3		15
16	260.39	286	33	103	147	71	17.4								33	11.7		16
17	276.46	302	33	103	147	71	18.9								33	13.2		17
18	292.55	319	33	103	147	71	20.6								33	14.8		18
19	308.64	335	33	103	147	71	22.3								33	16.5		19
20	324.74	351	33	103	147	71	24.2								33	18.2		20
21	340.84	368	33	103	147	71	26.1								33	20.1		21
22	356.96	384	38	118	167	80	30.2			38	118	167	125	37.8	38	22.6		22
23	373.07	400	38	118	167	80	33.2			38	118	167	125	40.6	38	25.0		23
24	389.19	416	38	118	167	80	34.4			38	118	167	125	42.2	38	27.0		24
25	405.32	433	38	118	167	80	36.6			38	118	167	125	44.5	38	29.3		25
26	421.45	449	38	118	167	80	38.9			38	118	167	125	46.9	38	31.7		26
27	437.58	465	38	118	167	80	42.7			38	118	167	125	50.0	38	34.4		27
28	453.72	481	38	118	167	80	45.3			38	118	167	125	52.6	38	37.1		28
30	485.99	514	38	118	167	100	52.3		38	118	167	125	57.5	38	42.2	30		
32	518.28	546	38	118	167	100	59.9		38	118	167	125	64.0	38	48.4	32		
34	550.57	579	38	118	167	100	66.2		38	118	167	125	70.3	38	54.7	34		
35	566.72	595	38	118	167	100	68.0		38	118	167	135	74.8	38	57.2	35		
36	582.86	611	38	118	167	100	71.8		38	118	167	135	78.5	38	61.3	36		
38	615.17	644	38	118	167	100	78.7		38	118	167	135	85.6	38	68.3	38		
40	647.47	676	38	132	187	121	93.4		38	132	187	150	94.8	38	75.2	40		
42	679.78	708	38	132	187	121	101.0		38	132	187	150	103.2	38	83.5	42		
45	728.25	757	38	132	187	121	113.2		38	132	187	150	120.3	38	95.2	45		
48	776.72	806	38	132	187	121	126.3		38	132	187	150	133.5	38	108.3	48		
50	809.04	838	38	132	187	121	135.4		38	132	187	150	143.3	38	118.4	50		
54	873.68	903	38	132	187	121	154.9		38	132	187	150	163.0	38	138.1	54		
60	970.65	1000	38	132	187	121	186.8		38	132	187	160	196.6	38	169.4	60		

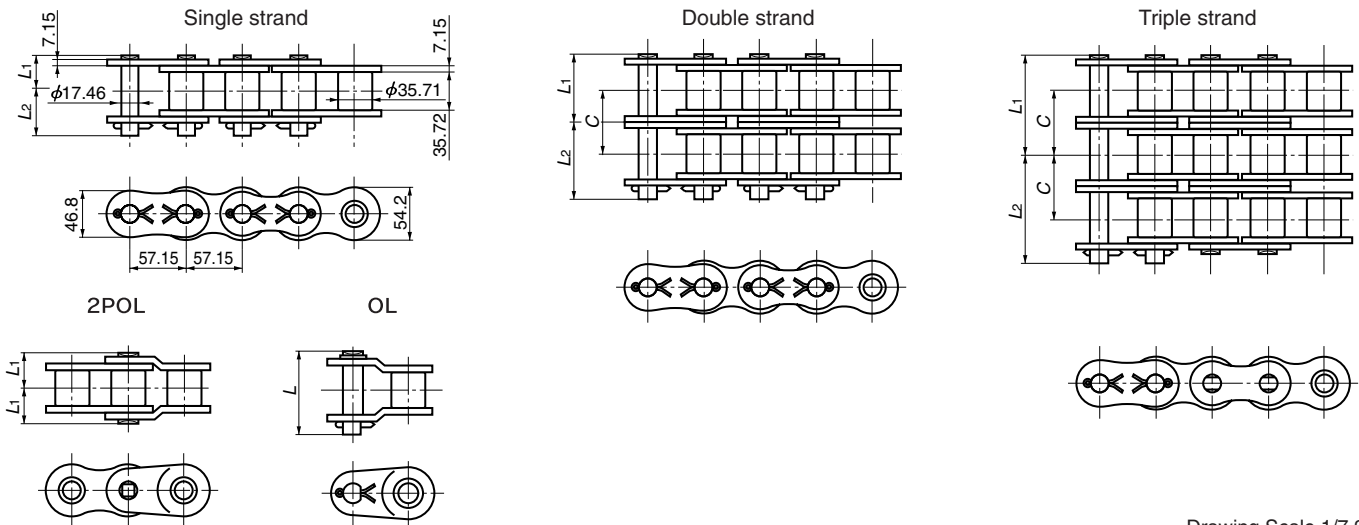
- Note: 1. Maximum bore diameter is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.
 2. Models in shaded areas have hardened teeth.
 3. For sprockets without hardened teeth, the Strong Series of sprocket with hardened teeth can be made-to-order.
 4. Models with approximate masses in bold typeface have one punched hole for lifting.

Sprocket Number

RS160 -1B 15T



RS180



Drawing Scale 1/7.2

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS180-1	1	78.1	35.65	42.45	80.6	65.8	Cotter pin	308.2{31428}	336 {34300}	370 {37700}	60.8{6200}	13.45
RS180-2	2	144.1	68.75	75.35	151.1			616.4{62885}	673 {68600}	739 {75400}	103{10540}	26.52
RS180-3	3	210.2	101.7	108.5	216.9			924.6{94283}	1010{102900}	1110{113100}	152{15500}	38.22
RS180-4	4	276.1	134.65	141.45	282.8		–	1350{137200}	1480{150800}	201{20460}	50.90	
RS180-5	5	342.0	167.6	174.4	348.6		–	1680{171500}	1850{188500}	237{24180}	63.59	
RS180-6	6	407.9	200.55	207.35	414.4		–	2020{205800}	2180{226200}	280{28520}	76.27	

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 54

■ RS180-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

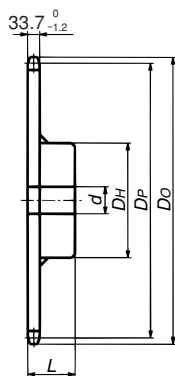
Small Sprocket No. of Teeth	Small Sprocket Max r/min																																																																						
	10			25			50			100			150			200			250			300			350			400			450			500			550			600			650			700			750			800			850			900			950			1000			1050			1100	
Lubrication Type	A						B						C																																																										
9	4.94	11.3	21.0	39.2	56.5	73.2	89.4	90.8	81.9	68.6	58.6	50.8	44.6	39.5	35.4	31.9	29.0	26.4	24.3	22.4	20.7	19.3	18.0																																																
10	5.53	12.6	23.5	43.9	63.3	82.0	100	102	95.9	80.4	68.6	59.5	52.2	46.3	41.4	37.4	33.9	31.0	28.4	26.2	24.3	22.6	21.0																																																
11	6.13	14.0	26.1	48.7	70.1	90.9	111	113	111	92.7	79.2	68.6	60.2	53.4	47.8	43.1	39.1	35.7	32.8	30.2	28.0	26.0	24.3																																																
12	6.73	15.4	28.7	53.5	77.0	100	122	126	126	106	90.2	78.2	68.6	60.9	54.5	49.1	44.6	40.7	37.4	34.4	31.9	29.6	27.6																																																
13	7.34	16.7	31.3	58.3	84.0	109	133	142	142	119	102	88.2	77.4	68.6	61.4	55.4	50.3	45.9	42.1	38.8	36.0	33.4																																																	
14	7.95	18.1	33.9	63.2	91.0	118	144	159	159	133	114	98.5	86.5	76.7	68.6	61.9	56.2	51.3	47.1	43.4	40.2	37.4																																																	
15	8.57	19.5	36.5	68.1	98.0	127	155	176	176	148	126	109	95.9	85.1	76.1	68.6	62.3	56.9	52.2	48.1	44.6	41.4																																																	
16	9.19	21.0	39.1	73.0	105	136	166	191	191	163	139	120	106	93.7	83.9	75.6	68.6	62.7	57.5	53.0	49.1	45.6																																																	
17	9.81	22.4	41.8	77.9	112	145	178	201	201	178	152	132	116	103	91.8	82.8	75.2	68.6	63.0	58.1	53.8																																																		
18	10.4	23.8	44.4	82.9	119	155	189	216	216	194	166	144	126	112	100	90.2	81.9	74.8	68.6	63.3	58.6																																																		
19	11.1	25.2	47.1	87.9	127	164	200	229	229	211	180	156	137	121	109	97.8	88.8	81.1	74.4	68.6	63.5																																																		
20	11.7	26.7	49.8	92.9	134	173	212	243	243	227	194	168	148	131	117	106	95.9	87.6	80.4	74.1	68.6																																																		
21	12.3	28.1	52.5	97.9	141	183	223	256	256	245	209	181	159	141	126	114	103	94.2	86.5	79.7	73.8																																																		
22	13.0	29.6	55.2	103	148	192	235	269	269	262	224	194	170	151	135	122	111	101	92.7	85.5																																																			
23	13.6	31.0	57.9	108	156	202	246	282	282	280	239	208	182	162	145	130	118	108	99.1	91.4																																																			
24	14.2	32.5	60.6	113	163	211	258	299	299	299	255	221	194	172	154	139	126	115	106	97.4																																																			
25	14.9	33.9	63.3	118	170	221	270	318	318	318	271	235	206	183	164	148	134	122	112	104																																																			
26	15.5	35.4	66.1	123	178	230	281	331	337	337	288	249	219	194	174	157	142	130	119																																																				
28	16.8	38.4	71.6	134	192	249	305	359	377	377	322	279	245	217	194	175	159	145	133																																																				
30	18.1	41.3	77.1	144	207	269	328	387	418	418	357	309	271	241	215	194	176	161	148																																																				
32	19.4	44.3	82.7	154	222	288	352	415	448	448	393	341	299	265	237	214	194	177																																																					
35	21.4	48.8	91.1	170	245	317	388	457	494	494	449	390	342	303	271	245	217	164																																																					
40	24.7	56.4	105	196	283	366	448	504	504	504	463	429	391	347	297	242	182																																																						
45	28.1	64.0	119	223	321	416	509	551	551	551	507	471	431	383	329	269	202																																																						

Note: 1. KW rating when using a one-pitch offset link (OL) is 65% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

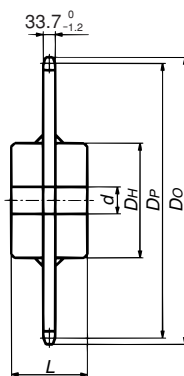
Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	–	–

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

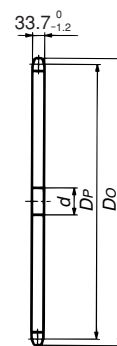
RS180 Sprocket



Welded construction
1B type



Welded construction
1C type



1A type

Number of Teeth	Pitch Circular Diameter (Dp)	Sprocket Outer Diameter (Do)	1B type					1C type					1A type			Number of Teeth			
			Bore Diameter (d)		Hub		Approx. Mass (kg)	Material	Bore Diameter (d)		Hub		Approx. Mass (kg)	Material	Pilot Bore Diameter (d)		Approx. Mass (kg)	Material	
			Pilot Bore Diameter	Maximum	Diameter (Dh)	Length (L)			Pilot Bore Diameter	Maximum	Diameter (Dh)	Length (L)							
11	202.85	229	43	75	110	55	9.3	Welded construction: machine-structural carbon steel (teeth) and structural rolled steel (hub)								43	7.8	Machine-structural carbon steel	11
12	220.81	248	43	85	130	65	12.6									43	9.3		12
13	238.81	266	43	95	150	75	16.6									43	10.9		13
14	256.83	285	43	105	170	80	20.9									43	12.6		14
15	274.87	303	43	110	180	80	23.8									43	14.5		15
16	292.94	322	43	110	180	80	25.9									43	16.5		16
17	311.02	340	43	115	180	80	28.1									43	18.7		17
18	329.12	358	43	115	180	80	29.9									43	21.5		18
19	347.21	377	43	115	180	80	32.4									43	23.9		19
20	365.33	395	43	115	180	80	35.0									43	26.6		20
21	383.45	413							63	120	190	85	38.8	Welded construction: machine-structural carbon steel (teeth) and structural rolled steel (hub)	63	28.9	21		
22	401.57	432							63	120	190	85	41.7		63	31.7	22		
23	419.70	450							63	120	200	90	47.8		63	35.0	23		
24	437.84	468							63	125	200	90	50.2		63	37.9	24		
25	455.99	487							63	125	200	90	53.5		63	41.2	25		
26	474.13	505							63	125	200	90	56.8		63	44.6	26		
27	492.28	523							63	125	200	90	61.3		63	48.5	27		
28	510.43	542							63	125	200	90	65.0		63	52.2	28		
30	546.74	578							63	135	220	110	81.1		63	59.6	30		
32	583.06	615							63	135	220	110	89.6		63	68.4	32		
34	619.39	651						63	135	220	110	98.5	63	77.2	34				
35	637.55	669						63	135	220	110	102.9	63	81.3	35				
36	655.72	688						63	135	220	110	108.0	63	86.7	36				
38	692.06	724						63	135	220	110	118.0	63	96.6	38				
40	728.41	760						63	150	240	125	137.5	63	106.4	40				
42	764.75	797						63	150	240	125	148.9	Welded construction: structural rolled steel (teeth and hub)	63	118.2	42			
45	819.28	852						63	150	240	125	166.1		63	134.8	45			
48	873.81	906						63	150	240	125	184.9		63	153.5	48			
50	910.17	943						63	150	240	125	198.6		63	167.7	50			
54	982.89	1016						63	150	240	125	226.7		63	195.7	54			
60	1091.98	1125						63	150	240	125	272.2		63	240.2	60			

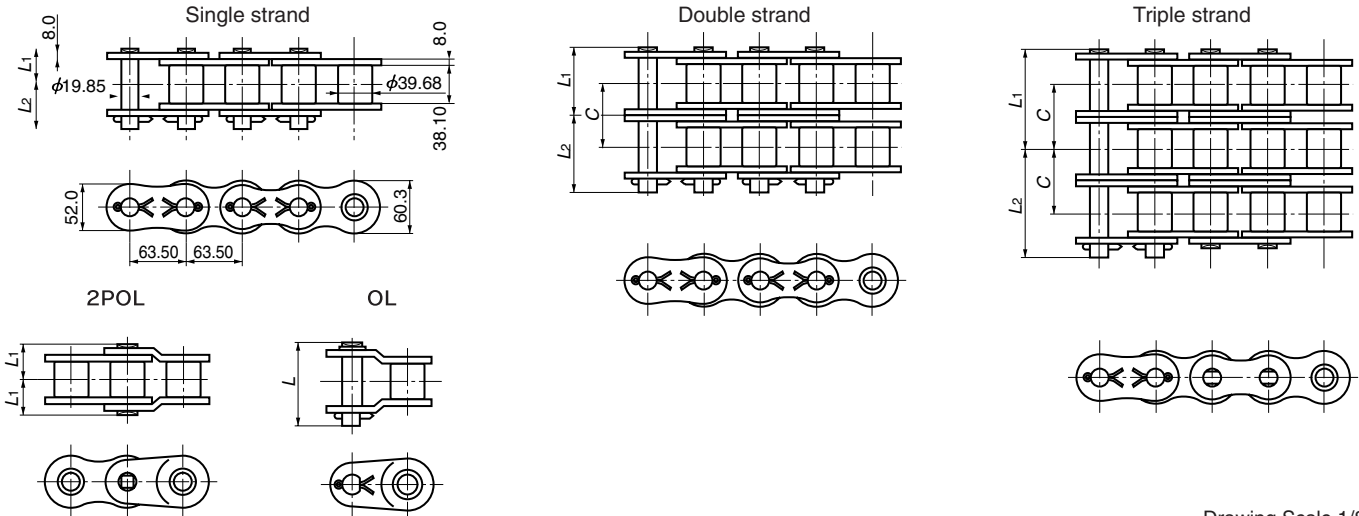
Note: 1. Maximum bore diameter is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.
2. Models with approximate masses in bold typeface have one hole punched for lifting.

Sprocket Number

RS180 -1B 15T



RS200



Drawing Scale 1/8

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS200-1	1	83.8	39.0	44.8	87.3	71.6	Cotter pin	381.7 {38923}	427 {43500}	471 {48000}	71.6{7300}	16.49
RS200-2	2	155.5	74.85	80.65	161.2			763.4 {77845}	853 {87000}	941 {96000}	122{12410}	32.63
RS200-3	3	227.2	110.75	116.45	233.0		Riveting	1145.1{116768}	1280{130500}	1410{144000}	179{18250}	49.02
RS200-4	4	298.9	146.6	152.3	304.7			—	1710{174000}	1880{192000}	236{24090}	65.16
RS200-5	5	370.6	182.4	188.2	376.3		—	—	2130{217500}	2350{240000}	279{28470}	81.32
RS200-6	6	442.3	218.25	224.05	448.0		—	—	2560{261000}	2820{288000}	329{33580}	97.59

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 48

■ RS200-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

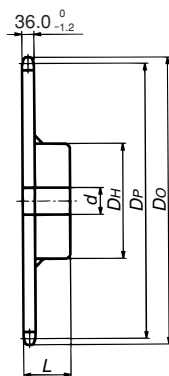
Small Sprocket No. of Teeth	Small Sprocket Max r/min																		
	10	15	20	30	40	50	70	100	150	200	250	300	350	400	450	500	550	600	650
	A					B								C					
9	6.46	9.30	12.1	17.4	22.5	27.5	37.2	51.3	73.9	95.73	108	108	108	89.1	74.7	63.8	55.3	48.5	43.0
10	7.24	10.4	13.5	19.5	25.2	30.8	41.7	57.5	82.8	107	122	122	122	104	87.5	74.7	64.7	56.8	50.4
11	8.02	11.6	15.0	21.6	27.9	34.1	46.2	63.7	91.8	119	135	135	135	120	101	86.1	74.7	65.5	58.1
12	8.81	12.7	16.4	23.7	30.7	37.5	50.8	70.0	101	131	148	148	148	137	115	98.2	85.1	74.7	
13	9.61	13.8	17.9	25.8	33.5	40.9	55.4	76.3	110	142	161	161	161	155	130	111	95.9	84.2	
14	10.4	15.0	19.4	28.0	36.2	44.3	60.0	82.7	119	154	175	175	175	173	145	124	107	94.1	
15	11.2	16.2	20.9	30.1	39.0	47.7	64.6	89.1	128	166	192	192	192	192	161	137	119	104	
16	12.0	17.3	22.4	32.3	41.9	51.2	69.3	95.5	138	178	211	211	211	211	177	151	131	115	
17	12.8	18.5	24.0	34.5	44.7	54.6	74.0	102	147	190	231	231	231	231	194	166	143	126	
18	13.7	19.7	25.5	36.7	47.5	58.1	78.7	108	156	202	247	252	252	252	211	180	156	137	
19	14.5	20.8	27.0	38.9	50.4	61.6	83.4	115	166	215	262	273	273	273	229	196	170	149	
20	15.3	22.0	28.5	41.1	53.3	65.1	88.2	122	175	227	277	290	290	290	247	211	183		
21	16.1	23.2	30.1	43.3	56.2	68.6	92.9	128	185	239	292	305	305	305	266	227	197		
22	17.0	24.4	31.6	45.6	59.0	72.2	97.7	135	194	251	307	321	321	321	285	244	211		
23	17.8	25.6	33.2	47.8	62.0	75.7	103	141	204	264	322	337	337	337	305	260	226		
24	18.6	26.8	34.8	50.1	64.9	79.3	107	148	213	276	338	353	353	353	325	278	241		
25	19.5	28.0	36.3	52.3	67.8	82.9	112	155	223	289	353	369	369	369	346	295	256		
26	20.3	29.3	37.9	54.6	70.7	86.5	117	161	232	301	368	385	385	385	367	313	271		

Note: 1. KW rating when using a one-pitch offset link (OL) is 65% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

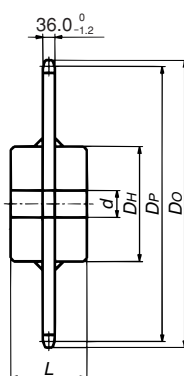
Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

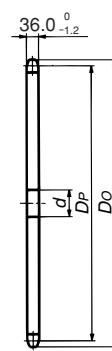
RS200 Sprocket



Welded construction
1B type



Welded construction
1C type



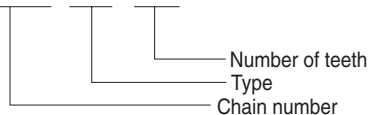
1A type

Number of Teeth	Pitch Circular Diameter (Dp)	Sprocket Outer Diameter (Do)	1B type					1C type					1A type		Number of Teeth				
			Bore Diameter (d)		Hub		Approx. Mass (kg)	Material	Bore Diameter (d)		Hub		Approx. Mass (kg)	Material		Pilot Bore Diameter (d)	Approx. Mass (kg)		
			Pilot Bore Diameter	Maximum	Diameter (DH)	Length (L)			Pilot Bore Diameter	Maximum	Diameter (DH)	Length (L)							
11	225.39	254	43	80	130	65	13.4	Welded construction: machine-structural carbon steel (teeth) and structural rolled steel (hub)								43	10.4	11	
12	245.34	275	43	90	150	75	17.8										43	12.3	12
13	265.34	296	43	100	170	80	22.4										43	14.5	13
14	285.37	316	43	110	180	80	25.7										43	16.8	14
15	305.42	337	43	115	180	80	28.3										43	19.3	15
16	325.49	357	43	115	180	80	30.3										43	22.5	16
17	345.58	378	43	120	190	85	35.3										43	25.4	17
18	365.68	398	43	120	190	85	38.4										43	28.5	18
19	385.79	419							63	125	200	90	42.9	Welded construction: structural rolled steel (teeth and hub)			63	31.3	19
20	405.92	439							63	125	200	90	46.4				63	34.7	20
21	426.05	459							63	135	220	110	59.1			63	38.3	21	
22	446.20	480							63	135	220	110	62.2			63	42.1	22	
23	466.34	500							63	140	230	110	69.0			63	46.5	23	
24	486.49	520							63	140	230	110	73.1			63	50.3	24	
25	506.65	541							63	140	230	110	77.5			63	54.6	25	
26	526.81	561							63	140	230	110	82.0			63	59.1	26	
27	546.98	581							63	140	230	110	86.8			63	64.3	27	
28	567.14	602							63	140	230	110	91.7			63	69.1	28	
30	607.49	642							63	150	240	125	109.1			63	78.9	30	
32	647.85	683							63	150	240	125	120.1			63	90.5	32	
34	688.21	723							63	150	240	125	131.9			63	102.2	34	
35	708.39	744							63	150	240	125	138.0			63	107.6	35	
36	728.58	764							63	150	240	125	144.3			63	114.7	36	
38	768.96	804							63	150	240	125	157.5			63	127.8	38	
40	809.34	845							63	170	270	140	186.1			63	140.7	40	
42	849.73	885						63	170	270	140	200.8			63	156.3	42		
45	910.31	946						63	170	270	140	223.9			63	178.3	45		
48	970.90	1007						68	170	270	140	248.2			68	202.8	48		
50	1011.30	1047						68	170	270	140	265.7			68	221.6	50		
54	1092.10	1128						68	170	270	140	302.6			68	258.6	54		
60	1213.31	1250						68	170	270	140	363.2			68	317.3	60		

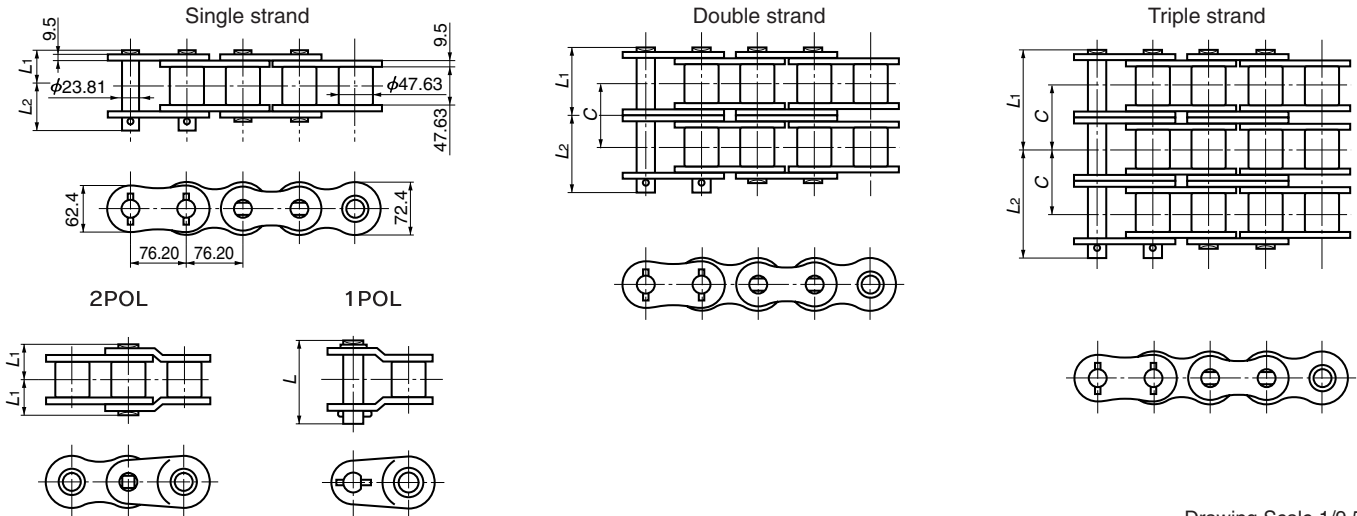
Note: 1. Maximum bore diameter is the typical range. Determine bore diameter and key bearing pressure based on general mechanical design.
2. Models with approximate masses in bold typeface have one punched hole for lifting.

Sprocket Number

RS200 -1B 15T



RS240



Drawing Scale 1/9.5

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Offset Pin Length L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength kN{kgf}	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS240-1	1	103.4	47.9	55.5	106.7	87.8	Riveting	550.4{56125}	623 {63500}	686 {70000}	99.0{10100}	24.5
RS240-2	2	191.3	91.9	99.4	198.4			1100.8{112250}	1250{127000}	1370{140000}	168{17170}	48.1
RS240-3	3	279.0	135.85	143.15	286.3			1651.2{168376}	1870{190500}	2060{210000}	248{25250}	71.6
RS240-4	4	367.1	179.8	187.3	374.2			-	2490{254000}	2750{280000}	327{33330}	95.1
RS240-5	5	455.0	223.75	231.25	462.0			-	3110{317500}	3430{350000}	386{39390}	118.6
RS240-6	6	542.8	267.7	275.1	550.1			-	3740{381000}	4120{420000}	456{46460}	142.1

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 2. Number of links per unit = 40

■ RS240-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min																			
	5	10	15	20	25	30	40	50	60	80	100	125	150	175	200	250	300	350	400	450
	A						B												C	
9	5.74	10.7	15.4	20.0	24.4	28.8	37.3	45.6	53.7	69.6	85.1	104	123	141	159	159	159	126	103	86.5
10	6.43	12.0	17.3	22.4	27.4	32.3	41.8	51.1	60.2	78.0	95.4	117	137	158	178	183	183	148	121	101
11	7.13	13.3	19.2	24.8	30.4	35.8	46.3	56.7	66.8	86.5	106	129	152	175	197	202	202	170	140	116
12	7.83	14.6	21.1	27.3	33.4	39.3	50.9	62.2	73.3	95.0	116	142	167	192	217	222	222	194	159	
13	8.54	15.9	23.0	29.7	36.4	42.8	55.5	67.9	80.0	104	127	155	182	210	236	242	242	219	179	
14	9.25	17.3	24.9	32.2	39.4	46.4	60.1	73.5	86.6	112	137	168	198	227	256	263	263	245	200	
15	9.97	18.6	26.8	34.7	42.4	50.0	64.8	79.2	93.3	121	148	181	213	245	276	283	283	271	222	
16	10.7	19.9	28.7	37.2	45.5	53.6	69.5	84.9	100	130	158	194	228	262	296	299	299	269	245	
17	11.4	21.3	30.7	39.7	48.6	57.2	74.2	90.7	107	138	169	207	244	280	300	300	300	281	268	
18	12.1	22.7	32.6	42.3	51.7	60.9	78.9	96.4	114	147	180	220	259	298	303	303	303	291	281	
19	12.9	24.0	34.6	44.8	54.8	64.6	83.6	102	120	156	191	233	275	316	317	317	317	304	293	
20	13.6	25.4	36.6	47.4	57.9	68.2	88.4	108	127	165	202	246	290	330	330	330	330	316	304	
21	14.3	26.8	38.5	49.9	61.0	71.9	93.2	114	134	174	213	260	306	345	345	345	345	328	314	
22	15.1	28.1	40.5	52.5	64.2	75.6	98.0	120	141	183	223	273	322	346	346	346	342	339	315	
23	15.8	29.5	42.5	55.1	67.3	79.3	103	126	148	192	234	287	338	370	370	370	359	350	334	
24	16.6	30.9	44.5	57.7	70.5	83.1	108	132	155	201	246	300	354	396	396	396	376	360		
25	17.3	32.3	46.5	60.3	73.7	86.8	112	137	162	210	257	314	370	410	410	410	388	370		
26	18.1	33.7	48.5	62.9	76.9	90.6	117	143	169	219	268	327	386	418	418	418	397	380		

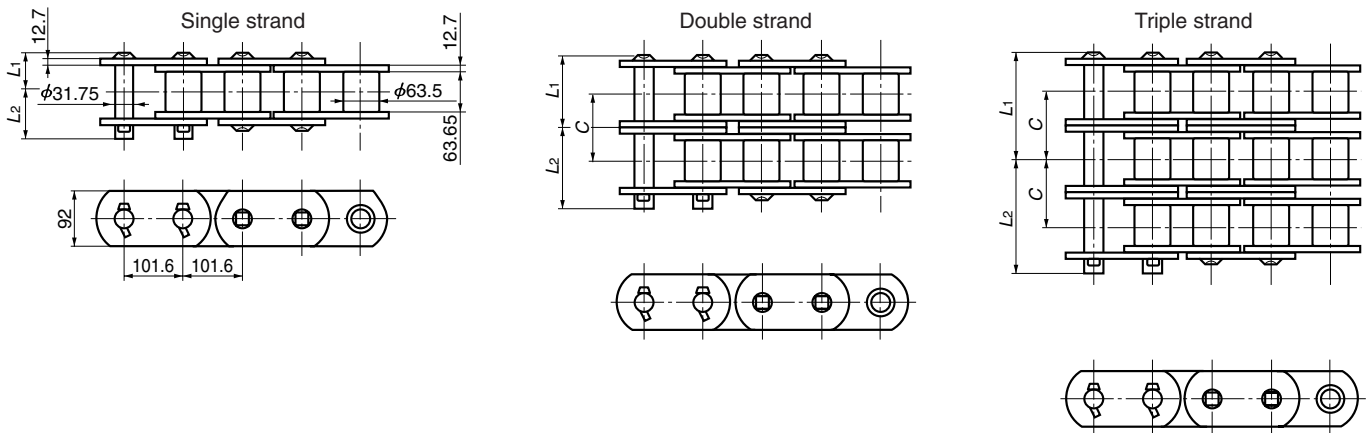
Note: 1. kW rating when using a one-pitch offset link (OL) is 65% of the above.
 2. Please consult TSUBAKI prior to use of kW ratings in the colored area of the table.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

RF320-T, RF400-T

RF320-T

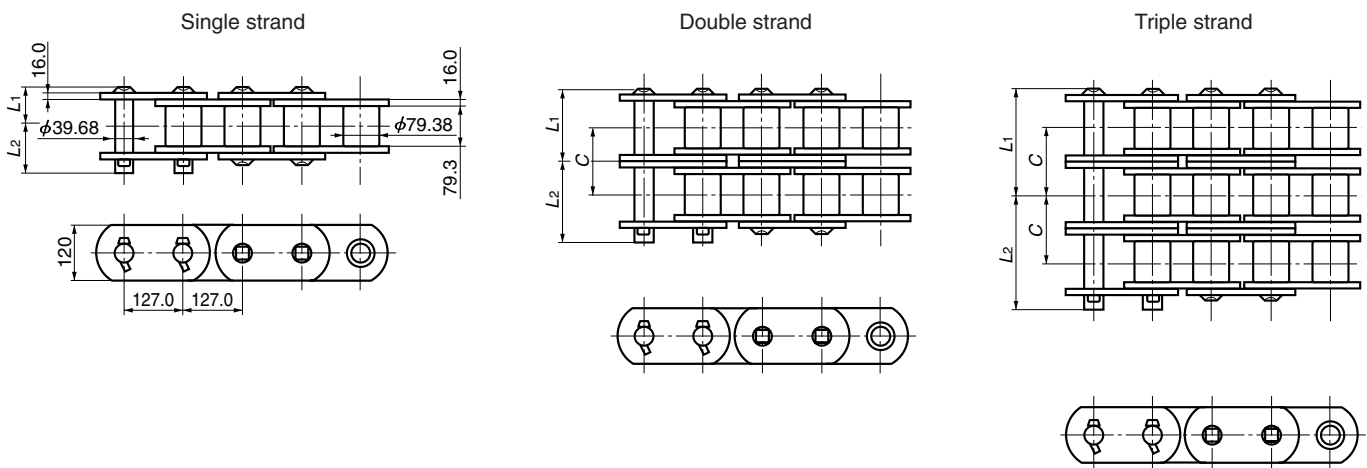


Drawing Scale: 1/12.7

TSUBAKI Chain Number	Number of Strands	Pin Length L_1+L_2	Dimensions L_1	Dimensions L_2	Offset Pin Length L	Transverse Pitch C	Pin Type	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RF320-T-1	1	141.4	63.8	77.6	—	117.1	Riveting	1000{102000}	1150{117000}	123{12500}	47.6
RF320-T-2	2	258.7	122.4	136.3	—			2000{204000}	2290{234000}	208{21250}	94.6
RF320-T-3	3	375.9	181.05	194.85	—			3000{306000}	3440{351000}	306{31250}	141.5
RF320-T-4	4	493.2	239.65	253.55	—			4000{408000}	4590{468000}	405{41250}	188.5

Note 1. Number of links per unit = 30

RF400-T



Drawing Scale 1/16

TSUBAKI Chain Number	Number of Strands	Pin Length L_1+L_2	Dimensions L_1	Dimensions L_2	Offset Pin Length L	Transverse Pitch C	Pin Type	Tsubaki Minimum Tensile Strength kN{kgf}	Tsubaki Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RF400-T-1	1	172.3	79.65	92.65	—	146.8	Riveting	1730{176000}	1950{199000}	188{19200}	83.9
RF400-T-2	2	319.0	153.05	165.95	—			3450{352000}	3900{398000}	320{32640}	166.8
RF400-T-3	3	465.7	226.45	239.25	—			5180{528000}	5850{597000}	471{48000}	249.7
RF400-T-4	4	612.3	299.8	312.5	—			6900{704000}	7810{796000}	621{63360}	332.7

Note 1. Number of links per unit = 24

MEMO

Horizontal dashed lines for writing.

BS/DIN Standard Chain



Since 1917, Tsubakimoto Chain has maintained a line-up of cutting edge chain products with exceptional quality and performance that help end-users meet their power transmission and conveying requirements.

Tsubaki presents the enhanced version of BS/DIN European Standard chain, Tsubaki Runner.

Tsubaki BS/DIN European Standard chain is available in chain sizes from RS05B up to RS48B.

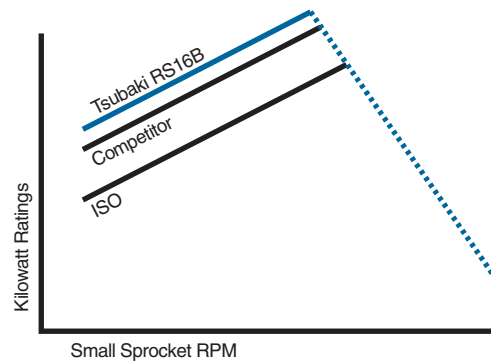
Single, double, or triple strand chains are available.

Key factors for superior performance

► Increased kilowatt ratings

Reinforced connecting link with Ring Coining.

For easy assembling, the pin and link plate of a connecting link are slip fit. In general, this type of connecting link has a 20% lower fatigue strength than the chain itself. However, TSUBAKI has developed a special process to eliminate that loss of fatigue strength and still satisfy the customer demand for easy assembly: the patented Ring Coining process.



► Easy disassembling - RS08B to RS16B

New riveting style.

Possible to be disassembled quick and safely with an original Tsubaki Chain tool without damaging the bushes.



► Higher tensile strength

Pin toughness.

Uses selected alloy steel material and the most effective heat treatment process.

► Wear resistance

High quality chain lubricant.

Proper lubrication extends chain life and improves chain performance.

Tsubaki roller chain is pre-lubricated before packing to give the best performance in general applications.

► Higher fatigue strength

Shot peened parts.

High pin & bush push-out force.

Fatigue strength has become a more widely used value for chain performance relating to link plate failure.

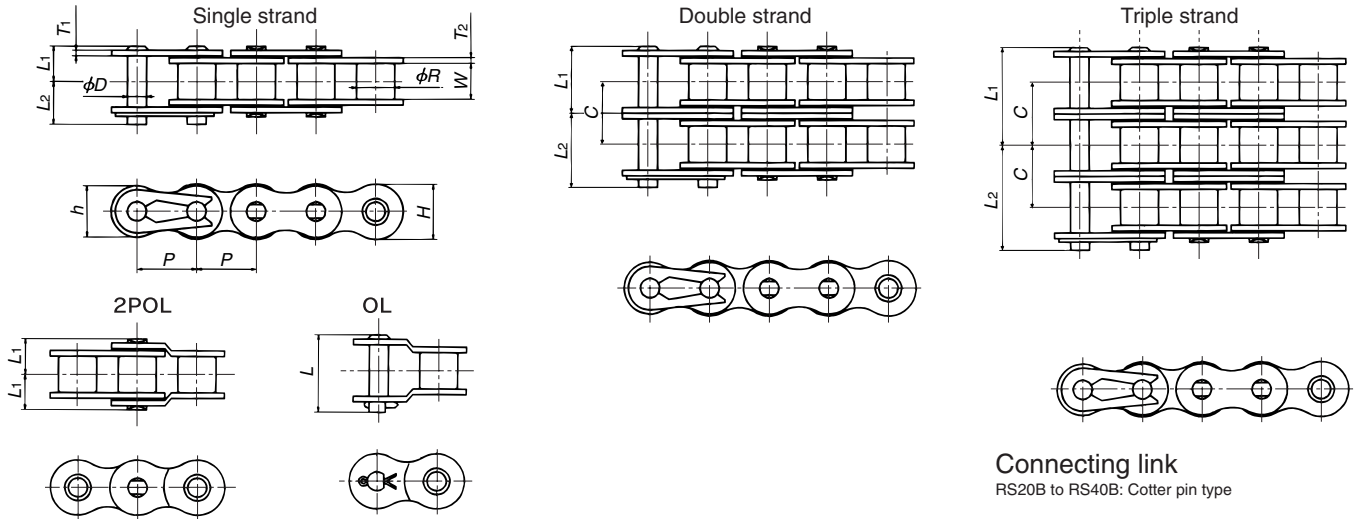
In pursuit of outstanding quality, Tsubaki conducts fatigue strength confirmation tests.

► Accurate chain length tolerance

Tsubaki carefully chooses link plate material, fabrication methods, heat-treatment and shot-peening techniques to provide the most accurate chain length tolerance.



BS Roller Chain



Connecting link
RS20B to RS40B: Cotter pin type

TSUBAKI Chain Number	JIS No.	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates				Pin Diameter D
					Thickness T_1	Thickness T_2	Height H	Height h	
RS05B-1	05B	8.00	5.00	3.00	0.75	0.75	7.1	7.1	2.30
RF06B-1	06B	9.525	6.35	5.72	1.0	1.3	8.2	8.2	3.28
RS08B-1	08B	12.70	8.51	7.75	1.6	1.6	11.8	10.4	4.45
RS10B-1	10B	15.875	10.16	9.65	1.5	1.5	14.7	13.7	5.08
RS12B-1	12B	19.05	12.07	11.68	1.8	1.8	16.1	16.1	5.72
RS16B-1	16B	25.40	15.88	17.02	3.2	4.0	21.0	21.0	8.28
RS20B-1	20B	31.75	19.05	19.56	3.4	4.4	26.0	26.0	10.19
RS24B-1	24B	38.10	25.40	25.40	5.6	6.0	33.4	31.2	14.63
RS28B-1	28B	44.45	27.94	30.99	6.3	7.5	36.4	36.4	15.90
RS32B-1	32B	50.80	29.21	30.99	6.3	7.0	42.2	41.6	17.81
RS40B-1	40B	63.50	39.37	38.10	8.0	8.5	52.9	52.0	22.89

Note: Outer plate thickness is given for single-strand chain. Outer plate thickness will vary for multi-strand chains due to their relation to the horizontal pitch.

TSUBAKI Chain Number	Number of Strands	Pin Length $L_1 + L_2$	Dimensions L_1	Dimensions L_2	Offset Pin Length L	Transverse Pitch C	Tsubaki Minimum Tensile Strength $kN\{kgf\}$	ISO "B" Tensile Strength $kN\{kgf\}$	Approximate Mass kg/m	Number of Links Per Unit (5m)
RS05B-1	1	8.5	3.8	4.7	—	—	5.0 {510}	4.4 {449}	0.18	626
RF06B-1	1	13.8	6.1	7.7	15.1	—	9.0 {920}	8.90{910}	0.39	—
RF06B-2	2	24.0	11.2	12.8	25.9	10.24	17.0 {1730}	16.9{1720}	0.75	526
RF06B-3	3	34.3	16.4	17.9	36.1	—	24.9 {2540}	24.9{2540}	1.11	—
RS08B-1	1	18.4	8.4	10.0	18.6	—	19.0 {1930}	17.8{1820}	0.70	—
RS08B-2	2	32.2	15.3	16.9	34.5	13.92	32.0 {3260}	31.1{3170}	1.35	394
RS08B-3	3	46.1	22.25	23.85	48.4	—	47.5 {4840}	44.5{4540}	2.00	—
RS10B-1	1	20.8	9.55	11.25	20.8	—	23 {2340}	22.2{2260}	0.95	—
RS10B-2	2	37.4	17.85	19.55	39.4	16.59	44.5 {4540}	44.5{4540}	1.85	316
RS10B-3	3	54.0	26.15	27.85	56.0	—	66.8 {6810}	66.7{6800}	2.80	—
RS12B-1	1	24.1	11.1	13.0	24.4	—	31 {3160}	28.9{2950}	1.25	—
RS12B-2	2	43.6	20.85	22.75	45.9	19.46	61 {6220}	57.8{5890}	2.50	264
RS12B-3	3	63.1	30.6	32.5	65.4	—	92 {9400}	86.7{8840}	3.80	—
RS16B-1	1	37.7	17.75	19.95	39.3	—	70 {7100}	60 {6120}	2.70	—
RS16B-2	2	69.3	33.55	35.75	73.4	31.88	128 {13000}	106 {10800}	5.40	198
RS16B-3	3	101.2	49.5	51.7	105.3	—	192 {19600}	160 {16300}	8.00	—
RS20B-1	1	43.0	19.9	23.1	46.6	—	98.1{10000}	95 {9690}	3.85	—
RS20B-2	2	79.7	38.25	41.45	84.6	36.45	197 {20100}	170 {17300}	7.65	158
RS20B-3	3	116.2	56.5	59.7	121.0	—	295 {30100}	250 {25500}	11.45	—
RS24B-1	1	58.5	26.65	31.85	61.7	—	167 {17000}	160 {16300}	7.45	—
RS24B-2	2	106.8	50.8	56.0	112.8	48.36	335 {34100}	280 {28600}	14.65	132
RS24B-3	3	155.3	75.1	80.2	161.1	—	500 {51000}	425 {43300}	21.75	—
RS28B-1	1	69.9	32.45	37.45	74.4	—	200 {20400}	200 {20400}	9.45	—
RS28B-2	2	129.3	62.15	67.15	136.0	59.56	374 {38100}	360 {36700}	18.80	114
RS28B-3	3	188.9	91.95	96.95	195.9	—	560 {57100}	530 {54000}	28.20	—
RS32B-1	1	69.8	32.1	37.7	73.3	—	255 {26000}	250 {25500}	10.25	—
RS32B-2	2	128.1	61.25	66.85	134.5	58.55	485 {49500}	450 {45900}	20.10	100
RS32B-3	3	186.6	90.5	96.1	192.6	—	729 {74300}	670 {68300}	29.90	—
RS40B-1	1	84.3	39.25	45.05	88.6	—	373 {38000}	355 {36200}	16.35	—
RS40B-2	2	156.6	75.4	81.2	163.2	72.29	716 {73000}	630 {64200}	32.00	80
RS40B-3	3	228.8	111.5	117.3	235.3	—	1080 {110000}	950 {96900}	47.75	—

Note: 1. RF06B plate is flat: .
2. Multi-strand RF06B and RS08B chains have one middle plate.

Before Use
For Safe Use
Standard Roller Chains
Lube-Free Roller Chains
Heavy Duty Roller Chains
Corrosion Resistant Roller Chains
Specialty Roller Chains
Accessories
Selection
Handling



Lube-Free Roller Chains

Tsubaki Lambda® Chains

Tsubaki's Lambda® Chains were the first in the industry to use a special oil-impregnated bush. Since their launch in 1988, they have been adopted for diverse industries and applications, and their performance has been highly rated. Tsubaki has a wide line-up of lube-free, long life products that help customers reduce costs.

Lube-free and long-life Longer lasting chains made possible by special oil-impregnated bushes.

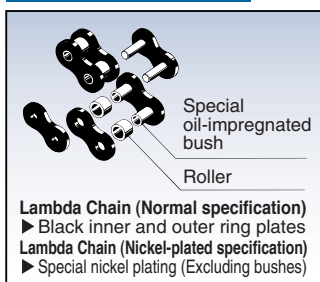
Compatibility Compatible with RS Roller Chains.

Note) Single-strand chain can be used with RS type sprockets; however, because the transverse pitch (C) of double-strand chain differs from that of RS roller chain, RS type double-strand sprockets cannot be used. Specialized sprockets are required.

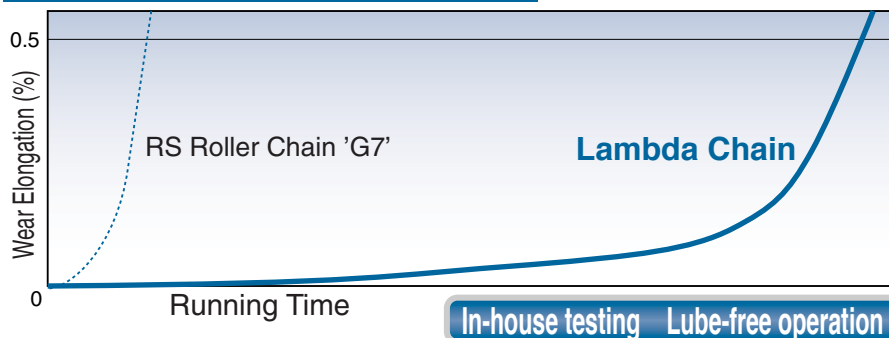
Operating temperature -10 to 150°C

Selection Use the General Selection Method.

Basic construction



Performance in ambient temperature (-10 to 60°C)



Wear elongation life is 7 times longer than RS Roller Chains. RS120-LMD-1 and RS140-LMD-1 wear elongation life are 2.5 times longer.

Products

Lambda Chain

Painting the inner and outer plates black has added more corrosion resistance and given the chain a high-grade finish. To ensure compatibility with RS Roller Chain, the inner plate is one size thicker with the same tensile strength and maximum allowable load as RS Roller Chain. Thus, pins are longer than with the RS Roller Chain, so interference with equipment should be checked.

Note 1. Kilowatt ratings differ slightly from RS Roller Chain.

2. Single-strand chains use an RS-type sprocket, whereas double-strand chains require a special sprocket because the horizontal pitch (dimension C) differs from that of RS Roller Chain.

Surface Treated Lambda Chain

The plates and rollers of this Lambda Chain are surface-treated to increase corrosion resistance.

- NP specification ... Plates and rollers have a special nickel plating for low level corrosion resistance.
- NEP specification ... Plates and rollers undergo NEP treatment to increase corrosion resistance.

Heavy Duty Lambda Chain

The same strength as RS Roller Chains is achieved, even with double-strand chains, by increasing the thickness of the outer and inner plates by one size.

Note: Special sprockets required.

Curved Lambda Chain

This roller chain has a wide horizontal bending radius thanks to its original pin and bush construction, and a large clearance between plates. Curved transmission can be easily configured using RS-type sprockets.

BS Lambda Chain (ISO606-Compliant B Series)

This Lambda Chain is compatible with ISO606-compliant B Series chains. It can directly replace any existing B Series chain. With its specially designed pin, cutting and connection of single-strand RS08B - RS16B chains is a snap.

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



X-Lambda Chain (X-A[®]) (Patent No. 3280312)

X-Lambda Chain greatly increases the performance of Lambda Chains through an oil-impregnated felt seal.

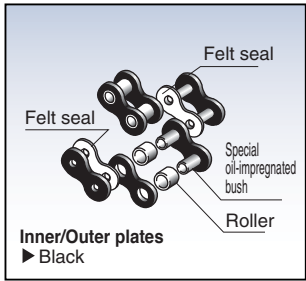
Lube-free and ultra long life Chain life has been further extended through a special oil-impregnated bush and oil-impregnated felt seal.

Compatibility Compatible with Lambda Chains. However, pins are longer than with Lambda Chains, so interference with equipment should be checked.

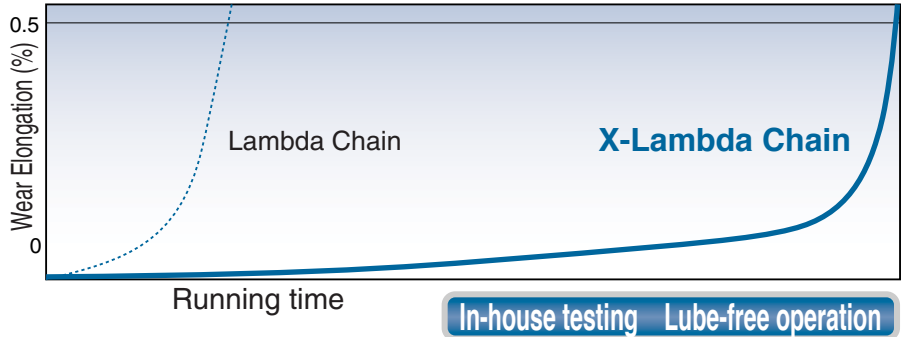
Operating temperature -10 to 150°C

Selection Use the General Selection Method.

Basic construction

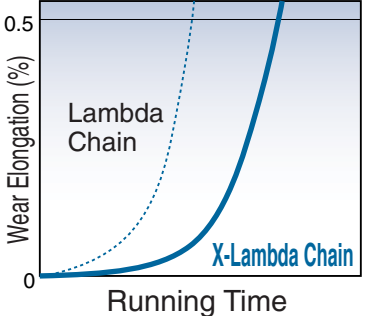


Performance in ambient temperature (-10 to 60°C)



Wear elongation life is over 5 times longer than with Lambda Chains.

Performance in mid-range temperatures (150°C)



In-house testing Lube-free operation

⚠ Safety Precautions for Lambda Chains

- Do not use Lambda Chain if the chain will come in direct contact with food or where coating flakes or wear dust can contaminate food. Also, in non-food applications, appropriately cover the chains or contact Tsubaki about chain selection if using in environments where coating flakes or wear dust present problems.
- Do not use Lambda Chains where there is the possibility of exposure to chemicals, water, or cleaning / degreasing vapors.

Before Use
For Safe Use
Standard Roller Chains
Lube-Free Roller Chains
Heavy Duty Roller Chains
Corrosion Resistant Roller Chains
Specialty Roller Chains
Accessories
Selection
Handling



Lube-Free Roller Chains

Old-New Chain Number Comparison

Product codes have been assigned to all products (except customized products) and chain numbers have been rewritten. The following clarifies the differences between old and new chain numbers.

Lambda Chain

- ① The old RSD○-LAMDA chain number has been changed to RS○-LMD.
- ② Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number

Chain number with connecting link (CL) **RS80-LMD-1-CL**

Chain number with OL **RS80-LMD-1-OL**

X-Lambda Chain

- ① The old RSD○X-LAMDA chain number has been changed to RS○-LMDX.
- ② Old chain numbers of single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number

Chain number with connecting link (CL) **RS80-LMDX-1-CL**

Indicate connecting link after strand number as shown at left. X-Lambda Chains do not have offset links.

Surface Treated Lambda Chain: NP/NEP specification

- ① The old RSD○NP-LAMDA chain number has been changed to RS○-LMD-NP.
- ② Old chain numbers of single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number

Chain number with connecting link (CL) **RS80-LMD-NP-1-CL**

Chain number with OL **RS80-LMD-NP-1-OL**

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



Heavy Duty Lambda Chain

① The old RSD○H-LAMDA-2 chain number has been changed to RS○-LMD-H-2.

New chain number	Old chain number
<p>RS80 -LMD-H -2</p> <p>①</p> <p>Applicable sizes 40, 50, 60, 80, 100</p> <p>Double-strand only</p>	<p>RSD80H-LAMDA-2</p> <p>Applicable sizes 40, 50, 60, 80, 100</p>

- Chain number with connecting link (CL) **RS80-LMD-H-2-CL**
- Chain number with OL **RS80-LMD-H-2-OL**

Curved Lambda Chain

① The old RSC○CU-LAMDA chain number has been changed to RS○-LMC-CU.

② Old chain numbers of single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number
<p>RS40 -LMC-CU -1</p> <p>①</p> <p>Applicable sizes 40, 50, 60</p> <p>single-strand only</p>	<p>RSC40CU-LAMDA</p> <p>Applicable sizes 40, 50, 60</p>

- Chain number with connecting link (CL) **RS40-LMC-CU-1-CL**
- Chain number with OL **RS40-LMC-CU-1-OL**

BS Lambda Chain (ISO606-Compliant B Series)

① The old RS○OB-LAMDA chain number has been changed to RS○OB-LM.

New chain number	Old chain number
<p>RF06B-LM-1</p> <p>①</p> <p>②</p> <p>Applicable Lambda Chain sizes 08B, 10B, 12B, 16B, 20B, 24B</p> <p>Number of strands Check this catalog for the number of strands.</p>	<p>RF06B-LAMDA</p> <p>Applicable sizes 08B, 10B, 12B, 16B, 20B, 24B</p>

- Chain number with connecting link (CL) **RS08B-LM-1-CL**
- Chain number with OL **RS08B-LM-1-OL**

Before Use

For Safe Use

Standard Roller Chains

Light-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

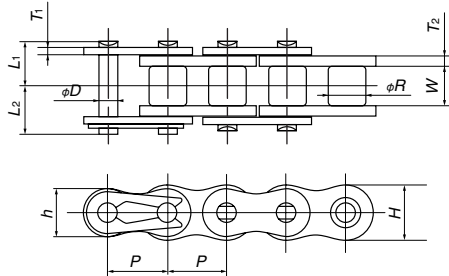
Accessories

Selection

Handling

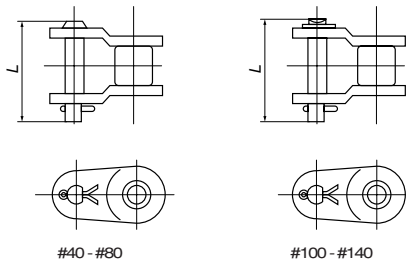
Lambda Chain

Single strand

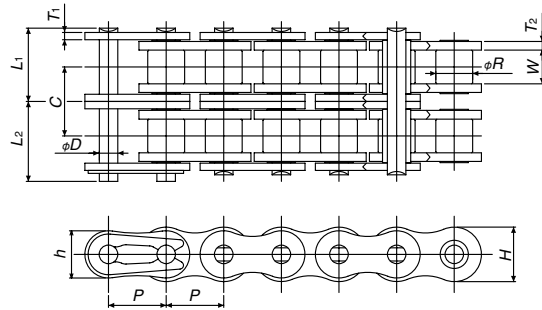


OL

OL



Double strand



Offset links are not available for double strand.

Cotter pins are used in connecting links for RS80 and larger size chains.

Cotter pins are used in both main body and connecting links for RS100 and large chains.

TSUBAKI Chain Number		Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates				Pins			Offset Pin Length L
Single-strand	Double-strand				Thickness T ₁	Thickness T ₂	Height H	Height h	Diameter D	L ₁ 2-strand value in ()	L ₂ 2-strand value in ()	
RS40-LMD-1	RS40-LMD-2	12.70	7.92	7.55	1.5	2.0	12.0	10.4	3.97	8.75 (16.5)	10.45 (18.1)	20.0
RS50-LMD-1	RS50-LMD-2	15.875	10.16	9.26	2.0	2.4	15.0	13.0	5.09	10.75 (20.2)	12.45 (22.0)	24.0
RS60-LMD-1	RS60-LMD-2	19.05	11.91	12.28	2.4	3.2	18.1	15.6	5.96	13.70 (26.05)	15.75 (28.05)	32.0
RS80-LMD-1	RS80-LMD-2	25.40	15.88	15.48	3.2	4.0	24.1	20.8	7.94	17.15 (32.7)	20.25 (35.9)	39.9
RS100-LMD-1	RS100-LMD-2	31.75	19.05	18.70	4.0	4.8	30.1	26.0	9.54	20.65 (39.5)	23.85 (42.5)	47.5
RS120-LMD-1		38.10	22.23	24.75	4.8	5.6	36.2	31.2	11.11	25.75	29.95	59.0
RS140-LMD-1		44.45	25.40	24.75	5.6	6.4	42.2	36.4	12.71	27.70	32.20	63.7

TSUBAKI Chain Number		Average Tensile Strength kN{kgf} 2-strand value in ()	Maximum Allowable Load kN{kgf}		Approximate Mass kg/m 2-strand value in ()	Links Per Unit	Allowable Speed m/min	Transverse Pitch C
Single-strand	Double-strand		Single-strand	Double-strand				
RS40-LMD-1	RS40-LMD-2	19.1{1950} { 38.2{3900} }	3.63{370}	5.08{518}	0.70 (1.4)	240	150	15.4
RS50-LMD-1	RS50-LMD-2	31.4{3200} { 62.8{6400} }	6.37{650}	8.92{910}	1.11 (2.2)	192	135	19.0
RS60-LMD-1	RS60-LMD-2	44.1{4500} { 88.3{9000} }	8.83{900}	12.4{1260}	1.72 (3.4)	160	120	24.52
RS80-LMD-1	RS80-LMD-2	78.5{8000} { 157{16000} }	14.7{1500}	20.6{2100}	2.77 (5.5)	120	90	31.1
RS100-LMD-1	RS100-LMD-2	118{12000} { 235{24000} }	22.6{2300}	31.6{3220}	4.30 (8.6)	96	80	37.6
RS120-LMD-1		167{17000}	30.4{3100}		6.4	80	50	
RS140-LMD-1		216{22000}	40.2{4100}		8.1	68	50	

Note 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% that of the above values.

2. Offset links are not available for double-strand chains. Chains should be designed for an even number of links.

Precautions for Use

- Dust in the bush accelerates wear. Wet environments can cause the oil in the oil-impregnated bush to leak. Bushes are also coated with less rust-preventing oil, causing early rusting.
- Bush oil can leak in a vacuum, decreasing wear resistance. Do not use in a vacuum.
- The life of the chain will decrease dramatically if oil in oil-impregnated bush is depleted. (See "(9) Lambda Chain Life" on pg. 159.)
- KW ratings for double-strand Lambda Chain (Double-strand coefficient)
The coefficient of a double-strand chain with the same part dimensions of a single-strand chain is 1.4. To achieve the same coefficient of multi-strand RS Roller Chain, the outer and inner plates must be thickened, and an H class FCL (press fit) must be used. In any event, sprockets must be customized - double-strand RS-type sprockets cannot be used.
- Double-strand Lambda Chain pin length
Because the inner plate is thicker than that of an RS Roller Chain, the pin is longer by an equal amount (L1 and L2). Check for machine interference.

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

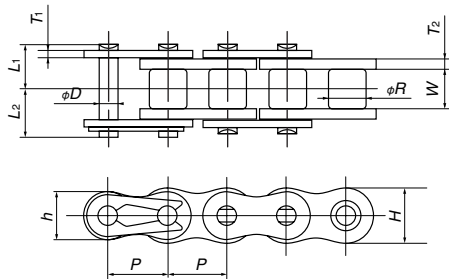
Accessories

Selection

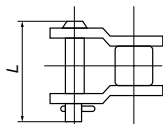
Handling

NP Specification

Single strand

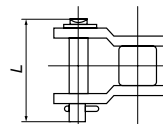


OL



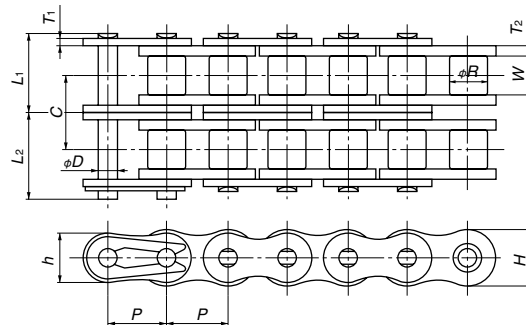
#40 - #80

OL



#100 - #140

Double strand



Offset links are not available for double strand.

Cotter pins are used in connecting links for RS80 and larger size chains.

Cotter pins are used in both main body and connecting links for RS100 and large chains.

TSUBAKI Chain Number		Pitch P	Roller Diameter R	Inner width of Inner Link W	Plates				Pins			Offset Pin Length L
Single-strand	Double-strand				Thickness T ₁	Thickness T ₂	Height H	Height h	Diameter D	L ₁ 2-strand value in ()	L ₂ 2-strand value in ()	
RS40-LMD-NP-1	RS40-LMD-NP-2	12.70	7.92	7.55	1.5	2.0	12.0	10.4	3.97	8.75 (16.5)	10.45 (18.1)	20.0
RS50-LMD-NP-1	RS50-LMD-NP-2	15.875	10.16	9.26	2.0	2.4	15.0	13.0	5.09	10.75 (20.2)	12.45 (22.0)	24.0
RS60-LMD-NP-1	RS60-LMD-NP-2	19.05	11.91	12.28	2.4	3.2	18.1	15.6	5.96	13.70 (26.05)	15.70 (28.05)	32.0
RS80-LMD-NP-1	RS80-LMD-NP-2	25.40	15.88	15.48	3.2	4.0	24.1	20.8	7.94	17.15 (32.7)	20.25 (35.9)	39.9
RS100-LMD-NP-1	RS100-LMD-NP-2	31.75	19.05	18.70	4.0	4.8	30.1	26.0	9.54	20.65 (39.5)	23.85 (42.5)	47.5
RS120-LMD-NP-1		38.10	22.23	24.75	4.8	5.6	36.2	31.2	11.11	25.75	29.95	59.0
RS140-LMD-NP-1		44.45	25.40	24.75	5.6	6.4	42.2	36.4	12.71	27.70	32.20	63.7

TSUBAKI Chain Number		Average Tensile Strength kN{kgf} 2-strand value in ()	Maximum Allowable Load kN{kgf}		Approximate Mass kg/m 2-strand value in ()	Links Per Unit	Allowable Speed m/min	Transverse Pitch C
Single-strand	Double-strand		Single-strand	Double-strand				
RS40-LMD-NP-1	RS40-LMD-NP-2	19.1{1950} (38.2{3900})	3.04{310}	4.26{430}	0.70 (1.4)	240	150	15.4
RS50-LMD-NP-1	RS50-LMD-NP-2	31.4{3200} (62.8{6400})	5.39{550}	7.55{770}	1.11 (2.2)	192	135	19.0
RS60-LMD-NP-1	RS60-LMD-NP-2	44.1{4500} (88.3{9000})	7.26{740}	10.2{1040}	1.72 (3.4)	160	120	24.52
RS80-LMD-NP-1	RS80-LMD-NP-2	78.5{8000} (157{16000})	12.7{1300}	17.8{1820}	2.77 (5.5)	120	90	31.1
RS100-LMD-NP-1	RS100-LMD-NP-2	118{12000} (235{24000})	19.1{1950}	26.7{2730}	4.30 (8.6)	96	80	37.6
RS120-LMD-NP-1		167{17000}	25.5{2600}		6.4	80	50	
RS140-LMD-NP-1		216{22000}	34.3{3500}		8.1	68	50	

Note 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% that of the above values.

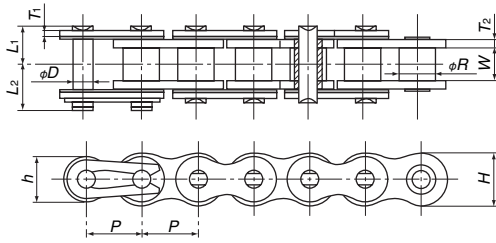
2. Offset links are not available for double-strand chains. Chains should be designed with an even number of links.

⚠ Nickel-plated specification

Do not use nickel-plated chain if the chain will come in direct contact with food or where coating flakes or wear dust can contaminate food. Also, in non-food applications, appropriately cover the chains or contact Tsubaki about chain selection if using in environments where coating flakes and wear dust present problems. Though nickel is not subject to the Food Sanitation Law or the Industrial Safety and Health Law, plating on sliding parts can peel.

X-Lambda Chain (X-Λ[®])

Single strand



Offset links are not available with X-Lambda Chains.

Cotter pins are used in connecting links for RS80 and larger size chains.

Cotter pins are used in both main body and connecting links for RS100 and large chains.

TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates				Pins		
				Thickness T_1	Thickness T_2	Height H	Heibht h	Diameter D	L_1	L_2
RS40-LMDX-1	12.70	7.92	7.55	1.5	2.0	12.0	10.4	3.97	9.4	11.1
RS50-LMDX-1	15.875	10.16	9.26	2.0	2.4	15.0	13.0	5.09	11.4	13.1
RS60-LMDX-1	19.05	11.91	12.28	2.4	3.2	18.1	15.6	5.96	14.8	16.5
RS80-LMDX-1	25.40	15.88	15.48	3.2	4.0	24.1	20.8	7.94	18.3	20.9
RS100-LMDX-1	31.75	19.05	18.70	4.0	4.8	30.1	26.0	9.54	21.8	24.5
RS120-LMDX-1	38.10	22.23	24.75	4.8	5.6	36.2	31.2	11.11	26.7	30.75

TSUBAKI Chain Number	Average Tensile Strength $kN\{kgf\}$	Maximum Allowable Load $kN\{kgf\}$	Approximate Mass kg/m	Number of Links Per Unit	Allowable Speed m/min
RS40-LMDX-1	19.1{1950}	3.63{370}	0.70	240	150
RS50-LMDX-1	31.4{3200}	6.37{650}	1.11	192	135
RS60-LMDX-1	44.1{4500}	8.83{900}	1.72	160	120
RS80-LMDX-1	78.5{8000}	14.7{1500}	2.77	120	90
RS100-LMDX-1	118 {12000}	22.6{2300}	4.30	96	80
RS120-LMDX-1	167 {17000}	30.4{3100}	6.40	80	50

KW ratings: See pgs. 62 and 63.

Precautions for use

- Because the inner plate is thicker than the RS Roller Chain s inner plate and its felt seals, the pin is longer (L_1 and L_2). Check for equipment interference.
- Offset links are not available for X-Lambda Chains. Chains should be designed with an even number of links.
- Due to oil in the felt seal, more oil adheres to the surface of X-Lambda Chains than regular Lambda Chains.

Connecting

Use a connecting link (with felt seal) to connect X-Lambda Chains. Set the felt seals on the inside of both the outer plate and connecting plate (Fig.1). (For chain connecting instructions, see pg. 149.)

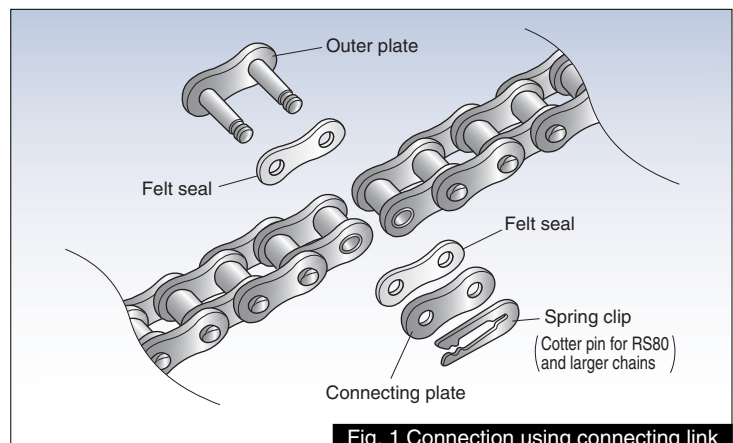


Fig. 1 Connection using connecting link

Kilowatt Ratings Tables (Lambda Chain / Surface Treated Lambda Chain / X-Lambda Chain)

■RS100-LMD-1 Kilowatt Ratings Table (Single Strand Chain)

Small sprocket number of teeth	Small Sprocket Max r/min											
	10	25	50	75	100	125	150	175	200	225	250	275
9	0.66	1.51	2.82	4.07	5.27	6.44	7.59	8.72	9.83	10.9	12.0	13.1
10	0.74	1.70	3.16	4.56	5.90	7.22	8.50	9.77	11.0	12.2	13.5	
11	0.82	1.88	3.51	5.05	6.54	8.00	9.42	10.8	12.2	13.6		
12	0.90	2.06	3.85	5.55	7.19	8.79	10.4	11.9	13.4			
13	0.99	2.25	4.20	6.05	7.84	9.58	11.3	13.0				
14	1.07	2.44	4.55	6.55	8.49	10.4	12.2	14.0				
15	1.15	2.63	4.90	7.06	9.15	11.2	13.2					
16	1.23	2.82	5.26	7.57	9.81	12.0	14.1					
17	1.32	3.01	5.61	8.08	10.5	12.8						
18	1.40	3.20	5.97	8.60	11.1	13.6						
19	1.49	3.39	6.33	9.11	11.8	14.4						
20	1.57	3.58	6.69	9.63	12.5	15.3						
21	1.66	3.78	7.05	10.2	13.2							
22	1.74	3.97	7.41	10.7	13.8							
23	1.83	4.17	7.78	11.2	14.5							
24	1.91	4.36	8.14	11.7	15.2							
25	2.00	4.56	8.51	12.3	15.9							
26	2.09	4.76	8.88	12.8								
28	2.26	5.15	9.62	13.9								
30	2.43	5.55	10.4	14.9								
32	2.61	5.95	11.1	16.0								
35	2.88	6.56	12.2									
40	3.32	7.58	14.1									
45	3.77	8.60	16.1									

■RS120-LMD-1 Kilowatt Ratings Table (Single Strand Chain)

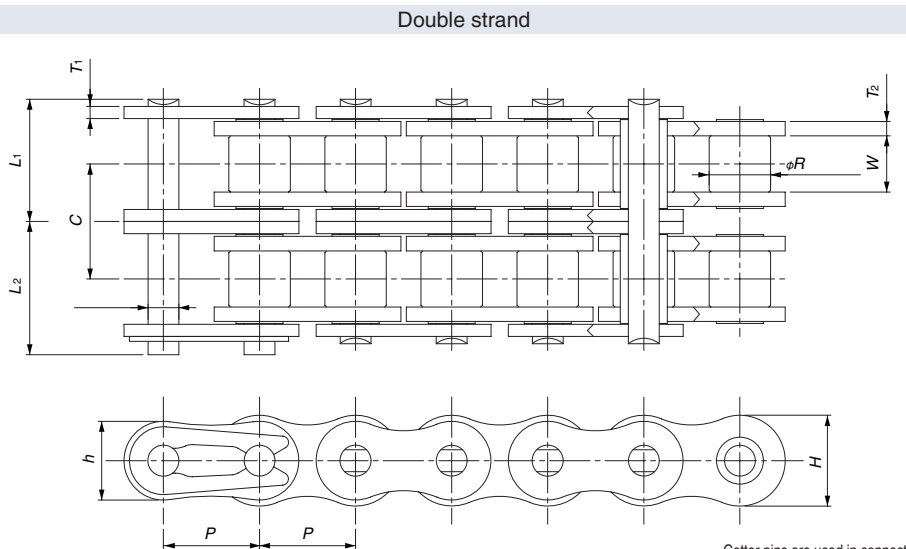
Small sprocket number of teeth	Small Sprocket Max r/min											
	5	10	15	20	25	30	40	50	60	80	100	125
9	0.65	1.22	1.75	2.27	2.77	3.27	4.23	5.17	6.09	7.90	9.65	11.8
10	0.73	1.36	1.96	2.54	3.11	3.66	4.74	5.80	6.83	8.85	10.8	13.2
11	0.81	1.51	2.17	2.82	3.44	4.06	5.25	6.42	7.57	9.81	12.0	
12	0.89	1.66	2.39	3.09	3.78	4.46	5.77	7.06	8.31	10.8	13.2	
13	0.97	1.81	2.60	3.37	4.12	4.86	6.29	7.69	9.07	11.7	14.4	
14	1.05	1.96	2.82	3.65	4.47	5.26	6.82	8.33	9.82	12.7		
15	1.13	2.11	3.04	3.94	4.81	5.67	7.35	8.98	10.6	13.7		
16	1.21	2.26	3.26	4.22	5.16	6.08	7.88	9.63	11.3	14.7		
17	1.29	2.41	3.48	4.51	5.51	6.49	8.41	10.3	12.1			
18	1.38	2.57	3.70	4.79	5.86	6.90	8.94	10.9	12.9			
19	1.46	2.72	3.92	5.08	6.21	7.32	9.48	11.6	13.7			
20	1.54	2.88	4.15	5.37	6.57	7.74	10.0	12.3	14.4			
21	1.63	3.03	4.37	5.66	6.92	8.15	10.6	12.9	15.2			
22	1.71	3.19	4.60	5.95	7.28	8.58	11.1	13.6				
23	1.79	3.35	4.82	6.25	7.64	9.00	11.7	14.2				
24	1.88	3.50	5.05	6.54	7.99	9.42	12.2	14.9				
25	1.96	3.66	5.28	6.83	8.35	9.84	12.8	15.6				
26	2.05	3.82	5.50	7.13	8.72	10.3	13.3	16.3				
28	2.22	4.14	5.96	7.72	9.44	11.1	14.4					
30	2.39	4.46	6.42	8.32	10.2	12.0	15.5					
32	2.56	4.78	6.89	8.92	10.9	12.9	16.7					
35	2.82	5.27	7.59	9.83	12.0	14.2						
40	3.26	6.08	8.76	11.4	13.9	16.4						
45	3.70	6.91	9.95	12.9	15.8							

■RS140-LMD-1 Kilowatt Ratings Table (Single Strand Chain)

Small sprocket number of teeth	Small Sprocket Max r/min											
	5	10	15	20	25	30	40	50	60	80	100	125
9	1.02	1.90	2.74	3.55	4.34	5.12	6.63	8.10	9.55	12.4	15.1	18.5
10	1.14	2.13	3.07	3.98	4.87	5.73	7.43	9.08	10.7	13.9	16.9	
11	1.27	2.36	3.41	4.41	5.39	6.35	8.23	10.1	11.9	15.4	18.8	
12	1.39	2.60	3.74	4.85	5.92	6.98	9.04	11.1	13.0	16.9		
13	1.52	2.83	4.08	5.28	6.46	7.61	9.86	12.1	14.2	18.4		
14	1.64	3.07	4.42	5.72	7.00	8.25	10.7	13.1	15.4	19.9		
15	1.77	3.30	4.76	6.17	7.54	8.88	11.5	14.1	16.6			
16	1.90	3.54	5.10	6.61	8.08	9.52	12.3	15.1	17.8			
17	2.03	3.78	5.45	7.06	8.63	10.2	13.2	16.1	19.0			
18	2.16	4.02	5.80	7.51	9.18	10.8	14.0	17.1	20.2			
19	2.29	4.27	6.14	7.96	9.73	11.5	14.9	18.2				
20	2.42	4.51	6.49	8.41	10.3	12.1	15.7	19.2				
21	2.55	4.75	6.85	8.87	10.8	12.8	16.6	20.2				
22	2.68	5.00	7.20	9.33	11.4	13.4	17.4	21.3				
23	2.81	5.24	7.55	9.78	12.0	14.1	18.3					
24	2.94	5.49	7.91	10.2	12.5	14.8	19.1					
25	3.07	5.74	8.26	10.7	13.1	15.4	20.0					
26	3.21	5.99	8.62	11.2	13.7	16.1	20.8					
28	3.48	6.48	9.34	12.1	14.8	17.4	22.6					
30	3.74	6.99	10.1	13.0	15.9	18.8						
32	4.01	7.49	10.8	14.0	17.1	20.1						
35	4.42	8.25	11.9	15.4	18.8	22.2						
40	5.11	9.53	13.7	17.8	21.7							

Note 1. KW ratings when using a one-pitch offset link (OL) are 80% that of the above values.
 2. KW ratings shown for X-Lambda Chain, whose wear performance is 7 x greater than RS Roller Chains in lube-free operation (14 x for RS40 to RS60; 2.5 x for RS120 and RS140) and over 5 x that of Lambda Chains. (See "Glossary".)
 3. Kilowatt ratings tables for RS Roller Chains differ from the above.

Heavy Duty Lambda Chain



Cotter pins are used in connecting links for RS80 and larger sized chains.

TSUBAKI Chain Number Normal Specification	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates				Pins			Transverse Pitch C
				Thickness T_1	Thickness T_2	Height H	Height h	Diameter D	L_1	L_2	
RS40-LMD-H-2	12.70	7.92	7.55	2.0	2.0	12.0	10.4	3.97	17.5	19.15	16.4
RS50-LMD-H-2	15.875	10.16	9.26	2.4	2.4	15.0	13.0	5.09	20.95	22.65	19.7
RS60-LMD-H-2	19.05	11.91	12.28	3.2	3.2	18.1	15.6	5.96	27.55	29.45	26.1
RS80-LMD-H-2	25.40	15.88	15.48	4.0	4.0	24.1	20.8	7.94	34.6	37.2	32.6
RS100-LMD-H-2	31.75	19.05	18.70	4.8	4.8	30.1	26.0	9.54	41.35	44.05	39.1

TSUBAKI Chain Number Normal Specification	Average Tensile Strength kN {kgf}	Maximum Allowable Load Tension kN {kgf}	Approximate Mass kg/m	Number of Links Per Unit	Allowable Speed m/min
RS40-LMD-H-2	38.2 {3900}	6.17 {629}	1.57	240	150
RS50-LMD-H-2	62.8 {6400}	10.8 {1100}	2.35	192	135
RS60-LMD-H-2	88.3 {900 }	15.0 {1530}	3.59	160	120
RS80-LMD-H-2	157 {16000}	25.0 {2550}	6.18	120	90
RS100-LMD-H-2	235 {24000}	38.3 {3910}	9.03	96	80

Ambient temperature: -10 to 150°C

Sprocket

■ The chain horizontal pitch (C) differs from that of RS Roller Chain. Therefore, double-strand RS-type sprockets cannot be used. Used only customized sprockets.

Kilowatt ratings (Multiple strand coefficient)

■ The multiple-strand coefficient of Heavy Duty Lambda Chains is 1.7. To select a chain, multiply the kW ratings on pgs. 62 and 63 by 1.7.

■ Use an H-grade FCL (press fit) for the connecting link. (Using a MCL decreases the multiple strand coefficient.)

Offset link

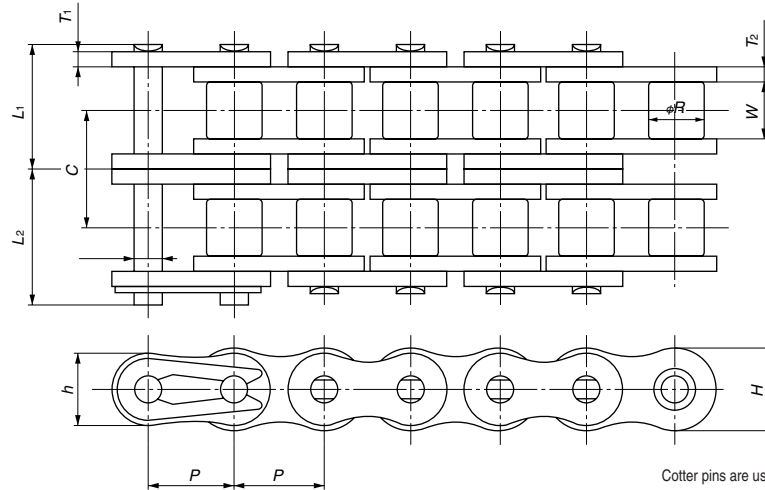
■ Offset links are available.

Pin length

■ Because the outer and inner plates are thicker than RS Roller Chain s outer and inner plates, the pin is longer by an equal amount (L_1 and L_2). Check for machine interference.

Heavy Duty Lambda Chain NP Specification

Double strand



Cotter pins are used in connecting links for RS80 and larger sized chains.

TSUBAKI Chain Number Nickel-plated Specification	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates				Pins			Transverse Pitch C
				Thickness T_1	Thickness T_2	Height H	Height h	Diameter D	L_1	L_2	
RS40-LMD-H-NP-2	12.70	7.92	7.55	2.0	2.0	12.0	10.4	3.97	17.5	19.15	16.4
RS50-LMD-H-NP-2	15.875	10.16	9.26	2.4	2.4	15.0	13.0	5.09	20.95	22.65	19.7
RS60-LMD-H-NP-2	19.05	11.91	12.28	3.2	3.2	18.1	15.6	5.96	27.55	29.45	26.1
RS80-LMD-H-NP-2	25.40	15.88	15.48	4.0	4.0	24.1	20.8	7.94	34.6	37.2	32.6
RS100-LMD-H-NP-2	31.75	19.05	18.70	4.8	4.8	30.1	26.0	9.54	41.35	44.05	39.1

TSUBAKI Chain Number Nickel-plated Specification	Average Tensile Strength $kN\{kgf\}$	Maximum Allowable Load Tension $kN\{kgf\}$		Approximate Mass kg/m	Number of Links Per Unit	Allowable Speed m/min
			Nickel-plated Specification			
RS40-LMD-H-NP-2	38.2 {3900}		5.17 {527}	1.57	240	150
RS50-LMD-H-NP-2	62.8 {6400}		9.17 {935}	2.35	192	135
RS60-LMD-H-NP-2	88.3 {9000}		12.4 {1260}	3.59	160	120
RS80-LMD-H-NP-2	157 {16000}		21.7 {2210}	6.18	120	90
RS100-LMD-H-NP-2	235 {24000}		32.5 {3310}	9.03	96	80

Ambient temperature: -10 to 150°C

Sprocket

■ The chain horizontal pitch (C) differs from that of RS Roller Chain. Therefore, double-strand RS-type sprockets cannot be used. Used only customized sprockets.

Kilowatt ratings (Multiple strand coefficient)

■ The multiple-strand coefficient of Heavy Duty Lambda Chains is 1.7. To select a chain, multiply the kW ratings on pgs. 62 and 63 by 1.7.

■ Use an H-grade FCL (press fit) for the connecting link. (Using a MCL decreases the multiple strand coefficient.)

Offset link

■ Offset links are available.

Pin length

■ Because the outer and inner plates are thicker than RS Roller Chain's outer and inner plates, the pin is longer by an equal amount (L_1 and L_2). Check for machine interference with equipment in use.

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

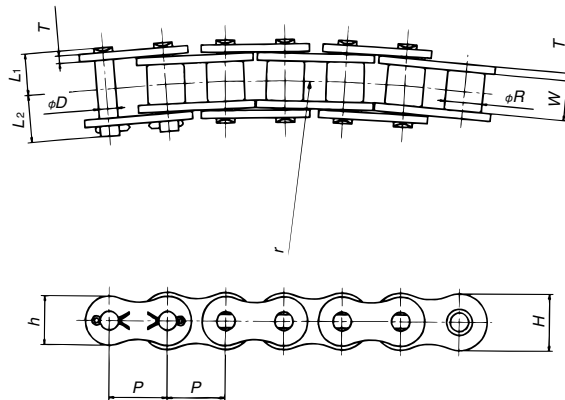
Specialty Roller Chains

Accessories

Selection

Handling

Curved Lambda Chain



TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			
				Thickness T	Height H	Height h	Diameter D	$L_1 + L_2$	L_1	L_2
RS40-LMC-CU-1	12.70	7.92	7.95	1.5	12.0	10.4	3.59	18.2	8.45	9.75
RS50-LMC-CU-1	15.875	10.16	9.53	2.0	15.0	13.0	4.45	22.0	10.3	11.7
RS60-LMC-CU-1	19.05	11.91	12.70	2.4	18.1	15.6	5.35	27.5	12.95	14.55

TSUBAKI Chain Number	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m	Number of Links Per Unit	Minimum Horizontal Bending Radius r
RS40-LMC-CU-1	12.4 {1260}	1.86 {190}	0.61	240	400
RS50-LMC-CU-1	19.2 {1960}	2.84 {290}	1.01	192	500
RS60-LMC-CU-1	27.9 {2840}	4.02 {410}	1.40	160	600

Ambient temperature: -10 to 150°C

Sprocket

- Pin gear attachment chains are available.
- See 4.6 on pg. 154 for installation.

BS Lambda Chain (ISO606-Compliant B Series)

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

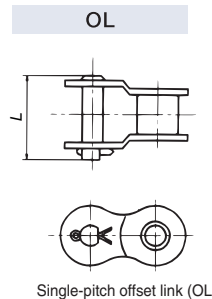
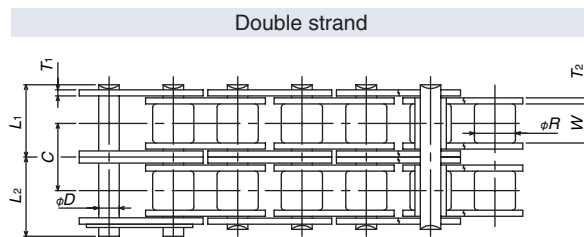
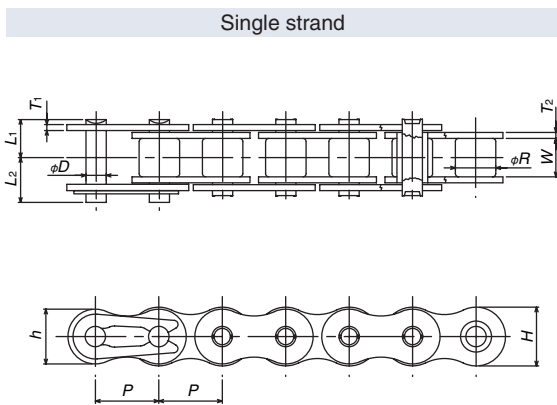
Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



Cotter pins are used in connecting links for RS20B and larger sized chains.
Double-strand OL use connecting pins on both ends.

Single-pitch offset link (OL)

TSUBAKI Chain Number		JIS No.	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates				Pins		
Single-strand	Double-strand					Thickness T ₁	Thickness T ₂	Height H	Height h	Diameter D	L ₁ 2-strand value in ()	L ₂ 2-strand value in ()
RF06B-LM-1	RF06B-LM-2	06B	9.525	6.35	5.72	1.0	1.3	8.2	8.2	3.28	6.1 (11.2)	7.7 (12.8)
RS08B-LM-1	RS08B-LM-2	08B	12.70	8.51	7.75	1.6	1.6	12.0	10.4	4.45	8.4 (15.3)	10.0 (16.9)
RS10B-LM-1	RS10B-LM-2	10B	15.875	10.16	9.65	1.5	1.5	14.7	13.7	5.08	9.55 (17.85)	11.25 (19.55)
RS12B-LM-1	RS12B-LM-2	12B	19.05	12.07	11.68	1.8	1.8	16.1	16.1	5.72	11.1 (20.85)	13.0 (22.75)
RS16B-LM-1	RS16B-LM-2	16B	25.40	15.88	17.02	3.2	4.0	21.0	21.0	8.28	17.75 (33.55)	19.95 (35.75)
RS20B-LM-1	RS20B-LM-2	20B	31.75	19.05	19.56	3.4	4.4	26.4	26.0	10.19	19.9 (38.25)	23.1 (41.45)
RS24B-LM-1	RS24B-LM-2	24B	38.10	25.40	25.40	5.6	6.0	33.4	31.2	14.63	26.65 (50.8)	31.85 (56.0)

TSUBAKI Chain Number		Offset Pin Length L 2-strand value in ()	Minimum Tensile Strength kN{kgf}		Approximate Mass kg/m 2-strand value in ()	Links Per Unit	Transverse Pitch C
Single-strand	Double-strand		Single-strand	Double-strand			
RF06B-LM-1	RF06B-LM-2	15.1 (25.9)	8.90 {910}	16.9 {1720}	0.39 (0.75)	320	10.24
RS08B-LM-1	RS08B-LM-2	18.6 (34.5)	17.8 {1820}	31.1 {3170}	0.70 (1.35)	240	13.92
RS10B-LM-1	RS10B-LM-2	20.8 (39.4)	22.2 {2260}	44.5 {4540}	0.95 (1.85)	192	16.59
RS12B-LM-1	RS12B-LM-2	24.4 (45.9)	28.9 {2950}	57.8 {5890}	1.25 (2.50)	160	19.46
RS16B-LM-1	RS16B-LM-2	39.3 (73.4)	60.0 {6120}	106 {10800}	2.70 (5.40)	120	31.88
RS20B-LM-1	RS20B-LM-2	46.6 (84.6)	95.0 {9690}	170 {17300}	3.85 (7.65)	96	36.45
RS24B-LM-1	RS24B-LM-2	61.7 (112.8)	160 {16300}	280 {28600}	7.45 (14.65)	80	48.36

- Note 1. RF06B plate is flat:
2. Multi-strand RF06B and RS08B chains have one inner plate.
3. Minimum tensile strength of pin gear attachment chains differs from those above. Contact Tsubaki for details.

Ambient temperature: -10 to 150°C

Sprocket

- Use BS Roller chain (ISO-compliant B Series) sprockets.

Pin type

- Single-strand RS08B to RS16B chains use a special pin for easy cutting / connection (center sink pin). Other sizes and double-strand chains use dual riveting.

Easy cutting / connection

- Cutting and connecting is easy with a special tool due to a newly developed pin and new riveting style. (On single-strand chains from RS08B to RS16B.)

Chain selection: Contact Tsubaki.

Compatibility

- When replacing old specification chains, always replace the entire chain.
- New specification chains cannot be connected to old specification chains, and old specification connecting parts (connecting links, offset links, etc.) cannot be used with new specification chains.



Heavy Duty Roller Chains

1. Extensive line-up with outstanding reliability

Tsubaki's Heavy Duty Roller Chains come in a wide array of products. Their high maximum allowable load make them commonly used in compact transmission systems.

2. Uses

Use Tsubaki Heavy Duty Roller Chains when capacity exceeds that of RS Roller Chains, such as in:

1. Harsh environments where the chain will be subjected to heavy impact.
2. Compact drives for equipment or machines that must work in tight spaces.
3. When higher transmission power, allowable load or tensile strength is required.
4. When a lower rate of elastic elongation is required.

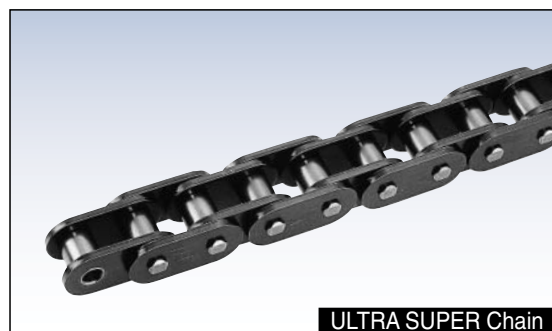
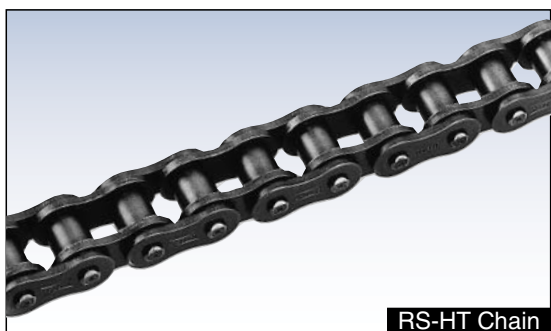
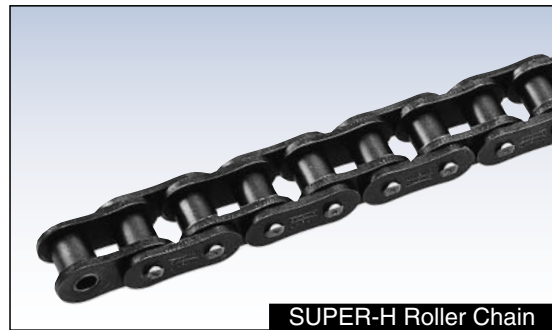
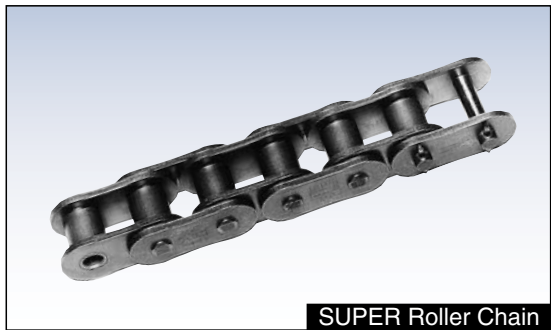
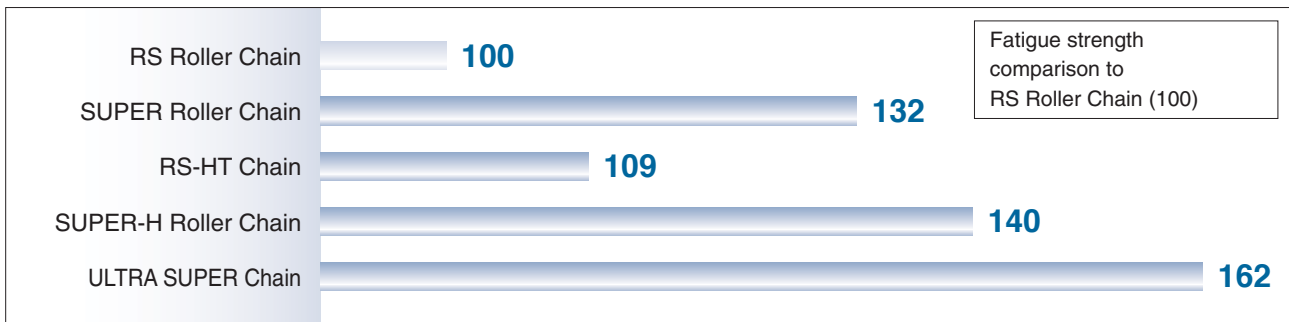
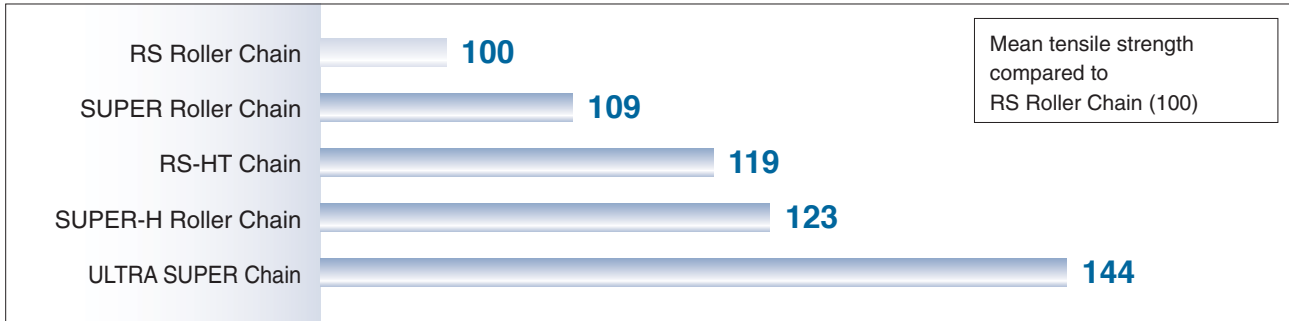
3. Applications and features

Model Item	SUPER Roller Chain	RS-HT Chain	SUPER-H Roller Chain	ULTRA SUPER Chain
Main applications	For heavy-duty transmission, lifting			
Features	<ul style="list-style-type: none"> ● High kilowatt ratings ● High shock absorption ● Can go down one size when used in place of RS Roller Chain 	<ul style="list-style-type: none"> ● High kilowatt ratings ● High tensile strength 	<ul style="list-style-type: none"> ● High fatigue strength ● High tensile strength ● High shock absorption 	<ul style="list-style-type: none"> ● Has the highest fatigue strength, tensile strength, and shock absorption of all Tsubaki chains. Designed for compact drives.
	<p>Note Tsubaki's Heavy Duty Roller Chains are designed for low to medium speed heavy-duty transmission. RS Roller Chain should be used in speed ranges not appearing in the kilowatt ratings tables.</p>			
Example applications	Construction machinery, farm equipment, lifting mechanisms, port equipment, parking structures, etc.			
Offset links	<ul style="list-style-type: none"> ● Single-strand 4POL 	<ul style="list-style-type: none"> ● Offset links are not available. Use an even number of links. 		
Sprockets	<ul style="list-style-type: none"> ● Both single and multi-strand chains can use RS Roller Chain sprockets. 	<ul style="list-style-type: none"> ● Use sprockets made of S35C or higher carbon steel. Small sprockets must have hardened teeth. Steel sprockets cannot be used. 		
Design drawings	pgs. 80 - 86	pgs. 72 - 79	pg. 87	pg. 88



Heavy Duty Roller Chains

4. Tensile strength and fatigue strength comparison



Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



Heavy Duty Roller Chains

Old-New Chain Number Comparison

Product codes have been assigned to all products (except customized products) and chain numbers have been rewritten. The following clarifies the differences between old and new chain numbers.

RS-HT Chain

- ① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers. Current strand indicators are still used with multi-strand chains.

New chain number	Old chain number
<p>RS80 -HT -1</p> <p>①</p> <p>Applicable sizes 60, 80, 100, 120, 140, 160, 200, 240</p> <p>Number of strands Check this catalog for the number of strands.</p>	<p>RS80HT</p> <p>Applicable sizes 60, 80, 100, 120, 140, 160, 200, 240</p>

Chain number with connecting link (CL) **RS80-HT-1-CL** Indicate the connecting link after the number of strands as shown at left. Offset links are not available with RS-HT Roller Chains.

SUPER Roller Chain

- ① The old SUPER \circ chain number was changed to RS \circ -SUP.
- ② Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.
- ③ Distinguish chain numbers by connecting link (FCL or MCL) using -F and -M.

New chain number	Old chain number
<p>RS80 -SUP -1 -F or -M</p> <p>① ② ③ ③</p> <p>Applicable sizes 80, 100, 120, 140, 160, 200, 240</p> <p>Number of strands Check this catalog for the number of strands.</p>	<p>SUPER80</p> <p>Applicable sizes 80, 100, 120, 140, 160, 200, 240</p>

Chain number with connecting link (CL) **RS80-SUP-1-F or MCL** Indicate the connecting link after the number of strands as shown at left.

Chain number when equipped with 4POL **RS80-SUP-1-4POL** 1P offset links and 2P offset links are not available with SUPER Roller Chains.



Heavy Duty Roller Chains

Old-New Chain Number Comparison

Product codes have been assigned to all products (except customized products) and chain numbers have been rewritten. The following clarifies the differences between old and new chain numbers.

SUPER-H Roller Chain

- ① The old SUPER \circ H chain number has been changed to RS \circ -SUP-H.
- ② Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number
	<p>SUPER80H</p> <p>Applicable sizes 80, 100, 120, 140, 160, 200, 240</p>

Chain number with connecting link (CL) **RS80-SUP-H-1-CL** Indicate the connecting link after the number of strands as shown at left. Offset links are not available with SUPER-H Roller Chain.

ULTRA SUPER Chain

- ① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.

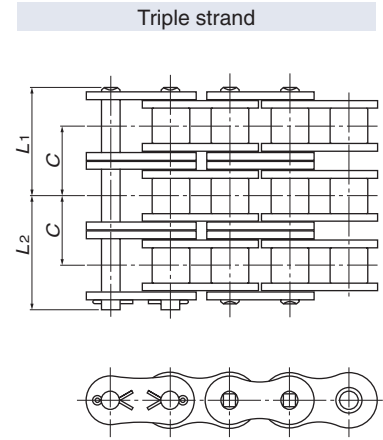
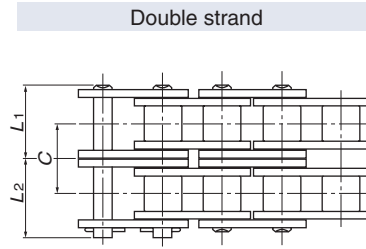
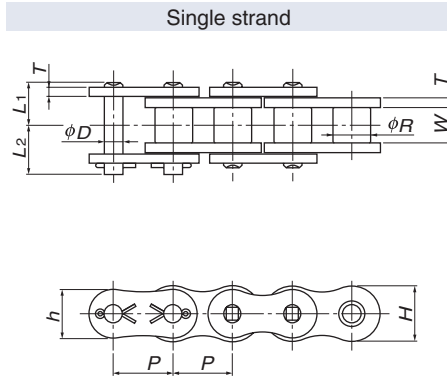
New chain number	Old chain number
	<p>US100</p> <p>Applicable sizes 100, 120, 140, 160, 200, 240</p>

Chain number with connecting link (CL) **RF100-US-1-CL** Indicate the connecting link after the number of strands as shown at left. Offset links are not available with ULTRA SUPER Roller Chain.

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 Standard Roller Chains
 Lubri-Free Roller Chains
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
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 Handling

RS60-HT

Old chain number: RS60HT



TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m
					Thickness T	Height H	Height h	Diameter D	L1	L2					
RS60-HT-1	1								14.8	17.0	—	48.1 { 4900 }	55.9 { 5700 }	9.81 { 1000 }	1.80
RS60-HT-2	2	19.05	11.91	12.70	3.2	18.1	15.6	5.96	27.8	29.9	26.1	96.1 { 9800 }	112 { 11400 }	16.7 { 1700 }	3.59
RS60-HT-3	3								40.85	42.95	26.1	144 { 14700 }	168 { 17100 }	24.5 { 2500 }	5.36

Note: 1. Number of links per unit = 160
2. Offset links are not available.

RS60-HT-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min																
	10	25	50	100	150	200	300	400	500	600	700	800	900	1000	1100	1200	
	A							B							C		
9	0.27	0.61	1.13	2.11	3.04	3.93	5.67	7.34	8.98	10.1	10.1	10.1	10.1				
10	0.30	0.68	1.27	2.36	3.40	4.41	6.35	8.23	10.1	11.4	11.4	11.4	11.4				
11	0.33	0.75	1.40	2.62	3.77	4.89	7.04	9.12	11.1	12.7	12.7	12.7	12.7				
12	0.36	0.83	1.54	2.88	4.14	5.37	7.73	10.0	12.2	13.9	13.9	13.9	13.9				
13	0.39	0.90	1.68	3.14	4.52	5.85	8.43	10.9	13.4	15.2	15.2	15.2	15.2				
14	0.43	0.98	1.82	3.40	4.89	6.34	9.13	11.8	14.5	16.7	16.7	16.7	16.7	16.7			
15	0.46	1.05	1.96	3.66	5.27	6.83	9.84	12.7	15.6	18.4	18.5	18.5	18.5	18.5			
16	0.49	1.13	2.10	3.93	5.65	7.32	10.6	13.7	16.7	19.7	20.4	20.4	20.4	20.4			
17	0.53	1.20	2.25	4.19	6.04	7.82	11.3	14.6	17.8	21.0	22.3	22.3	22.3	22.3			
18	0.56	1.28	2.39	4.46	6.42	8.32	12.0	15.5	19.0	22.4	23.7	23.7	23.7	23.7			
19	0.59	1.36	2.53	4.73	6.81	8.82	12.7	16.5	20.1	23.7	25.1	25.1	25.1	25.1			
20	0.63	1.43	2.68	4.99	7.19	9.32	13.4	17.4	21.3	25.1	26.6	26.6	26.6	26.6			
21	0.66	1.51	2.82	5.27	7.58	9.83	14.2	18.3	22.4	26.4	28.0	28.0	28.0	28.0			
22	0.70	1.59	2.97	5.54	7.97	10.3	14.9	19.3	23.6	27.8	29.5	29.5	29.5	29.5			
23	0.73	1.67	3.11	5.81	8.37	10.8	15.6	20.2	24.7	29.1	30.9	30.9	30.9	30.9			
24	0.77	1.75	3.26	6.08	8.76	11.3	16.3	21.2	25.9	30.5	32.5	32.5	32.5	32.5	32.5		
25	0.80	1.83	3.41	6.36	9.16	11.9	17.1	22.1	27.1	31.9	34.5	34.5	34.5	34.5	34.5		
26	0.83	1.90	3.55	6.63	9.55	12.4	17.8	23.1	28.2	33.3	36.6	36.6	36.6	36.6	36.6		
28	0.90	2.06	3.85	7.18	10.3	13.4	19.3	25.0	30.6	36.0	40.9	40.9	40.9	40.9	40.9		
30	0.97	2.22	4.15	7.74	11.1	14.4	20.8	26.9	32.9	38.8	44.6	44.9	44.9	44.9	44.9		
32	1.04	2.38	4.45	8.30	12.0	15.5	22.3	28.9	35.3	41.6	47.8	48.1	48.1	48.1	48.1		
35	1.15	2.63	4.90	9.14	13.2	17.1	24.6	31.8	38.9	45.9	52.7	53.0	53.0	53.0	53.0		
40	1.33	3.03	5.66	10.6	15.2	19.7	28.4	36.8	44.9	53.0	60.8	61.3	61.3	61.3	61.3	61.3	
45	1.51	3.44	6.43	12.0	17.3	22.4	32.2	41.8	51.0	60.1	69.1	73.2	73.2	73.2	73.2	73.2	73.2

Note: Use RS Roller Chains in the high-speed range.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

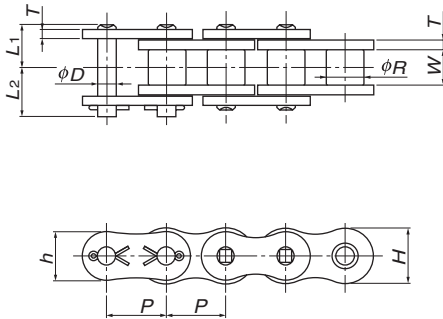
Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use
For Safe Use
Standard Roller Chains
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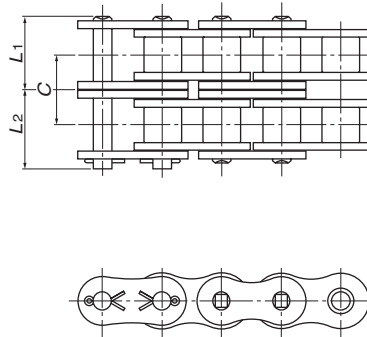
RS80-HT

Old chain number: RS80HT

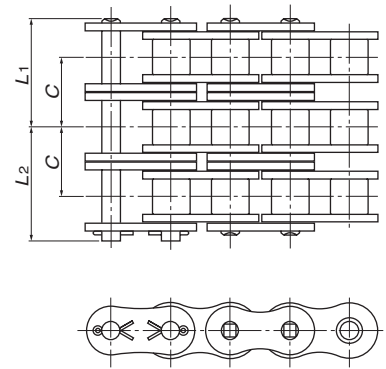
Single strand



Double strand



Triple strand



TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m
					Thickness T	Height H	Height h	Diameter D	L ₁	L ₂					
RS80-HT-1	1							7.94	18.3	20.9	—	81.4 { 8300 }	93.2 { 9500 }	16.2 { 1650 }	3.11
RS80-HT-2	2	25.40	15.88	15.88	4.0	24.1	20.8	7.94	34.6	37.2	32.6	163 { 16600 }	186 { 19000 }	27.6 { 2810 }	6.18
RS80-HT-3	3							7.94	50.95	53.55	32.6	244 { 24900 }	279 { 28500 }	40.5 { 4130 }	9.24

Note: 1. Number of links per unit = 120
2. Offset links are not available.

RS80-HT-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min										
	10	25	50	100	150	200	300	400	500	600	700
	A						B				C
9	0.58	1.33	2.49	4.64	6.69	8.66	12.5	16.2	18.2	18.2	
10	0.65	1.49	2.79	5.20	7.49	9.71	14.0	18.1	20.4	20.4	
11	0.73	1.66	3.09	5.77	8.31	10.8	15.5	20.1	22.6	22.6	
12	0.80	1.82	3.39	6.33	9.12	11.8	17.0	22.1	24.9	24.9	
13	0.87	1.98	3.70	6.91	9.95	12.9	18.6	24.0	27.1	27.1	
14	0.94	2.15	4.01	7.48	10.8	14.0	20.1	26.1	29.4	29.4	
15	1.01	2.31	4.32	8.06	11.6	15.0	21.7	28.1	32.6	32.6	
16	1.09	2.48	4.63	8.64	12.4	16.1	23.2	30.1	35.9	35.9	
17	1.16	2.65	4.94	9.23	13.3	17.2	24.8	32.1	39.3	39.3	
18	1.24	2.82	5.26	9.82	14.1	18.3	26.4	34.2	41.8	42.8	
19	1.31	2.99	5.58	10.4	15.0	19.4	28.0	36.2	44.3	46.0	
20	1.38	3.16	5.89	11.0	15.8	20.5	29.6	38.3	46.8	48.7	
21	1.46	3.33	6.21	11.6	16.7	21.6	31.2	40.4	49.3	51.3	
22	1.53	3.50	6.53	12.2	17.6	22.7	32.8	42.4	51.9	53.9	
23	1.61	3.67	6.85	12.8	18.4	23.9	34.4	44.5	54.4	56.6	
24	1.69	3.85	7.18	13.4	19.3	25.0	36.0	46.6	57.0	59.3	
25	1.76	4.02	7.50	14.0	20.2	26.1	37.6	48.7	59.6	61.9	
26	1.84	4.19	7.82	14.6	21.0	27.2	39.2	50.8	62.2	64.6	
28	1.99	4.54	8.48	15.8	22.8	29.5	42.5	55.1	67.3	70.0	
30	2.15	4.89	9.13	17.0	24.5	31.8	45.8	59.3	72.5	77.2	
32	2.30	5.25	9.79	18.3	26.3	34.1	49.1	63.6	77.8	85.0	85.0
35	2.53	5.78	10.8	20.1	29.0	37.6	54.1	70.1	85.7	97.3	97.3
40	2.93	6.68	12.5	23.2	33.5	43.4	62.5	81.0	99.0	114	114
45	3.32	7.58	14.1	26.4	38.0	49.3	71.0	91.9	112	130	130

Note: Use RS Roller Chains in the high-speed range.

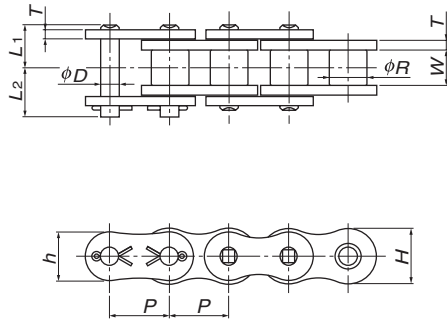
Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

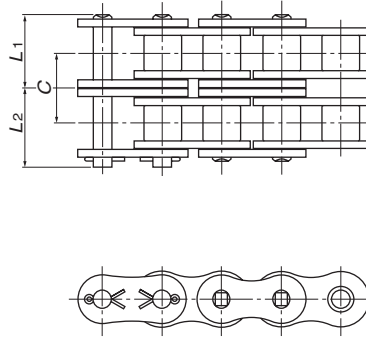
RS100-HT

Old chain number: RS100HT

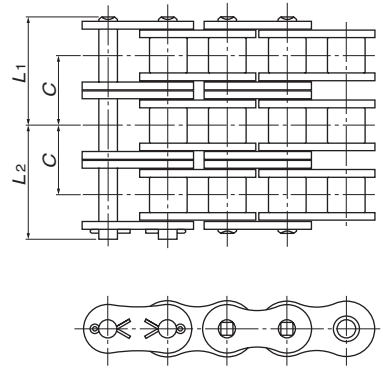
Single strand



Double strand



Triple strand



TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m
					Thickness T	Height H	Height h	Diameter D	L ₁	L ₂					
RS100-HT-1	1										-	124 { 12600}	142 { 14500}	24.5 { 2500}	4.58
RS100-HT-2	2	31.75	19.05	19.05	4.8	30.1	26.0	9.54	41.4	44.1	39.1	247 { 25200}	284 { 29000}	41.7 { 4250}	9.03
RS100-HT-3	3								61.0	63.6	39.1	371 { 37800}	427 { 43500}	61.3 { 6250}	13.54

Note: 1. Number of links per unit = 96
2. Offset links are not available.

RS100-HT-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min								
	10	25	50	100	150	200	300	400	500
	A				B				
9	1.10	2.52	4.70	8.78	12.6	16.4	23.6	26.4	
10	1.24	2.82	5.27	9.83	14.2	18.4	26.4	29.6	
11	1.37	3.13	5.84	10.9	15.7	20.3	29.3	32.8	
12	1.51	3.44	6.42	12.0	17.2	22.3	32.2	36.1	
13	1.64	3.75	7.00	13.1	18.8	24.4	35.1	39.3	
14	1.78	4.06	7.58	14.1	20.4	26.4	38.0	42.9	
15	1.92	4.38	8.17	15.2	21.9	28.4	41.0	47.6	
16	2.06	4.69	8.76	16.3	23.5	30.5	43.9	52.4	
17	2.20	5.01	9.35	17.4	25.1	32.6	46.9	57.4	57.4
18	2.34	5.33	9.94	18.6	26.7	34.6	49.9	62.5	62.5
19	2.48	5.65	10.5	19.7	28.3	36.7	52.9	67.8	67.8
20	2.62	5.97	11.1	20.8	29.9	38.8	55.9	71.9	71.9
21	2.76	6.29	11.7	21.9	31.6	40.9	58.9	75.8	75.8
22	2.90	6.62	12.3	23.0	33.2	43.0	61.9	79.7	79.7
23	3.04	6.94	13.0	24.2	34.8	45.1	65.0	83.7	83.7
24	3.19	7.27	13.6	25.3	36.5	47.2	68.0	87.6	87.6
25	3.33	7.60	14.2	26.5	38.1	49.4	71.1	91.5	91.5 ※C
26	3.47	7.93	14.8	27.6	39.8	51.5	74.2	95.5	95.5
28	3.76	8.59	16.0	29.9	43.1	55.8	80.4	103	103
30	4.06	9.25	17.3	32.2	46.4	60.1	86.6	111	111
32	4.35	9.92	18.5	34.5	49.8	64.5	92.8	120	121
35	4.79	10.9	20.4	38.0	54.8	71.0	102	132	139
40	5.53	12.6	23.6	44.0	63.3	82.0	118	153	170
45	6.28	14.3	26.7	49.9	71.9	93.1	134	174	196

Note: Use RS Roller Chains in the high-speed range.

Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

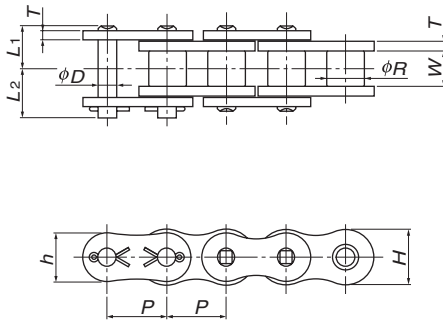
Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use | For Safe Use | Standard Roller Chains | Lubrication-Free Roller Chains | Heavy Duty Roller Chains | Corrosion Resistant Roller Chains | Specialty Roller Chains | Accessories | Selection | Handling

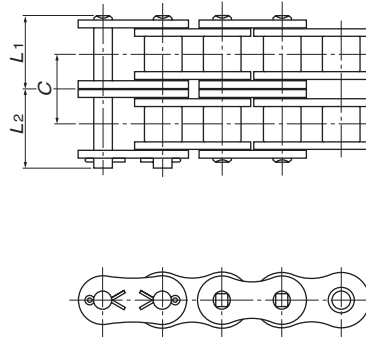
RS120-HT

Old chain number: RS120HT

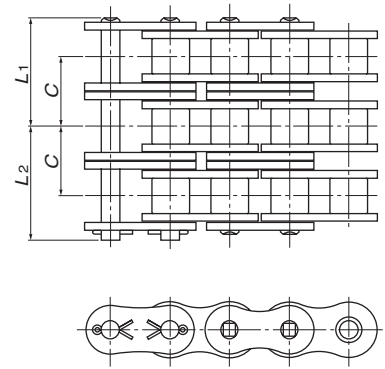
Single strand



Double strand



Triple strand



TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m
					Thickness T	Height H	Height h	Diameter D	L ₁	L ₂					
RS120-HT-1	1											167 { 17000}	191 { 19500}	32.4 { 3300}	6.53
RS120-HT-2	2	38.10	22.23	25.40	5.6	36.2	31.2	11.11	26.95	30.55	48.9	333 { 34000}	382 { 39000}	55.0 { 5610}	12.90
RS120-HT-3	3								75.85	79.55	48.9	500 { 51000}	574 { 58500}	80.9 { 8250}	19.33

Note: 1. Number of links per unit = 80
2. Offset links are not available.

RS120-HT-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min									
	10	25	50	100	150	200	300	400	500	
	A				B				C	
9	1.75	4.00	7.46	13.9	20.1	26.0	37.4	41.1		
10	1.96	4.48	8.36	15.6	22.5	29.1	41.9	46.1		
11	2.18	4.97	9.27	17.3	24.9	32.3	46.5	51.0		
12	2.39	5.46	10.2	19.0	27.4	35.5	51.1	56.1		
13	2.61	5.95	11.1	20.7	29.8	38.7	55.7	61.1		
14	2.83	6.45	12.0	22.4	32.3	41.9	60.3	66.2		
15	3.04	6.94	13.0	24.2	34.8	45.1	65.0	71.3		
16	3.26	7.45	13.9	25.9	37.3	48.4	69.7	76.5		
17	3.49	7.95	14.8	27.7	39.9	51.7	74.4	83.7		
18	3.71	8.46	15.8	29.4	42.4	54.9	79.1	91.2		
19	3.93	8.96	16.7	31.2	45.0	58.3	83.9	98.9		
20	4.15	9.47	17.7	33.0	47.5	61.6	88.7	107		
21	4.38	9.99	18.6	34.8	50.1	64.9	93.5	115	115	
22	4.60	10.5	19.6	36.6	52.7	68.2	98.3	123	123	
23	4.83	11.0	20.6	38.4	55.3	71.6	103	132	132	
24	5.06	11.5	21.5	40.2	57.9	75.0	108	140	140	
25	5.29	12.1	22.5	42.0	60.5	78.3	113	146	146	
26	5.51	12.6	23.5	43.8	63.1	81.7	118	152	152	
28	5.97	13.6	25.4	47.5	68.3	88.5	128	165	165	
30	6.44	14.7	27.4	51.1	73.6	95.4	137	178	178	
32	6.90	15.7	29.4	54.8	79.0	102	147	191	191	
35	7.60	17.3	32.4	60.4	87.0	113	162	210	210	
40	8.78	20.0	37.4	69.7	100	130	187	242	242	
45	9.97	22.7	42.4	79.2	114	148	213	276	286	

Note: Use RS Roller Chains in the high-speed range.

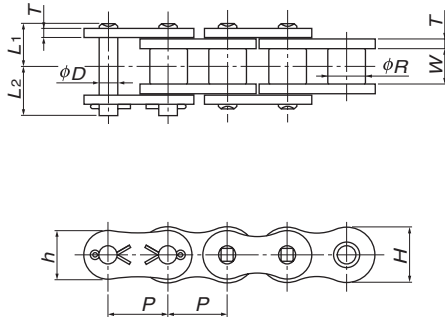
Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

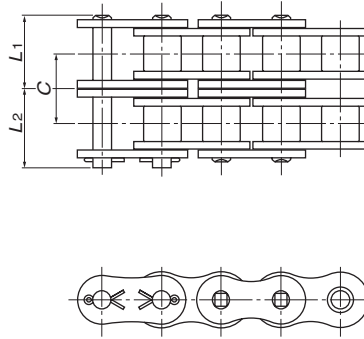
RS140-HT

Old chain number: RS140HT

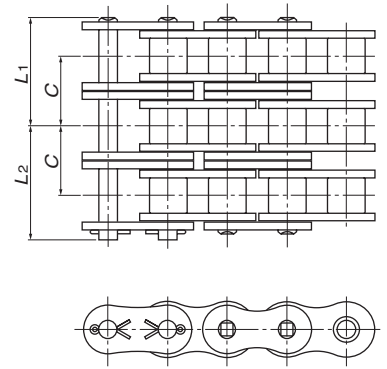
Single strand



Double strand



Triple strand



TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins		Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m	
					Thickness T	Height H	Height h	Diameter D	L ₁						L ₂
RS140-HT-1	1									-	218 { 22200}	250 { 25500}	42.7 { 4350}	8.27	
RS140-HT-2	2	44.45	25.40	25.40	6.4	42.2	36.4	12.71	55.0	59.5	52.2	435 { 44400}	500 { 51000}	72.6 { 7400}	16.38
RS140-HT-3	3								81.15	85.25	52.2	653 { 66600}	750 { 76500}	107 {10880}	24.54

Note: 1. Number of links per unit = 68
2. Offset links are not available.

RS140-HT-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min										
	10	25	50	100	150	200	250	300	350	400	450
	A			B							C
9	2.70	6.15	11.5	21.4	30.8	40.0	48.9	56.1	56.1		
10	3.02	6.89	12.9	24.0	34.6	44.8	54.7	64.5	65.6		
11	3.35	7.64	14.3	26.6	38.3	49.6	60.7	71.5	72.7		
12	3.68	8.39	15.7	29.2	42.1	54.5	66.7	78.5	79.9		
13	4.01	9.15	17.1	31.9	45.9	59.4	72.7	85.6	87.1		
14	4.34	9.91	18.5	34.5	49.7	64.4	78.7	92.8	94.4		
15	4.68	10.7	19.9	37.2	53.6	69.4	84.8	100	103		
16	5.02	11.4	21.4	39.9	57.4	74.4	90.9	107	114		
17	5.36	12.2	22.8	42.6	61.3	79.4	97.1	114	124		
18	5.70	13.0	24.3	45.3	65.2	84.5	103	122	136	136	
19	6.04	13.8	25.7	48.0	69.1	89.6	109	129	144	144	
20	6.39	14.6	27.2	50.7	73.1	94.7	116	136	152	152	
21	6.73	15.4	28.7	53.5	77.0	100	122	144	161	161	
22	7.08	16.1	30.1	56.2	81.0	105	128	151	169	169	
23	7.43	16.9	31.6	59.0	85.0	110	135	159	177	177	
24	7.78	17.7	33.1	61.8	89.0	115	141	166	186	186	
25	8.13	18.5	34.6	64.6	93.0	120	147	174	194	194	
26	8.48	19.3	36.1	67.3	97.0	126	154	181	204	204	
28	9.18	21.0	39.1	73.0	105	136	166	196	225	228	
30	9.90	22.6	42.1	78.6	113	147	179	211	243	253	
32	10.6	24.2	45.2	84.3	121	157	192	227	260	276	
35	11.7	26.7	49.8	92.8	134	173	212	250	287	304	
40	13.5	30.8	57.5	107	154	200	245	288	331	351	
45	15.3	35.0	65.3	122	175	227	278	327	376	408	408

Note: Use RS Roller Chains in the high-speed range.

Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

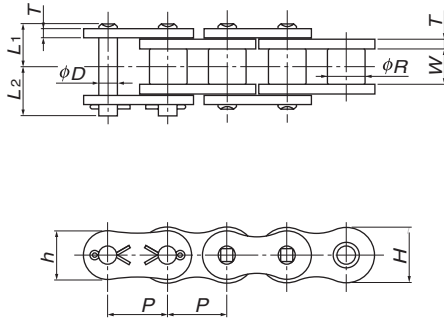
Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use
 For Safe Use
 Standard Roller Chains
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 Corrosion Resistant Roller Chains
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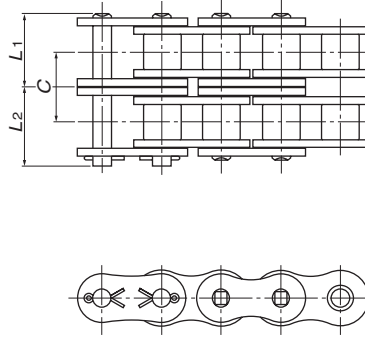
RS160-HT

Old chain number: RS160HT

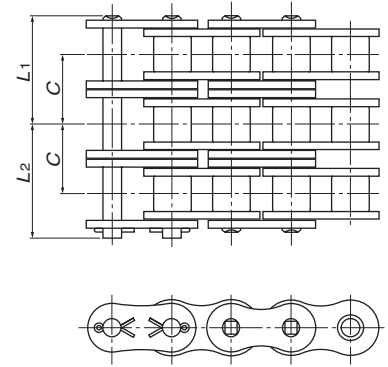
Single strand



Double strand



Triple strand



TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m
					Thickness T	Height H	Height h	Diameter D	L ₁	L ₂					
RS160-HT-1	1							33.95	38.45	-	278 { 28300}	319 { 32500}	55.9 { 5700}	10.97	
RS160-HT-2	2	50.80	28.58	31.75	7.15	48.2	41.6	64.9	69.6	61.9	555 { 56600}	638 { 65000}	95 { 9690}	21.78	
RS160-HT-3	3							95.95	100.45	61.9	833 { 84900}	956 { 97500}	140 { 14250}	32.63	

Note: 1. Number of links per unit = 60
2. Offset links are not available.

RS160-HT-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min									
	10	25	50	100	150	200	250	300	350	400
	A			B					C	
9	4.03	9.20	17.2	32.0	46.2	59.8	73.1	74.5		
10	4.52	10.3	19.2	35.9	51.7	67.0	81.9	87.3		
11	5.01	11.4	21.3	39.8	57.3	74.3	90.8	98.5		
12	5.50	12.6	23.4	43.7	63.0	81.6	100	108		
13	6.00	13.7	25.5	47.7	68.7	88.9	109	118		
14	6.50	14.8	27.7	51.6	74.4	96.4	118	128		
15	7.00	16.0	29.8	55.6	80.1	104	127	138		
16	7.51	17.1	32.0	59.6	85.9	111	136	148		
17	8.02	18.3	34.1	63.7	91.7	119	145	162		
18	8.53	19.5	36.3	67.7	97.6	126	155	177	177	
19	9.04	20.6	38.5	71.8	103	134	164	192	192	
20	9.56	21.8	40.7	75.9	109	142	173	204	207	
21	10.1	23.0	42.9	80.0	115	149	183	215	220	
22	10.6	24.2	45.1	84.1	121	157	192	226	231	
23	11.1	25.3	47.3	88.3	127	165	201	237	243	
24	11.6	26.5	49.5	92.4	133	172	211	248	254	
25	12.2	27.7	51.8	96.6	139	180	220	260	266	
26	12.7	28.9	54.0	101	145	188	230	271	277	
28	13.7	31.3	58.5	109	157	204	249	293	300	
30	14.8	33.8	63.0	118	169	219	268	316	325	
32	15.9	36.2	67.6	126	182	235	288	339	358	
35	17.5	39.9	74.4	139	200	259	317	373	409	409
40	20.2	46.1	86.0	160	231	299	366	431	485	485
45	22.9	52.3	97.6	182	262	340	416	490	551	551

Note: Use RS Roller Chains in the high-speed range.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

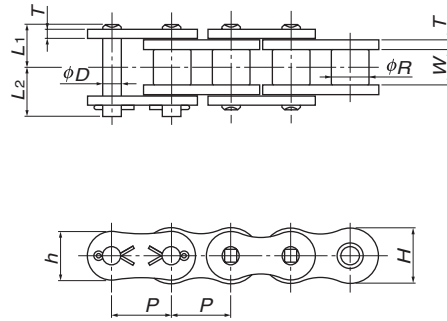
Selection

Handling

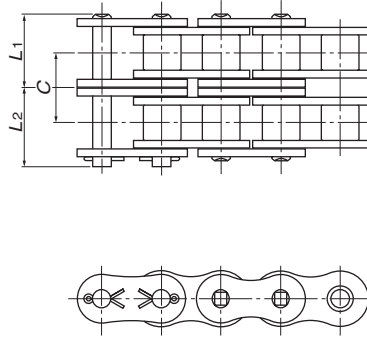
RS200-HT

Old chain number: RS200HT

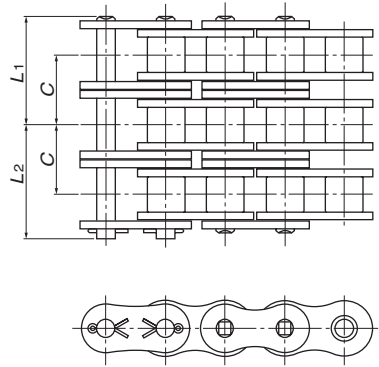
Single strand



Double strand



Triple strand



TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins		Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m	
					Thickness T	Height H	Height h	Diameter D	L ₁						L ₂
RS200-HT-1	1									-	486 { 49600}	559 { 57000}	78.5 { 8000}	18.41	
RS200-HT-2	2	63.50	39.68	38.10	9.5	60.3	52.0	19.85	82.05	87.3	78.3	973 { 99200}	1120 { 114000}	133 { 13600}	36.47
RS200-HT-3	3								121.25	126.55	78.3	1460 { 148800}	1680 { 171000}	196 { 20000}	54.77

Note: 1. Number of links per unit = 48
2. Offset links are not available.

RS200-HT-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min												
	10	15	20	30	40	50	70	100	150	200	250	300	
	A					B						C	
9	7.08	10.2	13.2	19.0	24.7	30.1	40.8	56.2	81.0	105	108		
10	7.93	11.4	14.8	21.3	27.6	33.8	45.7	63.0	90.8	118	122		
11	8.79	12.7	16.4	23.6	30.6	37.4	50.7	69.9	101	130	135		
12	9.66	13.9	18.0	26.0	33.6	41.1	55.7	76.7	111	143	148		
13	10.5	15.2	19.7	28.3	36.7	44.8	60.7	83.7	121	156	161		
14	11.4	16.4	21.3	30.7	39.7	48.6	65.8	90.6	131	169	175		
15	12.3	17.7	22.9	33.0	42.8	52.3	70.8	97.6	141	182	192		
16	13.2	19.0	24.6	35.4	45.9	56.1	76.0	105	151	195	211		
17	14.1	20.3	26.3	37.8	49.0	59.9	81.1	112	161	209	231		
18	15.0	21.6	27.9	40.2	52.1	63.7	86.3	119	171	222	252	252	
19	15.9	22.9	29.6	42.7	55.3	67.5	91.4	126	182	235	273	273	
20	16.8	24.2	31.3	45.1	58.4	71.4	96.6	133	192	249	290	290	
21	17.7	25.5	33.0	47.5	61.6	75.3	102	140	202	262	305	305	
22	18.6	26.8	34.7	50.0	64.7	79.1	107	148	213	276	321	321	
23	19.5	28.1	36.4	52.4	67.9	83.0	112	155	223	289	337	337	
24	20.4	29.4	38.1	54.9	71.1	86.9	118	162	234	303	353	353	
25	21.3	30.7	39.8	57.4	74.3	90.9	123	170	244	316	369	369	
26	22.3	32.1	41.6	59.9	77.5	94.8	128	177	255	330	385	385	

Note: Use RS Roller Chains in the high-speed range.

Multi-strand factor	Number of chain strands		Multi-strand factor	
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

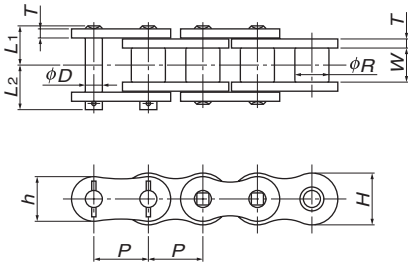
Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

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 Selection
 Handling

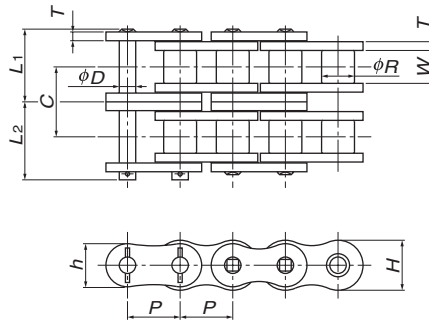
RS240-HT

Old chain number: RS240HT

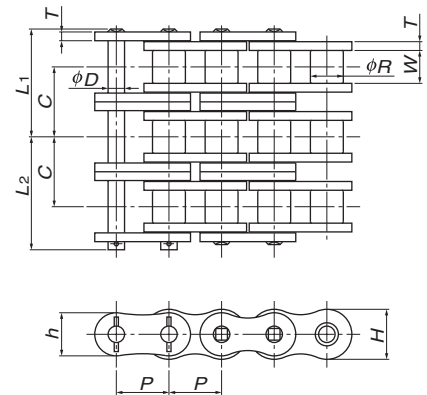
Single strand



Double strand



Triple strand



Spring pins are used with RS240HT joint links.

TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m
					Thickness T	Height H	Height h	Diameter D	L ₁	L ₂					
RS240-HT-1	1										-	768 { 78300}	883 { 90000}	113 { 11500}	29.13
RS240-HT-2	2	76.20	47.63	47.63	12.7	72.4	62.4	23.81	105.3	112.9	101.2	1540 {156600}	1770 {180000}	192 {19550}	57.35
RS240-HT-3	3								156.05	163.55	101.2	2300 {234900}	2650 {270000}	282 {28750}	85.47

Note: 1. Number of links per unit = 40
2. Offset links are not available.

RS240-HT-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min															
	5	10	15	20	25	30	40	50	60	80	100	125	150	175	200	250
	A						B									
9	6.55	12.2	17.6	22.8	27.9	32.9	42.6	52.1	61.3	79.5	97.15	119	140	159	159	
10	7.34	13.7	19.7	25.6	31.3	36.8	47.7	58.3	68.7	89.1	109	133	157	180	183	183
11	8.14	15.2	21.9	28.3	34.7	40.8	52.9	64.7	76.2	98.7	121	148	174	200	202	202
12	8.94	16.7	24.0	31.1	38.1	44.9	58.1	71.0	83.7	108	133	162	191	219	222	222
13	9.75	18.2	26.2	34.0	41.5	48.9	63.4	77.4	91.3	118	145	177	208	239	242	242
14	10.6	19.7	28.4	36.8	45.0	53.0	68.6	83.9	98.9	128	157	191	226	259	263	263
15	11.4	21.2	30.6	39.6	48.4	57.1	73.9	90.4	107	138	169	206	243	279	283	283
16	12.2	22.8	32.8	42.5	51.9	61.2	79.3	96.9	114	148	181	221	261	299	299	299
17	13.0	24.3	35.0	45.4	55.5	65.3	84.6	103	122	158	193	236	278	300	300	300
18	13.9	25.9	37.2	48.3	59.0	69.5	90.0	110	130	168	205	251	296	303	303	303
19	14.7	27.4	39.5	51.2	62.5	73.7	95.5	117	137	178	218	266	314	317	317	317
20	15.5	29.0	41.7	54.1	66.1	77.9	101	123	145	188	230	281	330	330	330	330
21	16.4	30.5	44.0	57.0	69.7	82.1	106	130	153	198	243	297	345	345	345	345
22	17.2	32.1	46.3	59.9	73.3	86.3	112	137	161	209	255	312	346	346	346	346
23	18.1	33.7	48.5	62.9	76.9	90.6	117	143	169	219	268	327	370	370	370	370
24	18.9	35.3	50.8	65.8	80.5	94.8	123	150	177	229	280	343	396	396	396	396
25	19.8	36.9	53.1	68.8	84.1	99.1	128	157	185	240	293	358	410	410	410	410
26	20.6	38.5	55.4	71.8	87.7	103	134	164	193	250	306	373	418	418	418	418

Note: Use RS Roller Chains in the high-speed range.

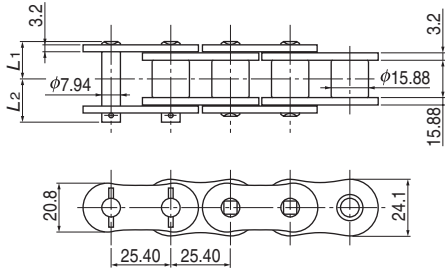
Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

Lubrication method	A	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

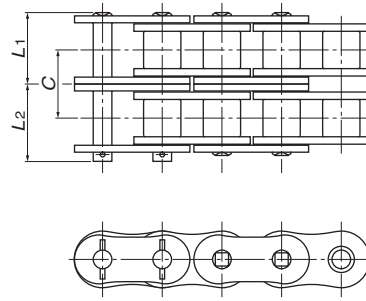
RS80-SUP

Old chain number: SUPER80

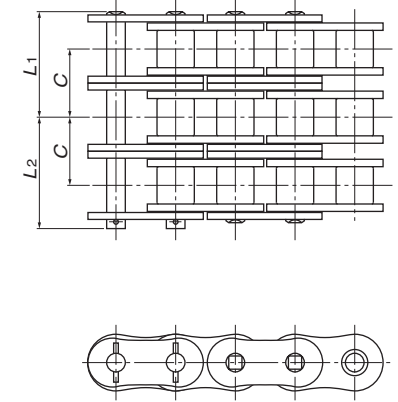
Single strand



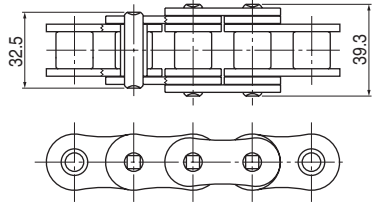
Double strand



Triple strand



4POL



Drawing Scale: 1/3.2

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Transverse Pitch C	Pin Type	Min. Ultimate Strength ANSI Standard kN{k _{gf} }	Minimum Tensile Strength kN{k _{gf} }	Average Tensile Strength kN{k _{gf} }	Maximum Allowable Load kN{k _{gf} }	Approximate Mass kg/m
RS80-SUP-1	1	35.5	16.25	19.25	29.3	Riveting	61.2 {6241}	74.2{7570}	85.3{8700}	18.6{1900}	2.81
RS80-SUP-2	2	64.8	30.9	33.9			122.4{12481}	148{15140}	171{17400}	31.7{3230}	5.62
RS80-SUP-3	3	94.1	45.6	48.5			183.6{18722}	223{22710}	256{26100}	46.6{4750}	8.40
RS80-SUP-4	4	123.5	60.25	63.25			222.4{22680}	297{30280}	341{34800}	61.5{6270}	11.17
RS80-SUP-5	5	152.9	74.95	77.95			278.0{28350}	371{37850}	427{43500}	72.7{7410}	13.97
RS80-SUP-6	6	182.1	89.6	92.5			333.6{34020}	445{45420}	512{52200}	85.7{8740}	16.75

- Note: 1. Number of links per unit = 120
 2. Four-pitch offset links (4POL) are only for single-strand chains.
 3. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

RS80-SUP-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min											
	10	25	50	100	150	200	300	400	500	600	700	800
	A II			B			C					
13	1.00	2.28	4.25	7.93	11.4	14.8	21.3	27.6	32.1	32.1	32.1	
14	1.08	2.47	4.60	8.59	12.4	16.0	23.1	29.9	35.9	35.9	35.9	
15	1.17	2.66	4.96	9.25	13.3	17.3	24.9	32.2	39.4	39.8	39.8	
16	1.25	2.85	5.32	9.92	14.3	18.5	26.7	34.6	42.2	43.8	43.8	
17	1.33	3.04	5.68	10.6	15.3	19.8	28.5	36.9	45.1	48.0	48.0	
18	1.42	3.24	6.04	11.3	16.2	21.0	30.3	39.2	48.0	51.4	51.4	
19	1.50	3.43	6.40	11.9	17.2	22.3	32.1	41.6	50.9	54.4	54.4	
20	1.59	3.63	6.77	12.6	18.2	23.6	33.9	44.0	53.8	57.5	57.5	
21	1.68	3.82	7.13	13.3	19.2	24.8	35.8	46.3	56.7	60.7	60.7	
22	1.76	4.02	7.50	14.0	20.2	26.1	37.6	48.7	59.6	63.8	63.8	
23	1.85	4.22	7.87	14.7	21.2	27.4	39.5	51.1	62.5	66.9	66.9	
24	1.94	4.42	8.24	15.4	22.1	28.7	41.3	53.5	65.4	70.1	70.1	
25	2.02	4.61	8.61	16.1	23.1	30.0	43.2	56.0	68.4	73.2	73.2	
26	2.11	4.81	8.98	16.8	24.1	31.3	45.1	58.4	71.4	76.4	76.4	
28	2.29	5.22	9.73	18.2	26.2	33.9	48.8	63.2	77.3	83.0	83.0	83.0
30	2.46	5.62	10.5	19.6	28.2	36.5	52.6	68.1	83.3	92.1	92.1	92.1
32	2.64	6.02	11.2	21.0	30.2	39.1	56.4	73.0	89.3	101	101	101
35	2.91	6.64	12.4	23.1	33.3	43.1	62.1	80.5	98.4	116	116	116
40	3.36	7.67	14.3	26.7	38.5	49.8	71.8	93.0	114	134	137	137
45	3.82	8.71	16.2	30.3	43.7	56.6	81.5	106	129	152	156	156

- Note: 1. Use RS Roller Chains in the high-speed range.
 2. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

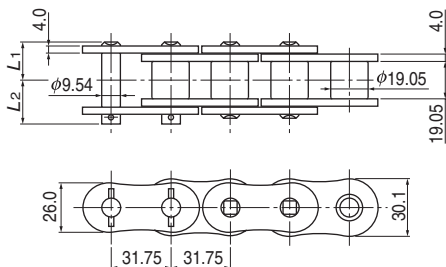
Lubrication method	A II	Manual lubrication or drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use
 For Safe Use
 Standard Roller Chains
 Lubrication-Free Roller Chains
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling

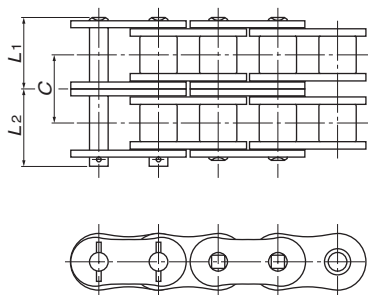
RS100-SUP

Old chain number: SUPER100

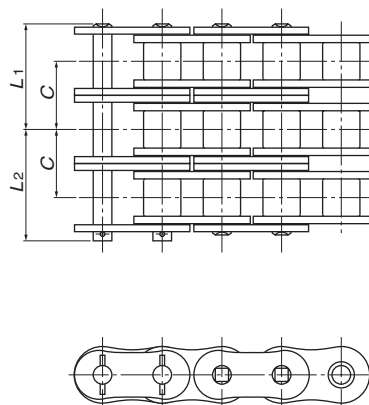
Single strand



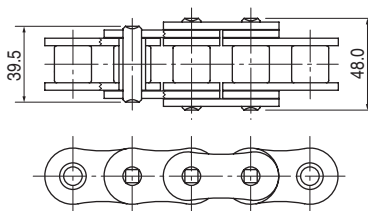
Double strand



Triple strand



4POL



Drawing Scale: 1/4

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Transverse Pitch C	Pin Type	Min. Ultimate Strength ANSI Standard kN{kgf}	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS100-SUP-1	1	42.6	19.75	22.85	35.8	Riveting	95.4 {9728}	111{11300}	127{13000}	30.4{3100}	4.25
RS100-SUP-2	2	78.5	37.7	40.8			190.8{19456}	222{22600}	255{26000}	51.7{5270}	8.38
RS100-SUP-3	3	114.4	55.65	58.75			286.2{29184}	332{33900}	382{39000}	76.0{7750}	12.57
RS100-SUP-4	4	150.2	73.55	76.65			346.8{35364}	443{45200}	510{52000}	100{10230}	16.76
RS100-SUP-5	5	186.1	91.5	94.6			433.5{44205}	554{56500}	637{65000}	119{12090}	20.87
RS100-SUP-6	6	222.0	109.45	112.55			520.2{53046}	665{67800}	765{78000}	140{14260}	25.08

- Note: 1. Number of links per unit = 96
 2. Four-pitch offset links (4POL) are only for single-strand chains.
 3. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

RS100-SUP-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min										
	10	25	50	100	150	200	300	400	500	600	700
	A II			B	C						
13	2.04	4.65	8.68	16.2	23.3	30.2	43.5	48.9	48.9		
14	2.21	5.04	9.40	17.6	25.3	32.8	47.2	54.0	54.0	54.0	
15	2.38	5.43	10.1	18.9	27.2	35.3	50.8	59.9	59.9	59.9	
16	2.55	5.82	10.9	20.3	29.2	37.8	54.5	66.0	66.0	66.0	
17	2.72	6.22	11.6	21.6	31.2	40.4	58.2	72.3	72.3	72.3	
18	2.90	6.61	12.3	23.0	33.2	43.0	61.9	78.8	78.8	78.8	
19	3.07	7.01	13.1	24.4	35.2	45.5	65.6	85.0	85.4	85.4	
20	3.25	7.41	13.8	25.8	37.2	48.1	69.3	89.8	91.8	91.8	
21	3.42	7.81	14.6	27.2	39.2	50.7	73.1	94.7	96.8	96.8	
22	3.60	8.21	15.3	28.6	41.2	53.4	76.9	99.6	102	102	
23	3.78	8.62	16.1	30.0	43.2	56.0	80.6	104	107	107	
24	3.95	9.02	16.8	31.4	45.2	58.6	84.4	109	112	112	
25	4.13	9.43	17.6	32.8	47.3	61.3	88.2	114	117	117	
26	4.31	9.84	18.4	34.2	49.3	63.9	92.1	119	122	122	
28	4.67	10.7	19.9	37.1	53.4	69.2	99.7	129	132	132	
30	5.03	11.5	21.4	40.0	57.6	74.6	107	139	142	142	
32	5.40	12.3	23.0	42.9	61.7	80.0	115	149	153	153	
35	5.94	13.6	25.3	47.2	68.0	88.1	127	164	170	170	170
40	6.87	15.7	29.2	54.5	78.6	102	147	190	207	207	207
45	7.80	17.8	33.2	61.9	89.2	116	166	216	247	247	247

- Note: 1. Use RS Roller Chains in the high-speed range.
 2. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A II	Drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

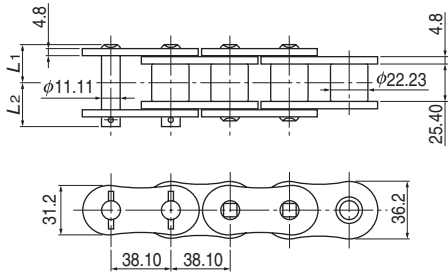
Selection

Handling

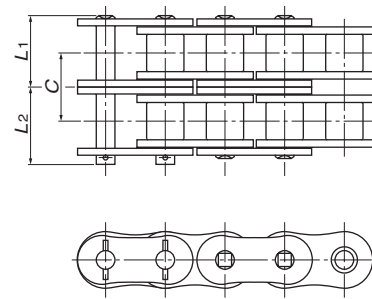
RS120-SUP

Old chain number: SUPER120

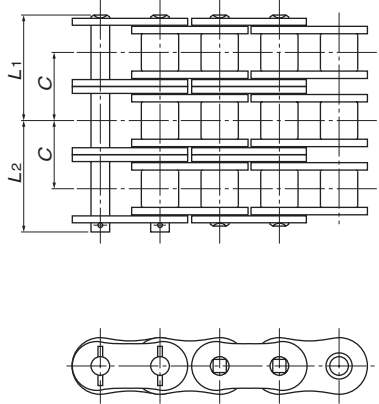
Single strand



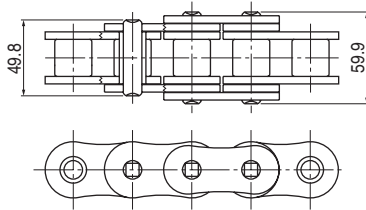
Double strand



Triple strand



4POL



Drawing Scale 1/4.8

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Transverse Pitch C	Pin Type	Min. Ultimate Strength ANSI Standard kN{kgf}	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS120-SUP-1	1	53.8	24.9	28.9	45.4	Riveting	137.1{13980}	162{16500}	186 {19000}	39.2 {4000}	6.3
RS120-SUP-2	2	99.2	47.6	51.6			274.2{27961}	324{33000}	373 {38000}	66.7 {6800}	12.44
RS120-SUP-3	3	144.8	70.4	74.4			411.3{41941}	485{49500}	559 {57000}	98.1{10000}	18.64
RS120-SUP-4	4	190.2	93.1	97.1			498.4{50824}	647{66000}	745 {76000}	129{13200}	24.84
RS120-SUP-5	5	235.7	115.85	119.85			623.0{63530}	809{82500}	932 {95000}	153{15600}	31.02
RS120-SUP-6	6	281.1	138.55	142.55			747.6{76236}	971{99000}	1120{114000}	180{18400}	37.2

- Note: 1. Number of links per unit = 80
 2. Four-pitch offset links (4POL) are only for single-strand chains.
 3. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

RS120-SUP-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min									
	A II		B			C				
	10	25	50	100	150	200	300	400	500	600
13	3.16	7.20	13.4	25.1	36.1	46.8	67.4	73.5	73.5	
14	3.42	7.80	14.6	27.2	39.1	50.7	73.0	82.2	82.2	
15	3.68	8.40	15.7	29.3	42.1	54.6	78.6	91.2	91.2	
16	3.95	9.01	16.8	31.4	45.2	58.5	84.3	100	100	
17	4.22	9.62	17.9	33.5	48.2	62.5	90.0	110	110	
18	4.48	10.2	19.1	35.6	51.3	66.5	95.8	118	118	
19	4.75	10.8	20.2	37.8	54.4	70.5	101.5	125	125	
20	5.03	11.5	21.4	39.9	57.5	74.5	107.3	132	132	
21	5.30	12.1	22.5	42.1	60.6	78.5	113	139	139	
22	5.57	12.7	23.7	44.2	63.7	82.6	119	146	146	
23	5.84	13.3	24.9	46.4	66.9	86.6	125	153	153	
24	6.12	14.0	26.0	48.6	70.0	90.7	131	160	160	
25	6.39	14.6	27.2	50.8	73.2	94.8	137	168	168	
26	6.67	15.2	28.4	53.0	76.3	98.9	142	175	175	
28	7.23	16.5	30.8	57.4	82.7	107	154	190	190	
30	7.79	17.8	33.1	61.9	89.1	115	166	204	204	
32	8.35	19.0	35.5	66.3	95.5	124	178	219	219	
35	9.20	21.0	39.1	73.1	105	136	196	247	247	247
40	10.6	24.2	45.2	84.4	122	157	227	294	302	302
45	12.1	27.5	51.4	95.8	138	179	258	334	360	360

- Note: 1. Use RS Roller Chains in the high-speed range.
 2. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	-	-

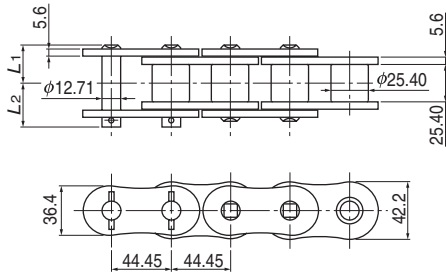
Lubrication method	A II	Drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use
 For Safe Use
 Standard Roller Chains
 Lubri-Free Roller Chains
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling

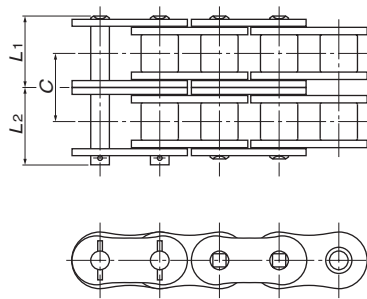
RS140-SUP

Old chain number: SUPER140

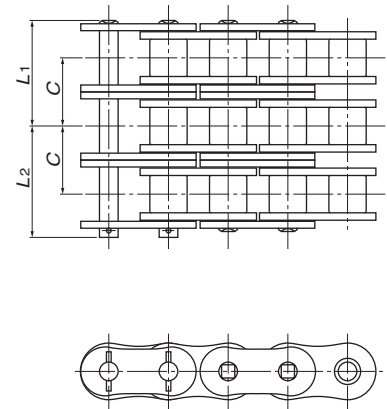
Single strand



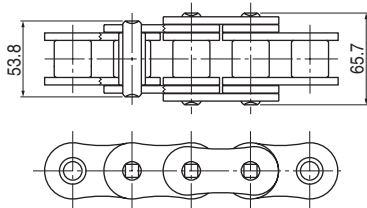
Double strand



Triple strand



4POL



Drawing Scale 1/5.6

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Transverse Pitch C	Pin Type	Min. Ultimate Strength ANSI Standard kN{kgf}	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS140-SUP-1	1	58.6	26.9	31.7	48.9	Riveting	185.9 {18957}	213 {21700}	245 {25000}	53.9{5500}	8.04
RS140-SUP-2	2	107.5	51.35	56.15			371.8 {37913}	426 {43400}	490 {50000}	91.7{9350}	15.92
RS140-SUP-3	3	156.6	75.85	80.75			557.7 {56870}	638 {65100}	735 {75000}	135{13750}	23.84
RS140-SUP-4	4	205.5	100.3	105.2			676.0 {68932}	851 {86800}	981{100000}	178{18150}	30.71
RS140-SUP-5	5	254.4	124.8	129.6			845.0 {86165}	1060{108500}	1230{125000}	210{21450}	39.69
RS140-SUP-6	6	303.5	149.3	154.2			1014.0{103398}	1280{130200}	1470{150000}	248{25300}	47.57

- Note: 1. Number of links per unit = 68
 2. Four-pitch offset links (4POL) are only for single-strand chains.
 3. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

RS140-SUP-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min												
	10	25	50	100	150	200	250	300	350	400	450	500	550
	A II			B		C							
13	5.06	11.5	21.5	40.2	57.9	75.0	91.7	96.8	96.8	96.8			
14	5.48	12.5	23.3	43.6	62.7	81.3	99.4	109	109	109	109		
15	5.91	13.5	25.2	46.9	67.6	87.6	107	121	121	121	121		
16	6.34	14.5	27.0	50.3	72.5	93.9	115	133	133	133	133		
17	6.76	15.4	28.8	53.7	77.4	100	123	144	144	144	144		
18	7.19	16.4	30.6	57.1	82.3	107	130	153	153	153	153		
19	7.63	17.4	32.5	60.6	87.3	113	138	162	162	162	162		
20	8.06	18.4	34.3	64.0	92.2	119	146	171	171	171	171		
21	8.50	19.4	36.2	67.5	97.2	126	154	181	181	181	181		
22	8.94	20.4	38.0	71.0	102	132	162	190	190	190	190		
23	9.38	21.4	39.9	74.5	107	139	170	199	199	199	199		
24	9.82	22.4	41.8	78.0	112	146	178	209	209	209	209		
25	10.3	23.4	43.7	81.5	117	152	186	219	222	222	222	222	
26	10.7	24.4	45.6	85.0	122	159	194	229	235	235	235	235	
28	11.6	26.4	49.4	92.1	133	172	210	248	263	263	263	263	
30	12.5	28.5	53.2	99.2	143	185	226	267	292	292	292	292	
32	13.4	30.6	57.0	106	153	199	243	286	313	313	313	313	
35	14.8	33.7	62.8	117	169	219	267	315	345	345	345	345	
40	17.0	38.9	72.5	135	195	253	309	364	398	398	398	398	
45	19.4	44.1	82.4	154	221	287	351	413	464	464	464	464	464

- Note: 1. Use RS Roller Chains in the high-speed range.
 2. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

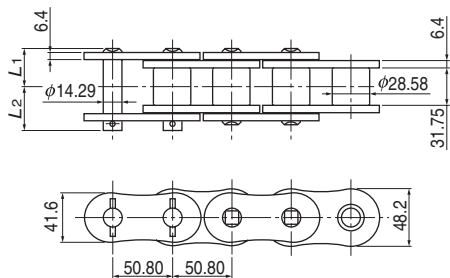
Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A II	Drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

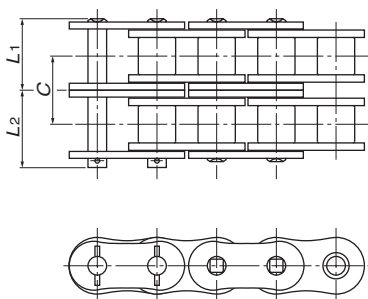
RS160-SUP

Old chain number: SUPER160

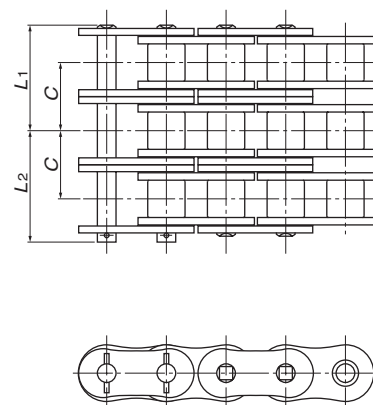
Single strand



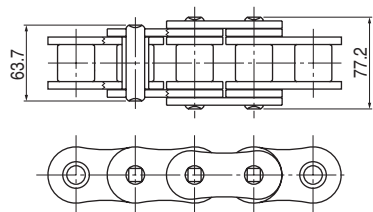
Double strand



Triple strand



4POL



Drawing Scale 1/6.5

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Transverse Pitch C	Pin Type	Min. Ultimate Strength ANSI Standard kN{k g f}	Minimum Tensile Strength kN{k g f}	Average Tensile Strength kN{k g f}	Maximum Allowable Load kN{k g f}	Approximate Mass kg / m
RS160-SUP-1	1	68.7	31.85	36.85	58.5	Riveting	244.6{24942}	273 {27800}	314 {32000}	70.6{7200}	10.79
RS160-SUP-2	2	127.3	61.15	66.15			489.2{49885}	545 {55600}	628 {64000}	120 {12240}	21.43
RS160-SUP-3	3	185.9	90.45	95.45			733.8{74827}	818 {83400}	941 {96000}	177 {18000}	32.10
RS160-SUP-4	4	244.4	119.75	124.65			889.6{90712}	1090{111200}	1260{128000}	233 {23760}	42.84
RS160-SUP-5	5	303.0	149.05	153.95			1112.0{113390}	1360{139000}	1570{160000}	275 {28080}	53.37
RS160-SUP-6	6	361.6	178.3	183.3			1334.4{136068}	1640{166800}	1880{192000}	325 {33120}	64.10

- Note: 1. Number of links per unit = 60
 2. Four-pitch offset links (4POL) are only for single-strand chains.
 3. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

RS160-SUP-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min											
	10	25	50	100	150	200	250	300	350	400	450	
	A II		B		C							
13	7.58	17.3	32.3	60.2	86.7	112	129	129	129			
14	8.21	18.7	34.9	65.2	93.9	122	145	145	145	145		
15	8.84	20.2	37.7	70.3	101	131	160	160	160	160		
16	9.48	21.6	40.4	75.3	108.5	141	172	177	177	177		
17	10.1	23.1	43.1	80.4	116	150	183	193	193	193		
18	10.8	24.6	45.8	85.5	123	160	195	207	207	207		
19	11.4	26.0	48.6	90.7	131	169	207	219	219	219		
20	12.1	27.5	51.4	95.9	138	179	219	232	232	232		
21	12.7	29.0	54.1	101	146	189	230	244	244	244		
22	13.4	30.5	56.9	106	153	198	242	257	257	257		
23	14.0	32.0	59.7	111	161	208	254	270	270	270		
24	14.7	33.5	62.5	117	168	218	266	282	282	282		
25	15.4	35.0	65.4	122	176	228	278	295	295	295		
26	16.0	36.5	68.2	127	183	237	290	308	308	308		
28	17.4	39.6	73.9	138	199	257	314	343	343	343	343	
30	18.7	42.7	79.6	149	214	277	339	380	380	380	380	
32	20.0	45.7	85.3	159	229	297	363	419	419	419	419	
35	22.1	50.4	94.0	175	253	327	400	472	472	472	472	
40	25.5	58.2	108.6	203	292	378	462	545	545	545	545	
45	29.0	66.1	123.3	230	331	429	525	619	619	619	619	

- Note: 1. Use RS Roller Chains in the high-speed range.
 2. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A II	Drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use
 For Safe Use
 Standard Roller Chains
 Lubrication-Free Roller Chains
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling

RS200-SUP

Old chain number: SUPER200

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

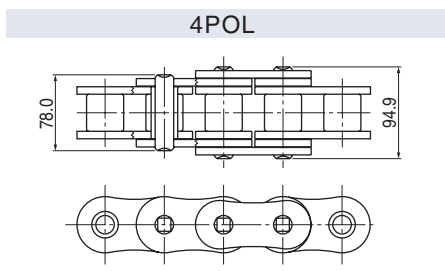
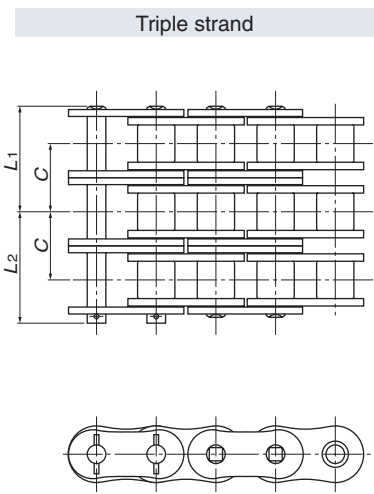
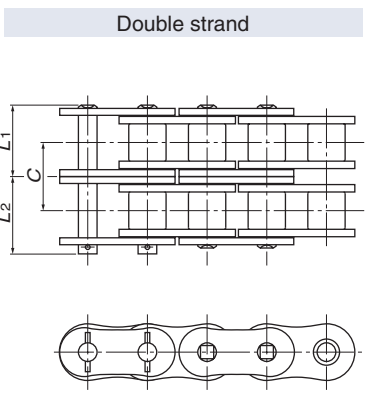
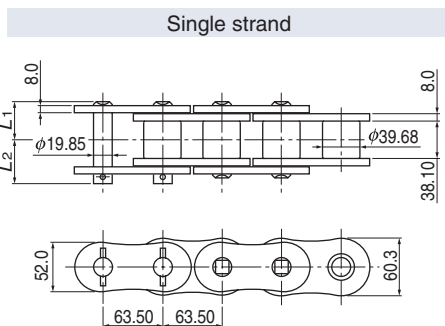
Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



Drawing Scale 1/8

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Transverse Pitch C	Pin Type	Min. Ultimate Strength ANSI Standard kN{kgf}	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS200-SUP-1	1	83.8	39.0	44.8	71.6	Riveting	381.7 {38923}	439 {44800}	505 {51500}	94.1{9600}	17.63
RS200-SUP-2	2	155.5	74.85	80.65			763.4 {77845}	879 {89600}	1010{103000}	160{16320}	34.91
RS200-SUP-3	3	227.2	110.75	116.45			1145.1{116768}	1320{134400}	1520{154500}	235{24000}	52.44
RS200-SUP-4	4	298.9	146.6	152.3			1388.0{141536}	1760{179200}	2020{206000}	311{31680}	69.73
RS200-SUP-5	5	370.6	182.4	188.2			1735.0{176920}	2200{224000}	2530{257500}	367{37440}	87.04
RS200-SUP-6	6	442.3	218.25	224.05			2082.0{212304}	2640{268800}	3030{309000}	433{44160}	94.44

- Note: 1. Number of links per unit = 48
 2. Four-pitch offset links (4POL) are only for single-strand chains.
 3. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

RS200-SUP-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min												
	10	15	20	30	40	50	70	100	150	200	250	300	350
	A II			B			C						
13	12.6	18.2	23.6	33.9	44.0	53.7	72.8	100	144	187	194	194	
14	13.7	19.7	25.5	36.8	47.6	58.2	78.8	109	156	203	211	211	211
15	14.7	21.2	27.5	39.6	51.3	62.7	84.9	117	169	218	234	234	234
16	15.8	22.8	29.5	42.5	55.0	67.3	91.0	126	181	234	258	258	258
17	16.9	24.3	31.5	45.3	58.7	71.8	97.2	134	193	250	283	283	283
18	17.9	25.8	33.5	48.2	62.5	76.4	103	143	205	266	308	308	308
19	19.0	27.4	35.5	51.1	66.2	81.0	110	151	218	282	334	334	334
20	20.1	29.0	37.5	54.0	70.0	85.6	116	160	230	298	355	355	355
21	21.2	30.5	39.5	57.0	73.8	90.2	122	168	242	314	374	374	374
22	22.3	32.1	41.6	59.9	77.6	94.9	128	177	255	330	393	393	393
23	23.4	33.7	43.6	62.8	81.4	99.5	135	186	268	347	412	412	412
24	24.5	35.3	45.7	65.8	85.2	104	141	194	280	363	432	432	432
25	25.6	36.9	47.7	68.8	89.1	109	147	203	293	379	451	451	451
26	26.7	38.4	49.8	71.7	92.9	114	154	212	305	396	471	471	471

- Note: 1. Use RS Roller Chains in the high-speed range.
 2. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

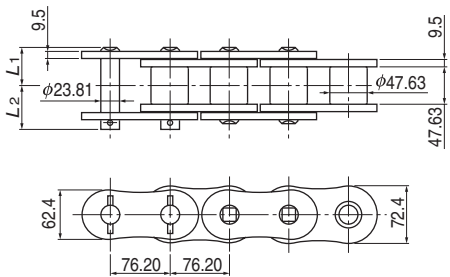
Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

Lubrication method	A II	Drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

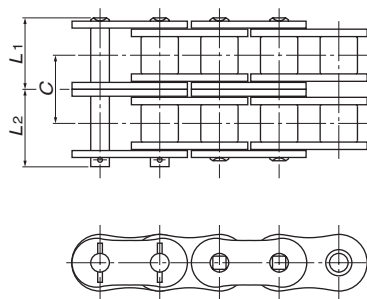
RS240-SUP

Old chain number: SUPER240

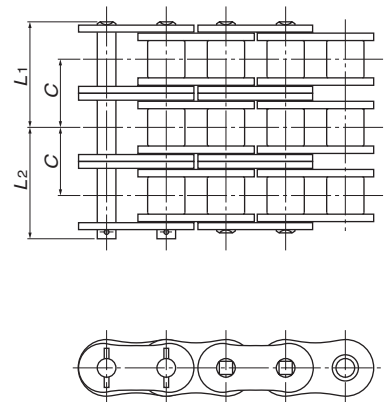
Single strand



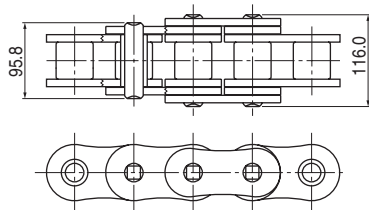
Double strand



Triple strand



4POL



Drawing Scale 1/9.5

TSUBAKI Chain Number	Number of Strands	Pin Length L ₁ +L ₂	Dimensions L ₁	Dimensions L ₂	Transverse Pitch C	Pin Type	Min. Ultimate Strength ANSI Standard kN{kgf}	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
RS240-SUP-1	1	103.4	47.9	55.5	87.8	Riveting	550.4 {56125}	639 {65200}	735 {75000}	132{13500}	25.63
RS240-SUP-2	2	191.3	91.9	99.4			1100.8{112250}	1280{130400}	1470{150000}	225{22950}	50.88
RS240-SUP-3	3	279.0	135.85	143.15			1651.2{168376}	1920{195600}	2210{225000}	331{33750}	76.11
RS240-SUP-4	4	367.1	179.8	187.3			2001.6{204108}	2560{260800}	2940{300000}	437{44550}	101.4
RS240-SUP-5	5	455.0	223.75	231.25			2502.0{255135}	3200{326000}	3680{375000}	516{52650}	126.6
RS240-SUP-6	6	542.8	267.7	275.1			3002.4{306162}	3840{391200}	4410{450000}	609{62100}	151.9

- Note: 1. Number of links per unit = 40
 2. Four-pitch offset links (4POL) are only for single-strand chains.
 3. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

RS240-SUP-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min																
	5	10	15	20	25	30	40	50	60	80	100	125	150	175	200	250	300
	A II			B			C										
13	11.4	21.3	30.6	39.7	48.5	57.1	74.0	90.5	107	138	169	206	243	276	276	276	276
14	12.3	23.0	33.2	43.0	52.5	61.9	80.2	98.0	115	150	183	224	263	303	308	308	308
15	13.3	24.8	35.7	46.3	56.6	66.7	86.4	106	124	161	197	241	284	326	341	341	341
16	14.3	26.6	38.3	49.6	60.7	71.5	92.6	113	133	173	211	258	304	350	376	376	376
17	15.2	28.4	40.9	53.0	64.8	76.3	98.9	121	142	185	226	276	325	373	412	412	412
18	16.2	30.2	43.5	56.4	68.9	81.2	105	129	151	196	240	293	346	397	448	449	449
19	17.2	32.0	46.1	59.8	73.0	86.1	112	136	161	208	254	311	366	421	475	483	483
20	18.1	33.8	48.7	63.2	77.2	91.0	118	144	170	220	269	329	387	445	502	510	510
21	19.1	35.7	51.4	66.6	81.4	95.9	124	152	179	232	283	346	408	469	529	538	538
22	20.1	37.5	54.0	70.0	85.6	101	131	160	188	244	298	364	429	493	556	565	565
23	21.1	39.4	56.7	73.4	89.8	106	137	168	197	256	313	382	450	517	583	593	593
24	22.1	41.2	59.4	76.9	94.0	111	144	175	207	268	327	400	472	542	611	621	621
25	23.1	43.1	62.0	80.4	98.2	115.8	150	183	216	280	342	418	493	566	638	649	649
26	24.1	44.9	64.7	83.8	102	121	156	191	225	292	357	436	514	591	666	677	677

- Note: 1. Use RS Roller Chains in the high-speed range.
 2. Maximum allowable load when using a four-pitch offset link (OL) is 90% that of the above values.

Multi-strand factor	Number of chain strands	Multi-strand factor	Number of chain strands	Multi-strand factor
	Double strand	1.7	Quintuple strand	3.9
	Triple strand	2.5	Sextuple strand	4.6
	Quadruple strand	3.3	—	—

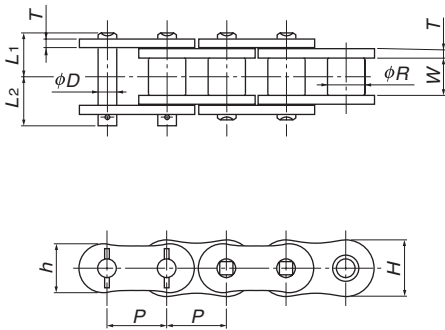
Lubrication method	A II	Drip lubrication	Details on Pg. 152
	B	Oil bath or slinger disc lubrication	
	C	Forced pump lubrication	

Before Use
 For Safe Use
 Standard Roller Chains
 Lubrication
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling

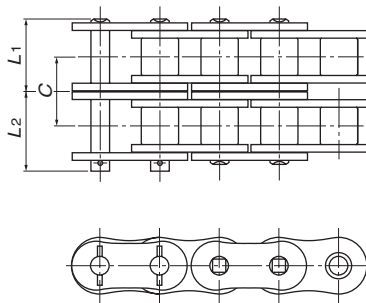
RS-SUP-H

Old chain number: SUPERH

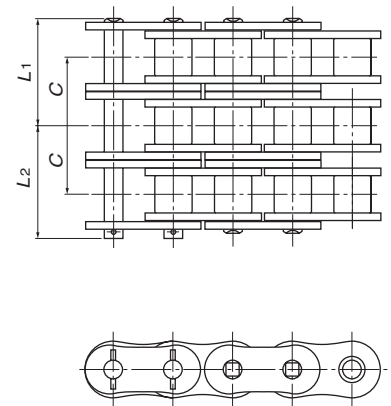
Single strand



Double strand



Triple strand



TSUBAKI Chain Number	Number of Strands	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Transverse Pitch C	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m
					Thickness T	Width H	Width h	Diameter D	L ₁	L ₂					
RS80-SUP-H-1	1								18.3	20.9	—	85.3 { 8700}	98.1 { 10000}	20.6 { 2100}	3.29
RS80-SUP-H-2	2	25.40	15.88	15.88	4.0	24.1	20.8	7.94	34.6	37.2	32.6	171 { 17400}	196 { 20000}	35.0 { 3570}	6.52
RS80-SUP-H-3	3								50.95	53.55	32.6	256 { 26100}	294 { 30000}	51.5 { 5250}	9.75
RS100-SUP-H-1	1								21.8	24.5	—	127 { 12900}	145 { 14800}	32.4 { 3300}	4.88
RS100-SUP-H-2	2	31.75	19.05	19.05	4.8	30.1	26.0	9.54	41.4	44.1	39.1	253 { 25800}	290 { 29600}	55.0 { 5610}	9.51
RS100-SUP-H-3	3								61.0	63.6	39.1	380 { 38700}	435 { 44400}	80.9 { 8250}	14.14
RS120-SUP-H-1	1								26.95	30.55	—	171 { 17400}	196 { 20000}	42.2 { 4300}	6.94
RS120-SUP-H-2	2	38.10	22.23	25.40	5.6	36.2	31.2	11.11	51.4	55.0	48.9	341 { 34800}	392 { 40000}	71.7 { 7310}	13.51
RS120-SUP-H-3	3								75.85	79.55	48.9	512 { 52200}	588 { 60000}	105 { 10750}	20.09
RS140-SUP-H-1	1								28.9	33.1	—	222 { 22600}	255 { 26000}	56.9 { 5800}	8.88
RS140-SUP-H-2	2	44.45	25.40	25.40	6.4	42.2	36.4	12.71	55.0	59.5	52.2	443 { 45200}	510 { 52000}	96.7 { 9860}	17.38
RS140-SUP-H-3	3								81.15	85.25	52.2	665 { 67800}	765 { 78000}	142 { 14500}	25.88
RS160-SUP-H-1	1								33.95	38.45	—	281 { 28700}	324 { 33000}	73.5 { 7500}	11.72
RS160-SUP-H-2	2	50.80	28.58	31.75	7.15	48.2	41.6	14.29	64.9	69.6	61.9	563 { 57400}	647 { 66000}	125 { 12750}	22.97
RS160-SUP-H-3	3								95.95	100.45	61.9	844 { 86100}	971 { 99000}	184 { 18750}	34.22
RS200-SUP-H-1	1								42.9	48.1	—	520 { 53000}	598 { 61000}	100 { 10200}	19.68
RS200-SUP-H-2	2	63.50	39.68	38.10	9.5	60.3	52.0	19.85	82.05	87.3	78.3	1040 { 106000}	1200 { 122000}	170 { 17340}	38.48
RS200-SUP-H-3	3								121.25	126.55	78.3	1560 { 159000}	1790 { 183000}	250 { 25500}	57.29
RS240-SUP-H-1	1								54.8	62.3	—	802 { 81800}	922 { 94000}	139 { 14200}	30.47
RS240-SUP-H-2	2	76.20	47.63	47.63	12.7	72.4	62.4	23.81	105.3	112.9	101.2	1600 { 163600}	1840 { 188000}	237 { 24140}	59.77
RS240-SUP-H-3	3								156.05	163.55	101.2	2410 { 245400}	2770 { 282000}	348 { 35500}	89.09

Size	RS80 SUP-H	RS100 SUP-H	RS120 SUP-H	RS140 SUP-H	RS160 SUP-H	RS200 SUP-H	RS240 SUP-H
Number of Links Per Unit	120	96	80	68	60	48	40

Notes for use

- Select chains and sprockets as per the Allowable Load Selection Method .
- Offset links are not available due to the super heavy-duty nature of transmission. Use an even number of links.
- Use drip lubrication, oil bath or splash lubrication, or forced pump lubrication.
- RS Roller Chain sprockets can be used only with single-strand chains. Steel sprockets cannot be used. Use sprockets made of S35C or higher carbon steel. Sprockets with lower teeth number must also have hardened teeth. Check key strength, etc.

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

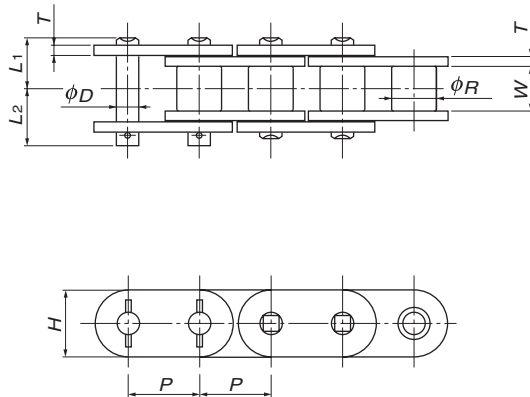
Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates		Pins			Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load Tension kN{kgf}	Approximate Mass kg/m	
				Thickness T	Width H	Diameter D	L ₁ + L ₂	L ₁					L ₂
RF100-US-1	31.75	19.05	19.05	4.8	30.1	10.32	47.7	22.35	25.35	149{15200}	172 {17500}	39.2{4000}	5.07
RF120-US-1	38.10	22.23	25.40	5.6	36.2	12.28	59.1	27.55	31.55	213{21700}	245 {25000}	53.9{5500}	7.22
RF140-US-1	44.45	25.40	25.40	6.4	42.2	13.97	63.7	29.5	34.2	273{27800}	314 {32000}	63.7{6500}	9.24
RF160-US-1	50.80	28.58	31.75	7.1	48.2	15.62	74.7	34.5	40.2	341{34800}	392 {40000}	85.3{8700}	12.19
RF200-US-1	63.50	39.68	38.10	9.5	60.3	20.41	93.9	42.95	50.95	580{59100}	667 {68000}	108{11000}	20.47
RF240-US-1	76.20	47.63	47.63	12.7	72.4	24.73	119.7	54.8	64.9	853{87000}	981{100000}	151{15400}	31.69

Notes for use

- Select chains and sprockets as per the Allowable Load Selection Method .
- Offset links are not available due to the super heavy-duty nature of transmission. Use an even number of links.
- Use drip lubrication, oil bath or splash lubrication, or forced pump lubrication.
- RS Roller Chain sprockets can be used only with single-strand chains. Steel sprockets cannot be used. Use sprockets made of S35C or higher carbon steel. Sprockets with lower teeth number must also have hardened teeth. Check key strength, etc.
- Check key strength, etc.
- Multi-strand chains are not available. Consider other heavy-duty chains if required.

Corrosion Resistant Roller Chains



Stainless Steel Roller Chains

These roller chains are made of stainless steel.

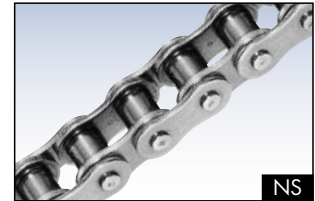
SS Specification

These roller chains are made of SUS304 (SUS301 clips). They offer greater corrosion resistance than RS Roller Chains and RS Surface Treated Roller Chains, and can be used in water and in corrosive atmospheres that are acidic or alkaline, as well as in low or high temperatures (-20 to 400°C). SUS304 is only marginally magnetic. Some magnetism exists only due to the cold-forging process.



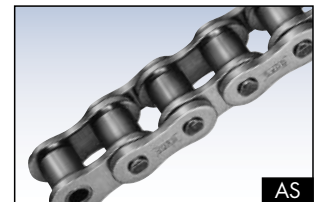
NS Specification

These roller chains are made of SUS316 (SUS301 clips on RS25NS, and SUS304 cotter pins on RS80NS). They are suited for applications that require higher corrosion resistance than SS chains. Except for the clips, they are non-magnetic.



AS Specification

The pins and rollers of these roller chains are made of precipitation-hardened, tempered stainless steel, while the plates and bushes are 18-8SUS (SUS304 clips are 17-7SUS (SUS301)). They have a maximum allowable load that is 1.5 times that of SS chains. Corrosion resistance is slightly less than that of SS chains. AS chains are suited for applications that require corrosion resistance, heat resistance, and smaller sizes / higher kilowatt ratings than SS chains. Because of its precipitation-hardened stainless steel, the chains are magnetic.



Surface Treated Roller Chains

These are surface-treated RS Roller Chains.

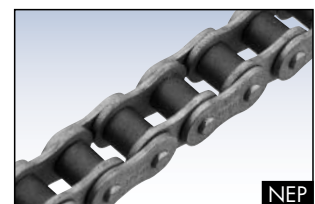
NP Specification

These chains are RS Roller Chains with nickel plating. The nickel plating not only improves appearance, but also adds a small degree of corrosion resistance. Therefore, they can be used in applications where there is exposure to water. Bear in mind when making your selection that maximum allowable load is approx. 15% lower than with RS Roller Chains.



NEP Specification

NEP Chain is a Coating Chain with a high corrosion resistance thanks to its zinc coating base and two different kinds of special surface coatings for rollers and other parts. The zinc coating and special surface coatings protect the chain body from corrosive environments, giving it superior rust prevention. NEP Chain has superior anti-rust capabilities over previous WP or DP chains, reducing its load on the environment.



APP Specification

Pins are treated with a non-strength degrading surface treatment to protect against pitting corrosion that leads to fatigue breakage, making it highly effective in environments that readily promote corrosion, such as outdoor or coastal applications.

Safety precautions when using Surface Treated Drive Chains

Do not use NP / NEP specification Surface Treated Drive Chains if the chains will come in direct contact with food or where coating flakes or wear dust can contaminate food. The specific gravity of flaked NEP film is lighter than water and will float.

Also, in non-food applications, either appropriately cover the chains or contact Tsubaki about chain selection if usage is planned in environments where coating flakes and wear dust present problems. Though nickel is not subject to the Food Sanitation Law or the Industrial Safety and Health Law, plating on sliding parts can flake.



Titanium Roller Chains

Titanium chains are non-magnetic and offer high corrosion resistance. For details on corrosion resistance selection, see pg. 148. These chains can be used in temperatures of -20 to 400°C .

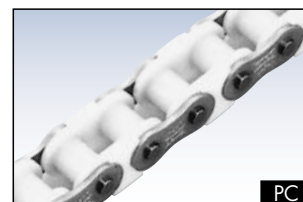
Poly Steel Chains

■ PC (Standard Specification)

The pins and outer plates of these chains are made of SUS304 (SUS301 clips), while the inner plates are of engineered plastic (white). They are lube-free, low noise (5 dB less than RS Roller Chains) and lightweight (50% of RS Roller Chains). They can be used in temperatures of -10 to 80°C . For details on corrosion resistance selection, see pg. 148.

■ PC-SY (Super Chemical Resistance Specification)

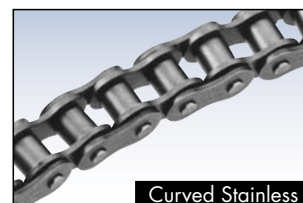
The pins and outer plates of these chains are made of titanium, while the inner plates are of a special engineered plastic (matte white); therefore they are suited for applications in which PC Chains have insufficient corrosion resistance. They can be used in temperatures of -10 to 80°C . For details on corrosion resistance selection, see pg. 148. Bear in mind when making your selection that maximum allowable load is about 60% that of PC Chains.



PC

Curved Stainless Steel Roller Chains

These roller chains have a wide sideflex due to its original pin / bush construction and the large clearance between its plates. Curved transmission is easy using RS-type standard sprockets.



Curved Stainless

Low Noise Roller Chains

These chains emit 6 to 8 dB less noise than pre-lubed RS Roller Chains (in-house comparison testing). They can be used in temperatures of -10 to 60°C .



SN Low Noise

Cold Resistant Roller Chains

These chains can be used in lower temperatures than RS Roller Chains yet deliver the same allowable load (when using an F-type connecting link). Expect a 20% reduction in strength when using an M-type connecting link. They can be used in temperatures of -40 to 60°C .



Pre-Delivery Lubrication

- Pre-delivery lubrication is not carried out on SS Specification or NS Specification Stainless Steel Roller Chain, Titanium Roller Chains, or Curved Stainless Steel Roller Chains. If these chains are to be used in environments where they are not submerged in or come in contact with water, pre-use lubrication of the chain must take place. If chains are used in these conditions without lubrication, poor articulation of the chain may occur at a much earlier stage than expected.
- The maximum allowable load is calculated when chain is lubricated (including water lubricant).

*RS11-SS-1 chain is lubricated.



Corrosion Resistant Roller Chains

Old-New Chain Number Comparison

Product codes have been assigned to all products (except customized products) and chain numbers have been rewritten. The following clarifies the difference between old and new chain numbers.

Stainless Steel Roller Chains

- ① The old RS○SS chain number has been changed to RS○-SS.
- ② Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.
- ③ Applicable sizes for SS, NS and AS chains differ. Check individual chain numbers.

New chain number	Old chain number

Chain number with connecting link (CL) **RS80-SS-1-CL** Indicate the connecting link after the number of strands as shown at left.

Surface Treated Roller Chains

- ① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.
Current chain numbers are still applicable for multi-strand chains.
- ② Applicable sizes for NP, NEP and APP chains differ. Check individual chain numbers.

New chain number	Old chain number

Chain number with connecting link (CL) **RS80-NP-1-CL** Indicate the connecting link after the number of strands as shown at left.

Chain number with OL **RS80-NP-1-OL**

Titanium Roller Chains

- ① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number

Chain number with connecting link (CL) **RS35-TI-1-CL** Indicate the connecting link after the number of strands as shown at left. Offset links are not available with Titanium Chains.

Before Use
 For Safe Use
 Standard Roller Chains
 Lubri-Free Roller Chains
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling



Poly Steel Chains

① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number
<p>RS 40 -PC -1</p> <p>①</p> <p>Check strand number.</p> <p>Applicable sizes 25, 35, 40, 50, 60</p>	<p>RF40PC</p> <p>Applicable sizes 25, 35, 40, 50, 60</p>

Chain number with connecting link (CL) **RS40-PC-1-CL** Indicate the connecting link after the number of strands as shown at left. Offset links are not available with Poly Steel Chains.

Curved Stainless Steel Roller Chains

① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number
<p>RS 80 -CU-SS -1</p> <p>①</p> <p>Check strand number.</p> <p>Applicable sizes 40, 50, 60, 80</p>	<p>RS80SS-CU</p> <p>Applicable sizes 40, 50, 60, 80</p>

Chain number with connecting link (CL) **RS80-CU-SS-1-CL** Indicate the connecting link after the number of strands as shown at left. Offset links are not available with Curved Stainless Steel Roller Chains.

Low Noise Roller Chains

- ① The old RS○SN chain number has been changed to RS○-SNS.
- ② Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number
<p>RS 80 -SNS -1</p> <p>① ②</p> <p>Check strand number.</p> <p>Applicable sizes 40, 50, 60, 80</p>	<p>RS80SN</p> <p>Applicable sizes 40, 50, 60, 80</p>

Chain number with offset link (OL) **RS80-SNS-1-OL** Indicate offset link after the number of strands as shown at left. Connecting links (CL) are the same as standard RS Roller Chains.

Cold Resistant Roller Chains

① Old chain numbers for single-strand chains indicated size only. Add "-1" to all new chain numbers.

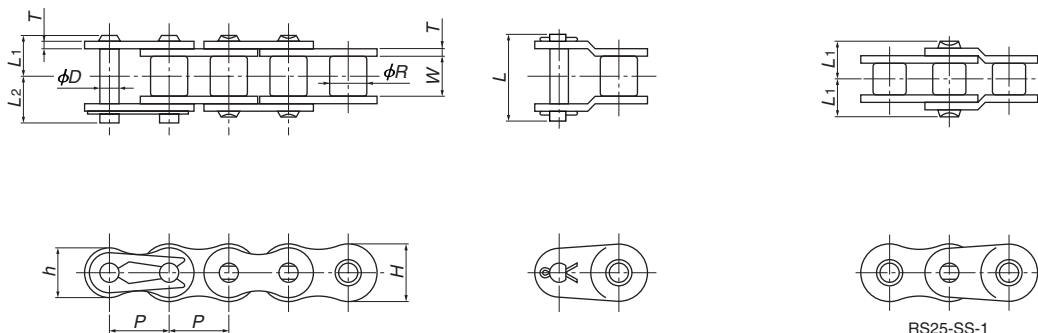
New chain number	Old chain number
<p>RS 80 -KT -1</p> <p>①</p> <p>Only for single strand chain.</p> <p>Applicable sizes 35, 40, 50, 60, 80 100, 120, 160</p>	<p>RS80KT</p> <p>Applicable sizes 35, 40, 50, 60, 80 100, 120, 160</p>

Chain number with connecting link (CL) **RS80-KT-1-CL** Indicate the connecting link after the number of strands as shown at left.

Chain number with OL **RS80-KT-1-OL**

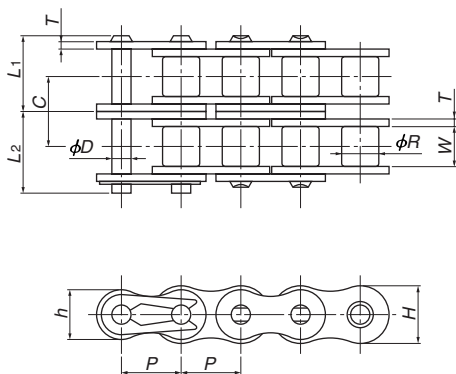
SS Specification

Single strand



RS25-SS-1
RS25-SS-1 uses 2-pitch OL.

Double strand



Connecting link

RS11-SS-1 to RS60-SS-1: Clip-type (11SS to 25SS: Dual riveting
35SS to 60SS: Button-head riveting)
RS80-SS-1 to RS240-SS-1: Cotter pin-type (Dual riveting)

Pre-delivery lubrication is not carried out on SS Specification Stainless Steel Roller Chain. If these chains are to be used in environments where they are not submerged in or come in contact with water, pre-use lubrication of the chain must take place. If chains are used in these conditions without lubrication, poor articulation of the chain may occur at a much earlier stage than expected.

The maximum allowable load is calculated when chain is lubricated (including water lubricant).

*RS11-SS-1 chain is lubricated.

TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins					Transverse Pitch C	Maximum Allowable Load kN {kgf}	Approximate Mass kg/m	Links Per Unit
				Thickness T	Height H	Height h	Diameter D	L ₁ + L ₂	L ₁	L ₂	Offset Pin Length L				
RS11-SS-1	3.7465	※2.285	1.83	0.38	3.5	3.5	1.57	5.44	2.275	3.165	—	—	0.05 {5}	0.052	134
RS25-SS-1	6.35	※3.30	3.18	0.75	5.84	5.05	2.31	8.6	3.8	4.8	—	—	0.12 {12}	0.14	160
RS35-SS-1	9.525	※5.08	4.78	1.25	9.0	7.8	3.59	12.7	6.05	6.65	14.7	—	0.26 {27}	0.33	320
RS40-SS-1	12.70	7.92	7.95	1.5	12.0	10.4	3.97	17.9	8.05	9.85	18.6	—	0.44 {45}	0.64	240
RS40-SS-2								32.6	15.25	17.35	33.5	14.4	0.88 {90}	1.27	
RS50-SS-1	15.875	10.16	9.53	2.0	15.0	13.0	5.09	22.3	10.1	12.2	23.9	—	0.69 {70}	1.04	192
RS50-SS-2								40.4	19.15	21.25	41.8	18.1	1.37 {140}	2.07	
RS60-SS-1	19.05	11.91	12.70	2.4	18.1	15.6	5.96	27.6	12.65	14.95	29.4	—	1.03 {105}	1.53	160
RS60-SS-2								50.4	24.05	26.35	52.6	22.8	2.06 {210}	3.04	
RS80-SS-1	25.40	15.88	15.88	3.2	24.1	20.8	7.94	35.7	16.25	19.45	39.0	—	1.77 {180}	2.66	120
RS80-SS-2								64.8	30.90	33.90	68.05	29.3	3.53 {360}	5.30	
RS100-SS-1	31.75	19.05	19.05	4.0	30.1	26.0	9.54	42.6	19.75	22.85	45.7	—	2.55 {260}	4.01	96
RS100-SS-2								78.5	37.70	40.80	81.6	35.8	5.10 {520}	7.99	
RS120-SS-1	38.10	22.23	25.40	5.0	36.2	31.2	11.11	55.55	25.75	29.80	59.7	—	3.82 {390}	6.13	80
RS120-SS-2								100.6	48.35	52.25	104.9	45.4	7.65 {780}	12.22	
RS140-SS-1	44.45	25.40	25.40	6.0	42.2	36.4	12.71	61.1	28.15	32.95	66.2	—	4.61 {470}	7.91	68
RS140-SS-2								110.0	52.70	57.30	114.6	48.9	9.22 {940}	15.77	
RS160-SS-1	50.80	28.58	31.75	7.0	48.2	41.6	14.29	72.1	33.55	38.55	77.3	—	6.37 {650}	10.86	60
RS160-SS-2				6.4				127.2	66.05	61.15	132.2	58.5	12.7 {1300}	21.66	
RS180-SS-1	57.15	35.71	35.72	7.15	52.3	43.4	17.46	78.5	36.05	42.45	84.9	—	8.55 {872}	13.45	54
RS200-SS-1	63.50	39.68	38.10	8.0	60.3	52.0	19.85	84.8	39.5	45.3	90.8	—	10.8 {1100}	16.54	48
RS240-SS-1	76.20	47.63	47.63	10.0	72.4	62.4	23.81	105.5	49.0	56.5	113.2	—	15.7 {1600}	24.50	40

Note: 1. Chains marked with an * are rollerless - - bush diameter given.

2. Multi-strand stainless steel chains and sprockets are made-to-order. Be aware that chain sizes greater than RS120-SS-1 have a different plate thickness than RS Roller Chains.

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

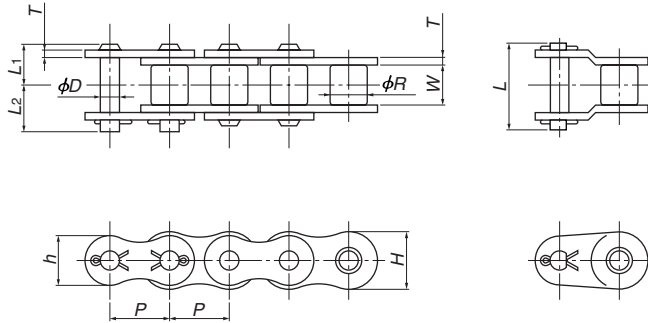
Specialty Roller Chains

Accessories

Selection

Handling

NS Specification



Connecting link

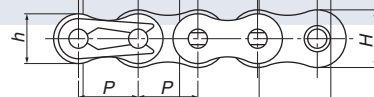
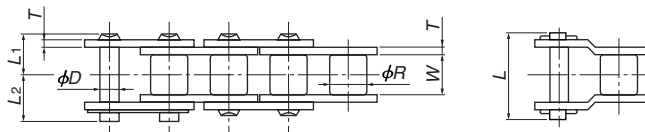
RS25-NS-1: Clip-type
 RS80-NS-1: Cotter pin-type (SUS304)
 RS35-NS-1 to RS60-NS-1: Cotter pin-type (SUS316)

Pre-delivery lubrication is not carried out on NS Specification Stainless Steel Roller Chain. If these chains are to be used in environments where they are not submerged in or come in contact with water, pre-use lubrication of the chain must take place. If chains are used in these conditions without lubrication, poor articulation of the chain may occur at a much earlier stage than expected.

TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins					Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	Links Per Unit
				Thickness T	Height H	Height h	Diameter D	L ₁ + L ₂	L ₁	L ₂	Offset Pin Length L			
RS25-NS-1	6.35	※3.30	3.18	0.75	5.85	5.05	2.31	8.6	3.8	4.8	(7.6)	0.12 {12}	0.14	160
RS35-NS-1	9.525	※5.08	4.78	1.25	9.0	7.8	3.59	13.0	5.85	7.15	14.7	0.26 {27}	0.33	320
RS40-NS-1	12.70	7.92	7.95	1.5	12.0	10.4	3.97	17.9	8.25	9.65	18.6	0.44 {45}	0.64	240
RS50-NS-1	15.875	10.16	9.53	2.0	15.0	13.0	5.09	22.2	10.3	11.9	23.9	0.69 {70}	1.04	192
RS60-NS-1	19.05	11.91	12.70	2.4	18.1	15.6	5.96	28.1	12.85	15.25	29.4	1.03{105}	1.53	160
RS80-NS-1	25.40	15.88	15.88	3.2	24.1	20.8	7.94	35.7	16.25	19.45	39.0	1.77{180}	2.66	120

Note: 1. Chains marked with an * are rollerless - - bush diameter given.
 2. RS25-NS-1 uses only 2POL.

AS Specification

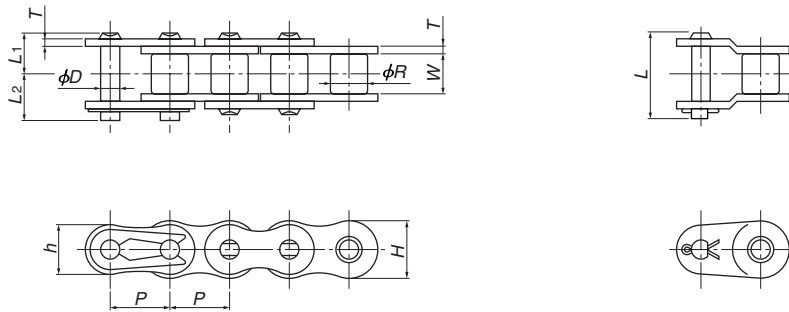


Connecting link

RS40-AS-1 to RS60-AS-1: Clip-type
 RS80-AS-1: Cotter pin-type

TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins					Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	Links Per Unit
				Thickness T	Height H	Height h	Diameter D	L ₁ + L ₂	L ₁	L ₂	Offset Pin Length L			
RS40-AS-1	12.70	7.92	7.95	1.5	12.0	10.4	3.97	18.2	8.25	9.95	18.6	0.69{70}	0.64	240
RS50-AS-1	15.875	10.16	9.53	2.0	15.0	13.0	5.09	22.3	10.3	12.0	23.9	1.03{105}	1.04	192
RS60-AS-1	19.05	11.91	12.70	2.4	18.1	15.6	5.96	27.6	12.85	14.75	29.4	1.57{160}	1.53	160
RS80-AS-1	25.40	15.88	15.88	3.2	24.1	20.8	7.94	35.7	16.25	19.45	39.0	2.65{270}	2.66	120

NP Specification



Connecting link

RS25-NP-1 to RS60-NP-1: Clip-type (Dual riveting)

RS80-NP-1 to RS120-NP-1: Cotter pin-type (Dual riveting)

RS25-NP-1 uses 2POL.

TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins					Pin type
				Thickness T	Height H	Height h	Diameter D	$L_1 + L_2$	L_1	L_2	Offset Pin Length L	
RS25-NP-1	6.35	※3.30	3.18	0.75	5.84	5.05	2.31	8.3	3.8	4.5	7.6	Riveting
RS35-NP-1	9.525	※5.08	4.78	1.25	9.0	7.8	3.59	12.7	5.85	6.85	13.5	//
RS40-NP-1	12.70	7.92	7.95	1.5	12.0	10.4	3.97	18.2	8.25	9.95	18.0	//
RS50-NP-1	15.875	10.16	9.53	2.0	15.0	13.0	5.09	22.3	10.3	12.0	22.5	//
RS60-NP-1	19.05	11.91	12.70	2.4	18.1	15.6	5.96	27.6	12.85	14.75	28.2	//
RS80-NP-1	25.40	15.88	15.88	3.2	24.1	20.8	7.94	35.5	16.25	19.25	36.0	//
RS100-NP-1	31.75	19.05	19.05	4.0	30.1	26.0	9.54	42.6	19.75	22.85	44.4	Cotter pin
RS120-NP-1	38.10	22.23	25.40	4.8	36.2	31.2	11.11	53.8	24.9	28.9	45.4	//

TSUBAKI Chain Number	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	Number of Links Per Unit
RS25-NP-1	4.12 {420}	4.7 {480}	0.64 {65}	0.14	160
RS35-NP-1	9.81 {1000}	11.3 {1150}	1.86 {190}	0.33	320
RS40-NP-1	17.7 {1800}	19.1 {1950}	3.04 {310}	0.64	240
RS50-NP-1	28.4 {2900}	31.4 {3200}	5.39 {550}	1.04	192
RS60-NP-1	40.2 {4100}	44.1 {4500}	7.26 {740}	1.53	160
RS80-NP-1	71.6 {7300}	78.5 {8000}	12.7 {1300}	2.66	120
RS100-NP-1	107 {10900}	118 {12000}	19.1 {1950}	3.99	96
RS120-NP-1	148 {15100}	167 {17000}	25.5 {2600}	5.93	80

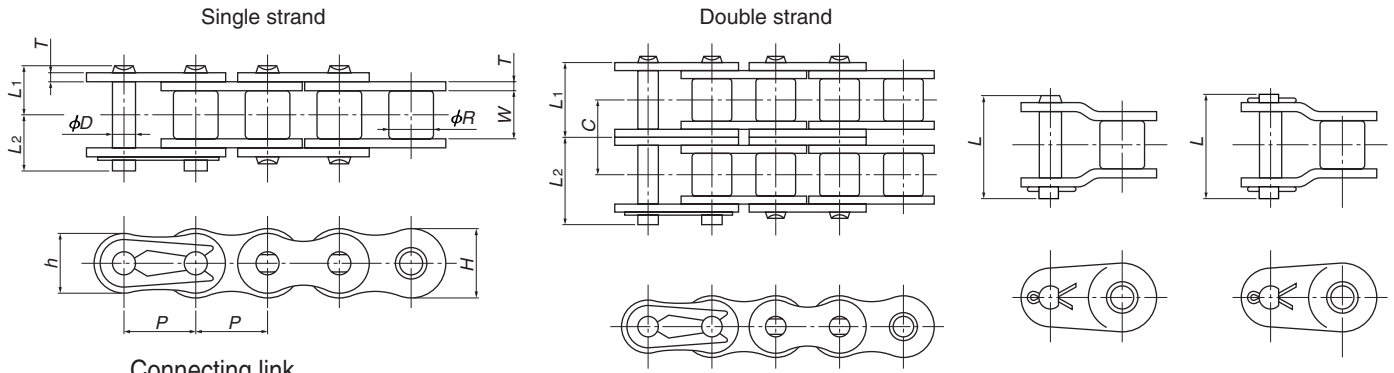
Chains marked with an * are rollerless - - bush diameter given.

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.

⚠ Precautions in Usage

- Do not use surface-treated drive chains if the chains will come in direct contact with food or where flakes coating can contaminate food.
- Though nickel is not subject to the Food Sanitation Law or Industrial Safety and Health Law, use with caution.

NEP Specification



Connecting link

RS35 to RS60: Clip-type

RS80 or larger: Cotter pin-type

All sizes of NEP chains are riveted (RP).

TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins					Transverse Pitch C
				Thickness T	Height H	Height h	Diameter D	$L_1 + L_2$	L_1	L_2	Offset Pin Length L	
RS35-NEP-1	9.525	(5.08)	4.78	1.25	9.0	7.8	3.59	12.7	5.85	6.85	13.5	—
RS40-NEP-1	12.70	7.92	7.95	1.5	12.0	10.4	3.97	18.2	8.25	9.95	18.0	—
RS40-NEP-2								32.6	15.45	17.15	33.5	14.4
RS50-NEP-1	15.875	10.16	9.53	2.0	15.0	13.0	5.09	22.3	10.3	12.0	22.5	—
RS50-NEP-2								40.5	19.35	21.15	41.8	18.1
RS60-NEP-1	19.05	11.91	12.70	2.4	18.1	15.6	5.96	27.6	12.85	14.75	28.2	—
RS60-NEP-2								50.5	24.25	26.25	52.6	22.8
RS80-NEP-1	25.40	15.88	15.88	3.2	24.1	20.8	7.94	35.5	16.25	19.25	38.2	—
RS80-NEP-2								64.8	30.9	33.9	67.5	29.3
RS100-NEP-1	31.75	19.05	19.05	4.0	30.1	26.0	9.54	42.6	19.75	22.85	45.7	—
RS100-NEP-2								78.5	37.7	40.8	81.5	35.8
RS120-NEP-1	38.10	22.23	25.40	4.8	36.2	31.2	11.11	53.8	24.9	28.9	57.8	—
RS140-NEP-1	44.45	25.40	25.40	5.6	42.2	36.4	12.71	58.6	26.9	31.7	63.4	—
RS160-NEP-1	50.80	28.58	31.75	6.4	48.2	41.6	14.29	68.7	31.85	36.85	73.6	—

TSUBAKI Chain Number	Minimum Tensile Strength $kN\{kgf\}$	Average Tensile Strength $kN\{kgf\}$	Maximum Allowable Load $kN\{kgf\}$	Approximate Mass kg/m	Number of Links Per Unit
RS35-NEP-1	9.81{1000}	11.3{1150}	2.16{220}	0.33	320
RS40-NEP-1	17.1{1800}	19.1{1950}	3.63{370}	0.64	
RS40-NEP-2	35.3{3600}	38.2{3900}	6.18{630}	1.27	240
RS50-NEP-1	28.4{2900}	31.4{3200}	6.37{650}	1.04	
RS50-NEP-2	56.9{5800}	62.8{6400}	10.7{1100}	2.07	192
RS60-NEP-1	40.2{4100}	44.1{4500}	8.83{900}	1.53	
RS60-NEP-2	80.4{8200}	88.3{9000}	15.0{1530}	3.04	160
RS80-NEP-1	71.6{7300}	78.5{8000}	14.7{1500}	2.66	
RS80-NEP-2	143 {14600}	157 {16000}	25.0{2550}	5.27	120
RS100-NEP-1	107 {10900}	118 {12000}	22.6{2300}	3.99	
RS100-NEP-2	214 {21800}	235 {24000}	38.3{3910}	7.85	96
RS120-NEP-1	148 {15100}	167 {17000}	30.4{3100}	5.93	
RS140-NEP-1	193 {19700}	216 {22000}	40.2{4100}	7.49	68
RS160-NEP-1	255 {26000}	279 {28500}	53.0{5400}	10.10	

Note: 1. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.

2. RS35-NEP is a bushed chain; it does not have rollers.

3. Multi-strand RS35-NEP is not available.

4. 2-pitch offset links are not available.

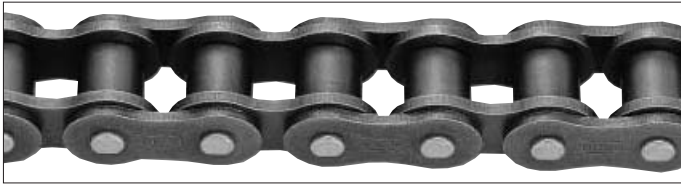
5. Please contact your local Tsubakimoto representative for information regarding RS180 and above chains.

⚠ Precautions in Usage

- Depending on the conditions of use, if steel roller chains are used with stainless steel sprockets, wear in the roller may occur at a much earlier stage than expected due to galvanic corrosion. Please avoid this set up as much as possible.
- Compared to single-strand chain, the inner link of multi-strand chain is slightly less corrosive resistant. (In-house testing results)

APP Specification

Outstanding performance in atmospheres conducive to pitting corrosion



Pins are treated with a special surface treatment to protect against pitting corrosion that leads to fatigue breaks, thus preventing strength loss. This treatment is highly effective in environments that readily promote corrosion, such as outdoors or coastal applications.

Note: Pitting is a type of localized corrosion affecting metal surfaces. Pits form toward the interior, and if pitting occurs on pin surfaces, that pin can quickly lead to fatigue breakage and chain failure.

■ Features

① **No strength loss!**
Same as standard steel chain.

② **Eco-friendly chrome-free!**
Special surface treatment does not use hazardous hexavalent chrome.

■ Example applications

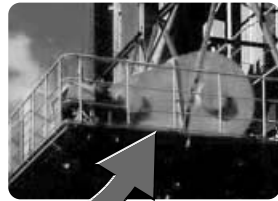
APP Chains are ideal for atmospheres that readily promote corrosion.

■ Outdoor uses

■ Coastal or riverside uses

■ When regular lubrication is difficult

● Bucket elevators



Because equipment is used outdoors, rain can infiltrate gaps in covers, creating conditions that promote pitting corrosion.

● Transfer cranes and other port machinery

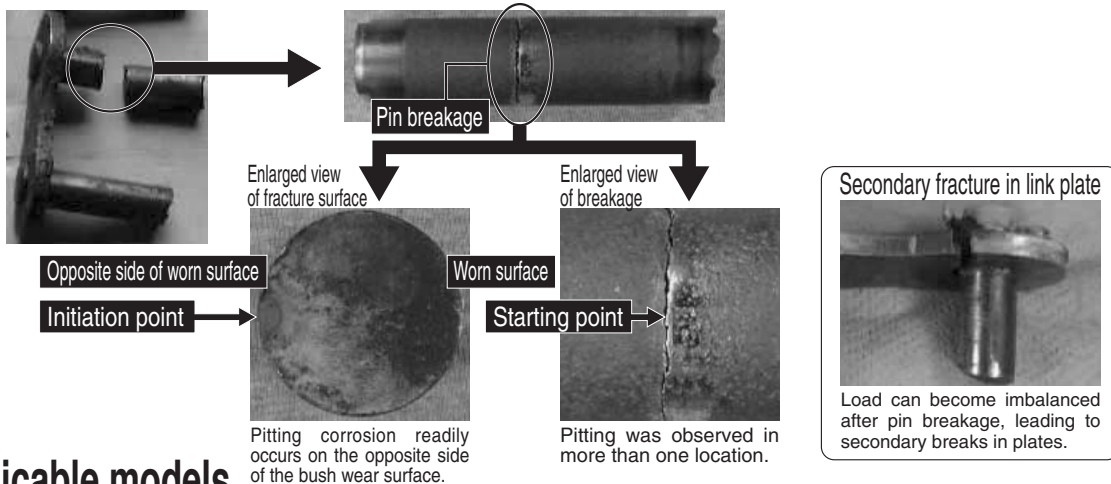


Pitting readily occurs in equipment exposed to salty air or saltwater spray.

■ Examples of fatigue breaks caused by pitting corrosion

Chain: RS240 Equipment: Port container carrier

Pitting corrosion of the pin due to insufficient lubrication (effects of salty air and saltwater) and corrosive atmosphere - - Fatigue breakage



■ Applicable models

■ Single/Double Strand RS Roller Chain

■ Single Strand Heavy Duty Roller Chain

(For other models, contact Tsubaki.)

Except for the surface-treated pins, dimensions and other specifications are the same as other roller chains.

■ Chain number

RS80-APP-1

RS80-SUP-APP-1-F or M

RS80-HT-APP-1

Note: Select connecting link (CL).

Anti-Pitting Roller Chain

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

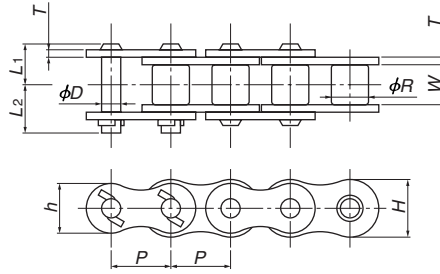
Specialty Roller Chains

Accessories

Selection

Handling

Titanium Roller Chains



Pre-delivery lubrication is not carried out on Titanium Roller Chains. If these chains are to be used in environments where they are not submerged in or come in contact with water, pre-use lubrication of the chain must take place. If chains are used in these conditions without lubrication, poor articulation of the chain may occur at a much earlier stage than expected.

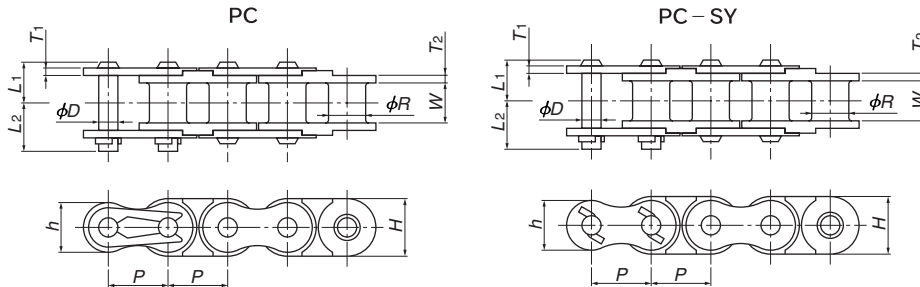
Model	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins				Maximum Allowable Load $kN\{kgf\}$	Approximate Mass kg/m	Links Per Unit
				Thickness T	Height H	Height h	Diameter D	$L_1 + L_2$	L_1	L_2			
RS35-TI-1	9.525	※5.08	4.78	1.25	9.0	7.8	3.59	13.2	6.05	7.15	0.26{27}	0.19	320
RS40-TI-1	12.70	7.92	7.95	1.5	12.0	10.4	3.97	18.35	8.25	10.1	0.44{45}	0.37	240

Note: 1. The figure shown is the bush diameter. 2. Connecting links (CL) use Z-pins.
3. Offset links are not available.

Corrosion Resistant Roller Chains

Poly Steel Chains

Old chain number: RF-PC



- Recheck chain tension when replacing stainless steel chains with Poly Steel chains.

- No offset links available.

PC Specification

TSUBAKI Chain Number	Pitch P	Bush Diameter R	Inner Width of Inner Link W	Plates				Pins				Maximum Allowable Load $kN\{kgf\}$	Approximate Mass kg/m	Links Per Unit
				Thickness T_1	Thickness T_2	Height H	Height h	Diameter D	$L_1 + L_2$	L_1	L_2			
RS25-PC-1	6.35	3.30	3.18	0.75	1.3	6.0	5.05	2.31	10.0	4.5	5.5	0.08 {8}	0.095	160
RS35-PC-1	9.525	5.08	4.78	1.25	2.2	9.0	7.8	3.59	14.7	6.85	7.85	0.18{18}	0.22	320
RS40-PC-1	12.70	7.92	7.95	1.5	1.5	12.0	10.4	3.97	18.2	8.25	9.95	0.44{45}	0.39	240
RS50-PC-1	15.875	10.16	9.53	2.0	2.0	15.0	13.0	5.09	22.3	10.3	12.0	0.69{70}	0.58	192
RS60-PC-1	19.05	11.91	12.70	2.4	2.4	18.1	15.6	5.96	27.6	12.85	14.75	0.88{90}	0.82	160

PC-SY Specification

TSUBAKI Chain Number	Pitch P	Bush Diameter R	Inner Width of Inner Link W	Plates				Pins				Maximum Allowable Load $kN\{kgf\}$	Approximate Mass kg/m	Links Per Unit
				Thickness T_1	Thickness T_2	Height H	Height h	Diameter D	$L_1 + L_2$	L_1	L_2			
RS40-PC-SY-1	12.70	7.92	7.95	1.5	1.5	12.0	10.4	3.97	18.35	8.25	10.1	0.25{25}	0.39	240
RS50-PC-SY-1	15.875	10.16	9.53	2.0	2.0	15.0	13.0	5.09	22.3	10.3	12.0	0.39{40}	0.58	192
RS60-PC-SY-1	19.05	11.91	12.70	2.4	2.4	18.1	15.6	5.96	28.1	12.85	15.25	0.49{50}	0.82	160

BS-PC Specification

TSUBAKI Chain Number	Pitch P	Bush Diameter R	Inner Width of Inner Link W	Plates				Pins				Maximum Allowable Load $kN\{kgf\}$	Approximate Mass kg/m	Links Per Unit (3m)
				Thickness T_1	Thickness T_2	Height H	Height h	Diameter D	$L_1 + L_2$	L_1	L_2			
RF06B-PC-1	9.525	6.35	5.72	1.0	1.3	8.2	8.2	3.28	13.75	6.5	7.25	0.20{20}	0.23	320
RS08B-PC-1	12.70	8.51	7.75	1.5	1.6	12.0	11.4	4.45	18.4	8.35	10.05	0.46{47}	0.4	240
RS10B-PC-1	15.875	10.16	9.65	1.5	1.5	14.7	13.7	5.08	20.8	9.55	11.25	0.53{54}	0.52	192
RS12B-PC-1	19.05	12.07	11.68	1.8	1.8	16.1	15.6	5.72	24.1	11.1	13.0	0.70{71}	0.65	160



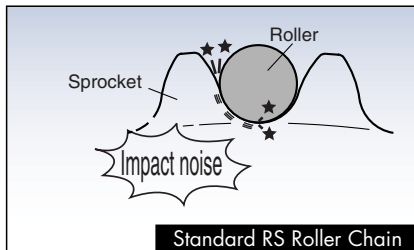
Corrosion Resistant Roller Chains

Low Noise Roller Chains

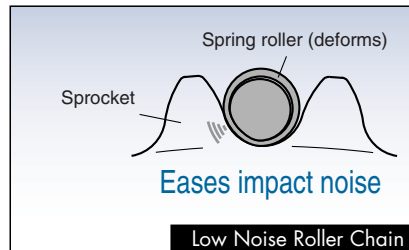
Tsubaki's uniquely structured spring rollers are used for the chain rollers. When Tsubaki's Low Noise Roller Chain engages the sprocket, the spring roller deforms and absorbs the force of impact, reducing impact noise between chain and sprocket for lower noise levels. Compared with Tsubaki's standard RS Roller Chain (pre-lubricated), noise levels of Low Noise Roller Chain are 6 - 8 dB lower. (In-house comparison testing)

Benefits of noise reduction

- Less factory noise for a better work environment.
- A low noise function is added to machinery and equipment used for manufacturing, and contributes to upgrading and improving their overall image.
- Belts were considered as a countermeasure for noise; however, there are many limitations in terms of application, strength and overall cost. Low Noise Chain is the perfect countermeasure.
- Recommended for applications where silence is a major concern, such as stage lifts used in theaters.



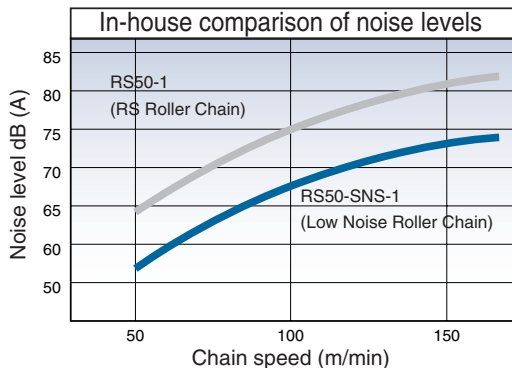
For less noise



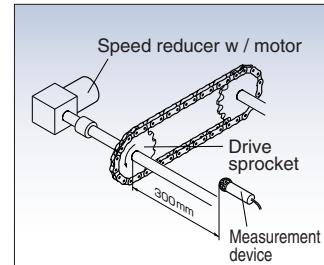
Features

Low noise

Noise levels reduced by 6 dB to 8 dB compared with the RS Roller Chain.



- **Test conditions**
Chain tension: 3.29 kN
Lubrication: Pre-lubrication only
measurement position: 300 mm from drive sprocket
- **Test chains**
 - RS50-SNS-1 (Low Noise Roller Chain)
 - RS50-1 (RS Roller Chain)



Interchangeability

Dimensional specifications are the same as for RS Roller Chain.
Note: There are limits on drive power; check kW ratings tables on pgs. 100—102.

Selection

Use the General Selection Method (the kilowatt ratings tables on pgs. 100—102).
See selection pages for more details.

Operating temperatures

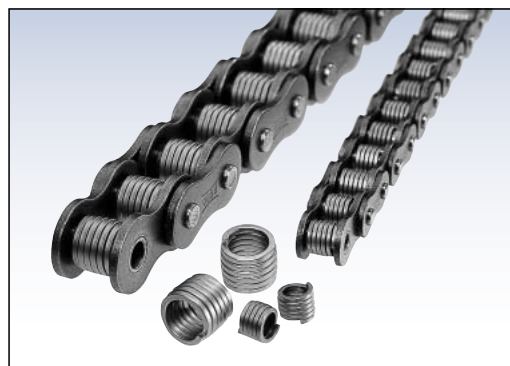
—10°C to 60°C

Allowable chain speed

200 m / min (max.)

Sprocket

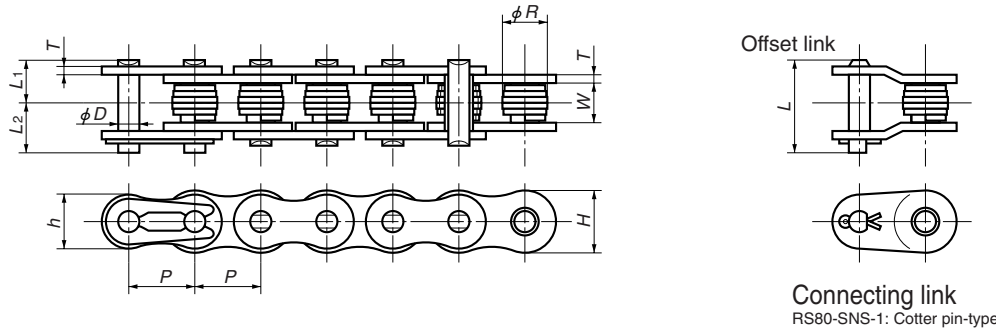
Can be used with standard RS sprockets.
If the chain cannot be sufficiently lubricated, choose sprockets with hardened tooth tip specifications.



Before Use | For Safe Use | Standard Roller Chains | Lube-Free Roller Chains | Heavy Duty Roller Chains | Corrosion Resistant Roller Chains | Specialty Roller Chains | Accessories | Selection | Handling

RS-SNS

Old chain number: RS-SN



TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins				
				Thickness T	Height H	Height h	Diameter D	L ₁ + L ₂	L ₁	L ₂	L
RS40-SNS-1	12.70	8.5	7.95	1.5	12.0	10.4	3.97	18.2	8.25	9.95	18.0
RS50-SNS-1	15.875	10.8	9.53	2.0	15.0	13.0	5.09	22.3	10.3	12.0	22.5
RS60-SNS-1	19.05	12.6	12.70	2.4	18.1	15.6	5.96	27.6	12.85	14.75	28.2
RS80-SNS-1	25.40	16.8	15.88	3.2	24.1	20.8	7.94	35.5	16.25	19.25	36.0

TSUBAKI Chain Number	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	Number of Links Per Unit
RS40-SNS-1	17.7{1800}	19.1{1950}	3.63{370}	0.64	240
RS50-SNS-1	28.4{2900}	31.4{3200}	6.37{650}	1.04	192
RS60-SNS-1	40.2{4100}	44.1{4500}	8.83{900}	1.53	160
RS80-SNS-1	71.6{7300}	78.5{8000}	14.7 {1500}	2.66	120

Note: 1. Maximum allowable load when using 1-pitch offset links (OL) is 65% of the above values.

■ RS40-SNS-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min													
	10	25	50	100	200	300	400	500	700	900	1000	1200	1400	1600
	Oiled or with drip-oiling system									Oil bath				
9	0.05	0.11	0.21	0.39	0.72	1.04	1.35	1.64	1.06	0.73	0.62	0.47	0.38	0.31
10	0.05	0.12	0.23	0.43	0.81	1.16	1.51	1.84	1.25	0.85	0.73	0.55	0.44	
11	0.06	0.14	0.26	0.48	0.90	1.29	1.67	2.04	1.44	0.99	0.84	0.64	0.51	
12	0.07	0.15	0.28	0.53	0.98	1.42	1.84	2.24	1.64	1.12	0.96	0.73		
13	0.07	0.17	0.31	0.57	1.07	1.54	2.00	2.45	1.85	1.27	1.08	0.82		
14	0.08	0.18	0.33	0.62	1.16	1.67	2.17	2.65	2.06	1.42	1.21			
15	0.08	0.19	0.36	0.67	1.25	1.80	2.34	2.86	2.29	1.57	1.34			
16	0.09	0.21	0.39	0.72	1.34	1.93	2.50	3.06	2.52	1.73				
17	0.10	0.22	0.41	0.77	1.43	2.06	2.67	3.27	2.76	1.89				
18	0.10	0.23	0.44	0.82	1.52	2.20	2.84	3.48	3.01					
19	0.11	0.25	0.46	0.87	1.62	2.33	3.02	3.69	3.26					
20	0.12	0.26	0.49	0.92	1.71	2.46	3.19	3.90	3.52					
21	0.12	0.28	0.52	0.96	1.80	2.59	3.36	4.11	3.79					
22	0.13	0.29	0.54	1.01	1.89	2.73	3.53	4.32	4.06					
23	0.13	0.31	0.57	1.06	1.99	2.86	3.71	4.53						
24	0.14	0.32	0.60	1.11	2.08	3.00	3.88	4.74						
25	0.15	0.33	0.62	1.16	2.17	3.13	4.06	4.96						
26	0.15	0.35	0.65	1.21	2.27	3.27	4.23	5.17						
28	0.17	0.38	0.71	1.32	2.46	3.54	4.58	5.60						
30	0.18	0.41	0.76	1.42	2.65	3.81	4.94	6.04						
32	0.19	0.44	0.81	1.52	2.84	4.09	5.29							
35	0.21	0.48	0.90	1.67	3.13	4.50	5.83							
40	0.24	0.56	1.04	1.93	3.61	5.20								
45	0.28	0.63	1.18	2.20	4.10	5.91								

Note: With a one-pitch offset link kW ratings are 80% of that shown above.

Low Noise Roller Chains

■ RS50-SNS-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min											
	10	25	50	100	200	300	400	500	700	900	1000	1200
	Oiled or with drip-oiling system								Oil bath			
9	0.10	0.23	0.43	0.80	1.49	2.15	2.78	2.11	1.27	0.87	0.74	0.57
10	0.11	0.26	0.48	0.90	1.67	2.41	3.12	2.47	1.49	1.02	0.87	0.66
11	0.12	0.28	0.53	0.99	1.85	2.67	3.46	2.85	1.72	1.18	1.01	
12	0.14	0.31	0.58	1.09	2.03	2.93	3.80	3.24	1.96	1.34	1.15	
13	0.15	0.34	0.64	1.19	2.22	3.19	4.14	3.66	2.21	1.51		
14	0.16	0.37	0.69	1.29	2.40	3.46	4.48	4.09	2.47			
15	0.17	0.40	0.74	1.39	2.59	3.73	4.83	4.53	2.74			
16	0.19	0.43	0.80	1.49	2.78	4.00	5.18	4.99	3.01			
17	0.20	0.46	0.85	1.59	2.96	4.27	5.53	5.47	3.30			
18	0.21	0.49	0.91	1.69	3.15	4.54	5.88	5.96				
19	0.23	0.51	0.96	1.79	3.34	4.81	6.24	6.46				
20	0.24	0.54	1.01	1.89	3.53	5.09	6.59	6.98				
21	0.25	0.57	1.07	2.00	3.72	5.36	6.95	7.51				
22	0.26	0.60	1.12	2.10	3.91	5.64	7.31	8.05				
23	0.28	0.63	1.18	2.20	4.11	5.92	7.66	8.60				
24	0.29	0.66	1.24	2.30	4.30	6.19	8.03	9.17				
25	0.30	0.69	1.29	2.41	4.49	6.47	8.39	9.75				
26	0.32	0.72	1.35	2.51	4.69	6.75	8.75					
28	0.34	0.78	1.46	2.72	5.08	7.32	9.48					
30	0.37	0.84	1.57	2.93	5.47	7.88	10.2					
32	0.40	0.90	1.69	3.14	5.87	8.45						
35	0.44	0.99	1.86	3.46	6.46	9.31						
40	0.50	1.15	2.14	4.00	7.47	10.8						
45	0.57	1.30	2.44	4.54	8.48							

Note: With a one-pitch offset link kW ratings are 80% of that shown above.

■ RS60-SNS-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Small Sprocket No. of Teeth	Small Sprocket Max r/min														
	10	25	50	100	150	200	300	400	500	600	700	800	900	1000	1100
	Oiled or with drip-oiling system								Oil bath						
9	0.18	0.41	0.76	1.41	2.03	2.63	3.79	3.41	2.44	1.85	1.47	1.20	1.01	0.86	0.75
10	0.20	0.45	0.85	1.58	2.28	2.59	4.25	3.99	2.85	2.17	1.72	1.41	1.18	1.01	
11	0.22	0.50	0.94	1.75	2.53	3.27	4.71	4.60	3.29	2.50	1.99	1.63	1.36		
12	0.24	0.55	1.03	1.93	2.77	3.59	5.18	5.24	3.79	2.85	2.26	1.85			
13	0.26	0.60	1.13	2.10	3.03	3.92	5.65	5.91	4.23	3.22	2.55	2.09			
14	0.29	0.65	1.22	2.28	3.28	4.25	6.12	6.61	4.73	3.60	2.85				
15	0.31	0.70	1.31	2.45	3.53	4.57	6.59	7.33	5.24	3.99					
16	0.33	0.75	1.41	2.63	3.79	4.90	7.06	8.07	5.78	4.39					
17	0.35	0.81	1.50	2.81	4.04	5.24	7.54	8.84	6.33	4.81					
18	0.38	0.86	1.60	2.98	4.30	5.57	8.02	9.63	6.89						
19	0.40	0.91	1.70	3.16	4.56	5.90	8.51	10.4	7.47						
20	0.42	0.96	1.79	3.34	4.82	6.24	8.99	11.3	8.07						
21	0.44	1.01	1.89	3.53	5.08	6.58	9.48	12.1							
22	0.47	1.06	1.99	3.71	5.34	6.92	9.96	12.9							
23	0.49	1.12	2.08	3.89	5.60	7.26	10.5	13.5							
24	0.51	1.17	2.18	4.07	5.87	7.60	10.9	14.2							
25	0.54	1.22	2.28	4.26	6.13	7.94	11.4	14.8							
26	0.56	1.28	2.38	4.44	6.40	8.29	11.9	15.5							
28	0.61	1.38	2.58	4.81	6.93	8.98	12.9								
30	0.65	1.49	2.78	5.18	7.46	9.67	13.9								
32	0.70	1.60	2.98	5.56	8.00	10.4	14.9								
35	0.77	1.76	3.28	6.12	8.82	11.4									
40	0.89	2.03	3.79	7.07	10.2	13.2									
45	1.01	2.31	4.30	8.03	11.6	15.0									

Note: With a one-pitch offset link kW ratings are 80% of that shown above.

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling

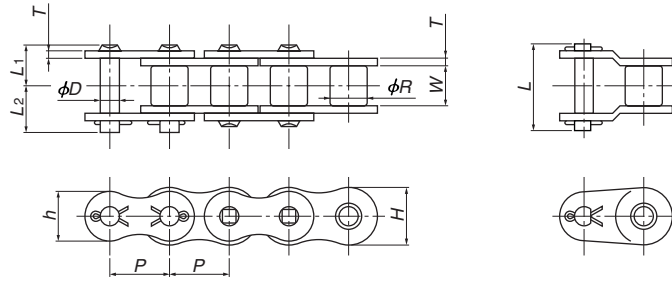
Low Noise Roller Chains

■ RS80-SNS-1 Maximum Kilowatt Ratings Table (kW Ratings for Single Strand Chain)

Lubrication Type Small Sprocket No. of Teeth	Small Sprocket Max r/min											
	10	25	50	100	150	200	300	400	500	600	700	800
	Oiled or with drip-oiling system						Oil bath					
9	0.40	0.91	1.69	3.16	4.55	5.90	6.60	4.29	3.07	2.33	1.85	1.52
10	0.45	1.02	1.90	3.54	5.10	6.61	7.73	5.02	3.59	2.73	2.17	
11	0.49	1.13	2.10	3.93	5.65	7.33	8.92	5.79	4.14	3.15	2.50	
12	0.54	1.24	2.31	4.31	6.21	8.05	10.2	6.60	4.72	3.59		
13	0.59	1.35	2.52	4.70	6.77	8.77	11.5	7.44	5.33	4.05		
14	0.64	1.46	2.73	5.09	7.34	9.51	12.8	8.32	5.95			
15	0.69	1.58	2.94	5.49	7.90	10.2	14.2	9.22	6.60			
16	0.74	1.69	3.15	5.88	8.48	11.0	15.6	10.2				
17	0.79	1.80	3.37	6.28	9.05	11.7	16.9	11.1				
18	0.84	1.92	3.58	6.68	9.63	12.5	18.0	12.1				
19	0.89	2.03	3.80	7.08	10.2	13.2	19.0	13.1				
20	0.94	2.15	4.01	7.49	10.8	14.0	20.1					
21	0.99	2.27	4.23	7.89	11.4	14.7	21.2					
22	1.04	2.38	4.45	8.30	12.0	15.5	22.3					
23	1.10	2.50	4.67	8.71	12.5	16.2	23.4					
24	1.15	2.62	4.89	9.12	13.1	17.0	24.5					
25	1.20	2.74	5.11	9.53	13.7	17.8	25.6					
26	1.25	2.85	5.33	9.94	14.3	18.5	26.7					
28	1.36	3.09	5.77	10.8	15.5	20.1						
30	1.46	3.33	6.22	11.6	16.7	21.6						
32	1.57	3.57	6.67	12.4	17.9	23.2						
35	1.73	3.94	7.34	13.7	19.7	25.6						
40	1.99	4.55	8.48	15.8	22.8							
45	2.26	5.16	9.63	18.0	25.9							

Note: With a one-pitch offset link kW ratings are 80% of that shown above.

Cold Resistant Roller Chains



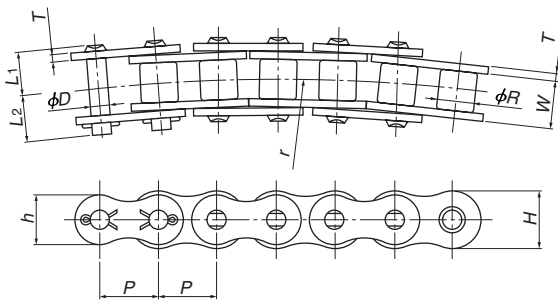
Model	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins				
				Thickness T	Height H	Height h	Diameter D	$L_1 + L_2$	L_1	L_2	Offset Pin Length L
RS35-KT-1	9.525	※5.08	4.78	1.25	9.0	7.8	3.59	12.9	5.85	7.05	13.5
RS40-KT-1	12.70	7.92	7.95	1.5	12.0	10.4	3.97	17.9	8.25	9.65	18.0
RS50-KT-1	15.875	10.16	9.53	2.0	15.0	13.0	5.09	22.2	10.3	11.9	23.7
RS60-KT-1	19.05	11.91	12.70	2.4	18.1	15.6	5.96	28.1	12.85	15.25	28.2
RS80-KT-1	25.40	15.88	15.88	3.2	24.1	20.8	7.94	35.5	16.25	19.25	36.6
RS100-KT-1	31.75	19.05	19.05	4.0	30.1	26.0	9.54	42.6	19.75	22.85	43.7
RS120-KT-1	38.10	22.23	25.40	4.8	36.2	31.2	11.11	53.8	24.9	28.9	55.0
RS140-KT-1	44.45	25.40	25.40	5.6	42.2	36.4	12.71	58.6	26.9	31.7	62.8
RS160-KT-1	50.80	28.58	31.75	6.4	48.2	41.6	14.29	68.7	31.85	36.85	70.2

Model	Minimum Tensile Strength kN{kgf}	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	Number of Links Per Unit
RS35-KT-1	9.81{1000}	11.3{1150}	2.16{220}	0.33	320
RS40-KT-1	17.7 {1800}	19.1{1950}	3.63{370}	0.64	240
RS50-KT-1	28.4 {2900}	31.4{3200}	6.37{650}	1.04	192
RS60-KT-1	40.2 {4100}	44.1{4500}	8.83{900}	1.53	160
RS80-KT-1	71.6 {7300}	78.5{8000}	14.7{1500}	2.66	120
RS100-KT-1	107 {10900}	118 {12000}	22.6{2300}	3.99	96
RS120-KT-1	148 {15100}	167 {17000}	30.4{3100}	5.93	80
RS140-KT-1	193 {19700}	216 {22000}	40.2{4100}	7.49	68
RS160-KT-1	255 {26000}	279 {28500}	53.0{5400}	10.10	60

- Note: 1. Those marked with * are rollerless.
 2. Offset pin shape varies according to size.
 3. Maximum allowable load when using MCL is 80% of the above values.
 4. Maximum allowable load when using 1-pitch offset links (OL) is 65% of the above values.
 5. Normally, chains are coated only with anti-rust oil when shipped. Chain should be lubricated with an oil suitable to the ambient temperature during actual use. Customized models that are coated with a silicon (low temperature) oil are also available.

Corrosion Resistant Roller Chains

Curved Stainless Steel Roller Chain

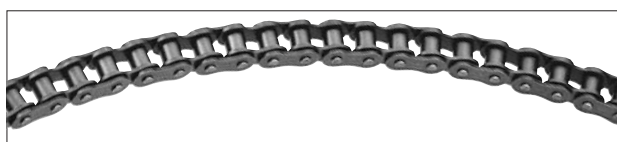


Pre-delivery lubrication is not carried out on Curved Stainless Steel Roller Chains. If these chains are to be used in environments where they are not submerged in or come in contact with water, pre-use lubrication of the chain must take place. If chains are used in these conditions without lubrication, poor articulation of the chain may occur at a much earlier stage than expected.

Stainless Steel (SUS304) Specification

Model	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Min. Radius r	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	Links Per Unit	
				Thickness T	Height H	Height h	Diameter D	$L_1 + L_2$	L_1					L_2
RS40-CU-SS-1	12.70	7.92	7.95	1.5	12.0	10.4	3.59	18.1	8.35	9.75	400	0.26 {27}	0.61	240
RS50-CU-SS-1	15.875	10.16	9.53	2.0	15.0	13.0	3.97	22.2	10.15	12.05	500	0.44 {45}	1.01	192
RS60-CU-SS-1	19.05	11.91	12.70	2.4	18.1	15.6	5.09	28.3	13.25	15.05	600	0.69 {70}	1.40	160
RS80-CU-SS-1	25.40	15.88	15.88	3.2	24.1	20.8	5.96	35.0	16.5	18.5	800	1.03{105}	2.47	120

Note: 1. Made-to-order product.



Specialty Roller Chains

Old-New Chain Number Comparison

Product codes have been assigned to all products (except customized products) and chain numbers have been rewritten. The following clarifies the differences between old and new chain numbers.

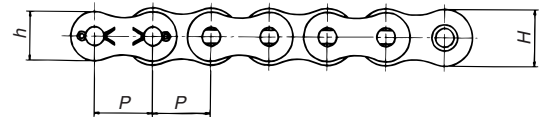
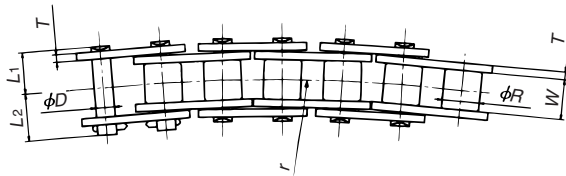
Curved Roller Chain

Old chain numbers of single-strand chains indicated size only. Add "-1" to all new chain numbers.

New chain number	Old chain number
Chain number with connecting link (CL) RS80-CU-1-CL	Indicate the connecting link after the number of strands as shown at left. Offset links are not available with Curved Roller Chain.

Specialty Roller Chains

Curved Roller Chain



TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Tightest lateral bend diameter r	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m	Number of Links Per Unit	
				Thickness T	Height H	Height h	Diameter D	L1 + L2	L1						L2
RS40-CU-1	12.70	7.92	7.95	1.5	12.0	10.4	3.97	18.2	8.45	9.75	350	15.5{1580}	1.86{190}	0.61	240
RS50-CU-1	15.875	10.16	9.53	2.0	15.0	13.0	5.09	23.0	10.6	12.4	400	24.1{2460}	2.84{290}	1.01	192
RS60-CU-1	19.05	11.91	12.70	2.4	18.1	15.6	5.96	28.3	13.25	15.05	500	34.9{3560}	4.02{410}	1.40	160
RS80-CU-1	25.40	15.88	15.88	3.2	24.1	20.8	7.94	36.8	16.75	20.05	600	61.6{6280}	6.96{710}	2.47	120

■ Features

Due to Tsubaki's exclusive pin and bush structure, this roller chain has a large sideflex radius due to its wide plate-plate clearance. RS sprockets can be used for easy curved drive use.

■ Applications

Curved roller conveyor drive and curved conveyors. Guides are required for curving areas.





Leaf Chains

Construction

Leaf chains are also commonly called balance chains. The most basic type of steel chain, they consist of just plates and pins. Conforming to JIS specifications and suitable for use in low-speed equipment, leaf chains are mainly used for lifting, counterweights, and motion drives.

The plates are connected by pins and take the strain when load is applied. Pins are press fitted to outer plates and riveted. However, a slip fit* is used with middle and inner plates and pins.

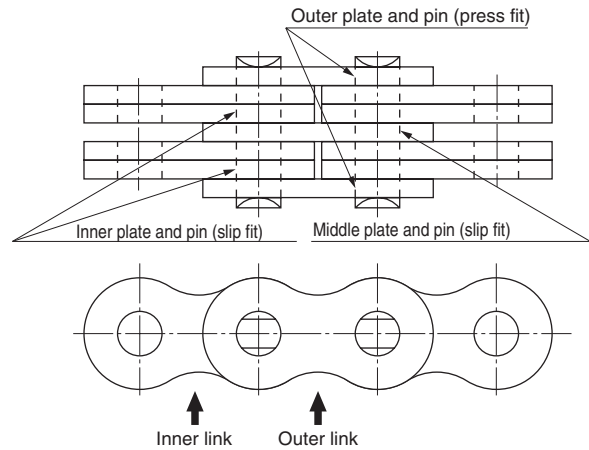
The pins pass between the plates and have to withstand the bulk of the shear forces resulting when the chain is under tension and move freely within the inner plate holes when the chain articulates.

*** Slip fit**

When a pin is fitted to a hole, some play is normally allowed. The tolerance range of the hole diameter is larger than the tolerance range for the pin diameter.

*** Press fit**

When a pin is fitted to a hole, the pin is normally tight against the hole. The tolerance range of the hole diameter is less than the tolerance range for the pin diameter.

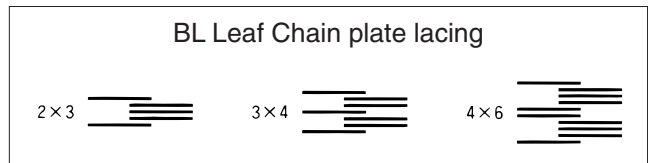
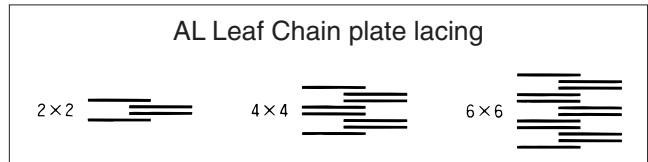


Types

There are two types of leaf chain: AL for light loads and BL for heavy loads. The dimensions and plate configuration for each is different.

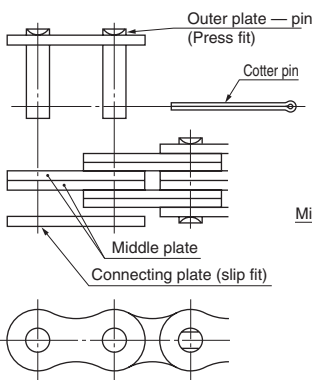
AL Type External plate dimensions and thickness are the same as for the outer plates of RS Roller Chain with the same pitch, while the pin diameter is almost the same.

BL Type Plate width is the same as for the inner plates of RS Roller Chain of the same pitch. Plate thickness is the same as for one pitch larger RS roller chain, as is pin diameter.

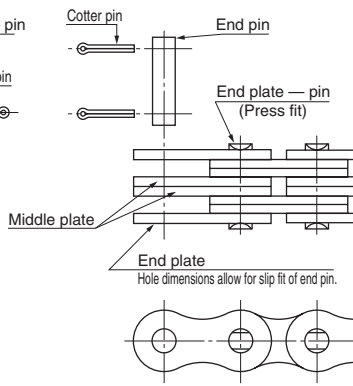


End links

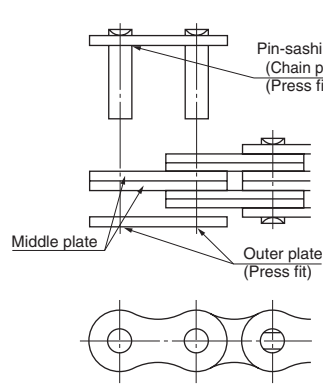
1. Connecting link



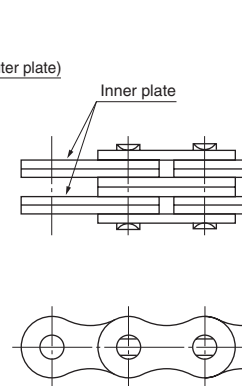
2. End link



3. Outer link



4. Inner link



Note: All four types require a slip fit between inner / middle plate holes and pins.

Leaf Chains

Chain number

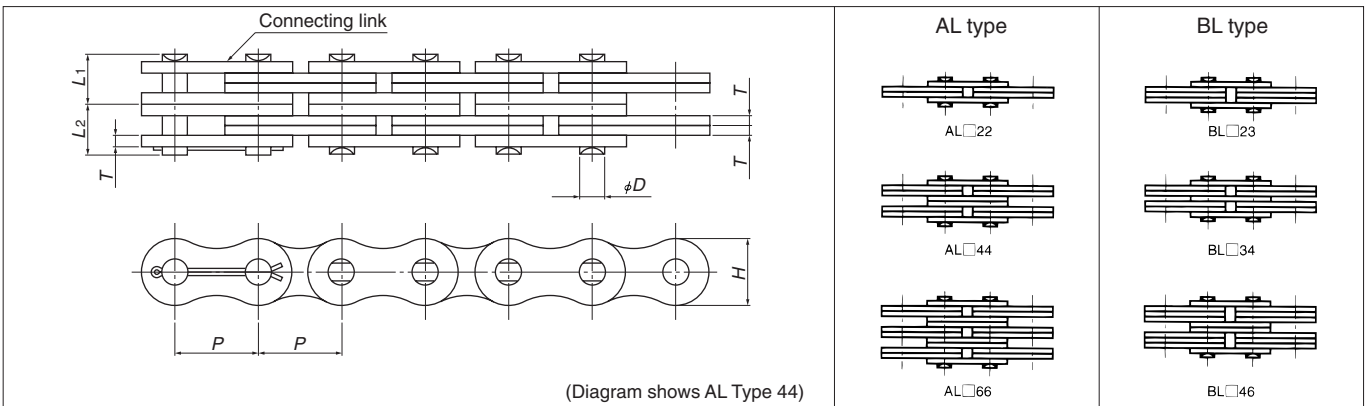
AL 4 22

Type
(AL or BL)

Lacing
(2 x 2)

Chain pitch (4 corresponds with RS40)

Dimensions



AL Type

TSUBAKI Chain Number	Pitch P	Plate Configuration	Plates		D	Pins		Minimum Tensile Strength kN{kgf}	Approximate Mass kg/m
			H	T		L1	L2		
AL422	12.70	2 x 2	10.4	1.5	3.97	4.20	5.30	16.7{ 1700}	0.38
AL444		4 x 4				7.43	8.52	33.3{ 3400}	0.74
AL466		6 x 6				10.65	11.75	50.5{ 5100}	1.10
AL522	15.875	2 x 2	13.0	2.0	5.08	5.43	6.97	27.5{ 2800}	0.62
AL544		4 x 4				9.68	11.22	54.9{ 5600}	1.22
AL566		6 x 6				13.90	15.45	82.4{ 8400}	1.81
AL622	19.05	2 x 2	15.6	2.4	5.94	6.33	8.22	38.2{ 3900}	0.87
AL644		4 x 4				11.28	13.17	76.5{ 7800}	1.71
AL666		6 x 6				16.23	18.12	115{11700}	2.54
AL822	25.40	2 x 2	20.8	3.2	7.90	8.18	10.97	64.7{ 6600}	1.51
AL844		4 x 4				14.90	17.70	129{13200}	2.98
AL866		6 x 6				21.60	24.40	194{19800}	4.44
AL1022	31.75	2 x 2	26.0	4.0	9.48	10.03	13.22	98.1{10000}	2.69
AL1044		4 x 4				18.35	21.55	196{20000}	5.31
AL1066		6 x 6				26.65	29.85	294{30000}	7.93
AL1222	38.10	2 x 2	31.2	4.8	11.04	12.10	15.80	141{14400}	3.57
AL1244		4 x 4				22.00	25.70	282{28800}	7.07
AL1266		6 x 6				31.93	35.62	424{43200}	10.56
AL1444	44.45	4 x 4	36.4	5.6	12.64	25.65	30.15	373{38000}	10.34
AL1466		6 x 6				37.28	41.77	559{57000}	15.16
AL1644	50.80	4 x 4	41.6	6.4	14.21	29.03	34.02	471{48000}	12.98
AL1666		6 x 6				42.23	47.22	706{72000}	19.41

BL Type

TSUBAKI Chain Number	Pitch P	Plate Configuration	Plates		D	Pins		Minimum Tensile Strength kN{kgf}	Approximate Mass kg/m
			H	T		L1	L2		
BL423	12.70	2 x 3	12.0	2.0	5.08	6.48	8.02	23.5{ 2400}	0.84
BL434		3 x 4				8.60	10.15	35.3{ 3600}	1.13
BL446		4 x 6				11.80	13.35	47.1{ 4800}	1.65
BL523	15.875	2 x 3	15.0	2.4	5.94	7.55	9.45	39.2{ 4000}	1.27
BL534		3 x 4				10.05	11.95	58.8{ 6000}	1.69
BL546		4 x 6				13.75	15.65	78.5{ 8000}	2.40
BL623	19.05	2 x 3	18.1	3.2	7.90	9.88	12.67	63.7{ 6500}	2.04
BL634		3 x 4				13.23	16.02	95.6{ 9750}	2.83
BL646		4 x 6				18.25	21.05	127{13000}	4.01
BL823	25.40	2 x 3	24.1	4.0	9.48	12.10	15.30	103{10500}	3.20
BL834		3 x 4				16.28	19.47	155{15800}	4.44
BL846		4 x 6				22.50	25.70	206{21000}	6.32
BL1023	31.75	2 x 3	30.1	4.8	11.04	14.45	18.15	141{14400}	4.69
BL1034		3 x 4				19.43	23.12	216{22000}	6.55
BL1046		4 x 6				26.85	30.55	282{28800}	9.29
BL1223	38.10	2 x 3	36.2	5.6	12.64	16.95	21.45	186{19000}	6.54
BL1234		3 x 4				22.75	27.25	299{30500}	9.10
BL1246		4 x 6				31.48	35.97	373{38000}	12.01
BL1423	44.45	2 x 3	42.2	6.4	14.21	19.10	24.10	235{24000}	9.06
BL1434		3 x 4				25.70	30.70	387{39500}	11.32
BL1446		4 x 6				35.63	40.62	471{48000}	18.00
BL1623	50.80	2 x 3	48.2	7.2	17.38	21.63	28.22	353{36000}	12.16
BL1634		3 x 4				29.20	35.80	554{56500}	16.95
BL1646		4 x 6				40.53	47.12	706{72000}	24.09

Leaf Chains

Clevises

Connecting links, end links, outer links, and inner links can all be used for Leaf Chain end links. When connecting end links (outer link, inner link), use the types of clevises shown below. Consult Tsubaki with special requests.

Connecting Leaf Chain to a clevis

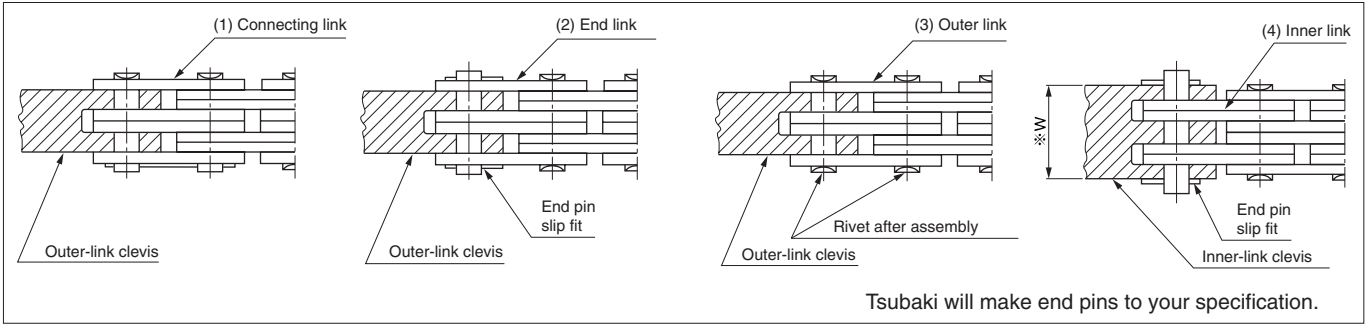
1. Connecting the chain end to a (1) connecting link, (2) end link, or (3) outer link.

Connect an outer-link clevis to the connecting link, end link, or outer link.

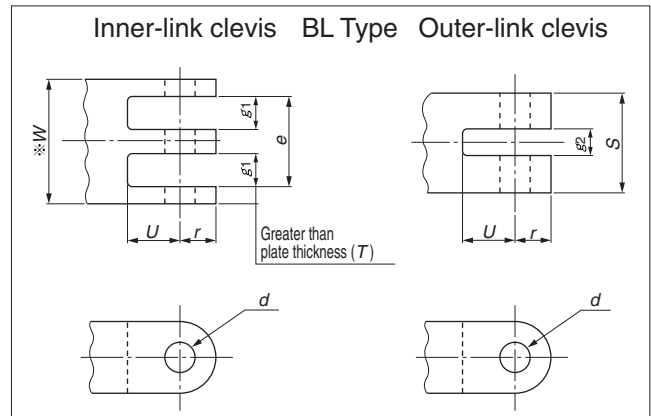
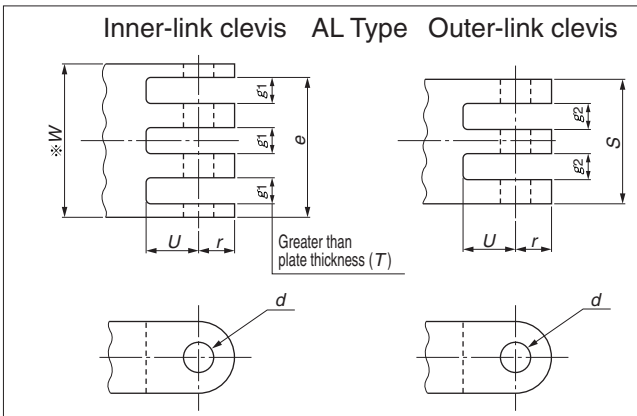
2. Connecting the chain end to an (4) inner link.

Connect an inner-link clevis to the end pin.

The end pin length varies according to the external width (W) of the clevis. When ordering, specify the W dimension.



Clevis size and material



AL Leaf Chain Number	d	r (max.)	U (min.)	$^{+0.2}_0 e$	$^{+0.1}_0 \xi_1$	$^{0}_{-0.2} s$	$^{+0.1}_0 \xi_2$
AL422	4.02 ^{+0.05}	6.3	6.0	—	3.4	3.1	—
AL444				9.8		9.5	3.4
AL466				16.2		15.9	3.4
AL522	5.13 ^{+0.05}	7.9	7.2	—	4.4	4.1	—
AL544				12.9		12.6	4.4
AL566				21.3		21.0	4.4
AL622	6.00 ^{+0.05}	9.5	9.0	—	5.1	4.8	—
AL644				15.0		14.7	5.1
AL666				24.8		24.5	5.1
AL822	7.97 ^{+0.1}	12.7	11.5	—	6.9	6.4	—
AL844				20.3		19.8	6.9
AL866				33.7		33.2	6.9
AL1022	9.57 ^{+0.1}	15.8	14.5	—	8.5	8.0	—
AL1044				25.1		24.6	8.5
AL1066				41.7		41.2	8.5
AL1222	11.14 ^{+0.1}	19.0	17.5	—	10.1	9.6	—
AL1244				29.9		29.4	10.1
AL1266				49.7		49.2	10.1
AL1444	12.74 ^{+0.1}	22.2	20.0	35.1	11.9	34.5	11.9
AL1466				58.3		57.7	11.9
AL1644	14.32 ^{+0.1}	25.4	23.0	39.9	13.5	39.2	13.5
AL1666				66.3		65.6	13.5

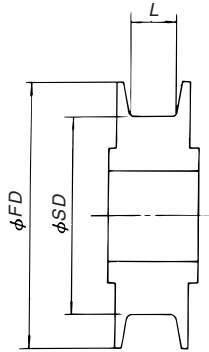
BL Leaf Chain Number	d	r (max.)	U (min.)	$^{+0.2}_0 e$	$^{+0.1}_0 \xi_1$	$^{0}_{-0.2} s$	$^{+0.1}_0 \xi_2$	
BL423	5.13 ^{+0.05}	6.3	6.3	—	6.5	6.2	—	
BL434				10.7		4.4	10.4	2.3
BL446				17.1		6.5	16.8	4.4
BL523	6.00 ^{+0.05}	7.9	7.9	—	7.6	7.3	—	
BL534				12.5		5.1	12.2	2.6
BL546				19.9		7.6	19.6	5.1
BL623	7.97 ^{+0.1}	9.5	9.5	—	10.3	9.8	—	
BL634				17.0		6.9	16.5	3.6
BL646				27.0		10.3	26.5	6.9
BL823	9.57 ^{+0.1}	12.7	12.7	—	12.7	12.2	—	
BL834				21.0		8.5	20.5	4.4
BL846				33.4		12.7	32.9	8.5
BL1023	11.14 ^{+0.1}	15.8	15.8	—	15.1	14.6	—	
BL1034				25.0		10.1	24.5	5.2
BL1046				39.8		15.1	39.3	10.1
BL1223	12.74 ^{+0.1}	19.0	19.0	—	17.7	17.1	—	
BL1234				29.3		11.9	28.7	6.1
BL1246				46.7		17.7	46.1	11.9
BL1423	14.32 ^{+0.1}	22.2	22.2	—	20.1	19.4	—	
BL1434				33.3		13.5	32.6	6.9
BL1446				53.1		20.1	52.4	13.5
BL1623	17.49 ^{+0.15}	25.4	25.4	—	23.1	22.1	—	
BL1634				38.2		15.6	37.2	8.0
BL1646				60.9		23.1	59.9	15.6

Use heat-treated alloy steel (SCM435, etc.) in order to obtain a hardness of HRC40 to 45. For clevises with screws, however, the hardness must be HRC30 to 35 in order to reduce any hazard due to delayed fractures.

Leaf Chains

Sheaves

Refer to the following chart when manufacturing sheaves.



- SD = Minimum external sheave diameter = chain pitch \times 5
 L = Minimum groove width = pin length \times 1.05
 FD = Flange external diameter
 = SD + maximum plate height (H)

AL Type

Chain Pitch	Minimum External Sheave Diameter SD	Flange External Diameter FD	Minimum Groove Width L		
			2 \times 2	4 \times 4	6 \times 6
12.70	63.50	73.90	8.85	15.60	22.40
15.875	79.38	92.38	11.40	20.35	29.20
19.05	95.25	110.85	13.30	23.70	34.10
25.40	127.00	147.80	17.20	31.30	45.40
31.75	158.75	184.75	21.10	38.55	56.00
38.10	190.50	221.70	25.45	46.20	67.05
44.45	222.25	258.65	—	53.90	78.30
50.80	254.00	295.60	—	61.00	88.70

BL Type

Chain Pitch	Minimum External Sheave Diameter SD	Flange External Diameter FD	Minimum Groove Width L		
			2 \times 3	3 \times 4	4 \times 6
12.70	63.50	75.50	13.60	18.10	24.80
15.875	79.38	94.38	15.90	21.15	28.90
19.05	95.25	113.35	20.75	27.80	38.35
25.40	127.00	151.10	25.45	34.20	47.25
31.75	158.75	188.85	30.35	40.80	56.40
38.10	190.50	226.70	35.60	47.80	66.10
44.45	222.25	264.45	40.15	54.00	74.85
50.80	254.00	302.20	45.45	61.35	85.15

- Dimensions for L in the table above assume that only the rivet pin is wound around the sheave. If a connecting pin is wound around the sheave, use $L \geq 2(L_2) \times 1.05$. Design L with an appropriate width while minding the installation precision of the sheave.
- Use sheaves made of machine-structural carbon copper. (S45C, etc.)
- Use heat-treated HRC (35 to 40) for high repetition applications.

Precautions for Use

- Lubricate regularly to prevent pin rotation and improve wear life.**
 Recommended lubrication: ISO VG 100 to 150 (SAE30 to SAE40)
 Lubrication method: With the chain loose, use a brush or oil stick to sufficiently lubricate the outer chain, making sure that oil also penetrates between plates.
 Lubrication period: Lubricate regularly so that sliding sections between pins and inner plates do not dry out.
- Avoid use in corrosive environments.**
 Wipe immediately when there is contact with water and lubricate well. When there is a possibility of corrosion, apply a large amount of grease to the surface of the chain. (To lubricate, wipe off grease and reapply after lubricating between plates.)
- Check for elongation.**
 Replace chain when elongation reaches allowable elongation limit (3%).

Guidelines for checking chain elongation

In order to prevent chain backlash, measure with slight tension on the chain.

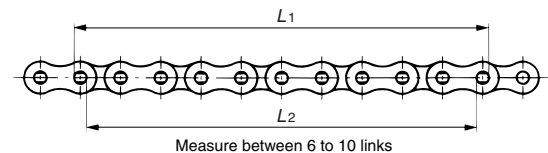
Use calipers to measure the distance between the outside L_1 and inside L_2 of the pins for the portion of the chain articulating around the sheave as shown in the illustration to obtain

$$L = (L_1 + L_2) / 2$$

Obtain chain elongation percentage using the following formula.

$$\text{Chain elongation} = \frac{L - \text{Standard length}}{\text{Standard length}} \times 100(\%)$$

$$\text{Standard length} = \text{Chain pitch} \times \text{No. of links}$$



Note: Pitch elongation limit can be quickly checked with a chain elongation scale. For details, see pg. 120.

Ordering

Specify the chain number, number of links, chain end specifications, and link pin requirements.

- The following specifications exist for each end of the chain. Specify your preference.
 - Connecting link
 - End link (Outer and inner end link hole diameters are the same)
 - Outer link
 - Inner link
- If no chain end specification
 With orders for an odd number of links, each end will be given an inner link. With orders for an even number of links, one end will have an inner link and the other a connecting link.
- End pins are available.

Leaf Chains

■ Selection

1. Determine the following based on usage conditions.

- Chain speed
- Number of repetitions per day
- Work load (including inertia and impact strength)
 - When a chain speed of 30 m/min or 1,000 cycles/day is exceeded, Leaf Chains may be inappropriate due to wear. Use an RS Roller Chain.

2. Determine the type of chain.

- BL Type is recommended.
- Limit use of AL Type to applications with no impact load or wear considerations (under 100 cycles/day).

3. Determine chain size using the following formula.

$$\text{Work load} \times \text{Usage coefficient (Table 1)} \times \text{Safety ratio (Table 2)} \leq \text{Minimum tensile strength}$$

4. ⚠ It is dangerous to use below the safety ratio in Table 2 as it may result in pin rotation and a reduction in strength. In addition, even if the safety ratio in Table 2 is followed, insufficient lubrication may also cause the pins to rotate. Always lubricate the chain regularly.

Table 1 Usage coefficient

Type of impact	Applications	Usage coefficient
Smooth power transmission	Starts and stops are smooth, and load changes are slight (balance weight suspension, etc.)	1.0
Slight impact	Repeated starts and stops, load changes, and reverse operation (forklifts, etc.)	1.3
Impact	Violent starts and stops, load changes, and reverse operation (mining and construction, etc.)	1.5

Table 2 Safety ratio

Plate combinations No. of cycles		Safety ratio	
		2×2、3×4 2×3、4×4	4×6 6×6
BL Type	1,000 cycles/day or less	8 or more	9 or more
AL Type	10 cycles/day or less	8 or more	9 or more
	100 cycles/day or less	12 or more	11 or more

5. Where determining a chain's safety ratio is established by law, select a chain with some leeway using that method and this catalog.

Pin Gear Attachment Chain

For straight drive and large-radius turning operations, a chain gear is used by the drive source (motor, etc.) through a reducer. This can result in cost issues and so on, as the chain requires a great deal of space, and precision processing is required for the gears. Pin Gears are perfect in this situation.

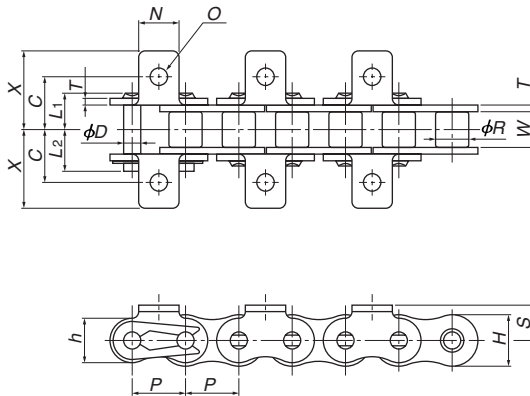
An Attachment Chain is used around the outside of the drum in place of a gear drive wheel, and a specially-processed sprocket is used for the pinion gear. For linear operation, an Attachment Chain is installed horizontally in place of the rack. Be sure to use heat-treated installation bolts. (See the selection pages.)



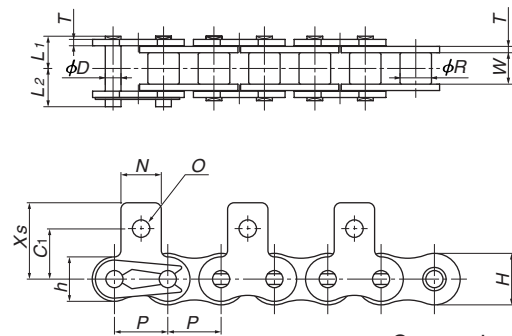
■ Pin Gear Sprocket

18-teeth sprockets are shown.
(See pg. 112 for sprockets.)

SK1 Attachment Chain



K1 Attachment Chain



Connecting link
RS40 to RS60: Clip type
RS80 to RS200: Cotter pin type
RS240: Spring pin type

Attachment dimensions are all common to standard K1 and SK1 Attachment Chains.

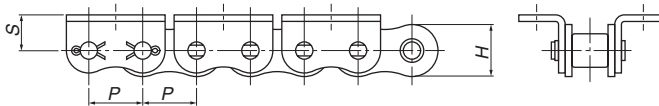
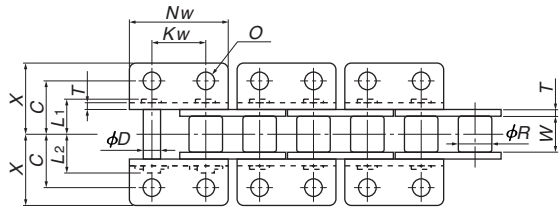
TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates			Pins			Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
				Thickness T	Width H	Width h	Diameter D	L ₁	L ₂			
RS40	12.70	7.92	7.95	1.5	12.0	10.4	3.97	8.25	9.95	16.7{1700}	2.16{220}	0.64
RS50	15.875	10.16	9.53	2.0	15.0	13.0	5.09	10.3	12.0	27.5{2800}	4.12{420}	1.04
RS60	19.05	11.91	12.70	2.4	18.1	15.6	5.96	12.85	14.75	40.2{4100}	4.90{500}	1.53
RS80	25.40	15.88	15.88	3.2	24.1	20.8	7.94	16.25	19.25	68.6{7000}	9.41{960}	2.66
RS100	31.75	19.05	19.05	4.0	30.1	26.0	9.54	19.75	22.85	108{11000}	15.7{1600}	3.99
RS120	38.10	22.23	25.40	4.8	36.2	31.2	11.11	24.9	28.90	151{15400}	20.6{2100}	5.93
RS140	44.45	25.40	25.40	5.6	42.2	36.4	12.71	26.9	31.70	204{20800}	29.4{3000}	7.49
RS160	50.80	28.58	31.75	6.4	48.2	41.6	14.29	31.85	36.85	258{26300}	37.3{3800}	10.10
RS200	63.50	39.68	38.10	8.0	60.3	52.0	19.85	39.0	44.80	431{44000}	46.1{4700}	16.49
RS240	76.20	47.63	47.63	9.5	72.4	62.4	23.81	47.9	55.50	667{68000}	68.6{7000}	24.50

TSUBAKI Chain Number	Attachment							K1/SK1 (additional weight per attachment location) kg	Number of Links Per Unit	Delivery
	C	C ₁	N	O	S	X	X _s			
RS40	12.7	12.7	9.5	3.6	8.0	17.8	17.40	0.004	240	Contact Tsubaki.
RS50	15.9	15.9	12.7	5.2	10.3	23.4	23.05	0.006	192	
RS60	19.05	18.3	15.9	5.2	11.9	28.2	26.85	0.014	160	
RS80	25.4	24.6	19.1	6.8	15.9	36.6	35.45	0.026	120	
RS100	31.75	31.8	25.4	8.7	19.8	44.9	44.00	0.052	96	
RS120	38.1	36.5	28.6	10.3	23.0	55.8	52.85	0.088	80	
RS140	44.5	44.5	34.9	11.9	28.6	63.1	63.50	0.142	68	
RS160	50.8	50.8	38.1	14.3	31.8	71.8	70.10	0.194	60	
RS200	63.5	63.5	48.0	17.5	42.9	83.5	85.50	0.356	48	
RS240	76.2	76.2	57.2	21.0	47.7	97.9	106.70	0.553	40	

Note: Use installation bolts with a strength category of 8.8 (JIS B1051) or more in light of operating environment.

Pin Gear Attachment Chain

WK2 Attachment Chain



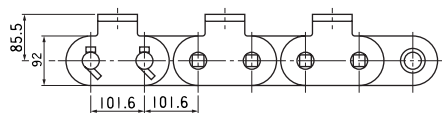
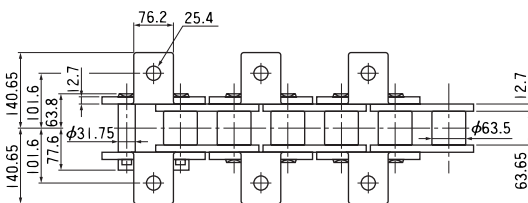
1. Attachment hole diameter is larger than that of K1 Attachment Chain and bolt strength is greater.
2. Attachment strength is greater than that of K1 Attachment Chain.
3. RS200 and RS240 plates are flat.
4. Spring pins are used with RS240 connecting links.

Attachment dimensions are all common to standard WK2 Attachment Chains.

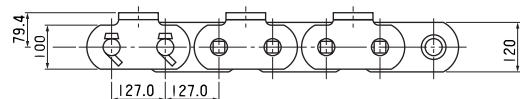
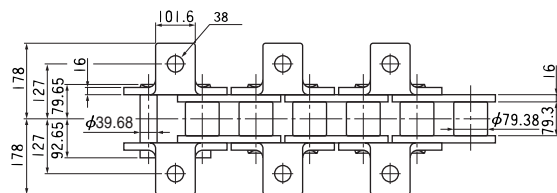
TSUBAKI Chain Number	Pitch P	Roller Diameter R	Inner Width of Inner Link W	Plates		Pins			Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate Mass kg/m
				Thickness T	Width H	Diameter D	L1	L2			
RS40	12.70	7.92	7.95	1.5	12.0	3.97	8.25	9.95	16.7{1700}	2.65{270}	0.64
RS50	15.875	10.16	9.53	2.0	15.0	5.09	10.3	12.0	27.5{2800}	4.31{440}	1.04
RS60	19.05	11.91	12.70	2.4	18.1	5.96	12.85	14.75	40.2{4100}	6.28{640}	1.53
RS80	25.40	15.88	15.88	3.2	24.1	7.94	16.25	19.25	68.6{7000}	10.7{1090}	2.66
RS100	31.75	19.05	19.05	4.0	30.1	9.54	19.75	22.85	108{11000}	17.1{1740}	3.99
RS200	63.50	39.68	38.10	8.0	60.3	19.85	39.0	44.8	431{44000}	46.1{4700}	16.49
RS240	76.20	47.63	47.63	9.5	72.4	23.81	47.9	55.5	667{68000}	68.6{7000}	24.15

TSUBAKI Chain Number	Attachment						WK2 (additional weight per attachment location) kg	Number of Links Per Unit	Delivery
	C	X	Nw	Kw	O	S			
RS40	12.7	17.8	23.0	9.5	4.5	8.0	0.006	240	Contact Tsubaki.
RS50	15.9	23.4	28.8	11.9	5.5	10.3	0.014	192	
RS60	19.05	28.2	34.6	14.3	6.6	11.9	0.024	160	
RS80	25.4	36.6	46.1	19.1	9.0	15.9	0.056	120	
RS100	31.75	44.9	57.7	23.8	11.0	19.8	0.110	96	
RS200	63.5	83.5	115.4	63.5	17.5	42.9	0.857	48	
RS240	76.2	97.9	138.5	57.0	21.0	47.7	1.338	40	

RF320-T-K1 Attachment Chain



RF400-T-K1 Attachment Chain



TSUBAKI Chain Number	Average Tensile Strength kN{kgf}	Maximum Allowable Load kN{kgf}	Approximate weight kg/m	K1 (additional weight per attachment location) kg	Number of links per unit	Delivery
RF320-T	1150{117000}	104{10600}	47.6	1.732	30	Contact Tsubaki
RF400-T	1950{199000}	176{17900}	83.9	3.136	24	

Pin Gear Sprocket

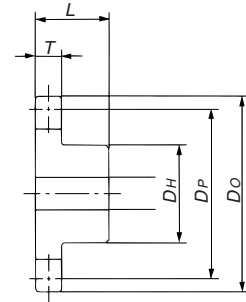
Pin Gear Sprocket

The shape of the teeth in a pin gear sprocket differs from that of RS-type sprockets for wound transmission. Since the shape of the teeth will also differ depending upon the pin gear device (internal or external connection), all products are made-to-order. See "Pin Gear Drive Selection Method".

■ Example with 18-teeth (B Type)

Sprocket Code Number	Pitch Circular Diameter D_P	Outer Diameter D_O	Width of Teeth T	Hub Diameter D_H	Length L	Material and Construction
RS40 1B18TG	74.4	83.5	7.3	57	22	Material and construction are determined on a case-by-case basis.
RS50 1B18TG	92.9	103.9	8.9	72	28	
RS60 1B18TG	111.5	125.3	11.9	83	40	
RS80 1B18TG	148.4	167.1	15.0	100	50	
RS100 1B18TG	185.4	208.3	18.0	120	60	
RS120 1B18TG	222.5	249.2	24.0	130	65	
RS140 1B18TG	259.4	289.9	24.0	160	90	
RS160 1B18TG	296.5	330.7	30.0	180	100	
RS180 1B18TG	333.4	376.0	33.7	200	110	
RS200 1B18TG	370.4	417.8	36.0	210	120	

The example is for an 18-teeth linear pin gear.

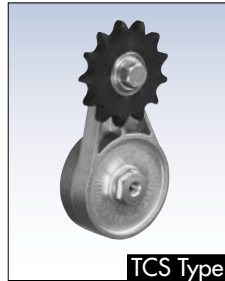




Accessories (Peripheral Instruments)

Chain Tensioner

The Tsubaki Chain Tensioner adjusts slackness in the chain to enable continuous and proper chain operation.



TCS Type

Chain Connecting Tool

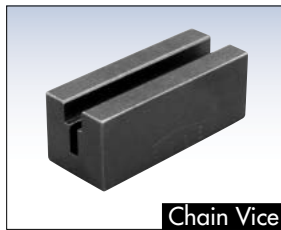
This tool pulls the two ends of the chain together when installing the chain on a machine.



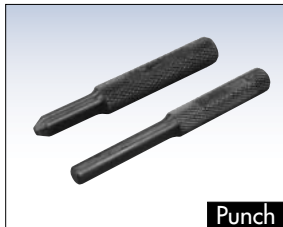
Chain Puller

Chain Cutting Tools

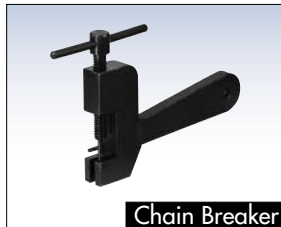
These tools enable chains to be cut to the desired length.



Chain Vice



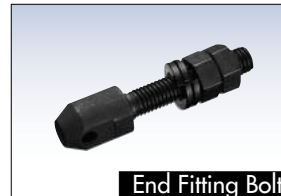
Punch



Chain Breaker

End Fixtures

The end fitting bolts and end fitting bolt connecting links are designed to be stronger than those of RS Roller Chains.



End Fitting Bolt



End Fitting Bolt Connecting Link

Chain Elongation Scale

Allows quick checks of pitch elongation limit.



Chain Elongation Scale

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



Accessories

Old-New Model Number Comparison

New model numbers are as follows.

Chain Tensioner

CT-TCS Type	New model number	Old model number
	CT-TCS40	TCS40
	CT-TCS50	TCS50
	CT-TCS60	TCS60
	CT-TCS80	TCS80

CT-ETS Type	New model number	Old model number
	CT-ETS40	ETS40
	CT-ETS50	ETS50
	CT-ETS60	ETS60
	CT-ETS80	ETS80

CT-TA Type	New model number	Old model number
	CT-TA40	TA40
	CT-TA50	TA50
	CT-TA60	TA60
	CT-TA80	TA80

Chain Cutting Tools

Chain Vices	New model number	Old model number
	RS-CR1	RSCR-1
	RS-CR2	RSCR-2
	RS-CR3	RSCR-3
	RS-CV1	RSCV-1
	RS-CV2	RSCV-2
	RS-CV3	RSCV-3

Punches (Primary punch)	New model number	Old model number
	RS-P11	RSS-S1
	RS-P14	RSS-1
	RS-P15	RSS-2
	RS-P16	RSS-3

Punches (Secondary punch)	New model number	Old model number
	RS-P21	RSD-S1
	RS-P22	RSD-S2
	RS-P23	RSD-S3
	RS-P24	RSD-1
	RS-P25	RSD-2
	RS-P26	RSD-3

Rivet Punches	New model number	Old model number
	RS-RP01	RS40-Punch
	RS-RP02	RS50-Punch
	RS-RP03	RS60-Punch
	RS-RP04	RS80-Punch

Chain Breakers	New model number	Old model number
	RS-CS-A1	RSCS-A1
	RS-CS-A2	RSCS-A2
	RS-CS-A3	RSCS-A3
	RS-CS-A4	RSCS-A4
	RS-CS-B1	RSCS-B1
	RS-CS-C1	RSCS-C1
	RS-CS-C2	RSCS-C2
	RS-CS-C3	RSCS-C3

Chain Cutting Tools

Poly-Steel Chain Cutting Tools	New model number	Old model number
	RS-PC01-AST	RF25PC-KOGU
	RS-PC02-AST	RF35PC-KOGU
	RS-PC03-AST	RF40PC-KOGU
	RS-PC04-AST	RF50PC-KOGU
	RS-PC05-AST	RF60PC-KOGU

Lambda Chain Cutting Tools	New model number	Old model number
	RS-LMD01-AST	RSD40LAMDA-KOGU
	RS-LMD02-AST	RSD50LAMDA-KOGU
	RS-LMD03-AST	RSD60LAMDA-KOGU
	RS-LMD04-AST	RSD80LAMDA-KOGU
	RS-LMD05-AST	RSD100LAMDA-KOGU
	RS-LMD06-AST	RSD120LAMDA-KOGU
	RS-LMD07-AST	RSD140LAMDA-KOGU

Chain Connecting Tool

Chain Pullers	New model number	Old model number
	RS-CP01	RSM-35
	RS-CP02	RSM-60
	RS-CP03	RSM-80

End Fixtures

End Fitting Bolts (for RS Roller Chains)	New model number	Old model number
	RS40EB	RS40EB
	RS50EB	RS50EB
	RS60EB	RS60EB
	RS80EB	RS80EB
	RS100EB	RS100EB
	RS120EB	RS120EB

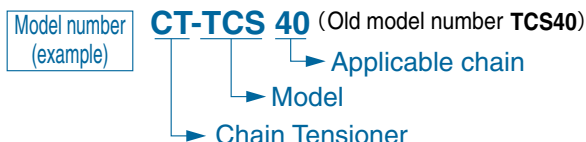
End Fitting Bolt Connecting Links (for RS Roller Chains)	New model number	Old model number
	RS40EB-JL	RS40EBJL
	RS50EB-JL	RS50EBJL
	RS60EB-JL	RS60EBJL
	RS80EB-JL	RS80EBJL
	RS100EB-JL	RS100EBJL
	RS120EB-JL	RS120EBJL

Chain Tensioner

Slackness in the chain can cause chain vibration and noise, and improper meshing with the sprocket, as well as preventing the chain from operating properly. The Tsubaki Chain Tensioner adjusts slackness in the chain to enable continuous and proper chain operation.

There are three types of Tsubaki Chain Tensioners: the TCS Type (swing type, with idler sprocket), the ETS Type (straight type, with idler sprocket), and the TA Type (straight type, with plastic shoe).

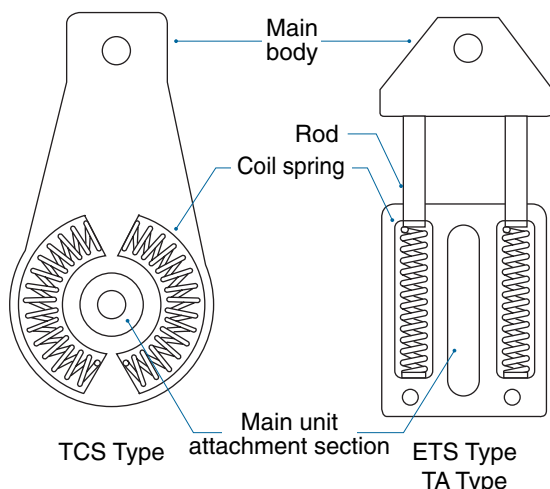
Ordering Specify the code (product code and model number)



Construction

The Tsubaki Chain Tensioner is composed of a main unit and an idler sprocket. (The TA Type is a unitized construction with plastic shoe.) The tensioner's main unit (aluminum) employs the elasticity of a built-in coil spring to tension.

<Main unit>



Product type

1 TCS Type: Swing type, with idler sprocket



Order placement

Product code	Model number	Qty	Unit
D210001	CT-TCS40	1	K

<Idler sprocket>

The idler sprocket is composed of a sprocket with a built-in bearing, an attachment bolt, and a washer.

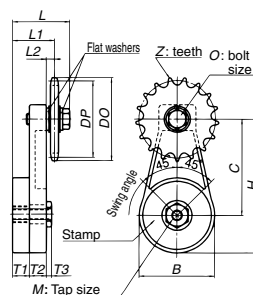
The sprocket teeth undergo induction hardening and are given a black coating.

Model Number	No. of Sprocket Teeth	Sprocket Attachment Bolt			Flat Washer		Tensioner Attachment Bolt	
		Size	Length	Strength Classification	No.	Diameter		No.
CT-TCS40	17	M10	30	10.9	1	10	2	M10
CT-TCS50	15	M10	30	10.9	1	10	2	M10
CT-TCS60	13	M12	35	10.9	1	12	2	M12
CT-TCS80	11	M12	35	10.9	1	12	4	M12
CT-ETS40	17	M10	35	10.9	1	10	2	M10
CT-ETS50	15	M10	35	10.9	1	10	2	M10
CT-ETS60	13	M12	45	10.9	1	12	2	M12
CT-ETS80	11	M12	45	10.9	1	12	4	M12

<TA Type main unit attachment bolt>

Model Number	Main Unit Attachment Bolt	Model Number	Main Unit Attachment Bolt
CT-TA40	M10	CT-TA60	M12
CT-TA50	M12	CT-TA80	M14

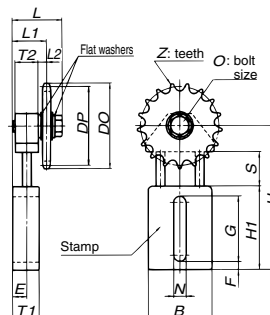
Note: Tensioner attachment bolt not included with tensioner.



Note: Only the CT-TCS80 has two washers installed on each side.

TCS Model Number	Stamp	Applicable Chain	B	C	H	M	T ₁	T ₂	T ₃	Z	DP	DO	O	L	L ₁	L ₂	Plunge Force kN{kgf}	Approximate Mass kg/unit
CT-TCS40	TC-1	RS40-1	69	87.5	122	M10	15.5	15.5	5	17	69.12	75	M10	50.5	37.5	6.5	0{0}~0.15{15}	0.74
CT-TCS50	TC-1	RS50-1	69	87.5	122	M10	15.5	15.5	5	15	76.35	83	M10	50.5	37.5	6.5	0{0}~0.15{15}	0.82
CT-TCS60	TC-2	RS60-1	90	100	145	M12	18	18	7	13	79.60	88	M12	60.5	44.5	8.5	0{0}~0.39{40}	1.30
CT-TCS80	TC-2	RS80-1	90	100	145	M12	18	18	7	11	90.16	101	M12	65.5	47	11	0{0}~0.39{40}	1.52

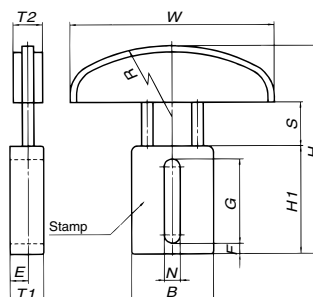
2 ETS Type: Straight type, with idler sprocket



Note: Only the CT-TCS80 has two washers installed on each side.

ETS Model Number	Stamp	Applicable Chain	S	H	H ₁	F	G	B	N	T ₁	T ₂	E	Z	DP	DO	O	L	L ₁	L ₂	Plunge Force kN{kgf}	Approximate Mass kg/unit
CT-ETS40	TO-1	RS40-1	30	129	74	7	58	56.2	11	23	20	12.5	17	69.12	76	M10	42	29	6.5	0.10{10}~0.25{25}	0.60
CT-ETS50	TO-1	RS50-1	30	129	74	7	58	56.2	11	23	20	12.5	15	76.35	84	M10	42	29	6.5	0.10{10}~0.25{25}	0.69
CT-ETS60	TO-2	RS60-1	38	163	87	9	70	70.5	12.5	28	25	15	13	79.60	89	M12	52	36	8.5	0.15{15}~0.39{40}	1.15
CT-ETS80	TO-2	RS80-1	38	163	87	9	70	70.5	12.5	28	25	15	11	90.16	102	M12	57	38.5	11	0.15{15}~0.39{40}	1.37

3 TA Type: Straight type, with plastic shoe



TA Model Number	Stamp	Applicable Chain	S	H	H ₁	F	G	B	N	T ₁	E	W	R	T ₂	Plunge Force kN{kgf}	Approximate Mass kg/unit
CT-TA40	TO-1	RS40-1	30	143	74	7	58	56.2	11	23	12.5	140	120	20	0.10{10}~0.25{25}	0.39
CT-TA50	TO-2	RS50-1	38	164	87	9	70	70.5	12.5	28	15	140	140	22	0.15{15}~0.39{40}	0.65
CT-TA60	TO-2	RS60-1	38	164	87	9	70	70.5	12.5	28	15	140	140	22	0.15{15}~0.39{40}	0.65
CT-TA80	TO-3	RS80-1	44	187	104	9	86	82	14.5	33	17.5	140	160	25	0.29{30}~0.59{60}	0.99

Assembly

Remove the main unit of the TCS or ETS Type tensioner, the idler sprocket, attachment bolt and washers from their packaging, and assemble them as shown in Fig. 1. The plastic shoe for the TA type comes as part of the main unit and no assembly is required.

One flat washer should be installed on each side of the idler sprocket. However, the CT-TCS80 and CT-ETS80 should have two washers installed on each side. The idler sprocket attachment bolt and flat washers are included with the idler sprocket.

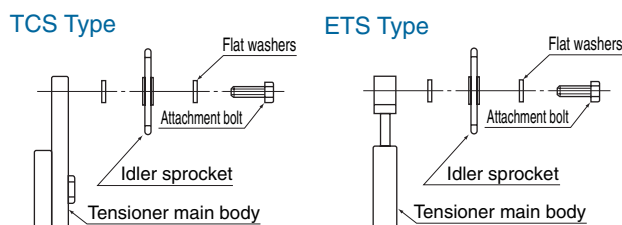


Fig. 1 Chain tensioner assembly

■ Handling Precautions

〈Bolt tightening torque〉

When installing the tensioner on a base after attaching the idler sprocket to the tensioner, be sure to fasten the idler sprocket and the tensioner with a bolt. The following table indicates the tightening torque. Be sure to use bolts with a strength classification of 8.8 or more.

〈Position adjustment〉

When setting the tensioner, adjust with a shim so that the center of the idler sprocket and chain are aligned.

〈Checking the rotation of the idler sprocket〉

If the idler sprocket is anchored in place, check whether or not the sprocket can turn smoothly. If it does not turn smoothly, the bolt may be too tight. Loosen the bolt and then retighten properly.

〈Lubrication〉

Lubricate the rod section regularly.

〈Operating temperature〉

	Range
TCS Type	-10°C - 100°C
ETS Type	-10°C - 100°C
TA Type	-10°C - 60°C

〈Attachment bolt locking torque〉

Unit: kN · m {kgf · m}

	Idler sprocket attachment bolt	Tensioner attachment bolt
CT-TCS40,50	0.02{2.0}	0.04{4.0}
CT-TCS60,80	0.03{3.0}	0.05{5.0}
CT-ETS40,50	0.03{3.0}	0.03{3.0}
CT-ETS60,80	0.04{4.0}	0.04{4.0}
CT-TA40	—	0.03{3.0}
CT-TA50,60	—	0.04{4.0}
CT-TA80	—	0.05{5.0}

■ Installation

〈Attaching the TCS type tensioner〉

- 1) Attach the roller chain to the drive and driven sprockets.
- 2) In order to attach the tensioner to the slack side of the roller chain as shown in Fig. 2, first push in on the roller chain with the idler sprocket and determine the attachment position (bolt hole) for the tensioner.

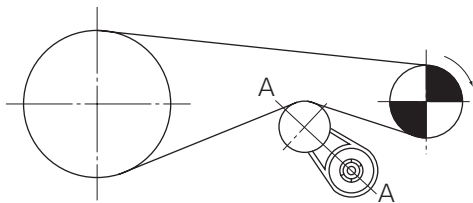


Fig. 2 Tensioner position (front)

- 3) Then, within a range where the roller chain does not contact the tensioner unit, ensure the force of the roller chain moves as perpendicular as possible to the A-A line. (Tensioner is a swing type unit.)

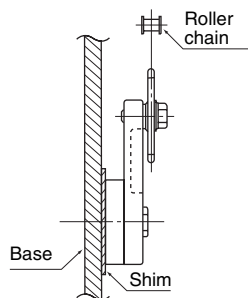


Fig. 3 Tensioner position (side)

- 4) Adjust with a shim, as shown in Fig. 3, so that the center of the roller chain and idler sprocket are aligned.

- 5) Open a hole in the base that holds the tensioner. (A slotted hole is convenient.)

- 6) Push in on the chain with the tensioner and temporarily tighten the tensioner to the base with a bolt. (Fig. 4) Then tighten the hexagonal screw and anchor so that the swing angle is about 15°.

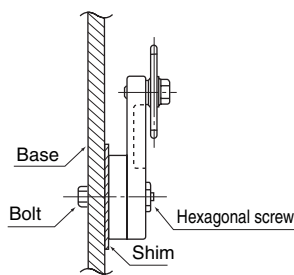


Fig. 4 Tightening the tensioner

- 7) Perform a test operation and check whether the tensioner works properly. If any of the following occurs, reset the tensioner.

- Contacts the side of the idler sprocket: Not centered properly
- Vertical or traverse vibration: Insufficient initial tension
- Increased noise: Excessive initial tension

〈Attaching the ETS and TA Type tensioners〉

- 1) Push in on the roller chain with the tensioner's idler sprocket (Fig. 5) and determine the position of the hole on the attachment base.

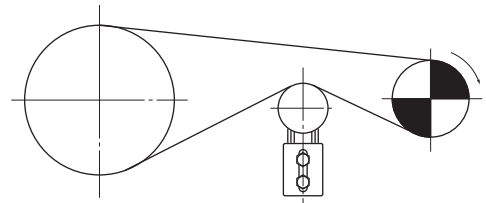


Fig. 5 Tensioner position (front)

- 2) Open a hole in the attachment base. In this case, two bolt holes are required, but a hole that is as long as possible will make positioning simpler, and the re-tensioning operation will be easier when the chain elongates.

- 3) Temporarily tighten the tensioner with two bolts. At this time, adjust with a shim, etc., so that the center of the idler sprocket and roller chain are aligned. (Fig. 6)

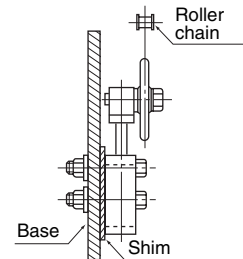


Fig. 6 Tightening the tensioner

- 4) Push in on the chain with the tensioner and, if the amount of slack is appropriate (δ), tighten the nut and anchor the tensioner. Aim for a value less than $\delta = 0.02 \times L$. (Fig. 7)

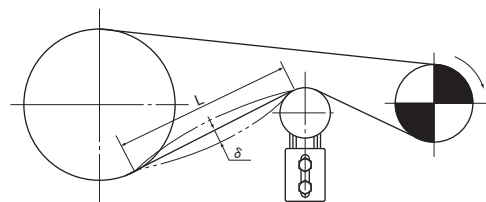


Fig. 7 Tensioner's anchored position

- 5) Perform a test operation and check whether the tensioner works properly. If any of the following occurs, reset the tensioner.

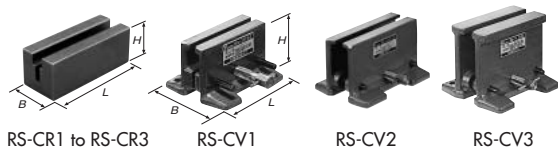
- Contacts the side of the idler sprocket: Not centered properly
- Vertical or traverse vibration: Insufficient initial tension
- Increased noise: Excessive initial tension



Chain Cutting Tools

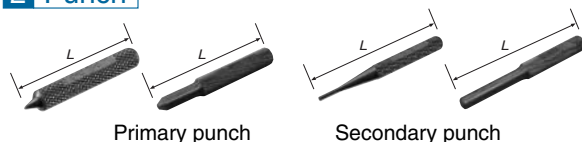
Your purchased chain is either a unit length (3048 mm) or a reel. The following tools are available for cutting the chain to a desired length. See "Roller Chain and Sprocket Handling" for use.

1 Chain Vice



Model Number	Applicable Chain			Dimensions		
	Single-strand	Double-strand	Triple-strand	L	H	B
RS-CR1	RS15	—	—	50	16.4	20
RS-CR2	RS25	—	—	50	19	20
RS-CR3	RS35	—	—	60	30	30
RS-CV1	RS40 - 80	RS40	—	100	65	94 - 115
RS-CV2	RS40 - 160	RS40 - 100	RS40 - 100	180	110	120 - 151
RS-CV3	RS80 - 240	RS80 - 160	RS80 - 100	200	170	180 - 220

2 Punch



Model Number				Applicable Chain
Primary punch	L	Secondary punch	L	
RS-P11	52	RS-P21	65	RS15
		RS-P22	70	RS25
		RS-P23	80	RS35
RS-P14	60	RS-P24	80	RS40 - 60
RS-P15	70	RS-P25	90	RS80 - 120
RS-P16	80	RS-P26	120	RS140 - 240

Note: 1. The RS-P11 can be used with three sizes: RS15, RS25, and RS35.

Model Number	L	Applicable Chain
Rivet punch		
RS-RP01	100	RS40
RS-RP02	100	RS50
RS-RP03	100	RS60
RS-RP04	100	RS80



Rivet punch

3 Chain Breakers



Model Number	L	Applicable Chain (Single-strand)	Model Number	L	Applicable Chain (Single-strand & Double-strand)
RS-CS-A1	116	RS25	RS-CS-B1	185	RS40 - 60
RS-CS-A2	119	RS35	RS-CS-C1	222	RS80, 100
RS-CS-A3	119	RS41	RS-CS-C2	290	RS120, 140
RS-CS-A4	119	RF06B	RS-CS-C3	708	RS160 - 240

Note: In addition to RS Roller Chains, Chain Breakers can be used with BS Roller Chains and Marine Chains. However, Chain Breakers for Marine Chains are made-to-order.

Ordering Specify the code (product code and model)

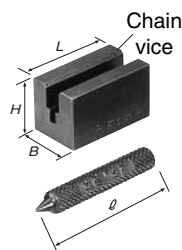
Order placement

Product code	Model number	Qty	Unit
D210013	RS-CR1	1	K

4 Poly Steel Chain Cutting Tools

Standard chain cutting tools cannot be used on Poly Steel Chains. A special punch and vice for Poly Steel Chains are required.

<Cutting Tools>



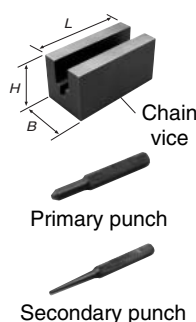
Model Number	L	H	B	φ	Applicable Chain
RS-PC01-AST	35	20	20	52	RS25-PC-1
RS-PC02-AST	50	30	30	52	RS35-PC-1
RS-PC03-AST	65	35	35	56	RS40-PC-1
RS-PC04-AST	80	40	35	56	RS50-PC-1
RS-PC05-AST	100	45	40	56	RS60-PC-1

Note: 1. The special punch and vice are included as a set.

5 Lambda Chain Cutting Tools

A special vice and a primary and secondary punch are required to disassemble Lambda Chains.

<Cutting Tools>



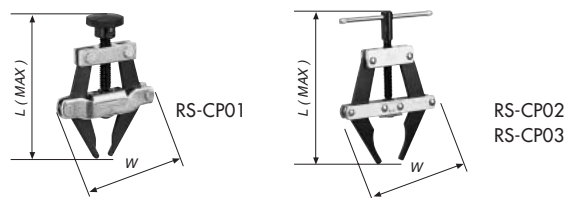
Model Number	L	H	B	Applicable Chain
RS-LMD01-AST	65	32	32	RS40-LMD-1
RS-LMD02-AST	80	40	40	RS50-LMD-1
RS-LMD03-AST	95	48	48	RS60-LMD-1
RS-LMD04-AST	130	60	60	RS80-LMD-1
RS-LMD05-AST	160	73	73	RS100-LMD-1
RS-LMD06-AST	160	88	88	RS120-LMD-1
RS-LMD07-AST	180	98	98	RS140-LMD-1

Note: 1. The special punch and vice are included as a set. Punch dimensions are the same as for the punch in section 2.

Chain Connecting Tool

1 Chain Puller

This tool pulls the two ends of the chain together when installing the chain on a machine.



Model Number	L	W	Applicable Chain (Single-strand)
RS-CP01	118	70	RS35 - 60
RS-CP02	185	112	RS60 - 100
RS-CP03	250	145	RS80 - 240

End Fixtures

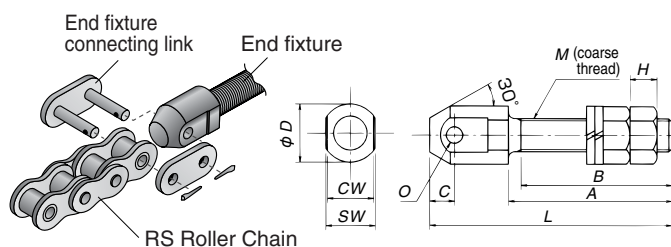
- Allows for reliable lifting equipment using RS Roller Chain.
- Designed to be stronger than RS Roller Chains, they sufficiently demonstrate RS Roller Chain's performance when connected to a chain with appropriate clearance.

■ Ordering Specify the code (product code and model number)



● Order placement

Product code	Model number	Qty	Unit
D210068	RS40EB	1	K



1 End Fitting Bolts (for RS Roller Chains)

Model Number	Applicable Chain	L	A	B	C	M	O	D	CW	SW	H	Approximate Weight kg/unit
RS40EB	RS40-1	61.0	41.5	38	6.0	M 8	4.00	15	11.2	13.0	6.5	0.04
RS50EB	RS50-1	72.5	48.5	44	7.5	M10	5.12	19	13.8	17.0	8.0	0.07
RS60EB	RS60-1	89.1	60.0	55	9.1	M12	5.99	21	17.8	19.0	10.0	0.12
RS80EB	RS80-1	117.1	79.0	73	12.1	M16	7.98	28	22.6	24.0	13.0	0.27
RS100EB	RS100-1	145.1	98.0	91	15.1	M20	9.58	34	27.5	30.0	16.0	0.51
RS120EB	RS120-1	173.1	117.0	108	18.1	M24	11.15	40	35.5	35.5	19.0	0.86

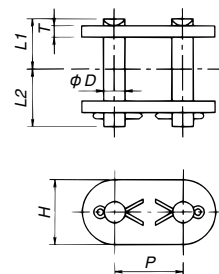
- Note: 1. SW dimensions are designed for wrench use.
 2. Old JIS B1181 (type 1) nuts and JIS B1251 spring washers are used.
 3. Black coating.



2 End Fitting Bolt Connecting Links (for RS Roller Chains)

Model Number	Applicable Chain	P	H	D	T	L ₁	L ₂	Approximate Weight kg/unit
RS40EB-CL	RS40-1	12.70	12.0	3.97	2.0	8.8	10.2	0.01
RS50EB-CL	RS50-1	15.875	15.0	5.09	2.4	10.7	12.3	0.02
RS60EB-CL	RS60-1	19.05	18.1	5.96	3.2	14.0	16.1	0.04
RS80EB-CL	RS80-1	25.40	24.0	7.94	4.0	17.5	20.1	0.09
RS100EB-CL	RS100-1	31.75	28.6	9.54	4.8	21.0	23.7	0.156
RS120EB-CL	RS120-1	38.10	34.4	11.11	5.6	26.1	29.6	0.264

- Note: 1. Contact Tsubaki for connecting links and end links of differing shapes.



■ Strength

Strength when Tsubaki RS Roller Chains (except for M-type connecting links and offset links) are connected to end fitting bolts, and special connecting links are as follows.

Applicable Chain	RS40-1	RS50-1	RS60-1	RS80-1	RS100-1	RS120-1
Minimum Tensile Strength kN{kgf}	17.7{1800}	28.4{2900}	40.2{4100}	71.6{7300}	107{10900}	148{15100}
Maximum Allowable Load kN{kgf}	3.63{370}	6.37{650}	8.83{900}	14.7{1500}	22.6{2300}	30.4{3100}

⚠ Safety Precautions

- Operating temperature: -10 to 60°C (Consult with Tsubaki for use in special environments.)
- Use the Tsubaki End Fitting Bolt Connecting Link when connecting an end fitting bolt and an RS Roller Chain. We recommended disassembling and lubricating regularly for safety.
- Do not use M-type connecting links for RS Roller Chains (that have a gap between the pin and connecting link plate) or offset links.
- Use only RS Roller Chains. These end fixtures cannot be used with Lube-Free Drive Chains, Heavy Duty Roller Chains, SUPER-H Roller Chains, and ULTRA SUPER Roller Chains. (When using a SUPER Chain, always use a SUPER Chain connecting link.)
- Grease the surface of the connecting link pin in advance when attaching the end fitting bolt and RS Roller Chain. Take care to attach precisely and avoid twisting the chain.
- Attach so that there is no bending load on the end fitting bolt.
- Do not subject the threads or head of the end fitting bolt to impacts or cause them to become distorted.



Chain Elongation Scale

The chain elongation scale allows for quick checks of a chain's pitch elongation limit.

The chain's elongation for RS Roller Chains, BS Roller Chains and Leaf Chains can be checked to determine when it is time for the chain to be replaced.

■ Ordering Specify the code (product code and model number)

● Order placement

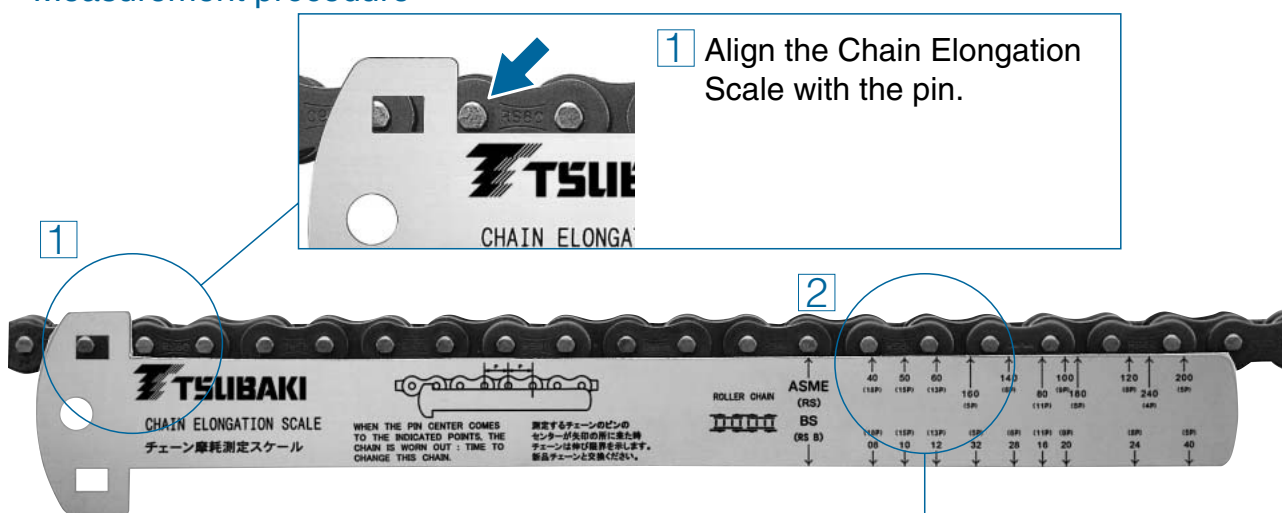
Product code	Model number	Qty	Unit
D210067	RS-CES	1	C

Note: 10 items per case

■ Applicable chain size

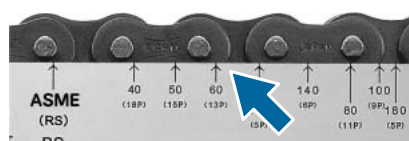
RS Roller Chains	: RS40 to RS240
BS Roller Chains	: RS08B to RS32B
Leaf Chains (AL/BL)	: #400 to #1600

■ Measurement procedure

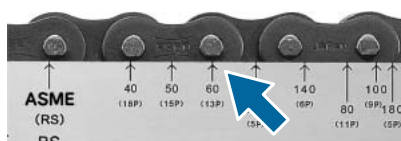


2 Check where along the scale the pin is positioned (pitch indicated in parentheses).

Scale positioning on a new product



Wear elongation limit



If the point of the scale past the center of the pin, the chain has reached its elongation limit and should be replaced.

⚠ Safety Precautions

- Depending upon the attachment and chain size, there may be interference with the Elongation Scale for Specialty attachment chains or K2 attachment chains [catalog item].
- Check chain elongation at the location on the chain where the sprocket teeth engage the most.
- Check chain elongation at a location on the chain where tensile force is applied.
- Do not use the scale for any purpose other than measuring chain elongation.
- Always turn off the power switch to the device and confirm that it has come to a complete stop before checking chain elongation. In addition, make sure that the switch cannot be turned on accidentally.

MEMO

Before Use

For Safe Use

Standard Roller Chains

Lube-Free Roller Chains

Heavy Duty Roller Chains

Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

Selection

Handling



Roller Chain / Sprocket Selection, Installation, and Maintenance

$$L = \frac{Z + Z' + 2C}{2} + \frac{\left(\frac{Z - Z'}{6.28}\right)^2}{C} \quad V = \frac{P \times Z' \times n}{1000} \text{ (m/min)}$$

$$F_m = \frac{60 \times kW}{V} \text{ (kN)}$$

$$L = \frac{180^\circ}{\tan^{-1}\left(\frac{P}{D + 2S}\right)} \quad I_r = M \times \left(\frac{V}{2\pi n}\right)^2 \text{ (kg} \cdot \text{m}^2)$$

$$T_n = 9.55 \times \frac{kW}{n_1} \text{ (kN} \cdot \text{m)}$$

$$T_r = \frac{M \times d}{2 \times 1000 \times i} \times \frac{G}{1000} \text{ (kN} \cdot \text{m)}$$

$$T_r = F_c \times \frac{1}{2 \times 1000 \times i} \text{ (kN} \cdot \text{m)}$$

$$T_m = \frac{T_s(\%) + T_b(\%)}{2 \times 100} \times T_n \text{ (kN} \cdot \text{m)}$$

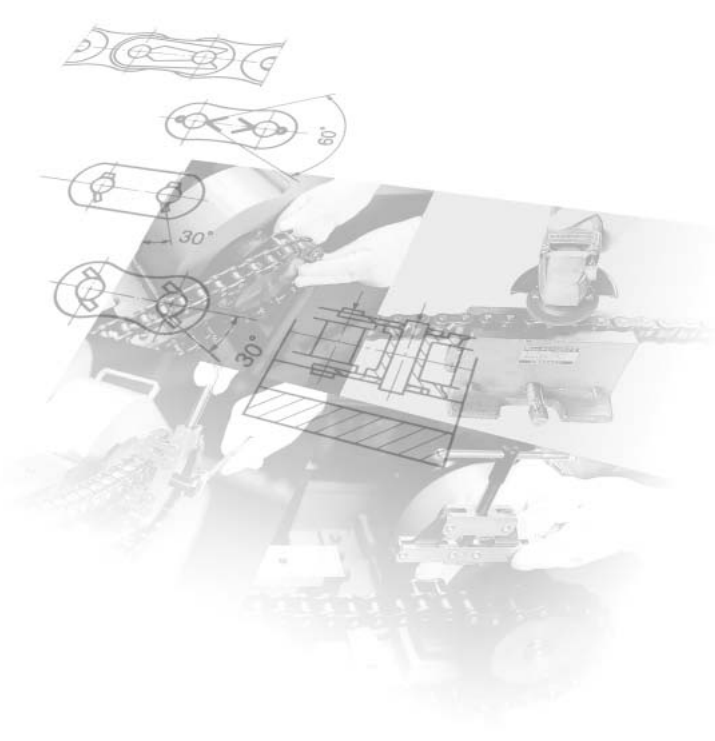
$$\text{または } T_m = \frac{T_s(\text{kN} \cdot \text{m}) + T_b(\text{kN} \cdot \text{m})}{2} \text{ (kN} \cdot \text{m)}$$

$$F_m s = \frac{T_s(\%) \times i}{d \cdot (2 \times 1000) \times 100} \times T_n \times 1 \text{ (kN)}$$

$$\text{または } F_m s = \frac{T_s(\text{kN} \cdot \text{m}) \times i}{d \cdot (2 \times 1000)} \times 1 \text{ (kN)}$$

$$F_m b = \frac{T_b(\%) \times i}{d \cdot (2 \times 1000) \times 100} \times T_n \times 1.2 \text{ (kN)}$$

$$\text{または } F_m b = \frac{T_b(\text{kN} \cdot \text{m}) \times i}{d \cdot (2 \times 1000)} \times 1.2 \text{ (kN)}$$



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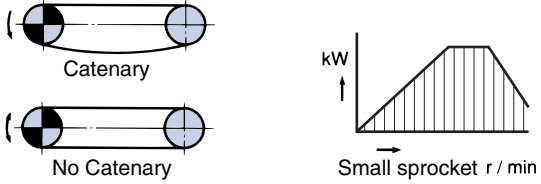
Roller Chain Selection

1. Selection Guide

Application — Key points for selection — **Selection method**

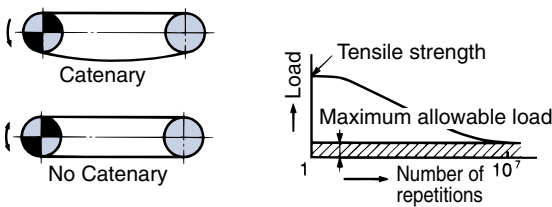
Ordinary transmission — Selection using kilowatt ratings tables — **General selection method**

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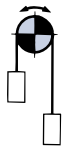
Ordinary transmission — Selection based on maximum allowable load — **Allowable load selection method**

Starting frequency
5 times/day (8 hr) or less
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Lifting applications — Selection based on maximum allowable load — **Example of lifting transmissions**

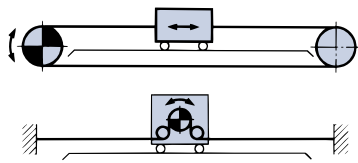
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For connecting links, use F-type connecting links or connecting links for end fixtures. (page 119) (for RS only).

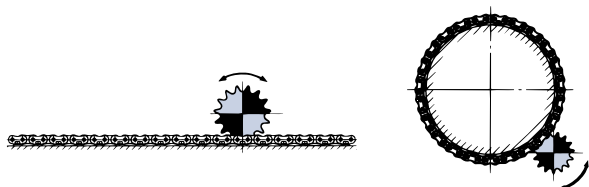
Shuttle traction — Selection based on maximum allowable load — **Example of shuttle traction**

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Pin gear drive — Selection based on maximum allowable load (Chain speed V = 50 m/min or less) — **Pin gear drive selection**

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Chain Type	Connecting parts that can be used in a normal atmosphere from -10BC to 60BC			
	M type CL	F type CL	2-pitch OL	1-pitch OL
RS	○	○	○	□
RS-LMD	○	○	—	□
RS-LMD-NP	○	—	—	□
RS-LMDX	○	—	—	—
RS-SUP	○	○	—	—
RS-HT-F	—	○	—	—
RS-SNS	○	○	○	□
RS	○	○	○	△
RS-SUP	○	○	—	—
RS-HT-F	—	○	—	—
RS-SUP-H	—	○	—	—
RF-US	—	○	—	—
NP	○	○	—	△
NEP	○	○	—	—
SS, AS	○	—	—	○
RS-PC	○	—	—	—
RS-PC-SY	○	—	—	—
NS	○	—	—	○
TI	○	—	—	○
KT	△	○	—	△
RS-CU	○	○	—	—
RS-CU-SS	○	—	—	—
RS Attachment	○	—	—	—
RS	○	○	×	×
RS-SUP	○	○	—	—

Remark: RS-SUP is only available in 4-pitch OL.

CL: "Connecting link".
OL: "Offset link".

○ : Usable □ : Allow for a reduction in kilowatt ratings
△ : Allow for a reduction in strength — : Manufacturing not possible × : Unusable Dotted line: Custom-made product

Before Use

For Safe Use

Standard Roller Chains

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Corrosion Resistant Roller Chains

Specialty Roller Chains

Accessories

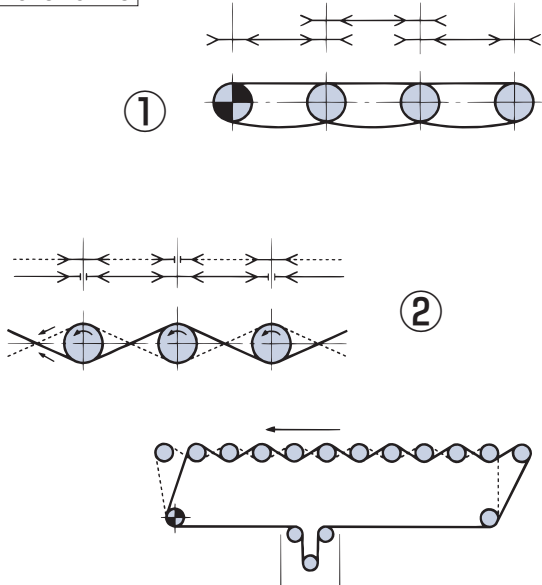
Selection

Handling

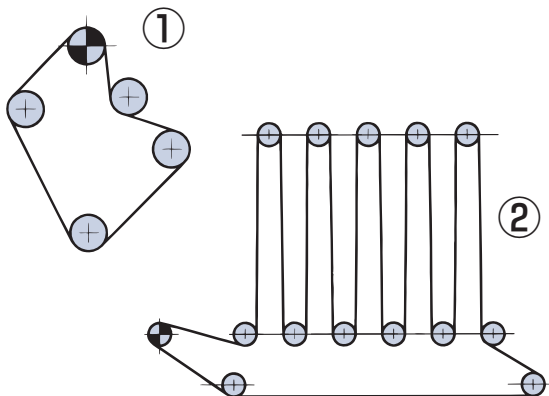


Other selections

Roller drive

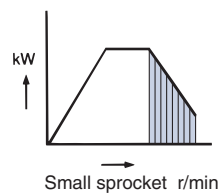


Multi-shaft drive

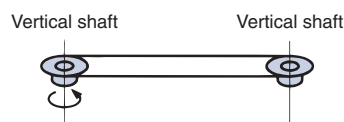


High-speed drive

Right side from peak of kW ratings tables (shaded area)



Vertical shaft drive



Required information for roller chain selection

- 1) Machine used
- 2) Type of impact
- 3) Motor type
- 4) Rated power of motor
- 5) Bore diameter of high-speed shaft and RPM
- 6) Bore diameter of low-speed shaft and RPM
- 7) Distance between shafts

Motor characteristics required for chain selection

When using the allowable load selection method or the pin gear drive selection method, check the following characteristics of the motor.

- 1) Moment of inertia of motor
- 2) Rated torque of motor, or output shaft RPM
- 3) Starting torque of motor
- 4) Stalling torque of motor

⚠ Safety precautions

The roller chain selection conditions provided here are only applicable to the selection of roller chain model and size. Please evaluate accessory devices such as safety and lubrication devices separately.

Please consult Tsubaki for these applications.

2. Service Factors

■ Multi-strand factor

The load borne by multi-strand roller chain is unequal across the width of the chain, and thus it cannot be expected that the transmission capacity will be equal to the capacity of a single-strand roller chain multiplied by the number of strands. For this reason, the transmission capacity of multi-strand roller chain is obtained by multiplying the transmission capacity of single-strand roller chain by a multi-strand factor.

Table 1: Multi-strand factor

Number of roller chain strands	Multi-strand factor
Double strand	1.7
Triple strand	2.5
Quadruple strand	3.3
Quintuple strand	3.9
Sextuple strand	4.6

■ Service factor Ks

The kW ratings are based on conditions of minimal load fluctuation. Depending on the degree of load fluctuation, it may be necessary to correct the kilowatt ratings using the service factor Ks.

Use Table 2 below to determine the appropriate service factor based on the type of machine and the source of power.

The design kW value is obtained by multiplying the kilowatt ratings by the service factor.

Table 2: Service factor Ks

Type of impact	Power source Example machines	Motor or Turbine	Internal combustion engine	
			With hydraulic drive	Without hydraulic drive
Smooth	Belt conveyors with little load fluctuation, chain conveyors, centrifugal pumps, centrifugal blowers, ordinary textile machines, and ordinary machines with little load fluctuation.	1.0	1.0	1.2
Moderate	Centrifugal compressors, marine engines, conveyors with moderate load fluctuation, automatic furnaces, dryers, pulverizers, general machine tools, compressors, general construction machines, general paper mill machines.	1.3	1.2	1.4
Large	Presses, crushers, construction and mining equipment, vibration machines, oil well rigs, rubber mixers, rolls, roll gangs, general machines with reverse or large-impact loads.	1.5	1.4	1.7

■ RPM factor Kn and teeth factor Kz

Table 3: RPM factor Kn and number of teeth factor Kz

RPM r/min	RPM factor Kn	Number of teeth	Teeth factor Kz
Less than 27	1.00	More than 9, less than 12	1.16
More than 27, less than 37	1.03	More than 12, less than 15	1.14
More than 37, less than 50	1.07	More than 15, less than 18	1.12
More than 50, less than 70	1.10	More than 18, less than 24	1.10
More than 70, less than 100	1.14	More than 24, less than 30	1.08
More than 100, less than 150	1.19	More than 30, less than 38	1.06
More than 150, less than 300	1.27	More than 38, less than 47	1.04
More than 300, less than 500	1.34	More than 47, less than 60	1.02
More than 500, less than 1000	1.44	60 or higher	1.00
More than 1000, less than 2000	1.54		
More than 2000, less than 4000	1.65		

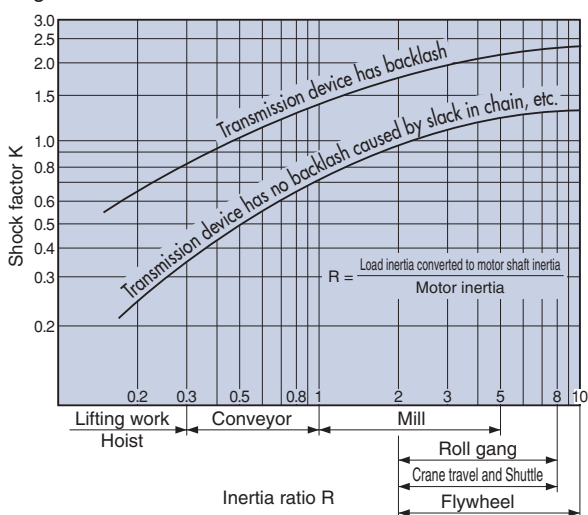
■ Shock factor K

This coefficient is determined by the ratio of the moments of inertia between the prime mover and the driven machine (rate of I, GD²), and the amount of backlash in the transmission device.

When the inertia ratio R is greater than 10, use R = 10. When the inertia ratio R is less than 0.2, use R = 0.2.

If I or GD² of the prime mover or driven machine is unknown, use the value of R in Figure 1.

Figure 1: Shock factor K



■ Imbalance load factor Ku

When carrying out shuttle traction and lifting with two chains, or four chains for shuttle drive and lifting, the chain tension is not uniform. This must be accounted for by multiplying the following imbalance load coefficient Ku to adjust the left-and-right load imbalance.

Example: For four lifting strands, the imbalance load factor for one strand $K_u = 0.6 \times 0.6 = 0.36$

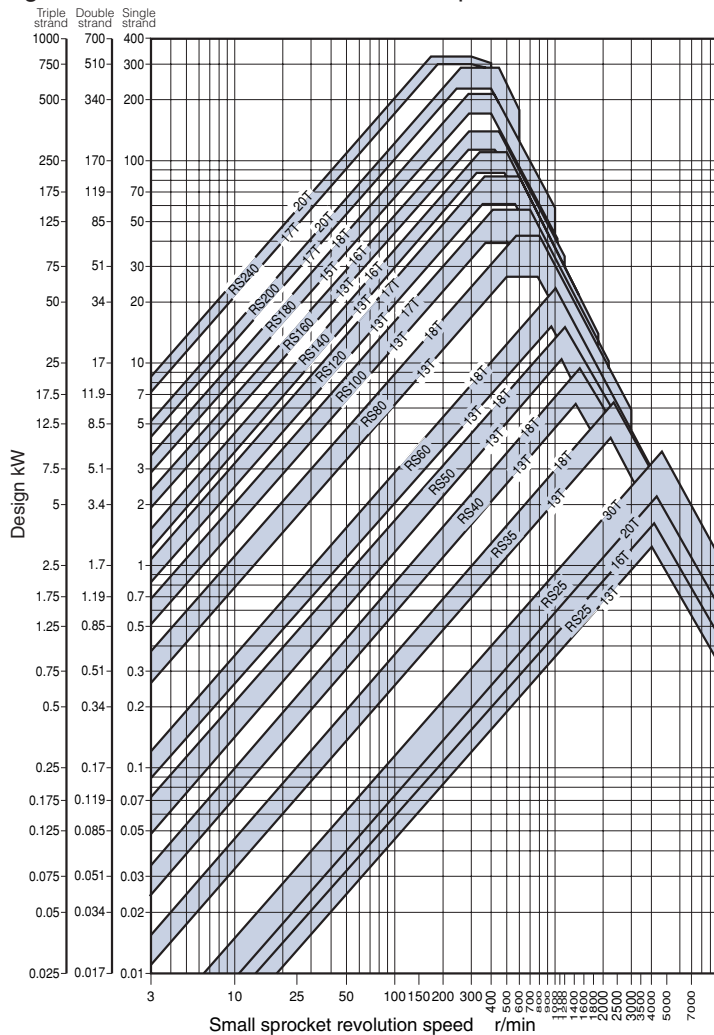
Table 4: Imbalance load factor Ku

2 lifting strands	0.6
4 lifting strands	0.36



3. Provisional Selection Graph

Figure 2: RS Provisional Selection Graph



■ How to use this table (Fig. 2)

1. Example: Single-strand chain, design kW=7kW

(1) Assume that the speed of the small sprocket is 100 r/min. Judging from the intersecting point of design kW value of 7 kW (vertical axis) and the speed value of 100 r/min (horizontal axis), RS80 and a sprocket with between 13 and 18 teeth would be appropriate. Therefore, based on the position of the intersection, we can see that a 15T sprocket can be used.

(2) Assume that the speed of the small sprocket is 200 r/min. Following the same procedure shown in the above example, RS80 and a sprocket with less than 13 teeth or RS60 and a sprocket with more than 18 teeth would be appropriate. This table is used for tentative selections only. The kW ratings tables should be used to confirm the chain sizes.

(3) Please allow for a drop in the kW rating values shown in the design kW ratings chart (Fig.2) when 1-pitch offset links or SUPER 4POL are used.

Figure 3: RS-HT Provisional Selection Graph

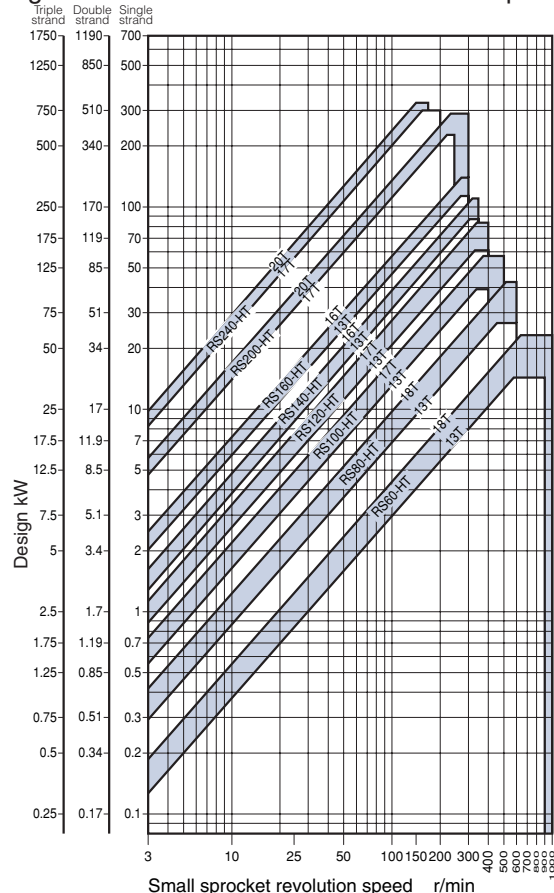
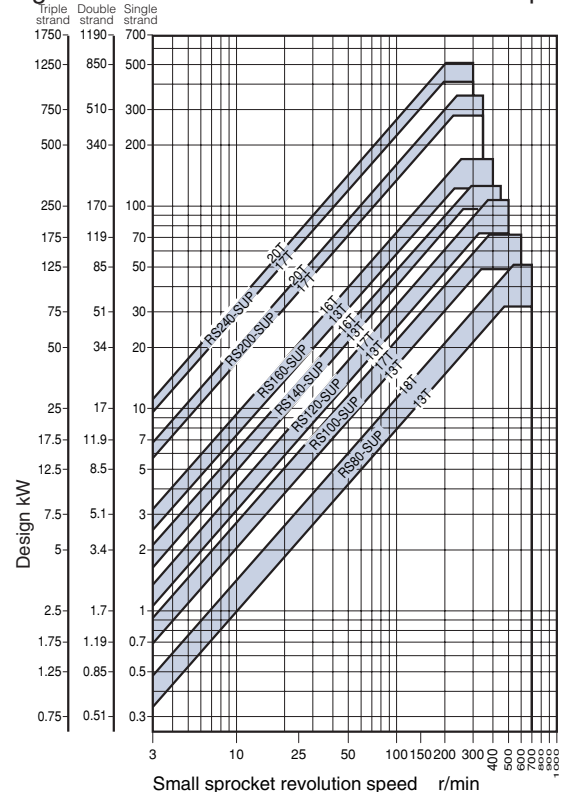


Figure 4: RS-SUP Provisional Selection Graph



4. Selection Formulae

SI units and gravimetric units are both indicated

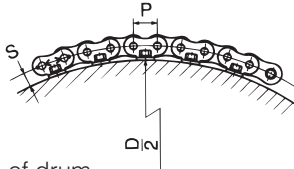
4-1 Symbols and units used in formulae (Table 5)

Symbol	Description	SI units	Gravimetric units
C	Center distance in pitches	—	—
C'	Center distance between shafts	m	m
d	Pitch circle diameter of the small sprocket	mm	mm
d ₂	Pitch circle diameter of the large sprocket	mm	mm
D	Outer diameter of the drum	mm	mm
F _b	Chain tension when the prime mover is decelerating (stalling)	kN	kgf
F' _b	Design chain tension when the prime mover is decelerating (stalling)	kN	kgf
F _c	Chain tension of shuttle drive	kN	kgf
F' _c	Design chain tension of shuttle drive	kN	kgf
F _ℓ	Chain tension from torque on load side (actual load)	kN	kgf
F' _ℓ	Design chain tension from torque on load side (actual load)	kN	kgf
F _m	Chain tension from prime mover rated output	kN	kgf
F' _m	Design chain tension from prime mover rated output	kN	kgf
F _{ms}	Chain tension from starting torque of prime mover	kN	kgf
F' _{ms}	Design chain tension from starting torque of prime mover	kN	kgf
F _{mb}	Chain tension from stalling torque of prime mover	kN	kgf
F' _{mb}	Design chain tension from stalling torque of prime mover	kN	kgf
F _s	Chain tension when prime mover accelerates (starting)	kN	kgf
F' _s	Design chain tension when prime mover accelerates (starting)	kN	kgf
F _w	Chain tension from load (actual load)	kN	kgf
F' _w	Design chain tension from load (actual load)	kN	kgf
f _i	Coefficient of friction between roller and rail (with lubrication 0.14, without lubrication 0.21)	—	—
G	Standard acceleration from gravity $G = 9.80665 \text{ m/s}^2$	—	—
i	Speed ratio (example) if ratio is 1/30 than $i = 30$	—	—
I _ℓ {GD ² _ℓ }	Converted moment of inertia of the loaded prime mover output shaft	kg·m ²	kgf·m ²
I _m {GD ² _m }	Moment of inertia of the prime mover output shaft	kg·m ²	kgf·m ²
K	Shock factor	Refer Table 4	—
K _n	RPM factor	—	—
K _s	Service factor	Refer Table 2	—
K _u	Imbalance load factor	Refer Table 5	—
K _v	Speed factor	Refer Table 3	—
K _z	Number of teeth factor	—	—
L	Chain length (number of links)	—	—
m	Unit mass of chain	kg/m	kgf/m
M{W}	Mass of load (weight)	kg	kgf
μ	Coefficient of friction between the rail and the axle = 0.1 (shuttle drive) Coefficient of friction between the rotating body and the support rollers = 0.3 (pin gear)	—	—
n	RPM of the small sprocket	r/min	rpm
n ₁	RPM of driver shaft	r/min	rpm
n ₂	RPM of driven shaft	r/min	rpm
P	Chain pitch	mm	mm
R	Inertia ratio	Refer Table 4	—
S	Attachment height for RS attachment chain (distance from the drum surface to the chain pitch center)	mm	mm
t _b	The time for deceleration of the prime mover (when stalling)	s	s
t _s	The time for acceleration of the prime mover (when starting)	s	s
T _b	Stalling torque of the prime mover	%(kN·m)	%(kgf·m)
T _s	Starting torque of the prime mover	%(kN·m)	%(kgf·m)
T _ℓ	Load torque	kN·m	kgf·m
T _m	Working torque	kN·m	kgf·m
T _n	Rated torque of the prime mover	kN·m	kgf·m
V	Chain speed	m/min	m/min
Z	Number of teeth of large sprocket	—	—
Z'	Number of teeth of small sprocket	—	—



4-2 Formulae (Table 6)

- 1) Perform all selections using a transmission efficiency, including the chain, of $\eta = 1$.
- 2) Use the values calculated in items 11 and 12 of this table for the tension and kW ratings used for selection.

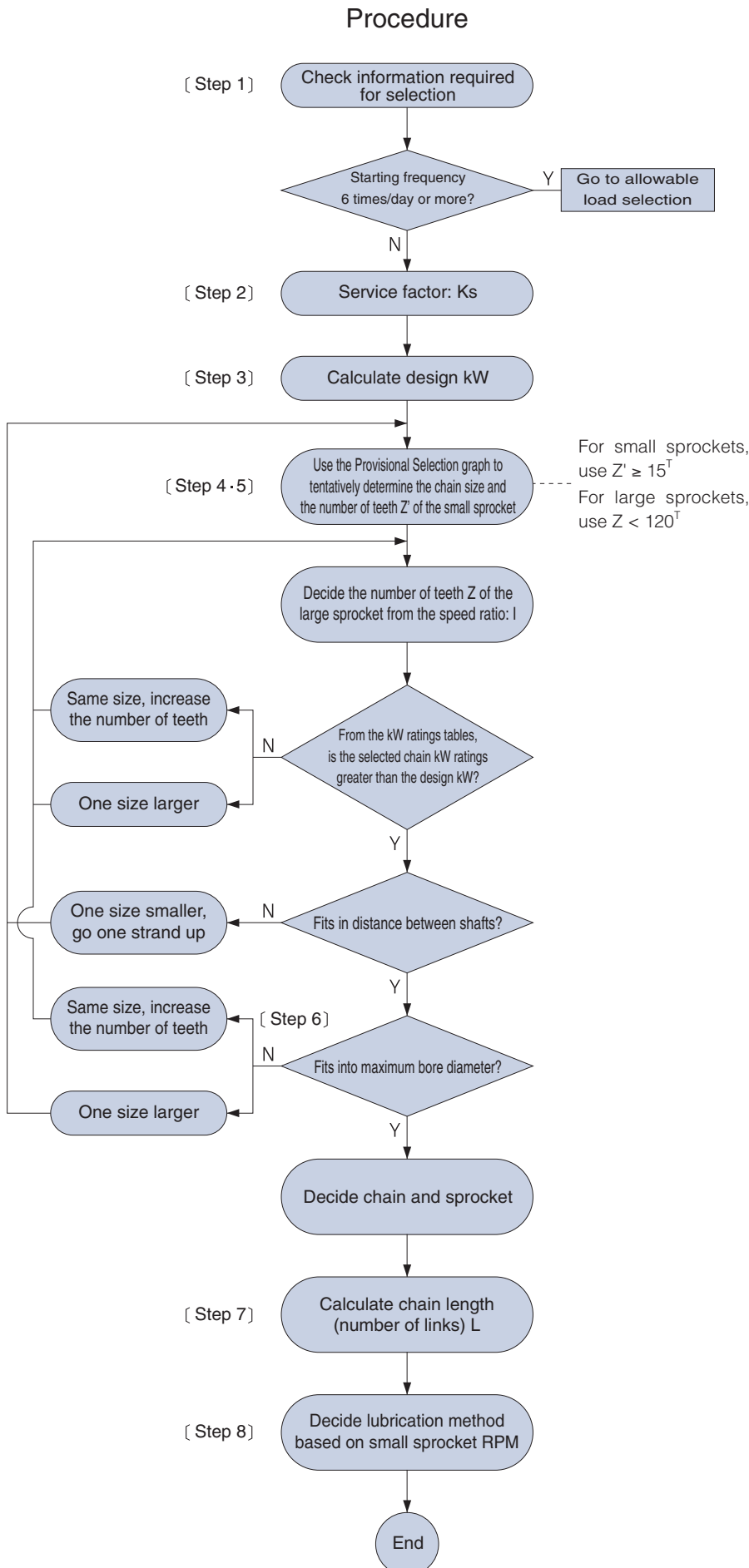
Item	SI units	Gravitational units
1. Chain length (number of links): L Ordinary transmission	Ordinary transmission between two shafts (1) When the number of teeth and distance between shafts has been decided for both sprockets: $L = \frac{Z + Z'}{2} + 2C + \frac{\left(\frac{Z - Z'}{6.28}\right)^2}{C}$ (2) When the number of links of chain and the number of teeth has been decided: $C = \frac{1}{8} \left\{ 2L - Z - Z' + \sqrt{(2L - Z - Z')^2 - \frac{8}{9.86}(Z - Z')^2} \right\}$ Even if the fractional part of the value found for L (below that of the decimal point) is small, round it up to the nearest integer and add a link. An offset link must be used when an odd number of links exist, however, if possible, change the number of teeth on the sprocket or the distance between shafts so that an even number of links may be used.	
Pin gear drive	When using a chain with attachment around a drum $L = \frac{180^\circ}{\tan^{-1}\left(\frac{P}{D + 2S}\right)}$  <p>P: Chain pitch D: Outer circumference of drum S: Height of attachment</p> <p>Round L up to an even number of links. When attaching the chain attachment around the drum, insert shims at equal intervals for adjustment.</p>	
2. Chain speed: V	$V = \frac{P \times Z' \times n}{1000} \quad (\text{m/min})$	
3. Chain tension from rated output (kW) of motor: Fm	$F_m = \frac{60 \times \text{kW}}{V} \quad (\text{kN})$	$F_m = \frac{6120 \times \text{kW}}{V} \quad (\text{kgf})$
4. Inertia where the motor shaft converts the moment of inertia of the load I (GD ²): I _ℓ (GD ² _ℓ)	$I_\ell = M \times \left(\frac{V}{2\pi n_1}\right)^2 \quad (\text{kg} \cdot \text{m}^2)$	$GD_\ell^2 = W \times \left(\frac{V}{\pi n_1}\right)^2 \quad (\text{kgf} \cdot \text{m}^2)$
5. Rated torque of motor: Tn	$T_n = 9.55 \times \frac{\text{kW}}{n_1} \quad (\text{kN} \cdot \text{m})$	$T_n = 974 \times \frac{\text{kW}}{n_1} \quad \text{kgf} \cdot \text{m}$
6. Working torque: Tm	$T_m = \frac{T_s(\%) + T_b(\%)}{2 \times 100} \times T_n \quad (\text{kN} \cdot \text{m})$ Or $T_m = \frac{T_s(\text{kN} \cdot \text{m}) + T_b(\text{kN} \cdot \text{m})}{2} \quad (\text{kN} \cdot \text{m})$	$T_m = \frac{T_s(\%) + T_b(\%)}{2 \times 100} \times T_n \quad (\text{kgf} \cdot \text{m})$ Or $T_m = \frac{T_s(\text{kgf} \cdot \text{m}) + T_b(\text{kgf} \cdot \text{m})}{2} \quad (\text{kgf} \cdot \text{m})$
7. Chain tension from starting torque: Fms Chain tension from stalling torque: Fmb	$F_{ms} = \frac{T_s(\%) \times i}{\{d/(2 \times 1000)\} \times 100} \times T_n \times 1 \quad (\text{kN})$ Or $F_{ms} = \frac{T_s(\text{kN} \cdot \text{m}) \times i}{d/(2 \times 1000)} \times 1 \quad (\text{kN})$ $F_{mb} = \frac{T_b(\%) \times i}{\{d/(2 \times 1000)\} \times 100} \times T_n \times 1.2^* \quad (\text{kN})$ Or $F_{mb} = \frac{T_b(\text{kN} \cdot \text{m}) \times i}{d/(2 \times 1000)} \times 1.2^* \quad (\text{kN})$ <p style="text-align: right;">*: Constants</p>	$F_{ms} = \frac{T_s(\%) \times i}{\{d/(2 \times 1000)\} \times 100} \times T_n \times 1 \quad (\text{kgf} \cdot \text{m})$ Or $F_{ms} = \frac{T_s(\text{kgf} \cdot \text{m}) \times i}{d/(2 \times 1000)} \times 1 \quad (\text{kgf} \cdot \text{m})$ $F_{mb} = \frac{T_b(\%) \times i}{\{d/(2 \times 1000)\} \times 100} \times T_n \times 1.2^* \quad (\text{kgf} \cdot \text{m})$ Or $F_{mb} = \frac{T_b(\text{kgf} \cdot \text{m}) \times i}{d/(2 \times 1000)} \times 1.2^* \quad (\text{kgf} \cdot \text{m})$ <p style="text-align: right;">*: Constants</p>

Item	SI units	Gravimetric units
8. Chain tension when motor accelerates: F_s Chain tension when motor decelerates: F_b	$F_s = \frac{M \times V}{t_s \times 60 \times 1000} + F_w \quad (\text{kN})$ $F_b = \frac{M \times V}{t_b \times 60 \times 1000} + F_w^* \quad (\text{kN})$	$F_s = \frac{W \times V}{t_s \times 60 \times \underline{G}} + F_w \quad (\text{kgf})$ $F_b = \frac{W \times V}{t_b \times 60 \times \underline{G}} + F_w \quad (\text{kgf})$
9. Design kW (for general selection)	Design kW = Rated kW of motor x K_s (kW)	
10. Design chain tension Design chain tension from motor: $F'm$ Design chain tension from starting torque: $F'm_s$ Design chain tension from stalling torque: $F'm_b$ Design chain tension from shuttle drive: $F'c$ Design chain tension during acceleration: $F's$ Design chain tension during deceleration: $F'b$ Design chain tension from load: $F'w$	$F'm = F_m \times K_s \times K_n \times K_z \quad (\text{kN} \{ \text{kgf} \})$ $F'm_s = F_{m_s} \times K \times K_n \times K_z \quad (\text{kN} \{ \text{kgf} \})$ $F'm_b = F_{m_b} \times K \times K_n \times K_z \quad (\text{kN} \{ \text{kgf} \})$ $F'c = F_c \times K_s \times K_n \times K_z \quad (\text{kN} \{ \text{kgf} \})$ $F's = F_s \times K_n \times K_z \quad (\text{kN} \{ \text{kgf} \})$ $F'b = F_b \times K_n \times K_z \quad (\text{kN} \{ \text{kgf} \})$	$F'w = W \text{ (Or } F_w) \times K_s \times K_n \times K_z \quad (\text{kgf})$
	$F'w = M \times K_s \times K_n \times K_z \times \frac{\underline{G}}{1000} \quad (\text{kN})$	
	If the mass M (weight W) is not known, use the rated torque T_n of the motor to calculate the shaft torque $T = T_n \times i \text{ kN}\cdot\text{m} \{ \text{kgf}\cdot\text{m} \}$, and use $F = 2T/d$ in place of W .	
11. Acceleration time of motor: t_s	$t_s = \frac{(I_m + I_\ell) \times n_1}{375 \times (T_m - T_\ell)} \times \frac{4 \times \underline{G}}{1000} \quad (\text{s})$	$t_s = \frac{(GD_m^2 + GD_\ell^2) \times n_1}{375 \times (T_m - T_\ell)} \quad (\text{s})$
12. Deceleration time of motor: t_b	$t_b = \frac{(I_m + I_\ell) \times n_1}{375 \times (T_m + T_\ell)} \times \frac{4 \times \underline{G}}{1000} \quad (\text{s})$	$t_b = \frac{(GD_m^2 + GD_\ell^2) \times n_1}{375 \times (T_m + T_\ell)} \quad (\text{s})$
13. Inertia ratio: R	$R = \frac{I_\ell}{I_m}$	$R = \frac{GD_\ell^2}{GD_m^2}$
14. Conversion of the flywheel effect (GD^2) to moment of inertia (I)	$1 \text{ kg} \cdot \text{m}^2 \cdots (I)$	$4 \text{ kgf} \cdot \text{m}^2 \cdots (GD^2)$

All chain tensions in the above formulae are the tensions when one strand of chain is used. When using two or more strands of chain, calculate the chain tension for one strand and multiply it by the imbalance load factor K_u (Table 4) for the number of strands used.



5. General Selection Method



Ordinary transmission (forward / reverse), continual revolution transmission
 Using kW ratings tables, infrequent start-up

Steps 4 and 5

(1) Select chain and number of teeth of small sprocket

Use the provisional selection graph (Fig. 2, 3 and 4) or the kW ratings tables to obtain a chain and small sprocket number of teeth that satisfy the revolution speed of the high-speed shaft and the transmission kW. Select a chain with the smallest pitch that has the required kW ratings.

If a single strand chain does not have sufficient power, select a multi-strand chain. If site restrictions require a short distance between shafts and the smallest possible sprocket outer diameter, use a multi-strand roller chain with a small pitch.

(2) Select number of teeth for large sprocket

Once the number of teeth of the small sprocket has been decided, the number of teeth of the large sprocket is determined by multiplying the number of teeth of the small sprocket by the speed ratio.

The number of teeth of the small sprocket should be at least 15. However, it is not desirable if this causes the number of teeth of the large sprocket to exceed 120. In this event, the number of teeth of the small sprocket must be reduced; however, it is recommended to use more than 13 teeth.

Step 7

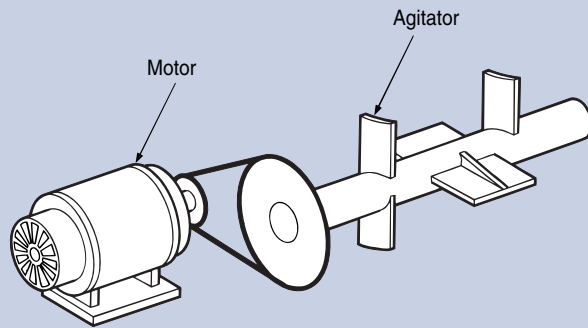
When the number of links is odd

If the number of links is odd, it is best to avoid using an offset link and instead change the distance between shafts so that the number of links is even. If the one-pitch offset link of RS roller chain or the four-pitch offset link of SUPER chain is used, allow for a decrease of transmission power as explained in the notes in the kW ratings tables.

Selection example using the general selection method

(Step 1) Required data

Machine used : Agitator
 Type of shock : Moderate shock
 Source of Power : Motor
 Rated power : 11 kW 1800 r/min
 High speed shaft: Shaft diameter 45mm 90 r/min
 Low speed shaft : Shaft diameter 60mm 30 r/min
 Distance between shafts: 350 mm
 Space limitation : 700 mm



(Step 2) Determine the service factor

Service factor $K_s = 1.3$ from Table 2 Service Factor

(Step 3) Determine the design kW

Design kW = 11 kW X 1.3 = 14.3 kW

(Steps 4 and 5) Determine the chain and the number of teeth for the sprocket

Decide on the chain number and number of teeth of the small sprocket derived from the speed of the high speed shaft, at 90 r/min, and the design kW (14.3 kW).

(1) 17 T of the single strand RS100 is derived from the basic selection figure and the kilowatt ratings table. Since the speed ratio is 1/3, the number of teeth will be 17T and 51T of RS100. But, with an outer diameter of 17T at 189 mm and 51T at 534 mm, these are not adequate because they do not fit in the required space. $\therefore 189 + 534 > 700$

(2) Checking multi-strand chains:

- 19T and 57T of the RS80-2 is derived for double-strand, and the outer diameter of its sprockets are 167 mm and 476 mm, which is within limits. Check RS80 kilowatt ratings table for the kW ratings of 19T of RS80-2.
- The kW ratings for the small sprocket number of teeth 19T is 5.06 kW at 50 r/min, and 9.44 kW at 100 r/min. By calculating proportionally using the tabular difference between them, drive kW for 90 r/min is 8.56 kW.

(3) This 8.56 kW is the kilowatt rating of single-strand chain, and the kilowatt rating of double-strand chain that will be used is derived from the multi-strand factor in Table 1.

$8.56 \text{ kW} \times 1.7 = 14.6 \text{ kW}$

(4) This kW rating, 14.6 kW, satisfies the design kW (14.3 kW).

(Step 6) Check the bore diameter

(1) Check the bore diameter on the dimension table. Maximum bore diameter for RS80-2-19T is 63 mm, and it can be used for the required bore diameter of 45 mm.

Maximum bore diameter for RS80-2-57T is 80 mm, and it can be used for the 60 mm.

(Step 7) Determine the distance between shafts

With a distance between shafts of 350 mm,

$$\frac{(167+476)}{2} < 350, \text{ and it will fit into the required space.}$$

Number of the links is calculated as

$$L = \frac{57+19}{2} + 2 \times \frac{350}{25.4} + \frac{\left(\frac{57-19}{6.28}\right)^2}{\frac{350}{25.4}} = 68.2$$

In order to have an even number of links, raise the value below the decimal point to an integer to get 70.

(Step 8) Check lubrication method

Since the small sprocket is RS80-2-19T at a speed of 90 r/min, according to the kilowatt ratings table, lubrication method A will be used. It is necessary to have an oil bath lubrication or lubrication with a slinger disc.

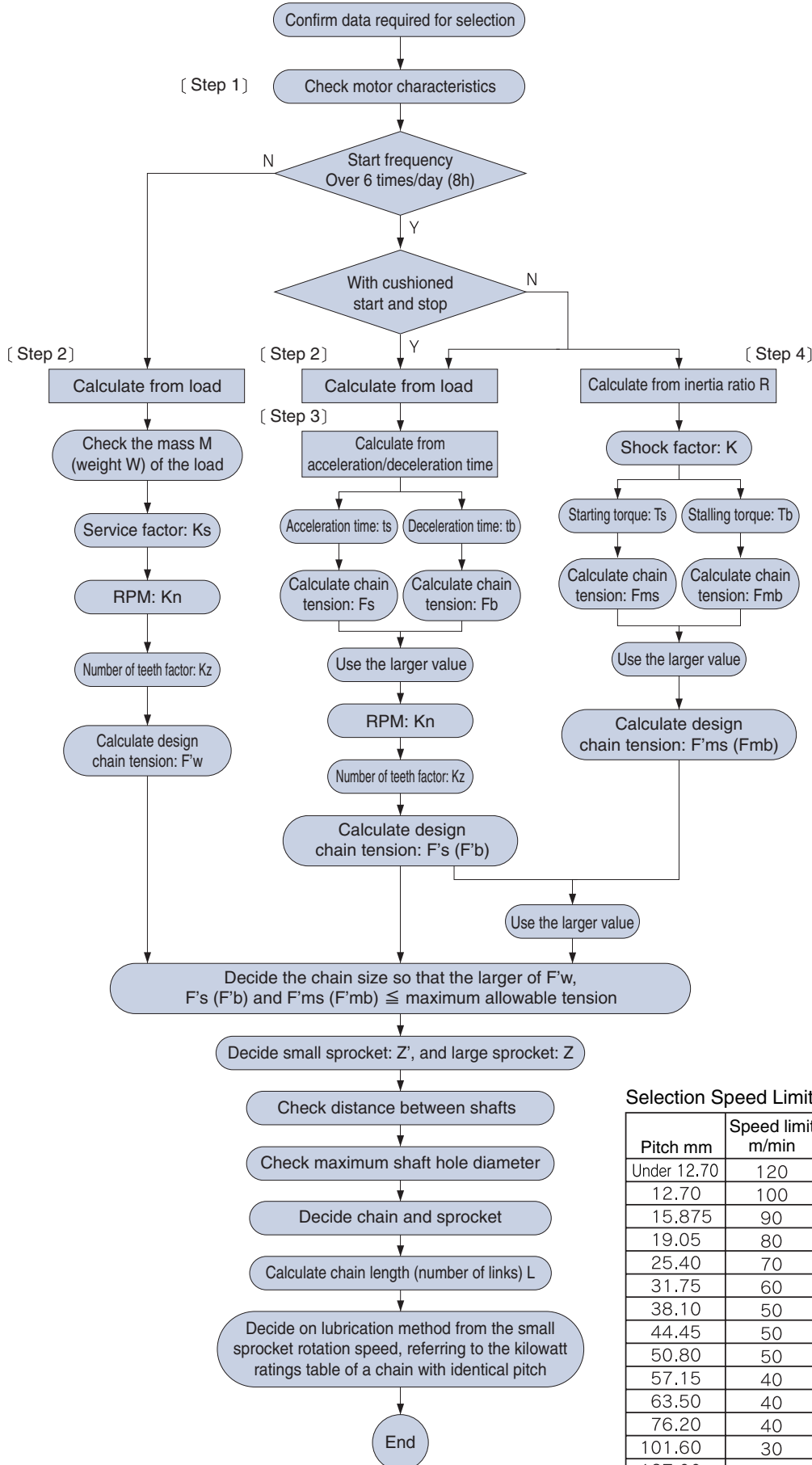
For selecting lifting or shuttle traction applications, do not use the General Selection method. Use the Allowable Load Selection method.

Reason: It is assumed that the braking force will be large when a balance weight is used, even if the motor capacity is small.



6. Allowable Load Selection Method

Procedures



Selection Speed Limit

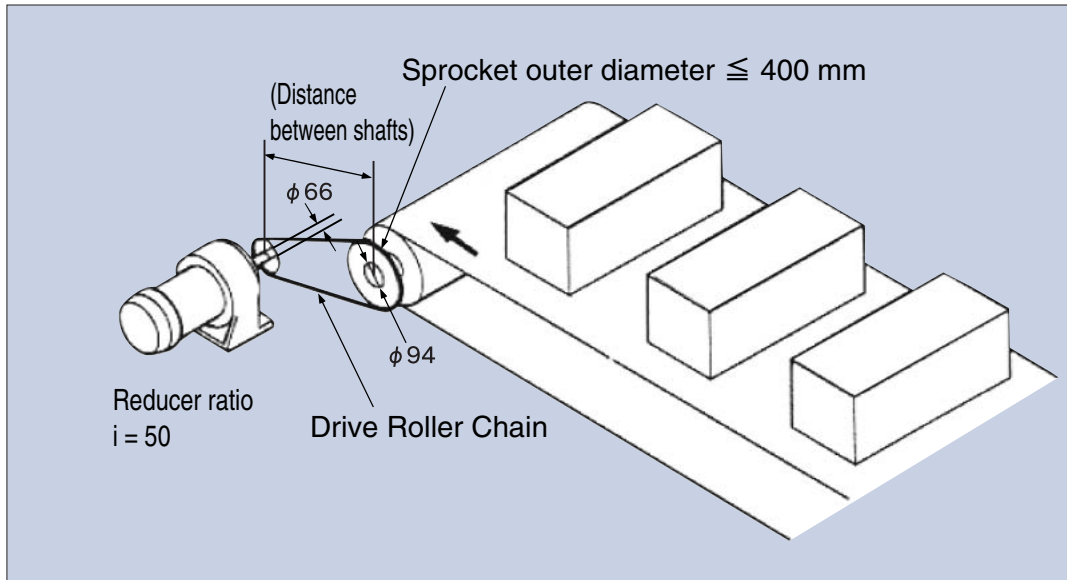
Pitch mm	Speed limit m/min
Under 12.70	120
12.70	100
15.875	90
19.05	80
25.40	70
31.75	60
38.10	50
44.45	50
50.80	50
57.15	40
63.50	40
76.20	40
101.60	30
127.00	30

The speed limit for Poly Steel Chain is 70 m/min.

The following selection method uses maximum allowable load for products with no kilowatt ratings tables, or for products operated under low speeds with frequent stops.

- (1) For transmission with large shocks and other extreme conditions, in particular large-load transmission and transmission where a thrust load may operate, use F-type connecting links or two-pitch offset links.
- (2) When using a one-pitch offset link, or a Super Chain 4 pitch offset link, make the following allowances for strength with respect to the maximum allowable load
 M-type CL*: 100%
 F-type CL: 100%
 Two-pitch offset link: 100% (Reference)
 One-pitch offset link: 65%
 4 pitch offset link: 90% (Super Chain single strand)
- (3) There is a possibility that the rim or boss of commercially available cast iron sprockets are not strong enough for the high tension of SUPER Chain, SUPER-H Roller Chain, and ULTRA SUPER Chain. A type, B type, and C type RS sprockets are suitably strong. (Use SS400, S35C, SC450, etc.)
- (4) For high-speed sprockets, use a sprocket with hardened tooth tips.
- (5) Be sure to lubricate roller chain, as the bearing pressure rises very high.

* Allow an 80% reduction for M type connecting links for RS15, 25, 37, 38, 41, BF25-H and Corrosion Resistant roller chain RS-KT.



Conditions

Machine used: Conveyor drive
 Chain load M: 6000 kg
 Chain speed: 30 m/min
 Conveyor roller diameter: 380 mm
 Belt thickness: 10 mm
 Conveyor roller rotation torque: 3.3 kN/m (337 kg/m)
 Motor : 11 kW n1 = 1800 r/min
 Start torque 200%
 Stop (maximum) torque 210%
 Moment of inertia 0.088 kg/m²
 (GD² 0.352 kgf/m²)

Reducer ratio: 1/50 (i = 50)
 Drive shaft diameter: 66 mm
 Driven shaft diameter: 94 mm
 Distance b/w shafts: 500 mm
 Driven sprocket diameter ≤ 400 mm
 Starting frequency: 10 times/day
 Type of shock: Moderate shock
 Soft start/stop: None

SI Units

(Step 1) Check motor characteristics

Rated torque $T_n = 9.55 \times \frac{kW}{n_1} = 9.55 \times \frac{11}{1800} = 0.058 \text{ (kN} \cdot \text{m)}$
 Starting torque $T_s = T_n \times 2 = 0.058 \times 2 = 0.116 \text{ (kN} \cdot \text{m)}$
 Stalling torque $T_b = T_n \times 2.1 = 0.058 \times 2.1 = 0.122 \text{ (kN} \cdot \text{m)}$
 Motor moment of inertia $I_m = 0.088 \text{ (kg} \cdot \text{m}^2)$

(Step 2) Calculate from load

Driven shaft revolution
 $n_2 = \frac{\text{Speed of transport} \times 1000}{(\text{External diameter of conveyor roller} + 2 \times \text{Belt thickness}) \times \pi}$
 $= 30 \times \frac{1000}{(380 + 20) \times \pi} = 23.9 \text{ (r/min)}$
 Drive shaft revolution
 $n = \frac{\text{Motor rotation}}{i} = \frac{1800}{50} = 36 \text{ (r/min)}$
 Chain reducer ratio $= \frac{23.9}{36} = \frac{1}{1.51}$
 If the driven sprocket $d_2 = 400 \text{ mm}$
 Chain tension $F_w = \text{Conveyor roller rotation torque} \times 1000 \times \frac{2}{d_2}$
 $= 3.3 \times 1000 \times \frac{2}{400} = 16.5 \text{ (kN)}$

Tentatively select the chain.
 With moderate shock Usage factor $K_s = 1.3$
 Tentative design chain tension $= F_w \times K_s = 16.5 \times 1.3 = 21.5 \text{ (kN)}$
 Tentatively select the RS120-1 with a maximum allowable load of 30.4 kN.

{Gravimetric units}

(Step 1) Check motor characteristics

Rated torque $T_n = 9.74 \times \frac{kW}{n_1} = 9.74 \times \frac{11}{1800} = 5.95 \text{ (kgf} \cdot \text{m)}$
 Starting torque $T_s = T_n \times 2 = 5.95 \times 2 = 11.9 \text{ (kgf} \cdot \text{m)}$
 Stalling torque $T_b = T_n \times 2.1 = 5.95 \times 2.1 = 12.5 \text{ (kgf} \cdot \text{m)}$
 GD² of the motor $GD^2_m = 0.352 \text{ (kgf} \cdot \text{m}^2)$

(Step 2) Calculate from load

Driven shaft revolution
 $n_2 = \frac{\text{Speed of transport} \times 1000}{(\text{External diameter of conveyor roller} + 2 \times \text{Belt thickness}) \times \pi}$
 $= 30 \times \frac{1000}{(380 + 20) \times \pi} = 23.9 \text{ (r/min)}$
 Drive shaft revolution
 $n = \frac{\text{Motor rotation}}{i} = \frac{1800}{50} = 36 \text{ (r/min)}$
 Chain reducer ratio $= \frac{23.9}{36} = \frac{1}{1.51}$
 If the driven sprocket $d_2 = 400 \text{ mm}$
 Chain tension $F_w = \text{Conveyor roller rotation torque} \times 1000 \times \frac{2}{d_2}$
 $= 337 \times 1000 \times \frac{2}{400} = 1690 \text{ (kgf)}$

Tentatively select the chain.
 With moderate shock Usage factor $K_s = 1.3$
 Tentative design chain tension $= F_w \times K_s = 1690 \times 1.3 = 2200 \text{ (kgf)}$
 Tentatively select the RS120-1 with a maximum allowable load of 3100 kgf.



31T from driven sprocket < 400mm

Outer diameter 398 mm PCD d₂=376.60 (mm)

Number of teeth of drive sprocket = $\frac{31}{1.51} = 21$ T PCD d=255.63 (mm)

$$\text{Chain speed} = \frac{P \times Z' \times n}{1000} = \frac{38.1 \times 21 \times 36}{1000} = 28.8 \text{ m/min} < 50 \text{ m/min,}$$

so it is possible to select by allowable load.

Small sprocket revolution 36r/min ··· RPM Kn=1.03

Number of teeth of small sprocket 21T ··· Number of teeth factor Kz=1.10

$$\begin{aligned} \text{Chain tension } F_w &= \text{Conveyor roller rotation torque} \times 1000 \times \frac{2}{d_2} \\ &= 3.3 \times 1000 \times \frac{2}{376.6} = 17.5 \text{ (kN)} \end{aligned}$$

$$\begin{aligned} \text{Design chain tension } F'w &= F_w \times K_s \times K_n \times K_z \\ &= 17.5 \times 1.3 \times 1.03 \times 1.10 = 25.8 \text{ (kN)} \cdots \textcircled{1} \end{aligned}$$

RS120-1 (Max. allowable load: 30.4kN) can be used.

Check the conveyance speed (selection conditions, 30 m/min)

$$\begin{aligned} \text{Conveyance speed at this point} &= n_2 \times \frac{(\text{Conveyor roller external diameter} + 2 \times \text{Belt thickness}) \times \pi}{1000} \\ &= n_1 \times \frac{21}{31} \times \frac{(\text{Conveyor roller external diameter} + 2 \times \text{Belt}) \times \pi}{1000} \\ &= 36 \times \frac{21}{31} \times \frac{(380 + 2 \times 10) \times \pi}{1000} \\ &= 30.6 \text{ (m/min)} \end{aligned}$$

(Step 3) Calculate from acceleration/deceleration time

The small sprocket was decided as RS120 21T from the calculations in step 2.
Thus, calculate using the same pitch and number of teeth.
If the acceleration/deceleration time is known, use that value for the calculation.
The following is calculated assuming it is unknown.

$$\text{Working torque } T_m = \frac{(T_s + T_b)}{2} = \frac{(0.116 + 0.122)}{2} = 0.119 \text{ (kN} \cdot \text{m)}$$

$$\begin{aligned} \text{Load torque } T_\ell &= F_w \times \frac{d}{(2 \times 1000 \times i)} = 17.5 \times \frac{255.63}{(2 \times 1000 \times 50)} \\ &= 0.045 \text{ (kN} \cdot \text{m)} \end{aligned}$$

Motor shaft conversion moment of inertia I_ℓ of load side

$$\begin{aligned} I_\ell &= M \times \left(\frac{\text{Conveyance speed}}{2 \times \pi \times n_1} \right)^2 \\ &= 6000 \times \left(\frac{30.6}{2 \times \pi \times 1800} \right)^2 \\ &= 0.044 \text{ (kg} \cdot \text{m}^2) \end{aligned}$$

Moment of inertia of the motor $I_m = 0.088 \text{ (kg} \cdot \text{m}^2)$

Acceleration time of the motor

$$\begin{aligned} t_s &= (I_m + I_\ell) \times \frac{n_1}{375 \times (T_m - T_\ell)} \times \frac{G}{1000} \times 4 \\ &= (0.088 + 0.044) \times \frac{1800}{375 \times (0.119 - 0.045)} \times \frac{G}{1000} \times 4 \\ &= 0.34 \text{ (s)} \end{aligned}$$

Deceleration time of the motor

$$\begin{aligned} t_b &= (I_m + I_\ell) \times \frac{n_1}{375 \times (T_m + T_\ell)} \times \frac{G}{1000} \times 4 \\ &= (0.088 + 0.044) \times \frac{1800}{375 \times (0.119 + 0.045)} \times \frac{G}{1000} \times 4 \\ &= 0.15 \text{ (s)} \end{aligned}$$

As $t_b < t_s$, chain tension during deceleration F_b is larger than chain tension during acceleration F_s . Thus, use the following.

Chain tension during deceleration

$$\begin{aligned} F_b &= M \times \frac{\text{Conveyance speed}}{(t_b \times 60 \times 1000)} \times \frac{(\text{Conveyor roller external diameter} + 2 \times \text{Belt thickness})}{d_2} + F_w \\ &= 6000 \times \frac{30.6}{(0.15 \times 60 \times 1000)} \times \frac{(380 + 2 \times 10)}{376.6} + 17.5 \\ &= 39.2 \text{ (kN)} \end{aligned}$$

31T from driven sprocket < 400mm

Outer diameter 398 mm PCD d₂=376.60 (mm)

Number of teeth of drive sprocket = $\frac{31}{1.51} = 21$ T PCD d=255.63 (mm)

$$\text{Chain speed} = \frac{P \times Z' \times n}{1000} = \frac{38.1 \times 21 \times 36}{1000} = 28.8 \text{ m/min} < 50 \text{ m/min,}$$

so it is possible to select by allowable load.

Small sprocket revolution 36r/min ··· RPM Kn=1.03

Number of teeth of small sprocket 21T ··· Number of teeth factor Kz=1.10

$$\begin{aligned} \text{Chain tension } F_w &= \text{Conveyor roller rotation torque} \times 1000 \times \frac{2}{d_2} \\ &= 337 \times 1000 \times \frac{2}{376.6} = 1790 \text{ (kgf)} \end{aligned}$$

$$\begin{aligned} \text{Design chain tension } F'w &= F_w \times K_s \times K_n \times K_z \\ &= 1790 \times 1.3 \times 1.03 \times 1.10 = 2640 \text{ (kgf)} \cdots \textcircled{1} \end{aligned}$$

RS120-1 (Max. allowable load: 3100kgf) can be used.

Check the conveyance speed (selection condition 30s, m/min)

$$\begin{aligned} \text{Conveyance speed at this point} &= n_2 \times \frac{(\text{Conveyor roller external diameter} + 2 \times \text{Belt thickness}) \times \pi}{1000} \\ &= n_1 \times \frac{21}{31} \times \frac{(\text{Conveyor roller external diameter} + 2 \times \text{Belt}) \times \pi}{1000} \\ &= 36 \times \frac{21}{31} \times \frac{(380 + 2 \times 10) \times \pi}{1000} \\ &= 30.6 \text{ (m/min)} \end{aligned}$$

(Step 3) Calculate from acceleration/deceleration time

The small sprocket was decided as RS120 21T from the calculations in step 2.
Thus, calculate using the same pitch and number of teeth.
If the acceleration/deceleration time is known, use that value for the calculation.
The following is calculated assuming it is unknown.

$$\text{Working torque } T_m = \frac{(T_s + T_b)}{2} = \frac{(11.9 + 12.5)}{2} = 12.2 \text{ (kgf} \cdot \text{m)}$$

$$\begin{aligned} \text{Load torque } T_\ell &= F_w \times \frac{d}{(2 \times 1000 \times i)} = 1790 \times \frac{255.63}{(2 \times 1000 \times 50)} \\ &= 4.58 \text{ (kgf} \cdot \text{m)} \end{aligned}$$

Motor shaft conversion GD^2 of the load side

$$\begin{aligned} GD^2 \ell &= M \times \left(\frac{\text{Conveyance speed}}{\pi \times n_1} \right)^2 \\ &= 6000 \times \left(\frac{30.6}{\pi \times 1800} \right)^2 \\ &= 0.176 \text{ (kgf} \cdot \text{m}^2) \end{aligned}$$

GD^2 of the motor $GD^2 m = 0.352 \text{ (kgf} \cdot \text{m}^2)$

Acceleration time of the motor

$$\begin{aligned} t_s &= (GD^2 m + GD^2 \ell) \times \frac{n_1}{375 \times (T_m - T_\ell)} \\ &= (0.352 + 0.176) \times \frac{1800}{375 \times (12.2 - 4.58)} \\ &= 0.34 \text{ (s)} \end{aligned}$$

Deceleration time of the motor

$$\begin{aligned} t_b &= (GD^2 m + GD^2 \ell) \times \frac{n_1}{375 \times (T_m + T_\ell)} \\ &= (0.352 + 0.176) \times \frac{1800}{375 \times (12.2 + 4.58)} \\ &= 0.34 \text{ (s)} \end{aligned}$$

As $t_b < t_s$, chain tension during deceleration F_b is larger than chain tension during acceleration F_s . Thus, use the following.

Chain tension during deceleration

$$\begin{aligned} F_b &= M \times \frac{\text{Conveyance speed}}{(t_b \times 60 \times G)} \times \frac{(\text{Conveyor roller external diameter} + 2 \times \text{Belt thickness})}{d_2} + F_w \\ &= 6000 \times \frac{30.6}{(0.15 \times 60 \times G)} \times \frac{(380 + 2 \times 10)}{376.6} + 1790 \\ &= 4000 \text{ (kgf)} \end{aligned}$$

Design chain tension

$F'b = F_b \times K_n \times K_z = 39.2 \times 1.03 \times 1.10 = 44.4 \text{ (kN)}$ ②
RS120-2 (maximum allowable load 51.7 kN) or RS120-SUP-2 (maximum allowable load 66.7 kN) can be used because $F'b = 44.4 \text{ (kN)}$.

Considering RS140 18T (outer diameter 279 mm $d = 255.98$) and 27T (outer diameter 407 mm $d_2 = 382.88$) with similar PCD results conflict with the driven sprocket external diameter ≤ 400 mm, they cannot be used.

Chain reduction ratio becomes $\frac{36}{23.9}$ from the required $\frac{26}{18}$, and conveyance speed $= 30 \times \frac{36}{23.9} \times \frac{18}{26} = 31.3 \text{ m/min}$,

but upon examination 26T (outer diameter 393mm $d_2 = 368.77$) ② is $F'b = 46.3 \text{ (kN)}$

RS140-1 cannot be used because its maximum allowable load is 40.2kN. RS140-SUP-1 can be used because its maximum allowable load is 53.9kN. Since the sprocket bore diameter of 18T is up to 89 mm, and for 26T is up to 103 mm, it can be used with a drive shaft diameter of 66 mm and driven shaft diameter of 94 mm.

With the distance between shafts at 500 mm, a sprocket with 18T ($d = 255.98$) and 26T ($d_2 = 368.77$) can be used.

Number of links will be 46 links.

Lubrication for RS140-SUP-1 should be oil bath or lubrication using a slinger disc as per the kilowatt ratings table.

(Step 4) Calculate from inertia ratio R

$$\text{Inertia ratio } R = \frac{I \ell}{I_m} = \frac{0.044}{0.088} = 0.5$$

There is clearance in the drive equipment Shock factor $K = 1.0$

Starting torque $T_s = 0.116 \text{ (kN} \cdot \text{m)}$

Chain tension from starting torque

$$F_{ms} = T_s \times i \times 1000 \times \frac{2}{d} = 0.116 \times 50 \times 1000 \times \frac{2}{255.63} = 45.4 \text{ (kN)}$$

Stalling torque $T_b = 0.122 \text{ (kN} \cdot \text{m)}$

Chain tension from stalling torque

$$F_{mb} = T_b \times i \times 1.2 \times 1000 \times \frac{2}{d} = 0.122 \times 50 \times 1.2 \times 1000 \times \frac{2}{255.63} = 57.3 \text{ (kN)}$$

Since $F_{mb} > F_{ms}$, use the larger F_{mb} .

Design chain tension

$$F'mb = F_{mb} \times K \times K_n \times K_z = 57.3 \times 1.0 \times 1.03 \times 1.10 = 64.9 \text{ (kN)} \text{ } \textcircled{3}$$

Comparing ①, ②, and ③, ③ is the largest.

Since $F'mb = 64.9 \text{ (kN)}$, RS120-3 (maximum allowable load 76.0 kN) or RS120-SUP-2 (maximum allowable load 66.7 kN) is usable.

With the distance between shafts at 500mm, a sprocket with 21T ($d = 255.63$) and 31T ($d_2 = 376.60$) can be used.

Number of links will be 54 links.

Lubrication for both RS120-1 and RS120-SUP-1 should be oil bath or lubrication by slinger disc as per the kilowatt ratings table.

Design chain tension

$F'b = F_b \times K_n \times K_z = 4000 \times 1.03 \times 1.10 = 4530 \text{ (kgf)}$ ②
RS120-2 (maximum allowable load 5270 kgf) or RS120-SUP-2 (maximum allowable load 6800kgN) can be used because $F'b = 4530 \text{ (kgf)}$.

Considering RS140 18T (outer diameter 279 mm $d = 255.98$) and 27T (outer diameter 407 mm $d_2 = 382.88$) with similar PCD results conflict with the driven sprocket external diameter ≤ 400 mm, they cannot be used.

Chain reduction ratio becomes $\frac{36}{23.9}$ from the required $\frac{26}{18}$, and conveyance speed $= 30 \times \frac{36}{23.9} \times \frac{18}{26} = 31.3 \text{ m/min}$,

but upon examination 26T (outer diameter 393mm $d_2 = 368.77$) ② is $F'b = 4720 \text{ (kgf)}$

RS140-1 cannot be used because its maximum allowable load is 4100kgf. RS140-SUP-1 can be used because its maximum allowable load is 5500kgf. Since the sprocket bore diameter of 18T is up to 89 mm, and for 26T is up to 103 mm, it can be used with a drive shaft diameter of 66 mm and driven shaft diameter of 94 mm.

With the distance between shafts at 500 mm, a sprocket with 18T ($d = 255.98$) and 26T ($d_2 = 368.77$) can be used.

Number of links will be 46 links.

Lubrication for RS140-SUP-1 should be oil bath or lubrication using a slinger disc as per the kilowatt ratings table.

(Step 4) Calculate from inertia ratio R

$$\text{Inertia ratio } R = \frac{GD^2 \ell}{GD_m^2} = \frac{0.176}{0.352} = 0.5$$

There is clearance in the drive equipment Shock factor $K = 1.0$

Starting torque $T_s = 11.9 \text{ (kgf} \cdot \text{m)}$

Chain tension from starting torque

$$F_{ms} = T_s \times i \times 1000 \times \frac{2}{d} = 11.9 \times 50 \times 1000 \times \frac{2}{255.63} = 4660 \text{ (kgf)}$$

Stalling torque $T_b = 12.5 \text{ (kgf} \cdot \text{m)}$

Chain tension from stalling torque

$$F_{mb} = T_b \times i \times 1.2 \times 1000 \times \frac{2}{d} = 12.5 \times 50 \times 1.2 \times 1000 \times \frac{2}{255.63} = 5870 \text{ (kgf)}$$

Since $F_{mb} > F_{ms}$, use the larger F_{mb} .

Design chain tension

$$F'mb = F_{mb} \times K \times K_n \times K_z = 5870 \times 1.0 \times 1.03 \times 1.10 = 6650 \text{ (kgf)} \text{ } \textcircled{3}$$

Comparing ①, ②, and ③, ③ is the largest.

Since $F'mb = 6650 \text{ (kgf)}$, RS120-3 (maximum allowable load 7750 kgf) or RS120-SUP-2 (maximum allowable load 6800 kgf) is usable.

With the distance between shafts at 500mm, a sprocket with 21T ($d = 255.63$) and 31T ($d_2 = 376.60$) can be used.

Number of links will be 54 links.

Lubrication for both RS120-1 and RS120-SUP-1 should be oil bath or lubrication by slinger disc as per the kilowatt ratings table.



Considering RS160 15T (outer diameter 269mm $d=244.33$) and 23T (outer diameter 400mm $d_2=373.07$) with similar PCD,

③ $F_{mb}=69.0(kN)$ will be largest.

RS160-1 cannot be used because its maximum allowable load is 53.0 kN. RS160-SUP-1 can be used because its maximum allowable load is 70.6kN. Since the sprocket bore diameter of 15T is up to 95mm, and 23T is up to 118mm, it can be used for a drive shaft diameter of 66mm, and driven shaft diameter of 94mm.

With the distance between shafts at 500mm, a sprocket with 15T ($d=244.33$) and 23T ($d_2=373.07$) can be used.

Number of links will be 42 links.

Lubrication for RS140-SUP-1 should be oil bath or lubrication by slinger disc as per kilowatt ratings table.

Considering RS160 15T (outer diameter 269mm $d=244.33$) and 23T (outer diameter 400mm $d_2=373.07$) with similar PCD,

③ $F_{mb}=7040(kgf)$ will be largest.

RS160-1 cannot be used because its maximum allowable load is 5400kgf. RS160-SUP-1 can be used because its maximum allowable load is 7200kgf. Since the sprocket bore diameter of 15T is up to 95mm, and 23T is up to 118mm, it can be used for a drive shaft diameter of 66mm, and driven shaft diameter of 94mm.

With the distance between shafts at 500mm, a sprocket with 15T ($d=244.33$) and 23T ($d_2=373.07$) can be used.

Number of links will be 42 links.

Lubrication for RS140-SUP-1 should be oil bath or lubrication by slinger disc as per kilowatt ratings table.

Measurement results

Condition	Step	Chain size	Sprocket	Number of links	Lubrication class
Start frequency 6 times or less	Step 2	RS120-1	21T×31T	54 links	B
Start frequency 6 times or more with cushion start.	Step 3	RS120-2	21T×31T	54 links	B
		RS140-1	18T×26T	46 links	B
Start frequency 6 times or more without cushion start.	Step 3	RS120-3	21T×31T	54 links	B
		RS120-SUP-2			B
	Step 4	RS160-SUP-1	15T×23T	42 links	B

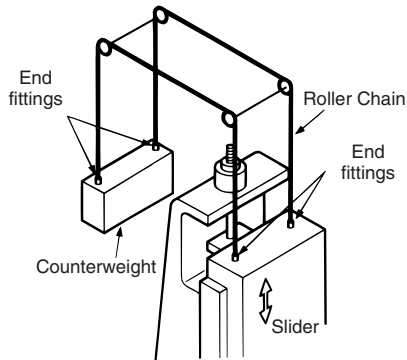
Lubrication class B: Lubrication with oil bath or slinger disc

All shaft distances need to be adjusted.

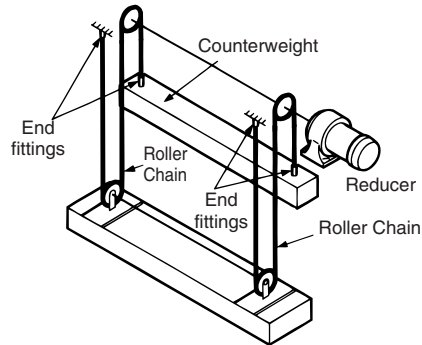
7. Example of lifting transmissions

There are many examples of where chain is used for lifting. By making use of Roller Chain features, choosing the right chain and following the important points, it is possible to use Roller Chain for lifting transmissions. Typical lifting applications are illustrated below. (Please give special consideration to safety devices.)

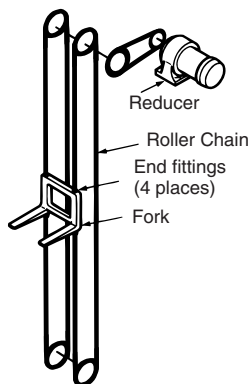
Balancing



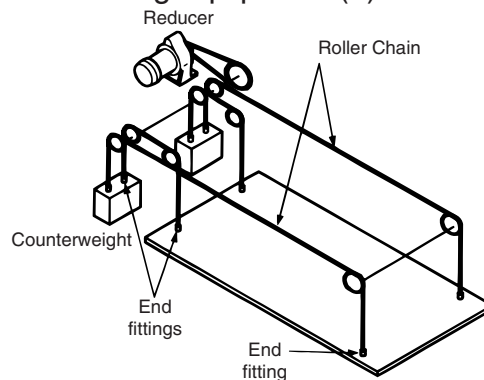
Lifting equipment (1)



Lifting equipment (2)



Lifting equipment (3)



⚠ Selecting hanging roller chain

- ① If there are any laws or guidelines for chain selection, check and calculate accordingly. Make sure to follow the manufacturer's selections and select the safer of the two selections.
- ② Use F-type (Semi Press-fit) connecting links. Offset links cannot be used.
- ③ Lubricate the chain joints as much as possible after you reduce the loads. Sufficient lubrication is also required at end fittings (end bolts and connecting links, etc.) and connecting parts, etc.



Weight required for counterweight to prevent sprocket tooth-jumping when using Roller Chain in lifting transmission applications

$$T_k = T_o \times \left\{ \frac{\sin \phi}{\sin(\phi + 2\alpha)} \right\}^{K-1}$$

T_k : Minimum weight tension (Minimum back-tension)

T_o : Roller Chain tension

ϕ : Sprocket minimum pressure angle $\phi = 17^\circ - \frac{64^\circ}{N}$

2α : Sprocket dividing angle $2\alpha = \frac{360^\circ}{N}$

K : Engaging No. of teeth $K = \frac{\theta}{360^\circ} \times N \dots$ Round up to the nearest whole number to be safe.

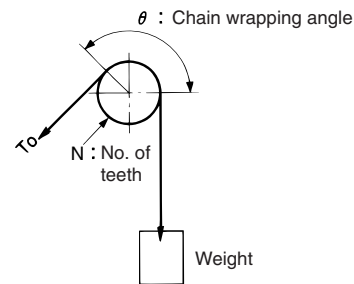
If $t_o = 1100 \text{ kgf}$, $N = 13$, and $\theta = 120^\circ$, then

$$\phi = 17^\circ - \frac{64^\circ}{N} = 17^\circ - \frac{64^\circ}{13} = 12.077$$

$$2\alpha = \frac{360^\circ}{N} = \frac{360^\circ}{13} = 27.692$$

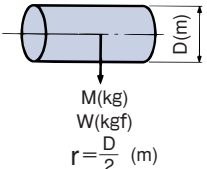
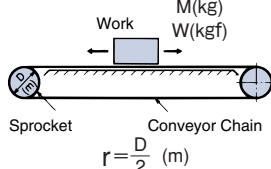
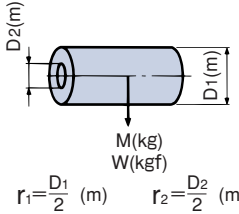
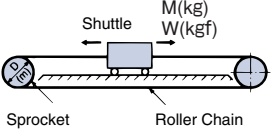
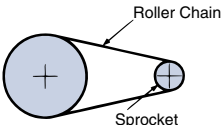
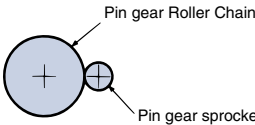
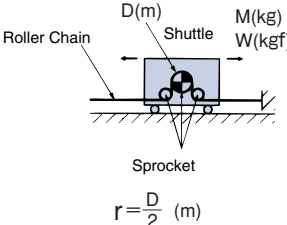
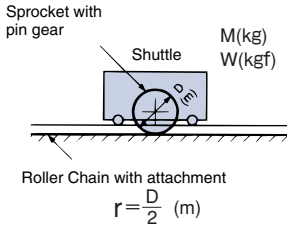
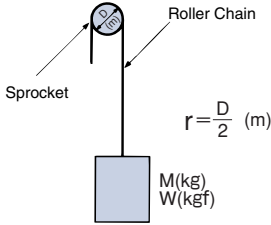
$$K = \frac{\theta}{360^\circ} \times N = \frac{120^\circ}{360^\circ} \times 13 = 4.33 \dots K = 4$$

$$T_k = 1100 \times \left\{ \frac{\sin 12.077}{\sin(12.077 + 27.692)} \right\}^{4-1} = 38.5 \text{ (kg)}$$



Accordingly, tooth-jumping will not occur if a 39 kg weight is used. However, this will change depending on the layout and amount of wear on the Roller Chain and sprocket teeth. Please use the above as a reference.

8. Calculating moment of inertia (Table 6)

Rotating Body	(Moment of inertia) Calculation Method (SI Unit)	$\left\{ \begin{array}{l} \text{GD}^2 \text{ Calculation} \\ \text{Method Gravimetric Unit} \end{array} \right\}$	Linear Body	(Moment of inertia) Calculation Method (SI Unit)	$\left\{ \begin{array}{l} \text{GD}^2 \text{ Calculation} \\ \text{Method Gravimetric Unit} \end{array} \right\}$						
Right cylinder  <p>$M(\text{kg})$ $W(\text{kgf})$ $r = \frac{D}{2} (\text{m})$</p>	$I = \frac{1}{2} Mr^2$ ($\text{kg} \cdot \text{m}^2$)	$GD^2 = \frac{1}{2} WD^2$ ($\text{kgf} \cdot \text{m}^2$)	Conveyor drive  <p>$M(\text{kg})$ $W(\text{kgf})$ $r = \frac{D}{2} (\text{m})$</p>	$I = Mr^2 (\text{kg} \cdot \text{m}^2)$	$GD^2 = WD^2$ ($\text{kgf} \cdot \text{m}^2$)						
Hollow right cylinder  <p>$M(\text{kg})$ $W(\text{kgf})$ $r_1 = \frac{D_1}{2} (\text{m})$ $r_2 = \frac{D_2}{2} (\text{m})$</p>	$I = \frac{1}{2} M(r_1^2 + r_2^2)$ ($\text{kg} \cdot \text{m}^2$)	$GD^2 = \frac{1}{2} W(D_1^2 + D_2^2)$ ($\text{kgf} \cdot \text{m}^2$)	Shuttle Traction  <p>$M(\text{kg})$ $W(\text{kgf})$ $r = \frac{D}{2} (\text{m})$</p>	$I = Mr^2 (\text{kg} \cdot \text{m}^2)$	$GD^2 = WD^2$ ($\text{kgf} \cdot \text{m}^2$)						
Wrapping drive 	Pin gear drive 		 <p>$M(\text{kg})$ $W(\text{kgf})$ $r = \frac{D}{2} (\text{m})$</p>	$I = Mr^2 (\text{kg} \cdot \text{m}^2)$	$GD^2 = WD^2$ ($\text{kgf} \cdot \text{m}^2$)						
Note <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>SI unit</th> <th>{Gravimetric unit}</th> </tr> </thead> <tbody> <tr> <td>Moment of inertia (I) and fly wheel effect (GD²)</td> <td>1 $\text{kg} \cdot \text{m}^2$ (I)</td> <td>4 $\text{kgf} \cdot \text{m}^2$ (GD²)</td> </tr> </tbody> </table>							SI unit	{Gravimetric unit}	Moment of inertia (I) and fly wheel effect (GD ²)	1 $\text{kg} \cdot \text{m}^2$ (I)	4 $\text{kgf} \cdot \text{m}^2$ (GD ²)
	SI unit	{Gravimetric unit}									
Moment of inertia (I) and fly wheel effect (GD ²)	1 $\text{kg} \cdot \text{m}^2$ (I)	4 $\text{kgf} \cdot \text{m}^2$ (GD ²)									
			Pin gear drive  <p>$M(\text{kg})$ $W(\text{kgf})$ $r = \frac{D}{2} (\text{m})$</p>	$I = Mr^2 (\text{kg} \cdot \text{m}^2)$	$GD^2 = WD^2$ ($\text{kgf} \cdot \text{m}^2$)						
			Lifting application  <p>$M(\text{kg})$ $W(\text{kgf})$ $r = \frac{D}{2} (\text{m})$</p>	$I = Mr^2 (\text{kg} \cdot \text{m}^2)$	$GD^2 = WD^2$ ($\text{kgf} \cdot \text{m}^2$)						
			To convert moment of inertia load to motor shaft Ω_1 : Motor shaft rotating speed Ω_2 : Load shaft rotating speed	$I \ell = \left(\frac{n_2}{n_1} \right)^2 I$ $= \frac{I}{i^2} (\text{kg} \cdot \text{m}^2)$ $I \ell = M \left(\frac{V}{2\pi n_1} \right)^2$ ($\text{kg} \cdot \text{m}^2$)	Moment of inertia GD ² load $GD^2 \ell = \left(\frac{n_2}{n_1} \right)^2 GD^2$ $= \frac{GD^2}{i^2} (\text{kgf} \cdot \text{m}^2)$ $GD^2 \ell = W \left(\frac{V}{\pi n_1} \right)^2$ ($\text{kgf} \cdot \text{m}^2$)						

The above does not include the mass of the sprocket and chain.

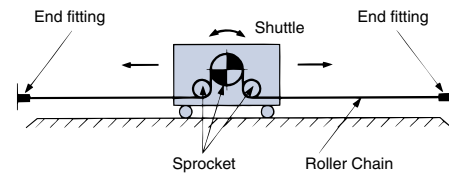
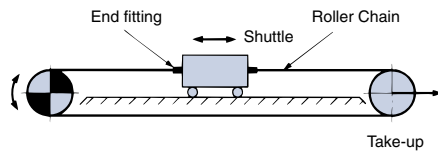


9. Example of shuttle traction

The following are typical examples of using Roller Chain for shuttle traction. The roller chain can be attached to the shuttle with an end fitting and towed using a sprocket on one end (left figure), or the driving unit can be attached to the shuttle, with a roller chain fixed to both ends using end fittings (right figure).

There are similar ways to tow a shuttle at an angle. With the left figure the drive sprocket would be set at the top of the incline.

⊕ : Drive side



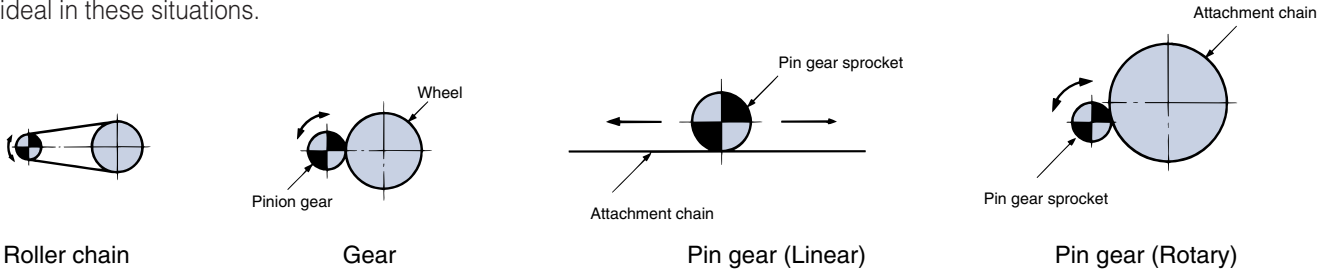
⚠ Selecting roller chain for shuttle traction

- ① If there are any laws or guidelines for chain selection, check and calculate accordingly. Make sure to follow the manufacturer's selections and select the safer of the two selections.
- ② Use F-Type (Semi Press-Fit) connecting links. M-Type connecting links can only be used if there is minimal shock with no lateral force. Offset links cannot be used.
- ③ Lubricate the chain joints as much as possible after you reduce the loads. Sufficient lubrication is also required at end fittings (end bolts and connecting links, etc.) and connecting parts, etc.

10. Pin gear drive selection method

Generally, linear movement or large radius rotation is made possible by a roller chain and gear through a transmission source (motor, etc.) via a reducer.

A roller chain, however, needs a lot of space, and gears requires precision machining, which increases the cost. A pin gear is ideal in these situations.



For pin gear drives, a roller chain is wrapped around the perimeter of the drum to make a wheel, and special sprockets (see Sprockets) are used instead of pinion gears. For linear motion, a roller chain is attached and used linearly instead of a rack.

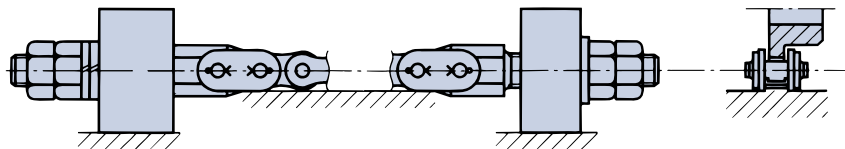
Item	Pin gear drive	Roller chain transmission	Gear transmission
Restrictions on distance between shafts	Yes	No	Yes
Number of engaged teeth	Low	High	Low
Speed ratio range	No limit	Up to 1:7	No limit
Tooth shape	Special teeth	Sprocket teeth	Involute
Engagement accuracy	Normal	Normal	Precise

10.1 Characteristics of pin gears

- 1) Economical at large speed ratios (1:5 or larger), especially when the drum has a large diameter.
 - 2) Roller chain attachments are bolted onto the drum for easy installation and maintenance.
 - 3) Design freedom in drum diameter, linear length, etc.
 - 4) Rough installation accuracy and no precision machining required for gears.
 - 5) Grease lubrication can be used.
- ▲ A pin gear is not suitable for ultra precise drives, and the noise level is high compared to gears.

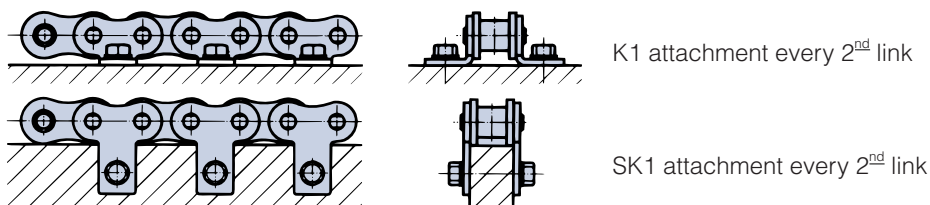
10.2 Chain installation and precautions

- 1) When used linearly (rack) with rollers facing up:
 - Use standard roller chain.



Connecting links are used on both ends, and fittings are attached and bolts and nuts are fastened to remove any slack. (Both ends need to be secured snugly with double nuts.) NOTE: This is not recommended as tooth slipping and interference can occur.

- Used an attachment roller chain.



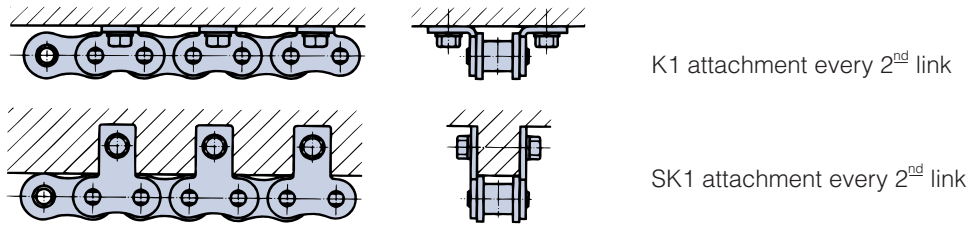
Attach K1 or SK1 attachments every 2nd link and fasten with bolts and nuts every 2nd or 4th link with chain pulled taut so there is no slack or meandering. (K attachments are recommended.) The attachment holes are usually processed on-site.



Use bolts with the strength class 8.8 or higher (JIS1051-2000 Tensile strength 800 N/mm² or higher). (SCM435 heat treated bolts, etc.)

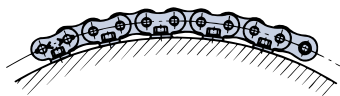
- The length of the chain should be the travel distance plus α .
- α : The distance of overrun based on usage conditions.

2) When used linearly (rack) with rollers facing down:

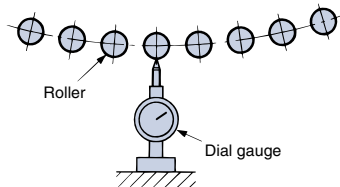


Attach K1 or SK1 attachments every 2nd link and fasten with bolts and nuts every 2nd or 4th link with chain pulled taut so there is no slack or meandering.

3) When wrapped partially or totally around the outside of a drum:

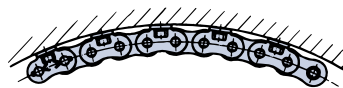


- Attachment chain length is in the range of -0.05 to 0.15% of standard length (nominal pitch x number of links). When the chain is wrapped around a drum, shims need to be used between the drum and the chain attachments to eliminate slack.
- Since K attachments can be adjusted with shims, they can be attached onto the drum more easily than SK attachments.
- When the drum is not perfectly round, the thickness of the shims needs to be adjusted while the chain is wrapped around the drum so the radius is circular. As shown below, a dial gauge or a surface gauge can be used for adjustment.
- Process tap holes to fit the holes of the chain attachments.



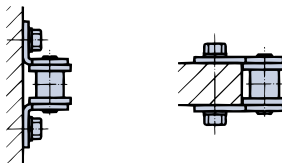
4) When wrapped partially or totally around the inside of a drum:

- Consult Tsubaki.



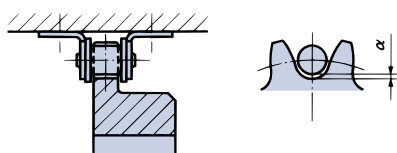
5) When used for lateral wrapping (horizontal drive)

- See section 3).
- Consult Tsubaki for internal fits.



6) Sprocket attachment

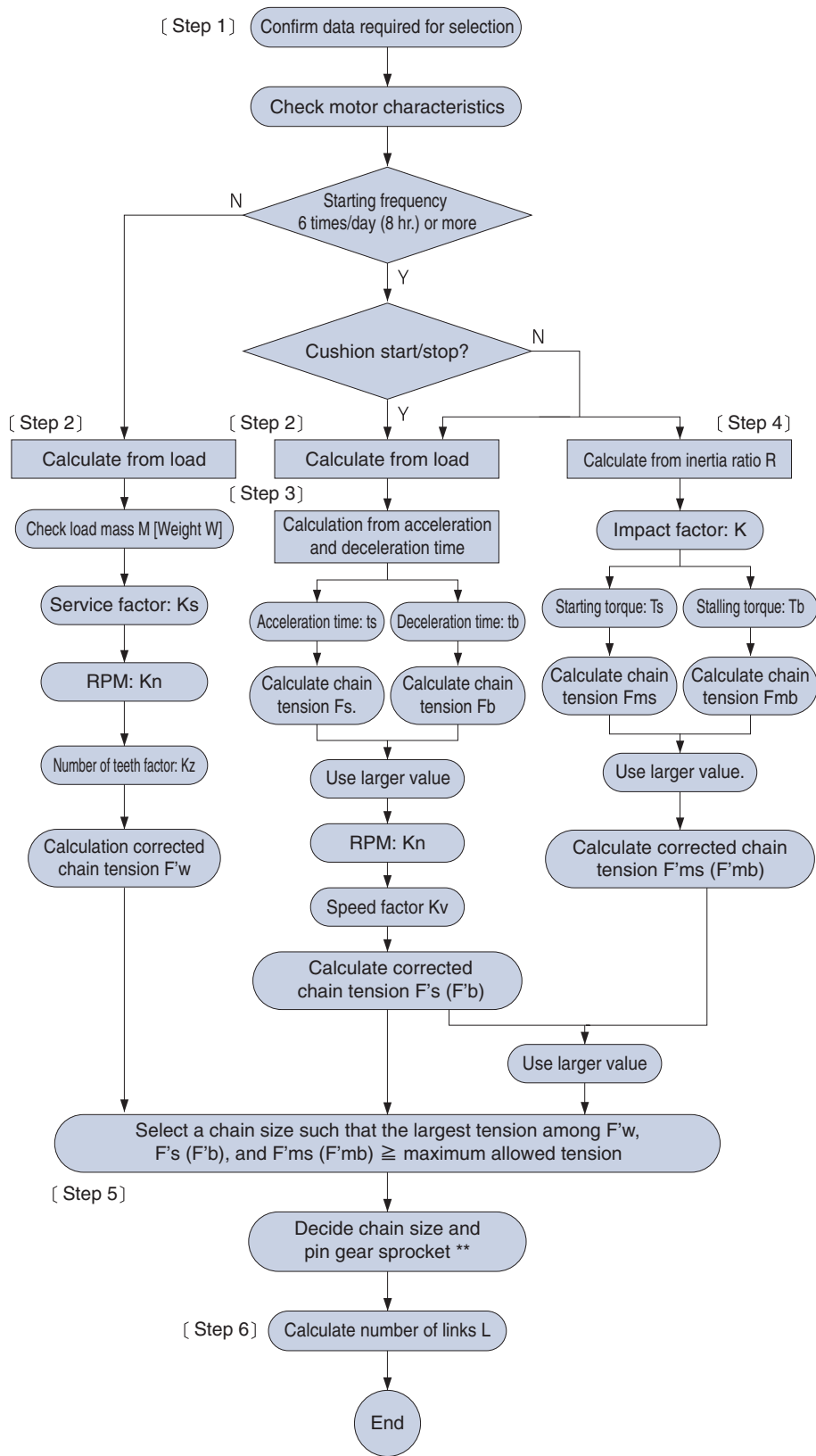
- Adjust the shaft of the sprocket so that the sprocket engages the chain straight.
- The clearance (α) between the rollers and the bottom of the sprocket teeth should be less than the dimensions shown in the following table. The bottom of the teeth and rollers should not touch each other.



Chain size	α
RS80 or less	1.0mm
RS100 to RS180	1.5mm
RS200 or more	2.0mm

- When the bottom of the teeth and rollers touch each other in the clearance described above, the tooth form needs to be pre-designed with larger clearance α . Consult Tsubaki.

Procedure



(Note) Chain relative speed V is 50 m/min or less.

(When V is greater than 50 m/min)
 Linear: Roll drive, etc.
 Drum: Change chain attachment diameter → Reduce size.

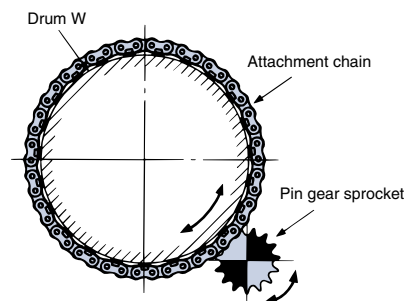
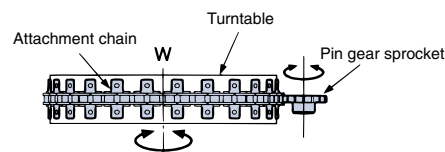
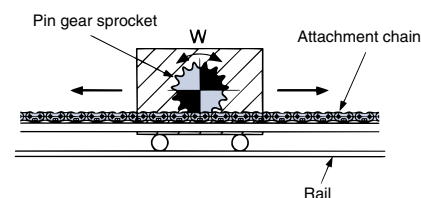
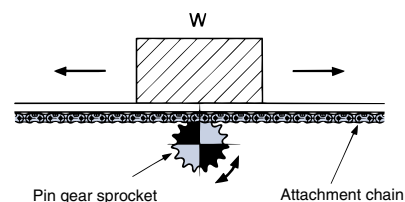
Pin gear speed factor K_v

Relative chain speed	Pin gear speed factor
0 to 15 m/min	1.0
15 to 30	1.2
30 to 50	1.4

** Sprocket for pin gear drive

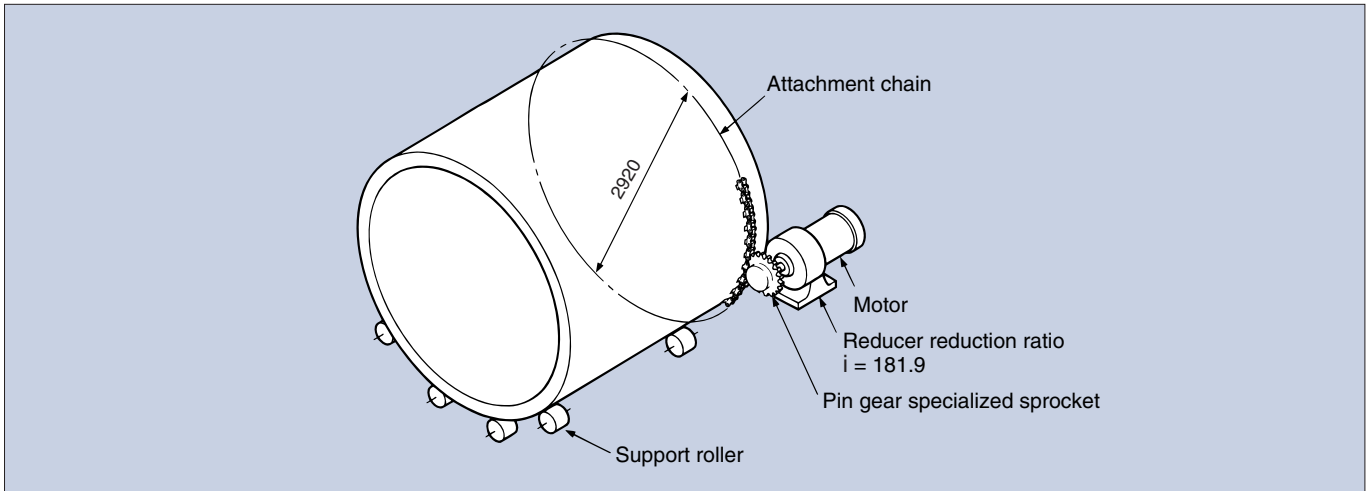
This sprocket is exclusively for special tooth shapes.

$N \geq 13$, with $N = 18$ recommended. Refer to previous sections for pin gear drive handling.





Pin gear drive selection example



SI units

[Step 1] Check machine and motor characteristics

Machine: Cutting machine
 Motor: 15 kW, 4P, 1750 r/min

Motor moment of inertia I : $I_m = 0.00425 \text{ kg} \cdot \text{m}^2$

Starting torque T_s 290%
 Stalling torque T_b 305%
 Reducer reduction ratio i 181.9
 Forward and reverse operation frequency ... Max 900 times/hour
 Sprocket pitch circle diameter (PCD) ... Approximately ϕ 220 mm

Moment of inertia for the motor shaft converted load I : $I_\ell = 0.00072 \text{ kg} \cdot \text{m}^2$
 There is no play in the chain.

[Step 2] Calculation from load

$$\text{Revolution speed of the pin gear drive sprocket } n = 1750 \times \frac{1}{181.9} = 9.6 \text{ r/min}$$

$$\text{Relative chain speed } v = \frac{220 \times \pi \times 9.6}{1000} = 6.6 \text{ m/min} \dots \text{Speed factor } K_v = 1.0$$

High forward and reverse operation frequency Service factor $K_s = 1.5$

Load is calculated from the torque on the drive side as the mass of the load is unknown.

$$\begin{aligned} \text{Rated torque of the motor } T_n &= 9.55 \times \frac{\text{kW}}{n_1} \\ &= 9.55 \times \frac{1.5}{1750} \\ &= 0.00819 \text{ (kN} \cdot \text{m)} \end{aligned}$$

$$\begin{aligned} \text{Pin gear drive sprocket shaft torque} \\ T &= T_n \times i = 0.00819 \times 181.9 \\ &= 1.49 \text{ (kN} \cdot \text{m)} \end{aligned}$$

$$\begin{aligned} \text{Chain working tension } F &= \frac{2T}{d} = \frac{2 \times 1.49}{0.22} \\ &= 13.6 \text{ (kN)} \end{aligned}$$

$$\begin{aligned} \text{Design chain tension } F'w &= F \times K_s \times K_v \\ &= 13.6 \times 1.5 \times 1.0 \\ &= 20.4 \text{ (kN)} \dots \text{①} \end{aligned}$$

{Gravimetric units}

[Step 1] Check machine and motor characteristics

Machine: Cutting machine
 Motor: 15 kW, 4P, 1750 r/min

GD^2 of the motor $GD^2 = 0.017 \text{ kgf} \cdot \text{m}^2$

Starting torque T_s 290%
 Stalling torque T_b 305%
 Reducer reduction ratio i 181.9
 Forward and reverse operation frequency ... Max 900 times/hour
 Sprocket pitch circle diameter (PCD) ... Approximately ϕ 220 mm

GD^2 of the motor shaft converted load: $GD^2_\ell = 0.00072 \text{ kg} \cdot \text{m}^2$
 There is no play in the chain.

[Step 2] Calculation from load

$$\begin{aligned} \text{Rated torque of the motor } T_n &= 974 \times \frac{\text{kW}}{n_1} \\ &= 974 \times \frac{1.5}{1750} \\ &= 0.835 \text{ (kgf} \cdot \text{m)} \end{aligned}$$

$$\begin{aligned} \text{Pin gear drive sprocket shaft torque} \\ T &= T_n \times i = 0.835 \times 181.9 \\ &= 152 \text{ (kgf} \cdot \text{m)} \end{aligned}$$

$$\begin{aligned} \text{Chain working tension } F &= \frac{2T}{d} = \frac{2 \times 1.49}{0.22} \\ &= 1382 \text{ (kgf)} \end{aligned}$$

$$\begin{aligned} \text{Design chain tension } F'w &= F \times K_s \times K_v \\ &= 1382 \times 1.5 \times 1.0 \\ &= 2073 \text{ (kgf)} \dots \text{①} \end{aligned}$$

[Step 3] Calculation based on acceleration and deceleration time

$$\begin{aligned} \text{Working torque } T_m &= \frac{T_s + T_b}{2 \times 100} \times T_n \\ &= \frac{290 + 305}{2 \times 100} \times 0.00819 \\ &= 0.0244 \text{ (kN} \cdot \text{m)} \end{aligned}$$

As the load is unknown, the rated torque of the motor is $T_n = T_\ell$ and the load torque $T_\ell = 0.00819 \text{ kN} \cdot \text{m}$ {0.835 kgf·m}

$$\begin{aligned} \text{Acceleration time } t_s &= \frac{(I_m + I_\ell) \times n}{375 \times (T_m - T_\ell)} \times \frac{G}{1000} \times 4 \\ &= \frac{(0.00425 + 0.00072) \times 1750}{375 \times (0.0244 - 0.00819)} \times \frac{9.80665}{1000} \times 4 \\ &= 0.056 \text{ (s)} \end{aligned}$$

$$\begin{aligned} \text{Acceleration time } t_b &= \frac{(I_m + I_\ell) \times n}{375 \times (T_m + T_\ell)} \times \frac{G}{1000} \times 4 \\ &= \frac{(0.00425 + 0.00072) \times 1750}{375 \times (0.0244 + 0.00819)} \times \frac{9.80665}{1000} \times 4 \\ &= 0.028 \text{ (s)} \end{aligned}$$

As the mass (weight) of the load is unknown, it is assumed that the mass M (weight W) is equivalent to the chain working tension F when a friction factor between the support roller and the rotator of 0.3 is applied.

$$M = \frac{F}{\mu} \times \frac{1000}{G} = \frac{13.6}{0.3} \times \frac{1000}{9.80665} = 4623 \text{ (kg)}$$

$$F_w = F = 13.6 \text{ (kN)} \text{ [Value calculated in step]}$$

As $t_b < t_s$,

$$\begin{aligned} \text{Chain tension while decelerating } F_b &= \frac{M \times V}{t_b \times 60 \times 1000} + F_w \\ &= \frac{4623 \times 6.6}{0.028 \times 60 \times 1000} + 13.6 \\ &= 31.8 \text{ (kN)} \end{aligned}$$

Design chain tension while decelerating

$$\begin{aligned} F'_b &= F_b \times K_v \\ &= 31.8 \times 1.0 \\ &= 31.8 \text{ (kN)} \dots\dots\dots \textcircled{3} \end{aligned}$$

[Step 4] Calculation based on the inertia ratio R

$$\begin{aligned} \text{Inertia ratio } R &= \frac{I_\ell}{I_m} = \frac{0.00072}{0.00425} \\ &= 0.17 \end{aligned}$$

According to Table 4, impact factor $K = 0.23$ (There is no play in the drive transmission equipment as $R < 0.2$, $R = 0.2$.)

Chain tension at start-up

$$\begin{aligned} F_{ms} &= \frac{T_s \times i}{(d/2) \times 100} \times T_n \\ &= \frac{290 \times 181.9}{\frac{0.22}{2} \times 100} \times 0.00819 \\ &= 39.3 \text{ (kN)} \end{aligned}$$

Chain tension at stop

$$\begin{aligned} F_{mb} &= \frac{T_b \times i}{(d/2) \times 100} \times T_n \times 1.2 \\ &= \frac{305 \times 181.9}{\frac{0.22}{2} \times 100} \times 0.00819 \times 1.2 \\ &= 49.6 \text{ (kN)} \end{aligned}$$

As $F_{ms} < F_{mb}$,

$$\begin{aligned} \text{Design chain tension } F'_{mb} &= F_{mb} \times K \times K_v \\ &= 49.6 \times 0.23 \times 1.0 \\ &= 11.4 \text{ (kN)} \dots\dots\dots \textcircled{2} \end{aligned}$$

[Step 3] Calculation based on acceleration and deceleration time

$$\begin{aligned} \text{Working torque } T_m &= \frac{T_s + T_b}{2 \times 100} \times T_n \\ &= \frac{290 + 305}{2 \times 100} \times 0.835 \\ &= 2.48 \text{ (kgf} \cdot \text{m)} \end{aligned}$$

$$\text{Acceleration time } t_s = \frac{(GD^2_m + GD^2_\ell) \times n}{375 \times (T_m - T_\ell)}$$

$$\begin{aligned} &= \frac{(0.017 + 0.00288) \times 1750}{375 \times (2.48 - 0.835)} \\ &= 0.056 \text{ (s)} \end{aligned}$$

$$\text{Acceleration time } t_b = \frac{(GD^2_m + GD^2_\ell) \times n}{375 \times (T_m + T_\ell)}$$

$$\begin{aligned} &= \frac{(0.017 + 0.00288) \times 1750}{375 \times (2.48 + 0.835)} \\ &= 0.028 \text{ (s)} \end{aligned}$$

$$W = \frac{F}{\mu} = \frac{1382}{0.3} = 4607 \text{ (kgf)}$$

$$F_w = F = 1382 \text{ (kgf)} \text{ [Value calculated in step]}$$

As $t_b < t_s$,

$$\begin{aligned} \text{Chain tension while decelerating } F_b &= \frac{W \times V}{t_b \times 60 \times G} + F_w \\ &= \frac{4607 \times 6.6}{0.028 \times 60 \times 9.80665} + 1382 \\ &= 3228 \text{ (kgf)} \end{aligned}$$

Design chain tension while decelerating

$$\begin{aligned} F'_b &= F_b \times K_v \\ &= 3228 \times 1.0 \\ &= 3228 \text{ (kgf)} \dots\dots\dots \textcircled{3} \end{aligned}$$

[Step 4] Calculation based on the inertia ratio R

$$\begin{aligned} \text{Inertia ratio } R &= \frac{GD^2_\ell}{GD^2_m} = \frac{0.00288}{0.017} \\ &= 0.17 \end{aligned}$$

Chain tension at start-up

$$\begin{aligned} F_{ms} &= \frac{T_s \times i}{(d/2) \times 100} \times T_n \\ &= \frac{290 \times 181.9}{\frac{0.22}{2} \times 100} \times 0.835 \\ &= 4004 \text{ (kgf)} \end{aligned}$$

Chain tension at stop

$$\begin{aligned} F_{mb} &= \frac{T_b \times i}{(d/2) \times 100} \times T_n \times 1.2 \\ &= \frac{305 \times 181.9}{\frac{0.22}{2} \times 100} \times 0.835 \times 1.2 \\ &= 5054 \text{ (kgf)} \end{aligned}$$

As $F_{ms} < F_{mb}$,

$$\begin{aligned} \text{Design chain tension } F'_{mb} &= F_{mb} \times K \times K_v \\ &= 5054 \times 0.23 \times 1.0 \\ &= 1162 \text{ (kgf)} \dots\dots\dots \textcircled{2} \end{aligned}$$



[Step 5] Comparison of ①, ②, and ③

Comparing ①, ②, and ③, an attachment chain for pin gears that meets 31.8kN [3228 kgf], the maximum working load ③ is selected.

The maximum allowable load for RS160 attachment chain, 37.3 kN [3800 kgf], is acceptable.

The number of the teeth $N = 14$ T from the pitch circle diameter of the pin gear specialized sprocket, approximately $\phi 220$. (PCD = 231.78 mm)

Step 2 and 3 are calculated again here.

[Step 2]

$$F = \frac{2T}{d} = \frac{2 \times 1.49}{0.23178} = 12.9 \text{ (kN)}$$

$$\begin{aligned} F'w &= F \times Kv \\ &= 12.9 \times 1.0 = 12.9 \text{ (kN)} \end{aligned}$$

[Step 3]

$$\begin{aligned} F_{mb} &= \frac{T b \times i}{(d/2) \times 100} \times T_n \times 1.2 \\ &= \frac{305 \times 181.9}{\frac{0.23178}{2} \times 100} \times 0.00819 \times 1.2 = 46.4 \text{ (kN)} \end{aligned}$$

$$\begin{aligned} F'_{mb} &= F_{mb} \times K \times Kv \\ &= 46.4 \times 0.23 \times 1.0 = 10.7 \text{ (kN)} \end{aligned}$$

The above selection is acceptable.

[Step 2]

$$F = \frac{2T}{d} = \frac{2 \times 152}{0.23178} = 1295 \text{ (kgf)}$$

$$\begin{aligned} F'w &= F \times Kv \\ &= 1295 \times 1.0 = 1295 \text{ (kgf)} \end{aligned}$$

[Step 3]

$$\begin{aligned} F_{mb} &= \frac{T b \times i}{(d/2) \times 100} \times T_n \times 1.2 \\ &= \frac{305 \times 181.9}{\frac{0.23178}{2} \times 100} \times 0.835 \times 1.2 = 4797 \text{ (kgf)} \end{aligned}$$

$$\begin{aligned} F'_{mb} &= F_{mb} \times K \times Kv \\ &= 4797 \times 0.23 \times 1.0 = 1103 \text{ (kgf)} \end{aligned}$$

The above selection is acceptable.

[Step 6] Calculation of the number of links L

$$\text{Number of links } L = \frac{180^\circ}{\tan^{-1}\left(\frac{P}{D+2S}\right)} = \frac{180^\circ}{\tan^{-1}\left(\frac{50.8}{2920}\right)} = 180.6 \cdots \cdots 182 \text{ links}$$

[Conclusion] Chain: RS160 K1 attachments on every 2nd link with 182 links Sprocket: RS160 pin gear specialized sprocket 14T (PCD231.78 mm) or larger, material S35C, induction hardening on teeth.

(Cautions)

- ① Ambient conditions during applications are not taken into consideration. When the ambient conditions are not adequate, the selection needs to be made in consideration of the conditions.
- ② Refer to Section 10.2 on the page 141 for cautions regarding pin gears.

11. Temperature selection method

11.1 RS Roller Chain temperature selection method

This selection method is for sizes that may experience strength degradation from temperature. Additionally, lubrication should be carried out using a suitable lubricant according to the operating temperatures.

- | | |
|---|---|
| 1) Problems with roller chain transmission at high temperatures | 2) Problems with roller chain transmission at low temperatures |
| ① Increased wear due to hardness reduction | ① Reduction of impact strength due to low temperature brittleness |
| ② Increased elongation due to softening | ② Solidification of lubricant |
| ③ Poor articulation and increased wear due to oil degradation and carburization | ③ Poor articulation due to frost and ice adhesion |
| ④ Increased wear and poor articulation due to scaling | |

Table 7 Maximum allowable load of RS Roller Chain at high and low temperatures

Temperature	RS roller chain		RS Cold Resistant Chain *
	RS60 or under	RS80 or over	
Below - 60°C	-	-	Unusable
- 60°C - - 50°C	-	-	Catalog Value × 1/2
- 50°C - - 40°C	-	Unusable	∕ × 2/3
- 40°C - - 30°C	Unusable	Catalog Value × 1/4	Catalog Value
- 30°C - - 20°C	Catalog Value × 1/4	∕ × 1/3	∕
- 20°C - - 10°C	∕ × 1/3	∕ × 1/2	∕
- 10°C - - 60°C	Catalog Value	Catalog Value	∕
60°C - 150°C	Catalog Value	Catalog Value	Unusable
150°C - 200°C	∕ × 3/4	∕ × 3/4	-
200°C - 250°C	∕ × 1/2	∕ × 1/2	-
Over 250°C	Unusable	Unusable	-

- Note)
- * RS Cold Resistant Chain
 - Made to order
 - Select using allowable load selection method
 - The ambient temperature is different from the temperature of the roller chain itself.

11.2 Selection method for Stainless Steel Roller Chain (SS and NS specification) at high temperatures (400°C or higher)

As the temperature of a chain increases, its strength decreases. The usage limit at high temperatures is determined by the temperature of the chain itself. Consult Tsubaki when using stainless steel chain at ambient temperatures of 400°C or higher. However, chain cannot be used at 700°C or higher. When a chain is selected using the temperature selection method, the chain speed must be below the maximum speed of the allowable load selection method.

Changes and cautions associated with high temperature environments are:

- All clearances need to be adjusted to prevent poor articulation and poor roller rotation due to thermal expansion.
- The chain may break (creep rupture) under low loads as the temperature increases.

12. Special selection method for Corrosion Resistant Roller Chain

When selecting Corrosion Resistant Chain use the allowable load selection method.

- The maximum allowable tension for Corrosion Resistant Chain is low compared to Standard RS Roller Chain. (Excluding NEP.)
- Avoid using offset links when possible.
- Refer to the following page when acid or alkali solutions or chemicals will come in direct contact with the chain.
- Selection formula:

$$\text{Maximum working load applied to the chain} \times \text{Service factor } K_s \times \text{RPM } K_n \times \text{Number of teeth factor } K_z \leq \text{Maximum allowable load of the chain}$$



13. Corrosion resistance guide for Corrosion Resistant Chains and Sprockets

Corrosion resistance varies accordingly depending on application conditions. This table should not be considered as a guarantee. Using this chart as a reference, be sure to check the corrosion resistance of the chain in advance according to the actual operating conditions determining chain type.

- : Sufficient corrosion resistance
- △ : Corrosion resistance in some applications
- × : No corrosion resistance
- : Unknown

Chemical / Food product	Corrosion-Resistant Drive Chain							Sprocket	
	SS	AS	NS	TI	PC	PC-SY	Engineering plastic	SS	
Acetone	20C	○	○	○	○	○	×	○	○
Oil (Plant and mineral)	20C	○	○	○	○	○	○	○	○
Linseed oil	100% 20C	○	△	○	○	○	-	○	○
Sulfur Dioxide (Wet)	20C	○	×	○	○	-	-	-	○
Alcohol (Methyl, ethyl, propyl, and butyl)		○	○	○	○	○	○	○	○
Ammonia water	20C	○	○	○	○	○	○	○	○
Whiskey	20C	○	○	○	○	○	○	○	○
Ether (Ethyl ether)	20C	○	○	○	○	○	○	○	○
Zinc chloride	50% 20C	△	×	△	○	△	○	×	△
Ammonium chloride	50% Boiling point	△	×	○	○	-	-	-	△
Potassium chloride	Saturated 20C	○	△	○	○	-	-	○	○
Calcium chloride	// 20C	△	×	○	○	△	○	○	△
Ferric chloride	5% 20C	△	×	△	○	-	-	×	△
Sodium chloride	// 20C	○	△	○	○	○	○	○	○
Hydrochloric acid	2% 20C	×	×	×	○	×	○	×	×
Chlorine gas (Dry)	20C	△	×	△	○	-	○	×	△
Chlorine gas (Wet)	20C	×	×	△	○	-	○	×	×
Chlorine water		×	×	○	○	×	-	×	×
Oleic acid	20C	○	○	○	○	○	-	○	○
Seawater	20C	△	×	○	○	△	○	○	△
Sodium perchlorate	10% Boiling point	○	×	○	○	-	-	-	○
Hydrogen peroxide	30% 20C	○	△	○	○	×	○	×	○
Gasoline	20C	○	○	○	○	○	○	○	○
Potassium permanganate	Saturated 20C	○	○	○	○	-	○	×	○
Formic acid	50% 20C	○	○	○	○	×	○	×	○
Milk	20C	○	○	○	○	○	○	○	○
Citric acid	50% 20C	○	○	○	○	-	○	○	○
Glycerine	20C	○	○	○	○	○	○	○	○
Creosote	20C	○	○	○	○	-	-	-	○
Chromium acid	5% 20C	○	△	○	○	×	○	×	○
Ketchup	20C	○	○	○	○	○	○	○	○
Developing solution (Photo)	20C	○	△	○	○	○	○	○	○
Synthetic detergent		○	○	○	○	○	○	○	○
Coffee	Boiling	○	○	○	○	○	○	○	○
Cola syrup		○	○	○	○	○	○	○	○
Acetic acid	10% 20C	○	○	○	○	○	○	△	○
Sugar solution	20C	○	○	○	○	○	○	○	○
Calcium hypochlorite (Bleaching powder) Available chlorine 11~14%	20C	○	×	○	○	×	○	△	○
Sodium hypochlorite	10% 20C	×	×	○	○	×	○	△	×
Sodium cyanide	20C	○	-	○	○	-	-	-	○
Carbon tetrachloride (Dry)	20C	○	○	○	○	○	○	○	○
Potassium dichromate	10% 20C	○	○	○	○	○	-	○	○
Oxalic acid	10% 20C	○	△	○	○	-	○	○	○
Tartaric acid	10% 20C	○	○	○	○	○	○	○	○
Nitric acid	5% 20C	○	△	○	○	×	○	×	○
Ammonium nitrate	Saturated boiling	○	○	○	○	△	○	○	○

Chemical / Food product	Corrosion-Resistant Drive Chain							Sprocket	
	SS	AS	NS	TI	PC	PC-SY	Engineering plastic	SS	
Potassium nitrate	25% 20C	○	○	○	○	○	-	○	○
//	25% Boiling point	○	×	○	○	-	-	-	○
Vinegar	20C	△	×	○	○	△	○	△	△
Potassium hydroxide	20% 20C	○	○	○	○	○	○	○	○
Calcium hydroxide	20% Boiling	○	○	○	○	○	○	-	○
Sodium hydroxide	25% 20C	○	○	○	○	○	○	○	○
Stearic acid	100% Boiling point	×	×	○	○	×	-	○	×
Soft drink	20C	○	○	○	○	○	○	○	○
Carbolic acid	20C	○	○	○	○	×	○	×	○
Petroleum	20C	○	○	○	○	○	-	○	○
Soapy water	20C	○	○	○	○	○	○	○	○
Carbonated water		○	○	○	○	-	-	-	○
Sodium hydrogen carbonate	20C	○	○	○	○	○	-	○	○
Sodium carbonate	Saturated boiling point	○	○	○	○	-	○	△	○
Sodium thiosulfate	25% Boiling point	○	○	○	○	-	-	-	○
Turpentine oil	35C	○	○	○	○	-	-	-	○
Kerosene	20C	○	○	○	○	-	○	-	○
Varnish		○	○	○	○	-	-	-	○
Concentrated nitric acid	65% 20C	○	×	○	○	×	○	×	○
//	// Boiled	△	×	△	○	×	×	×	△
Lactic acid	10% 20C	○	△	○	○	○	-	○	○
Honey, syrup		○	○	○	○	○	○	○	○
Paraffin	20C	○	○	○	○	○	○	○	○
Beer	20C	○	○	○	○	○	○	○	○
Picric acid	Saturated 20C	○	○	○	○	-	-	-	○
Fruit juice	20C	○	△	○	○	○	○	○	○
Benzene	20C	○	○	○	○	○	○	○	○
Boric acid	50% 100C	○	○	○	○	-	-	-	○
Formalin (Formaldehyde)	40% 20C	○	○	○	○	-	-	△	○
Mayonnaise	20C	○	△	○	○	○	○	○	○
Water		○	○	○	○	○	○	○	○
Vegetable juice	20C	○	○	○	○	○	○	○	○
Lard		○	○	○	○	-	-	-	○
Butyric acid	20C	○	○	○	○	○	-	○	○
Hydrogen sulfide (Dry)		○	○	○	○	○	○	○	○
// (Moistened)		×	×	×	○	×	-	-	×
Sulfuric acid	5% 20C	×	×	○	○	×	○	×	×
Zinc sulfate	25% Saturated 20C	○	○	○	○	-	○	-	○
Aluminum sulfate	Saturated 20C	○	×	○	○	-	-	-	○
Ammonium sulfate	// 20C	○	△	○	○	-	-	-	○
Sodium sulfate	Saturated 20C	○	○	○	○	-	-	-	○
Malic acid	50% 50C	○	○	○	○	○	○	○	○
Phosphoric acid	5% 20C	○	△	○	○	×	○	×	○
//	10% 20C	△	△	△	○	×	○	×	△
Wine	20C	○	○	○	○	○	○	○	○

Before Use
 For Safe Use
 Standard Roller Chains
 Lubefree Roller Chains
 Heavy Duty Roller Chains
 Corrosion Resistant Roller Chains
 Specialty Roller Chains
 Accessories
 Selection
 Handling

Handling Roller Chains and Sprockets



1. How to Cut Roller Chain

If the chain you purchased is either a unit length (3,048 mm) or on a reel, it is necessary for you to cut the chain to the necessary length.

How to cut a roller chain — Using a chain vice and punch
— Using a chain breaker

1.1 Using a chain vice and punch

- 1) For riveted type roller chain, grind down one end of the outer plate's two pins (same side) to the surface of the plate. Be careful of the chain overheating during the grinding process. This process is unnecessary for Poly Steel Chain as there are no rivets. As RS08B-1 to RS16B-1 use easy cutting pins, the rivets do not need to be ground.
- 2) Remove the cotter pin for cotter pin type roller chain.

(Grind the rivets of the pins until they are flush with the plate.)

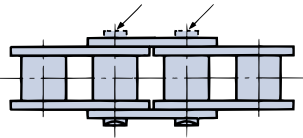


Fig. 1 Rivet-type roller chain

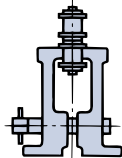


Fig. 2 Grinding the pin ends

- 3) Place the roller chain into the groove of the chain vice (see Accessories Section) and tighten the vice to secure the roller to be disassembled.
 - ① Follow 1.3 and 1.4 for Poly Steel Chain and Lambda chain.
 - ② For multi-strand SUPER Roller Chain, place the lowest roller into the groove of the chain vice.



Fig. 3 Setting the roller chain in the chain vice



Setting SUPER Roller Chain

- 4) Place a primary punch (see Accessories Section), according to chain size, on the head of the ground pin, and then hit the head of the primary punch with a hammer. Make sure to hit the pins alternatively to ensure the pins are removed evenly and at the same time. Continue to tap the pin until just before the pin is removed from the outer plate.
 - ①
 - ②
- 5) Use a secondary punch (see Accessories Section) to remove the pin completely from the outer link plate. Check to make sure that the bush where the pin was removed has not come loose or deformed. Do not use if loose or deformed.

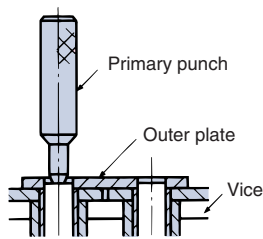


Fig. 4 Tapping the pin with the primary punch

⚠ Safety precautions

- ① Make sure to use a grinder when grinding the riveted portion of one end of the rivet-type pin. If it is extracted without being ground first, more time and effort will be spent, damaging the chain.
- ② Do not reuse any removed parts.

1.2 Using a chain breaker

- 1) For riveted type roller chain, grind down one end of the outer plate's two pins (same side) to the surface of the link plate. (Same as 1.1) Remove the cotter pin for cotter pin type roller chain.
- 2) Remove the two pins from the same outer plate. Check to make sure that the bush where the pin was removed has not come loose or deformed. Do not use if loose or deformed.



Fig. 5 How to cut a chain using a chain screw

⚠ Safety precautions

- ① A chain breaker (see Accessories Section) is a tool made for cutting chain, and can cut roller chain that is set on a machine. In this case, it is necessary beforehand to support the load on the roller chain and the weight of the roller chain itself to prevent it from falling after being cut.
- ② Do not reuse any removed parts.

1.3 How to cut Poly Steel Chain

- 1) Support the outer plate of the chain in the cradle and push down on the pinhead with the exclusive punch. Then lightly hit the head of the punch using a hammer.
- 2) Avoid using excess force on the engineering plastic part, as there is a possibility of causing damage.

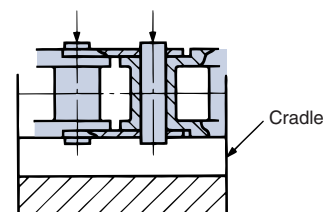


Fig. 6 Poly Steel Chain set in the cradle

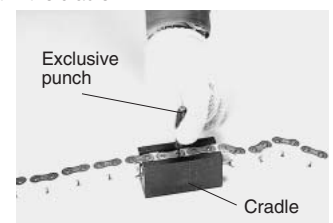


Fig. 7 Cutting Poly Steel Chain



1. 1 How to cut Lambda Chain

- 1) Support the chain with a chain vice and grind down one end of the outer link plate's two pins (same side) to the surface of the link plate. Be careful of the chain overheating during the grinding process. Grinding should be carried out slowly so as not to overheat the bushes in particular.
- 2) Then cut the chain using an exclusive cradle (see Accessories section) and an RS Roller Chain punch. Important points for cutting are outlined in 4) and 5) in 1.1. However, use an exclusive cradle instead of a vice.
- 3) Hit the pins alternatively when removing the pins with a punch. Take extra care not to remove or cause any damage to the bush. Do not use bush if it has come loose or been damaged.

2. How to Connect Roller Chain

2. 1 When connecting chain on sprocket teeth

When connecting or disconnecting roller chain, it is convenient to use the sprocket teeth. Please carry out the following steps.

- 1) Wind the chain around one of the sprockets so that both ends of the chain are facing each other on the sprocket.
- 2) Insert the connecting link in the two end links of the chain.
- 3) Insert the connecting link plate of the connecting link and fasten the plate using the clips/cotter pins or spring pins provided.
- 4) When using a press-fit connecting link or F-Type (semi press-fit) connecting link, insert the connecting link plate by tapping it with a hammer until it moves into position. Then fasten it using the clips/cotter pins or spring pins provided.
- 5) When using the sprocket teeth to connect the chain, take care not to damage the teeth, particularly when using a cast iron sprocket.



Fig. 8 Connecting on a sprocket

2. 2 When connecting between shafts

If a sprocket cannot be used due to layout, follow the procedures below.

- 1) Wind the chain around the sprockets and pull the chain ends together using a chain puller (see Accessories section) or wire.
- 2) Insert the connecting link in the two end links of the chain.
- 3) Insert the connecting link plate of the connecting link and fasten the plate using the clips/cotter pins or spring pins provided.



Fig. 9 Connecting between shafts

2. 3 Clip and Cotter Pins

1) Clip

Clips are used for small size roller chain (under RS60) connecting links. When connecting the chain, the clip should be inserted securely into the slot of the pin on the connecting link after the connecting plate has been inserted on the pin. If the legs of the clips are spread too far they will not catch properly and will fall off during operation of the chain, causing accidents. Care should be taken when inserting them. The clip is generally installed opposite to the direction of travel for the chain as shown in Fig. 10.

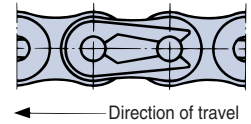


Fig. 10 Direction in which the clip is installed

2) Cotter Pins

Tsubaki cotter pins are treated for Standard, Heavy-Duty, and Lambda Chain. The legs of the cotter pin should be bent approx. 60 degrees. Cotter pins should not be reused, and commercially available cotter pins other than those produced by Tsubaki should be avoided.

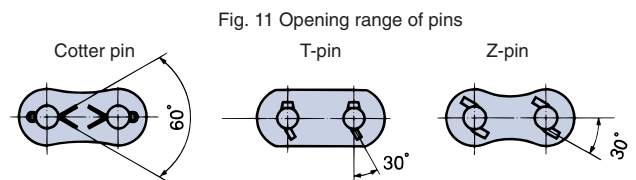


Fig. 11 Opening range of pins

RS Roller Chain cotter pin dimensions (These pins are not available commercially.)

Chain size	Nominal cotter pin dimension	Chain size	Nominal cotter pin dimension
RS35	1 × 6	RS100	2.5 × 20
RS40	1 × 6	RS120	3 × 23
RS50	1.6 × 8	RS140 · RS160	4 × 24.5
RS60	2 × 10	RS180	5 × 32
RS80	2.5 × 14	RS200	5 × 37

Note: RS240 uses a roll pin.

⚠ Safety Precautions

- ① Avoid using offset links wherever possible by varying the center distance between shafts or using an idler.
- ② In the case of pins and connecting link plate holes being press-fit type with F-Type or other connecting links, please avoid widening the connecting link plate hole or narrowing the pin diameter to make connecting easier, as this will result in a reduction in roller chain strength and cause an accident.
- ③ The outer link of cotter pin type roller chain can be used as a substitute for the connecting link. However, due to the press fit connection, the outer link plate must be carefully driven onto the pin parallel to the connecting link. If the connecting link plate is installed without due care to parallelism, chain damage or increased wear may result. Use caution as per (2) above.
- ④ Do not reuse press fit type link plates that have been detached, as the detachment results in a reduction in strength.

3. Roller Chain Lubrication

Lubrication is very important in roller chain transmission, and becomes especially important when stringent demands are placed on chain performance.

When lubrication is not complete, even the most advanced transmission device will not realize its full service life. Under some conditions the device may wear out within a very short period of time. For this reason, exercise special care with respect to lubrication.

- 1) The main reason for oiling and lubing roller chain is to minimize wear elongation of the chain and prevent corrosion. Wear elongation is caused by wear between the pin and bush in articulating parts.
- 2) Roller chain is coated with oil before being packaged (except for stainless steel chain). This oil is a high grade oil that prevents rust and provides lubrication. The oil prevents the wear that frequently occurs in the initial stage of operation, and it works well with lubrication oil to maintain a high wear resistance.
- 3) Avoid wiping the oil coating off of delivered roller chain, and avoid washing the chain with detergent or other cleaning agents.

3.1 Oil application locations

- 1) Roller chain wear occurs from wear between each pin and bush, and thus oil must be applied to these parts.
- 2) On the slack part of the chain, apply lubrication oil to the gap between each outer plate and inner plate. At the same time, apply oil between the bushes and rollers.

3.3 Recommended lubricating oils

1) SAE numbers (Table 1)

Lubricant type Ambient temperature	A I · A II · B				C			
	-10°C to 0°C	0°C to 40°C	40°C to 50°C	50°C to 60°C	-10°C to 0°C	0°C to 40°C	40°C to 50°C	50°C to 60°C
Chain number								
RS50 or lower small pitch chain	SAE10W	SAE20	SAE30	SAE40	SAE10W	SAE20	SAE30	SAE40
RS60 / 80	SAE20	SAE30	SAE40	SAE50				
RS100								
RS120 or higher large pitch chain	SAE30	SAE40	SAE50		SAE20	SAE30	SAE40	SAE50

2) Commercially available lubrication (Table 2)

ISOVG (CST40°C)	SAE	SAE10W	SAE20	SAE30	SAE40	SAE50
	Manufacturer name	32	68	100	150	220
	Exxon Mobile	Teresso 32	68	100	150	—
		DTE Oil Light	Heavy Medium	Heavy	Extra Heavy	BB
	General Sekiyu	Panorre 32	68	100	150	220
	Idemitsu Kosan	Dafuni Mechanic Oil 32	68	100	150	220
	Japan Energy (JOMO)	Retasu 32	68	100	150	220
	Shinnihon Sekiyu	FBK Oil RO32	68	100	150	220
	Showa Shell Sekiyu	Terasu Oil C32	68	100	150	220

3) Examples of lubrication at low and high temperatures (Table 3)

The following oils are available when roller chain is used at low or high temperatures. Regarding other brands, use an equivalent.

Ambient and operating temperature	-50°C to -25°C	-25°C to 0°C	-10°C to 60°C	60°C to 200°C	150°C to 250°C
Manufacturer name	Toray Dow Corning SH510			Sato Special Oil Co. Hot Bearing Oil #200	Sato Special Oil Co. High Thermal Lube #700
Lubrication name	Shin-Etsu Chemical KF50	Exxon Mobile Artic Oil C baby	See above	Exxon Mobile DTE Oil HH	Matsuken Moresukohai Lube R-220
	GE Toshiba Silicon TSF431			Matsuken Moresukohai Lube L-150	

Lubrication methods are drip, manual, and brush.

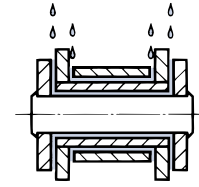


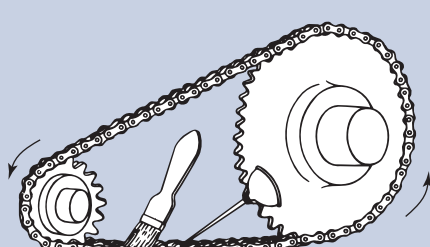
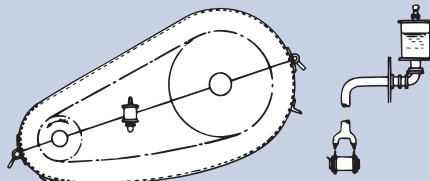
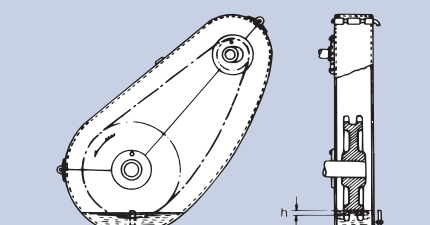
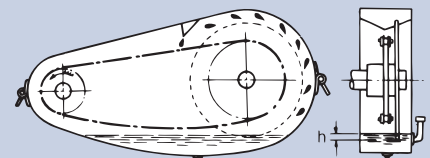
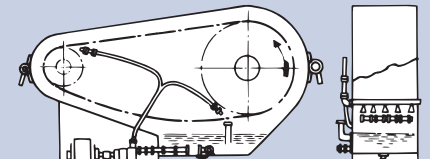
Fig. 10: Oiling locations

3.2 Chain used for lifting

- 1) In general the chain has no catenary parts. If possible, remove the load that acts on the roller chain before lubing the chain.
- 2) For roller chain that does not articulate, oil the chain sufficiently and then apply a thick layer of grease around the roller chain to prevent corrosion. Sufficiently lube end fitting connections, even if these do not move.
- 3) For roller chain that is used outdoors, contact with rain and snow will remove the lubrication and cause harmful corrosion, and thus a cover or other protection should be installed. If rain or snow does fall on the chain, remove the moisture and then promptly lube the chain and coat it with a thick layer of grease.



3.4 Lubrication systems and methods (Table 4)

Lubrication system	Method	Quantity																																	
A	<p>I</p>  <p>Apply oil to the gaps in the pins and inner links on the slack side of the chain. A brush can also be used.</p> <p>△ Stop operation before oiling.</p>	Oil with sufficient frequency (in general about once every 8 hours) so that the roller chain bearings do not dry out.																																	
	<p>II</p> <p>Drip Lubrication</p>  <p>Using a simple case, this method drips oil supplied from an oil cup.</p>	For one strand of chain, drip about 5 to 20 drops of oil each minute. Drip more oil on higher speed chains.																																	
B	<p>Oil Bath</p>  <p>The chain is run through oil in a leak-free casing.</p>	If depth h from the surface of the oil to the lowest point the chain reaches is too deep, the oil may heat up (80°C or higher) and deteriorate. The depth to which the chain descends in the oil should be about 6 to 12 mm.																																	
	<p>Lubrication using a Slinger Disc</p>  <p>Use a slinger disc attached to a leak free case to splash oil on the chain. The peripheral velocity of the disc should be 200 m/min or higher. If the width of the chain is greater than 125 mm, attach discs to both sides.</p>	The lowest point h reached by the slinger disc should be about 12 to 25 mm below the surface of the oil. The roller chain should not enter the oil.																																	
	<p>Forced Lubrication</p>  <p>The oil is circulated in a leak-free case and cooled by a pump. When there are n strands of chain, $n+1$ oiling holes are required, targeting the gaps between each part.</p>	<p>Approximate oiling quantity per oiling hole (L/min)</p> <table border="1"> <thead> <tr> <th rowspan="2">Name</th> <th rowspan="2">Chain number Chain speed (m/min)</th> <th colspan="4">Chain number</th> </tr> <tr> <th>RS60 or smaller</th> <th># 80 # 100</th> <th># 120 # 140</th> <th># 160 or larger</th> </tr> </thead> <tbody> <tr> <td>RS</td> <td>500 - 800</td> <td rowspan="2">1.0</td> <td rowspan="2">1.5</td> <td rowspan="2">2.5</td> <td rowspan="2">4.0</td> </tr> <tr> <td>SUP</td> <td>Less than 300</td> </tr> <tr> <td>RS</td> <td>800 - 1,100</td> <td rowspan="2">2.0</td> <td rowspan="2">2.5</td> <td rowspan="2">3.5</td> <td rowspan="2">5.0</td> </tr> <tr> <td>SUP</td> <td>300 - 500</td> </tr> <tr> <td>RS</td> <td>1,100 - 1,400</td> <td rowspan="2">3.0</td> <td rowspan="2">3.5</td> <td rowspan="2">4.5</td> <td rowspan="2">6.0</td> </tr> <tr> <td>SUP</td> <td>500 or more</td> </tr> </tbody> </table>	Name	Chain number Chain speed (m/min)	Chain number				RS60 or smaller	# 80 # 100	# 120 # 140	# 160 or larger	RS	500 - 800	1.0	1.5	2.5	4.0	SUP	Less than 300	RS	800 - 1,100	2.0	2.5	3.5	5.0	SUP	300 - 500	RS	1,100 - 1,400	3.0	3.5	4.5	6.0	SUP
Name	Chain number Chain speed (m/min)	Chain number																																	
		RS60 or smaller	# 80 # 100	# 120 # 140	# 160 or larger																														
RS	500 - 800	1.0	1.5	2.5	4.0																														
SUP	Less than 300																																		
RS	800 - 1,100	2.0	2.5	3.5	5.0																														
SUP	300 - 500																																		
RS	1,100 - 1,400	3.0	3.5	4.5	6.0																														
SUP	500 or more																																		

To verify sufficient lubrication is taking place, remove the chain and inspect the connecting pins and bushes. If the contact surfaces of the pins or bushes show tearing or a red or dark brown color, lubrication is generally not sufficient.

4. Layout and Installation of Roller Chain

4.1 Speed ratio and chain lap

A roller chain transmission speed ratio up to 7:1 is normally suitable; however, at very slow speeds a ratio up to about 10:1 is possible. The chain lap between the small sprocket and chain must be 120° or more. For lifting applications, the angle must be 90° or more.

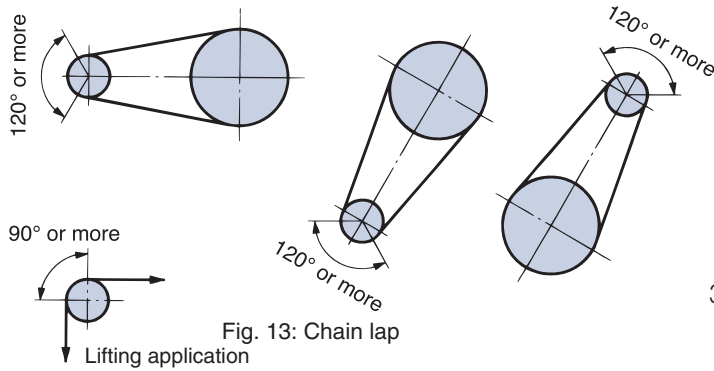


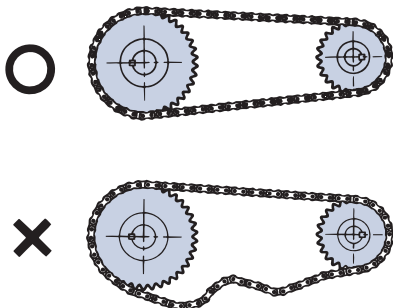
Fig. 13: Chain lap

4.2 Distance between shafts

The minimum distance can be as short as desired as long as the teeth of the two sprockets are not in contact. The optimum center-to-center distance between the shafts is 30 to 50 times the pitch of the roller chain. However, if the load is variable, a distance of 20 times or less is suitable.

4.3 Amount of slack

1) Unlike V or flat-belt transmission, there is no need to apply an initial tension in roller chain transmission; roller chain is normally used with a suitable amount of slack. If too much tension is applied to roller chain, the oil film between the pins and bushes will be broken, causing increased wear and damage on the roller chain and bearings. If there is too much slack in the roller chain, the chain will vibrate and ride up the sprocket, damaging both chain and sprocket.



2) If possible, the lower side should be the slack side in roller chain transmission. The amount of slack is appropriate when the distance (SS) that the chain can be moved perpendicularly by hand at the center of the slack side is 4% of the span (AB). (For example, when the span is 800 mm, the amount of slack should be $800 \text{ mm} \times 0.04 = 32 \text{ mm}$.)

In the following situations, this should be 2%:

- 1) When the transmission is vertical or close to vertical (a tensioner is required).
- 2) When the distance between the shafts is more than 1 m.
- 3) When frequent starts are made with a heavy load.
- 4) When sudden reverse motion takes place.

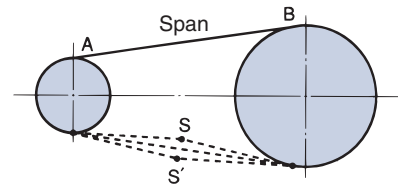


Fig. 14: Amount of slack

3) Roller chain will stretch slightly during the first few dozen hours of use as the contact surfaces wear in (about 0.05%). This may result in too much slack in the roller chain and may require adjustment of the slack. A tensioner can be used if the layout is designed for it. If you do not have a tensioner, move the shafts to adjust the amount of slack. Once the chain is worn-in, very little stretching will occur.

4.4 Horizon precision and parallelism of the shafts

The installation precision of the sprocket has a large effect on the smoothness of roller chain transmission. It also affects roller chain life.

Install the sprockets correctly as described below.

- 1) Verify Horizontal precision with a level. Adjust the precision to within $\pm 1/300$.

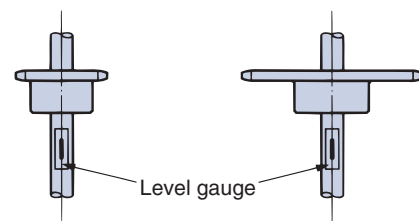


Fig. 15: Horizontal precision

2) Use a scale to correct the degree of parallelism of the shafts.

Adjust the shafts so that they are parallel to within $\pm 1/300 = (A-B/L)$.

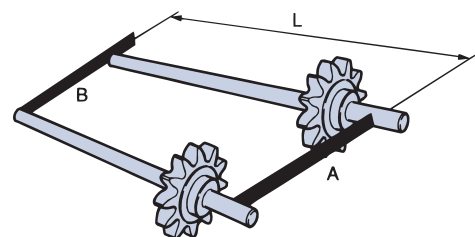


Fig. 16: Degree of parallelism of the shafts



- Using a straightedge (or a scale), adjust the two sprockets so that they are parallel. Adjust to within the following values based on the distance between the shafts.

Up to 1 m : ± 1 mm
 1 m to 10m : $\pm \frac{\text{Distance between shafts(mm)}}{10,000}$
 10m or more : ± 10 mm

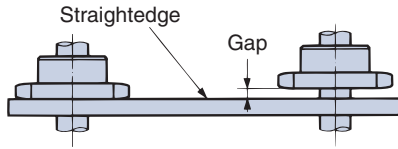


Fig. 17: Sprocket misalignment

- Secure each sprocket to the shaft with a power lock, lock sprocket, or key (if needed use a collar, set bolt, etc.).

4.5 Layout (⊕ indicates the driver side in the illustrations)

1) General layout

Ideally the line connecting the sprocket centers in the roller chain transmission equipment should be close to level. In a layout that is close to vertical, the roller chain may stretch and fall off the sprocket. Thus, an idler or tensioner should be used. If possible keep the angle of inclination within 60° .

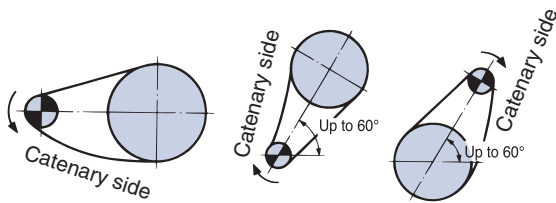


Fig. 18: General layout

2) Layouts requiring caution

- When the slack is on the upper side

When the center-to-center distance between the shafts is short, move the shafts to adjust the distance and slightly increase the tension.

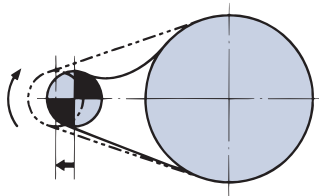


Fig. 19: Layout when the center-to-center distance is short

When the center-to-center distance is long, insert an intermediate idler under the slack part to support the roller chain.

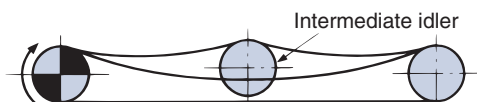


Fig. 20: Layout when the center-to-center distance is long

- When the chain speed is fast and the load varies
 Roller chain may vibrate if the natural vibration frequency of the chain, shock frequency of the driven machine, or chordal action of the chain (vertical pulsation of the chain due to the polygon effect) synchronize. In this event, use a guide shoe (made of NBR or ultra-high polymer polyethylene) or other device to stop the vibration.

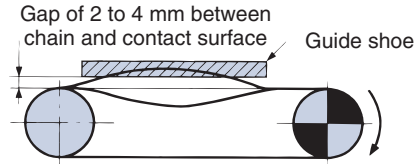


Fig. 21: Guide shoe to prevent vibration

- When the centerline is vertical
 Install a tensioner that can automatically eliminate excess slack. This is particularly necessary when the drive shaft is on the bottom.

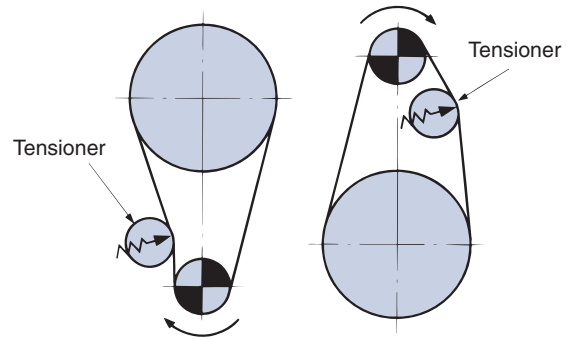
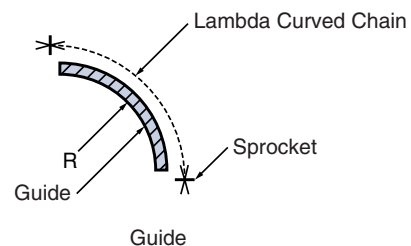


Fig. 22: Vertical transmission

4.5 Lambda Curved Chain installation

1) Installing the guide

Compared to a standard chain, a Lambda Curved Chain has a larger gutter between the pins and bushes, providing a greater degree of freedom. For this type of chain, please install a guide on the chain so that it engages straight onto the sprocket.



2) Minimum lateral bending radius (r)

Please manufacture the chain so that its minimum lateral bending radius is equal to or greater than the specifications shown below.

	Minimum lateral bending radius (r)
RS40-LMC-CU-I	400
RS50-LMC-CU-I	500
RS60-LMC-CU-I	600

5. Sprockets

5.1 Hardening of the teeth

When a sprocket is used under the following conditions, the sprocket teeth must be hardened.

- 1) When there is a small number of teeth (24 or less), and the speed is 1/8 or higher of the maximum rotation speed indicated on the kilowatt ratings tables.
- 2) When using small sprockets with a speed ratio of greater than 4:1.
- 3) When a large load is used at low speed (when using the Low-Speed Selection Method).
- 4) When using under conditions that will cause wear to the teeth.

5.2 Number of teeth

As many teeth as possible should be used on the sprocket on the high-speed shaft side to help ensure smooth drive transmission. Generally, 15 or more teeth should be used. However, when the speed ratio is high and the number of teeth on the low-speed sprocket exceeds 120, chain engagement problems can occur when there is even slight chain wear. In this case, decrease the number of teeth on the high-speed sprocket, but the number of teeth should still be kept to 13 or higher. However, if the sprocket will be used at extremely low speed and not subjected to shock, a sprocket with 12 or fewer teeth can be used.

5.3 Precautions related to additional processing

1) Shaft hole processing

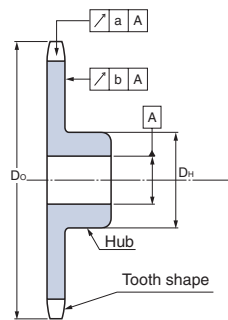
① Maximum shaft hole processing dimensions

The maximum finished shaft hole size should be at or below the size shown in the specifications for each model number. Please consult Tsubaki if using standards other than the JIS standards key.

② Processing standards

When processing, verify the standards for the tooth outer diameter ("D_o" in the diagram) and the hub outer diameter ("D_H" in the diagram).

Also, verify that the deflection on the bottom of the tooth ("a" in the diagram) and the deflection on the end surface of the tooth ("b" in the diagram) are at or below the values shown below.



When using machine specifications

Diameter of tooth-bottom cylinder	90 or less	> 90 but ≤ 190	> 190 but ≤ 850	> 850 but ≤ 1180	Greater than 1180
Deflection at tooth bottom a	0.15	0.0008d _r /+0.08			0.76
Face runout	0.25		0.0009d _r /+0.08		1.14

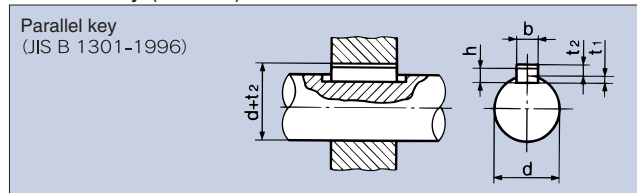
2) Sprocket welding

When welding a hub to A-type sprockets for use, the welding can cause deformation or deflection of the tooth and surface, making it impossible to maintain product quality. As such, welding should be avoided. With the A-type strong series sprocket, welding can also decrease the hardness of the sprocket, so again, welding should be avoided.

3) Processing on the hub outer diameter

Do not perform any additional processing to the outer diameter of the hub. If processing needs to be performed, please first consult with Tsubaki.

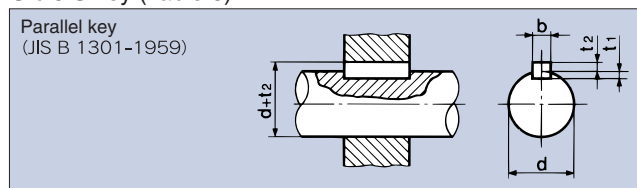
New JIS key (Table 5)



Shaft hole diameter d	Designated key diameter Shaft × Height b × h	Keyway depth	
		Shaft t ₁	Boss d+t ₂
6 — 8	2×2	1.2	d+ 1.0
8 ↗ 10	3×3	1.8	d+ 1.4
10 ↗ 12	4×4	2.5	d+ 1.8
12 ↗ 17	5×5	3.0	d+ 2.3
17 ↗ 22	6×6	3.5	d+ 2.8
20 ↗ 25	(7×7)	4.0	d+ 3.0
22 ↗ 30	8×7	4.0	d+ 3.3
30 ↗ 38	10×8	5.0	d+ 3.3
38 ↗ 44	12×8	5.0	d+ 3.3
44 ↗ 50	14×9	5.5	d+ 3.8
50 ↗ 55	(15×10)	5.0	d+ 5.0
50 ↗ 58	16×10	6.0	d+ 4.3
58 ↗ 65	18×11	7.0	d+ 4.4
65 ↗ 75	20×12	7.5	d+ 4.9
75 ↗ 85	22×14	9.0	d+ 5.4
80 ↗ 90	(24×16)	8.0	d+ 8.0
85 ↗ 95	25×14	9.0	d+ 5.4
95 ↗ 110	28×16	10.0	d+ 6.4
110 ↗ 130	32×18	11.0	d+ 7.4
125 ↗ 140	(35×22)	11.0	d+11.0
130 ↗ 150	36×20	12.0	d+ 8.4
140 ↗ 160	(38×24)	12.0	d+12.0
150 ↗ 170	40×22	13.0	d+ 9.4
160 ↗ 180	(42×26)	13.0	d+13.0
170 ↗ 200	45×25	15.0	d+10.4
200 ↗ 230	50×28	17.0	d+11.4
230 ↗ 260	56×32	20.0	d+12.4
260 ↗ 290	63×32	20.0	d+12.4
290 ↗ 330	70×36	22.0	d+14.4
330 ↗ 380	80×40	25.0	d+15.4
380 ↗ 440	90×45	28.0	d+17.4
440 ↗ 500	100×50	31.0	d+19.5

Note: The nominal dimensions shown in parentheses are not defined in international standards.

Old JIS key (Table 6)



Shaft hole diameter d	Designated key diameter Shaft × Height b × (t ₂ × t ₁)	Keyway depth	
		Shaft t ₁	Boss d+t ₂
10 or higher	13 Greater than	2.5	d+ 1.5
13 or lower	20 ↗	3.0	d+ 2.0
20 ↗	30 ↗	4.0	d+ 3.0
30 ↗	40 ↗	4.5	d+ 3.5
40 ↗	50 ↗	4.5	d+ 3.5
50 ↗	60 ↗	5	d+ 5
60 ↗	70 ↗	6	d+ 6
70 ↗	80 ↗	7	d+ 6
80 ↗	95 ↗	8	d+ 8
95 ↗	110 ↗	9	d+ 9
110 ↗	125 ↗	10	d+10
125 ↗	140 ↗	11	d+11
140 ↗	160 ↗	12	d+12
160 ↗	180 ↗	13	d+13
180 ↗	200 ↗	14	d+14
200 ↗	224 ↗	16	d+15.5
224 ↗	250 ↗	18	d+17.5



6. Chain Test Run

After installing the chain, carry out a test run and check the following items before you actually start running the chain.

6.1 Pre-Test Run

- 1) Connecting link plates, clips, and cotter pins are installed correctly.
- 2) Chain slack has been properly adjusted.
- 3) Adequate lubrication is available.
- 4) The chain is not touching the chain case.
- 5) The roller chain path is clean and free from obstructions.

6.2 Test-Run

- 1) There should be no strange noises. Make sure the chain does not touch the case.
- 2) Look for excessive chain vibration.
- 3) Make sure the chain does not run up on the sprockets.
- 4) Ensure that the chain is not jammed into the sprockets.
- 5) The chain should articulate smoothly.

Check the inspection items if there are any problems, and ensure roller chain and sprocket are correctly installed.

7. Roller Chain Inspection

- 1) In general, life of roller chain is said to be reached when parts are damaged or when 1.5% wear elongation occurs. (see 6) in 7.3) Try to replace the chain before these conditions occur.
- 2) If roller chain selection and operating conditions are suitable, you can expect rather long life with no unexpected trouble from the chain. However, wear will progress between the pins and bushes after long periods the following should be noted and inspected.

7.1 Inspection Checklist (Table 7)

Procedures	Method	Inspection items	Reference page for details
Step I	Visually check the chain during operation and look for any abnormalities.	<ol style="list-style-type: none"> 1. There should be no strange noises. 2. Look for excessive chain vibration. 3. Make sure the chain does not run up the sprockets. 4. The chain is not jammed into the sprockets. 5. There are no stiff areas during articulation. 6. Adequate lubrication is available (lubricating system and quantity of oil). 7. Make sure the chain doesn't touch the case. 	Inspection points are on the following pages and on the troubleshooting pages.
Step II	Stop the chain and carefully inspect each part of the chain and sprocket.	<ol style="list-style-type: none"> 1. Check the external cleanliness, corrosive, and lubrication conditions; also, look for scratches or other damage to the plate side and edge surfaces, pin edges, and roller surfaces. 2. Inspect for pin rotation and the clearance between the plate and the pins. 3. Inspect the sprocket teeth surfaces and teeth side surfaces for scratches or marks. 4. Measure the wear elongation of the chain. 5. Check the articulation of the chain and rotation of the rollers. 6. When using an end fitting for lifting applications, inspect the wear of the end bolts and the wear of the connecting plate pins. Also, check for proper installation at the same time. 	
Step III	In order to investigate in more detail, remove the roller chain and inspect it visually or check it with measuring instruments.	<ol style="list-style-type: none"> 1. The inspection items are identical to those in Step II except in more detail. 	

7.2 Inspection intervals

Regular inspection of roller chain is recommended at one month intervals. Inspection should be carried out at shorter intervals in:

- 1) Special or corrosive environments.
- 2) High speeds with sudden stoppage.
- 3) Lifting or indexing operations.

7.3 Inspection requirements for ordinary transmission

1) Inspection lubrication conditions

- ① During operation, check to see if there is lubrication in the clearance between the outer plate and inner plate. Also, check if the chain or rotating disc is immersed in lubricating oil.
- ② When the chain is stationary, the chain surface will generally appear dirty from wear dust if lubrication is unsatisfactory. This is especially the case between the link plates.
- ③ When the chain is removed, connecting link pins and the edge of the inside of the bushes should be checked. If there are any scratches, red or reddish-brown color, lubrication is improper or insufficient.

2) Inspecting link plates

- ① If repeated loads over the maximum allowable load are put on the chain, there is a strong possibility of fatigue breakage of the link plate. It is difficult to notice initial cracking from fatigue breakage simply from external observation.
- ② Usually, a crack develops at the edge of a hole or at the side of the link plate, as shown in the illustrations below. The presence of cracks should be checked carefully. Fatigue breakage progresses little by little, so it can be noticed with close attention.



Positions where cracks are likely to develop



Example of a crack

Fig. 23 Cracks on the link plates

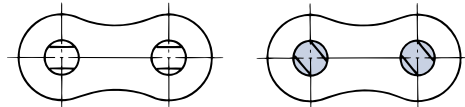
- ③ When wear occurs from sliding between the edges of the plates and the guides, it is necessary to adjust the position of either the chain or the guides. The allowable wear on the link plates is limited to 5% of their height.



Fig. 24 Wear on the edges of the link plates

3) Inspecting Pins

When the pins rotate, the roller chain must be completely replaced with new chain. This also applies to the connecting pins. By removing the connecting parts it is possible to see the conditions of wear and rust on the surfaces of the pins.



Correct position

Rotated position

Fig. 25 Rotation of the pins

4) Inspecting rollers

- ① As with the link plates, if rollers are also subjected to loads over the maximum allowable load, the repeated impact load between the chain and the sprockets may cause fatigue breakage to occur. The roller should be checked in the same way as the link plate.
- ② If foreign objects interfere with the engagement of the roller and sprocket, the roller may be damaged and a crack may develop. Careful attention should be paid to the above. Furthermore, with high-speed operations, even if foreign objects do not interfere with engagement, cracks may appear from the impact with the sprocket teeth.



Fig. 26 Cracks on the rollers

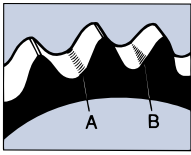
- ③ Chains damaged by fatigue breakage from the rollers must be completely replaced, as each part has received the same amount of repeated load.
- ④ Also check for poor roller rotation.

5) Inspecting sprockets

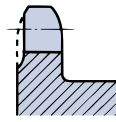
- ① Chain and sprocket engagement can be checked by observing the roller and teeth surface. Proper engagement is when the contact area is uniform with point A in the illustration. If the contact area is lopsided or the sides of the teeth are wearing away (point B), this may have been caused from improper installation of the sprockets or twisting of the roller chain. In this case, rechecking/readjustment is necessary.
- ② The normal point of impact is slightly up from the tooth bottom. However, when initial tension is applied to the chain and tension remains on the slack side, the roller will slightly touch the tooth bottom. However, point A receives the strongest impact.



- ③ When idlers or tensioners are used, the contact area will be the center of the tooth bottom.



B: Improper installation



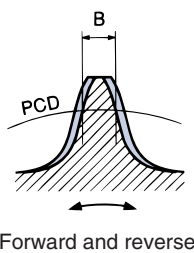
Improper installation causes the surface of the teeth to become ground down

Fig. 27 Contact area of the sprocket teeth

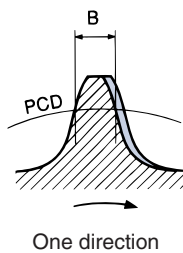
- ④ When wear on the teeth reaches the values in the following table, the lifespan of the sprocket has been reached. For a sprocket with induction hardened teeth, the lifespan is reached when the hardened layer has been removed.

Limit of usage based on tooth thickness/Dimension B (Table 8)

Size of RS Roller Chain	Dimension B		Size of BS Roller Chain	Dimension B Normal
	Normal	Pin-Gear		
RS 11-SS-1	0.6	—	RFO6B-1	1.6
∅ 15-1	1.1	—	RS08B-1	2.1
∅ 25-1	1.5	—	∅ 10B-1	2.9
∅ 35-1	2.5	—	∅ 12B-1	3.6
∅ 41-1	2.6	—	∅ 16B-1	5.0
∅ 40-1	2.5	3.1	∅ 20B-1	6.8
∅ 50-1	2.9	3.6	∅ 24B-1	7.2
∅ 60-1	3.7	4.6	∅ 28B-1	8.6
∅ 80-1	5.0	6.3	∅ 32B-1	11.9
∅ 100-1	6.9	8.6	∅ 40B-1	12.7
∅ 120-1	8.7	10.9		
∅ 140-1	10.6	13.3		
∅ 160-1	12.4	15.5		
∅ 180-1	11.3	14.1		
∅ 200-1	12.6	15.8		
∅ 240-1	15.1	18.9		
RF320-T-1	19.9	24.9		
RF400-T-1	24.9	31.2		



Forward and reverse



One direction

- ⑤ If a new roller chain is run on a worn sprocket, the chain will wear at a faster rate than normal. In this case, when replacing the chain, replacement of the sprocket is also recommended.

6) Inspection of chain elongation

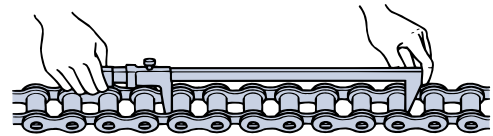
- ① Chain elongation is caused not by deformation of the link plate, but by wear on the pin and bush. Therefore, the remaining chain life can be estimated by periodically measuring the chain elongation.

② Measuring chain elongation

- The chain should be measured whilst stretching it slightly to eliminate any slack.
- Measure the distance of the inside (L1) and outside (L2) of the rollers at both ends of the measured links using a vernier to get a measurement (L).

$$L = \frac{L_1 + L_2}{2}$$

- (3) When measuring, use at least 6 to 10 links to help keep any measuring error down to a minimum.



Positioning of vernier callipers for measuring 6 links

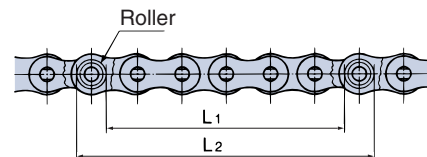


Fig. 28 Measurement of length

(4) Finding the chain elongation

$$\text{Chain elongation (\%)} = \frac{\text{Measured length} - \text{Standard length}}{\text{Standard length}} \times 100$$

$$\text{Standard length} = \text{Chain pitch} \times \text{Number of links}$$

- For multi-strand roller chain, the measurement is carried out in the same way as for single strand roller chain of the same pitch.
- The limit of usage based on roller chain elongation for a smooth transmission is as follows.

Limit of usage based on elongation (table 9)

Large sprocket with up to 60 teeth	Chain elongation 1.5%
Large sprocket with between 61 - 80 teeth	Chain elongation 1.2%
Large sprocket with between 81 - 100 teeth	Chain elongation 1.0%
Large sprocket with between 101 - 110 teeth	Chain elongation 0.8%

- (7) Dimensions for evaluating standard length (chain pitch x number of links) and 1.5% elongation are shown in Table 10 below.
- (8) When the length of the roller chain cannot be measured with a vernier, a tape measure may be used; however, measurements need to be taken over as many links as possible to reduce measuring error.
- (9) When chain elongation of Lambda/X-Lambda Roller Chain reaches about 0.5% it may be losing its lubricating properties. This may be determined by the adhesion of red wear particles between the plates and the occurrence of articulation stiffness. When this occurs, the life of the chain has been reached.

- 4) Inspection of twisting and side bending of the roller chain. If partial twisting or side bending of the chain occurs, the complete roller chain should be replaced. (Fig. 29)

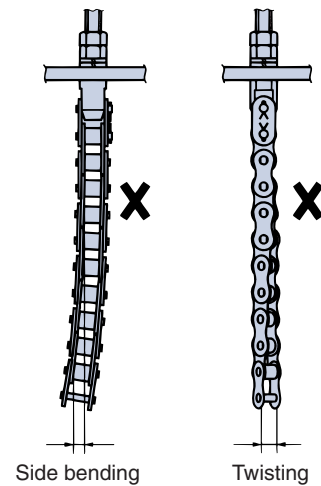


Fig. 29 Twisting of the roller chain

Standard Length and 1.5% Elongation (Table 10)

Chain No.		RS25	RS35	RS41	RS40
6 link Measure	Standard length	38.10	57.15	76.20	76.20
	1.5% Elongation	38.67	58.01	77.34	77.34
10 link Measure	Standard length	63.50	95.25	127.00	127.00
	1.5% Elongation	64.45	96.68	128.91	128.91

Chain No.		RS50	RS60	RS80	RS100
6 link Measure	Standard length	95.25	114.30	152.40	190.50
	1.5% Elongation	96.68	116.01	154.69	193.36
10 link Measure	Standard length	158.75	190.50	254.00	317.50
	1.5% Elongation	161.13	193.36	257.81	322.26

Chain No.		RS120	RS140	RS160	RS180
6 link Measure	Standard length	228.60	266.70	304.80	342.90
	1.5% Elongation	232.03	270.70	309.37	348.04
10 link Measure	Standard length	381.00	444.50	508.00	571.50
	1.5% Elongation	386.72	451.17	515.62	580.07

Chain No.		RS200	RS240
6 link Measure	Standard length	381.00	457.20
	1.5% Elongation	386.72	464.06
10 link Measure	Standard length	635.00	762.00
	1.5% Elongation	644.53	773.43

- 5) End fittings

Check for damage by deformation of the hole due to wear. If the hole is damaged or deformed, replace the end bracket immediately. The clearance on the pinhole of the bracket affects the life of the roller chain and should be kept to a minimum

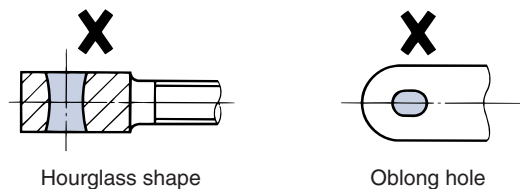


Fig. 30 Wear on the end fitting hole

7.4 Inspection of lifting and shuttle traction

- 1) This should be carried out with the same requirements as for ordinary transmission shown in item 6.3.
- 2) It is important to check the lubrication of the connecting parts between the roller chain and end brackets where end brackets are installed, as well as the parts where the roller chain winds around the sprocket. (Refer to item 3.2 on page 151)
- 3) The parts where the roller chain bends around the sprocket should be checked when inspecting the wear elongation of the roller chain.

7.5 Storage

Avoid storing spare parts, such as a roller chain, sprockets, and end brackets, in high temperature/high humidity and dusty environments. Also, when storing roller chain that has been removed, wash the roller chain and then apply lubrication. After the roller chain clearances have been supplied with a sufficient amount of lubricant, wrap the chain in grease paper completely before storing away.



8. Cautions on Use in Special Environments

As a general rule, roller chain should be used in a clean air flow; however, when used in a special atmosphere, reference should be made to the various items that follow.

8.1 Use in wet conditions

If the chain is used in a sterilizing machine or water screen, for example, where the chain is splashed with water or goes through heated vapor, the following problems may occur.

- 1) An increase in abrasive stretch due to improper or insufficient lubrication.
- 2) Decrease in fatigue strength from rust and corrosion (pitting) of the chain.
 - 1) Countermeasures
 - (1) Reduce bearing pressure using a larger sized chain to improve wear resistance.
 - (2) Use corrosion resistant roller chain for rust prevention.

8.2 Use in acidic or alkaline conditions

If roller chain is exposed to acids or alkaline conditions, such as battery acid and liquid used in plating processes, the following problems may occur.

- 1) Embrittlement fracture of link plates and pins.
- 2) Fatigue breakage of link plates and pins due to rust and pitting corrosion.
- 3) Wear from usual mechanical abrasion and corrosion.
- 4) Reduction in volume of the whole chain from corrosion.
- 5) In special cases where the chain is underwater (immersed in liquid), electrochemical corrosion may occur.
- 6) There are also circumstances where even stainless steel roller chain will corrode. Fig. 31 shows an example of chain that was used in a plating apparatus. The chain fell to pieces within one month due to the affect of the acid.



Fig. 31 Corrosion of stainless steel roller chain

- 1) Countermeasures for embrittlement fractures (Stress corrosion cracking)
 - Adopt a brittleness countermeasure that lowers crack susceptibility.
 - Install a cover or casing to prevent acids or alkalis from contacting the chain.
 - Adopt a high-grade material with anti-corrosive properties.
- 2) Countermeasures for corrosion
 - Use surface-treated chain.
 - Install a cover or casing to prevent acids or alkalis from contacting the chain.
 - Adopt a high-grade material with anti-corrosive properties.

In general, embrittlement fractures (stress corrosion cracking) occur around the link plate holes. This is the area where the pin and bush are press-fitted to the link plate having the highest concentration of stress. Cracks are generated even when there is no tension on the chain. Roller chain in general is more susceptible to acids than alkalis, and in special cases, embrittlement fractures (stress corrosion cracking) are generated by seawater or pit water.



Fig. 32. Hydrogen embrittlement cracking

8.3 Use under conditions where abrasion is a problem

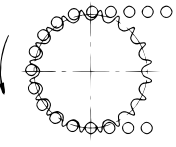
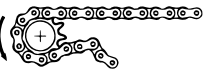
If the chain is exposed to strong abrasive materials that promote wear such as sand, coke and metal particles, the following problems may occur:

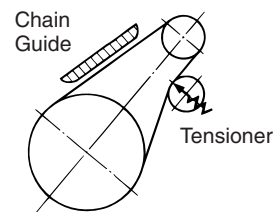
- 1) When abrasive materials penetrate between the pins and bushes, chain wear is promoted and poor articulation occurs.
- 2) When abrasive materials penetrate between the bushes and rollers, chain wear is promoted and poor roller rotation occurs.
- 3) When the abrasive materials penetrate between the link plates, poor articulation occurs.
 - 1) Countermeasures
 - Apply a dust-protection casing.
 - Remove foreign particles by regularly washing the roller chain.
 - Reduce bearing pressure using a larger sized chain to improve wear resistance.
 - Increase abrasion resistance by applying special processing to the parts of the chain where abrasion is a problem.

9. Roller Chain Drive Troubleshooting and Problem-Solving


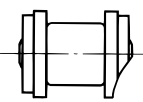


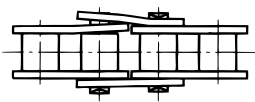
When there is significant damage and breakage with regard to the roller chain and sprockets, please carry out the following remedies and replace with new chain and sprockets.

9.1 General

Symptom	Possible Causes	Remedy
 <p>Chain is riding up on the sprocket.</p>	The roller chain and sprocket do not match.	Replace the chain or sprocket with the correct size.
	Excessive load.	Decrease the load, or increase the number of strands or size of the chain.
	Elongation of the chain due to wear or excessively worn sprocket teeth.	Replace with new chain and sprockets.
Unusual noises.	Improper installation of the sprocket or shaft.	Inspect and correct.
	Chain casing or bearings are loose.	Tighten all bolts and nuts.
	Excessive or insufficient slack in the chain.	Adjust the distance between shafts to obtain the proper amount of slack.
	Excessively worn chain or sprocket.	Replace the chain and sprocket with new chain and sprocket.
Excessive vibrations in chain.	Lack of or unsuitable lubrication.	Provide proper lubrication according to the operating conditions.
	Chain is resonating with periodic external force.	Change the chain's mode of vibration. <ol style="list-style-type: none"> 1. Preventing resonance. <ol style="list-style-type: none"> a. To change the natural frequency of the chain. <ul style="list-style-type: none"> • Alter the effective tension either by applying an initial tension or adjusting the existing one. • Install a tensioner to change the chain span. • Replace the chain. Choose a different quality and spring coefficient. b. Change the vibration frequency. <ul style="list-style-type: none"> • Change the speed of rotation of the sprocket. • Re-evaluate the device set-up. 2. Mechanically reducing the vibrations. <ul style="list-style-type: none"> • Install a guide shoe. • Install a self-adjusting tensioner on the slack side.
Load fluctuations are excessively large.	Reduce fluctuations with fluid coupling or similar technique.	
 <p>The chain winds onto the sprocket. (Poor separation from the sprocket teeth)</p>	Span between shafts is too large.	Install an idler.
	Excessive slack in chain.	Adjust the chain length or distance between shafts. Install a tensioner.
	Elongation of the chain due to chain wear or excessively worn sprocket teeth.	Replace with new chain and sprocket.





Symptom	Possible Causes	Remedy
Rusting of the chain	Improper lubrication or poor environment.	Replace chain and protect it from the environment with chain casing or proper lubrication.
Excessive wear on the inside surface of the link plates and sides of the sprocket teeth.	Improper installation 	Correct sprocket and shaft installation.
Excessive wear on the link plate side surfaces and pin heads.	Improper installation of guides, etc. 	Check the condition of the guides, and increase the gap between the guides and the chain.
 Improper flex or bending of chain, tight joints.	Chain is not installed correctly.	Inspect the installation and correct as necessary.
	Contamination from metal dust or dirt because of improper lubrication.	Remove the chain, wash it thoroughly, and provide proper lubrication.
	Excessive load or bent pin.	Reduce the load or increase the number of or size of chains. Replace chain with a larger size.
	Corrosion or rusting.	Install a chain casing to protect the chain.
	Seizing from improper lubrication.	Provide proper lubrication according to the operating conditions.
	Seizing of pin and bush.  Pin and bush seized from high-speed operation. This causes improper bending and can lead to chain breakage.	Provide the proper operating conditions.
Spreading of link plates.	Uneven or excessive loading caused by improper installation. 	Replace with new chain and correct installation.

Before Use
For Safe Use
Standard Roller Chains
Lube-Free Roller Chains
Heavy Duty Roller Chains
Corrosion Resistant Roller Chains
Specialty Roller Chains
Accessories
Selection
Handling

9.2 Link Plate Related

Symptom	Possible Causes	Remedy
Breakage of link plate.	Excessively large shock load.	Reduce shock loads by making the start-up, stopping, and other actions smoother (installing a shock absorber, etc.). Increase the size or number of chains.
	Vibration in the chain.	Install an anti-vibration device (for example, tensioner or idler), Refer to "Excessive vibration in chain" page.
	Large inertia in the driven machine. (excessive load).	Increase the size of number of chains.
	Corrosion.	Replace with a new chain. Install a casing to protect the chain. Otherwise, periodically clean the chain.



① Static fracture

Stretching the link plate with a tensile load beyond its breaking load will cause it to stretch and then break.



② Fatigue fracture

By repeatedly applying a load past its fatigue limit (fatigue strength), the fatigue will start at holes and then suddenly break.



③ Offset link plate fatigue

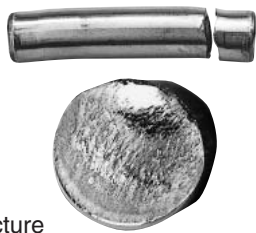
Offset link plates are bent at the center, and the resulting concentration of stress at the bend can cause a fatigue break. Avoid using offset links in high-stress applications.

Cracks in the link plates (fatigue), which are perpendicular to the direction of pull.	Loads are greater than allowable.	Remove all large or excessively repeating loads. Otherwise, increase the size or number of chains. Replace with a new chain.
Deformation of link plate holes.	Excessive load.	Remove the cause of the excessive load. Replace with a new chain.
Corrosion stress cracks appear, usually as bow-shaped cracks in the link plate.	The chain is being used in an acidic or alkaline environment. (This is not caused by a repetitive load).	<ul style="list-style-type: none"> Replace with a new chain. Install a casing to protect the chain from the environment. Consider a chain with a high resistance to corrosion stress cracks. (Please consult Tsubaki.)



9.3 Pin Related

Symptom	Possible Causes	Remedy
Breakage of pin.	Excessively large shock loads.	Reduce shock loads by making the start-up, stopping, and other actions smoother.
	Subject to a repetitive load greater than the fatigue limit of the pin.	Remove the large repetitive load. Otherwise, increase the size or number of chains.
	Corrosion.	Install a casing to protect the chain. Periodically clean and lubricate the chains.



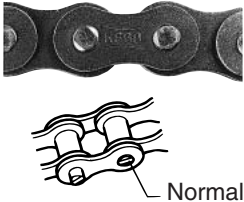
① Static fracture
The type of fracture found when subjecting the chain to the breakage test. Occurs when chain is subjected to a load greater than its breakage strength.





② Fatigue fracture
Occurs when the pin is repetitively subjected to loads greater than its fatigue limit. Re-check the size of the peak load and formulate a countermeasure.



③ Shock-induced bending fracture
The pin is subjected to a large shock load and breaks. The side with the initiating point receives tensile load, and the fracture progresses from this point. A pin is especially susceptible to becoming weak with regard to bending when the surface of the pin has corroded. This type of phenomenon occurs quite easily.

Pin rotates or begins to stick out.	Excessive load or improper lubrication.	Replace with new chain. Improve the lubrication or loading conditions.
 Normal	Operating a chain at high load without proper lubrication can create friction between the pin and bush, causing the pin to rotate. In this condition, the pin may come out, leading to chain breakage.	Replace with new chain immediately. Do not weld or reuse the pins. (Dispose of the old chain to be sure that it is not used again by mistake.) Also, if the pin head or link plate surface is worn, check the installation.
Wear or rust occurs only at the connecting pin in a lifting application or similar operation.	Improper initial lubrication at installation.	Replace the connecting link. If pin wear is excessive, replace the chain also. Take special care to properly install the connecting section for devices such as end brackets used for lifting applications, etc.

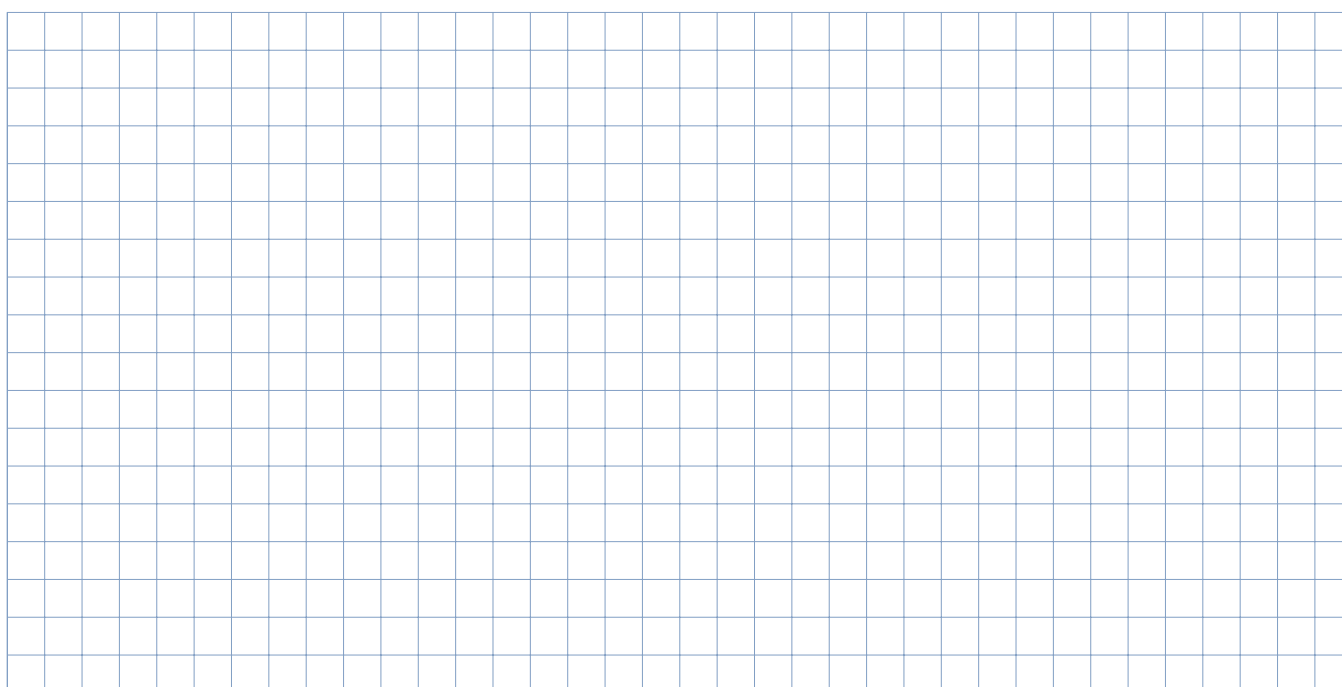
9.4 Bush / Roller Related

Symptom	Possible Causes	Remedy
Roller and/or bushing splits. (Falls)	Excessive load or speed of rotation.	Choose a different chain according to the kW ratings table.
	Inadequate lubrication.	Replace the chain. Provide adequate lubrication according to the operating conditions.
Roller does not rotate.	 Fatigue fracture. Reached the point of fatigue during operation and eventually broke. Impact with the sprocket teeth at a force exceeding the chain's transmission capacity.	
	RS11-SS-1, RS15-1, RS25-1, RS35-1	A bushed chain and not a roller chain is being used.
	The inner link plate is moving inward, or the bush is cracked.	Replace with a new chain. Re-inspect the installation and load conditions.
Roller is opening up.	Foreign particles have gotten between the bush and roller.	Periodically clean the chain. Install a casing to protect the chain.
	Excessive load. 	Reduce the load. Provide adequate lubrication.
Roller is becoming hourglass shaped.	Excessive load or inadequate lubrication.	Replace with new chain. Improve the lubrication or loading conditions.

Roller Chain Inquiry Sheet

1	Machine used	2	Chain	New installation	Replacement			
3	Only for replacement	Indicate currently used items at right	Chain number	Sprocket number				
	Number of links							
4	Operation time	Hours/day	Days/month	5	Motor output shaft torque (rated)	Hours/day	Days/month	
Note: If item 5 is not known, complete items 6, 7, and 8.				6	Type and rated output of motor			
7	Output and reduction gear ratio of reduction gears	kW	8	RPM of drive shaft and driven shaft r/min Drive shaft() Driven shaft()				
9	Do you have fluid couplings?	Yes	No	10	Do you have cushion start/stop?		Yes	No
11	Distance between shafts	mm	12	Load fluctuation	Smooth	Moderate shock	Large shock	
13	Frequency of starting (stopping) or forward (reverse) operation					Times/day (8 h)		
Note: When frequency of item 12 is for ordinary transmission: 5 times/day (8 h) or more When frequency of item 12 is for lifting, shuttle traction, or pin gear: 6 times/day (8h) or more							}	In this case, complete items 14 to 17.
14	Moment of inertia or GD ² of motor		kg·m ² {	kgf·m ² }				
15	Moment of inertia or GD ² converted to roller chain driven shaft inertia		kg·m ² {	kgf·m ² }				
16	Starting torque	kN·m {	kgf·m }	17	Stopping torque	kN·m {	kgf·m ² }	
18	Ambient temperature	Normal temperature (-10°C to 60°C)		°C to	°C			
19	Atmosphere	Abrasive dust (Yes No), Other		Acidic, alkaline, or other corrosive		Fluid Gas	(Yes No)	
20	Drive shaft diameter	() mm	Driven shaft diameter		() mm			
21	Trouble or other special mention		Company position					

22	Simple diagram of layout from prime mover to chain drive section	Note: For a conveyor drive or other application with a high shock frequency, indicate the size of the conveyed load, weight, speed, and conveyor length.
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COMPANY

NAME	TEL
DATE	FAX



TSUBAKIMOTO CHAIN CO.

Headquarters

Nakanoshima Mitsui Building
3-3-3 Nakanoshima, Kita-ku
Osaka 530-0005, Japan
Phone : +81-6-6441-0011
Facsimile : +81-6-6441-0489
Internet:
<http://tsubakimoto.com/>

Chain Division

Chain Sales Department
1-3 Kannabidai 1-chome
Kyotanabe, Kyoto 610-0380, Japan
Phone : +81-774-64-5023/4
Facsimile : +81-774-64-5212

For further information please
contact the Chain Division.



Kyotanabe Plant

Global Associated Partners:

NORTH and SOUTH AMERICA

U.S. TSUBAKI, INC.

301 E. Marquardt Drive
Wheeling, IL 60090-6497
U.S.A.
Phone : +1-847-459-9500
Facsimile : +1-847-459-9515

TSUBAKI of CANADA LIMITED

1630 Drew Road
Mississauga, Ontario, L5S 1J6
Canada
Phone : +1-905-676-0400
Facsimile : +1-905-676-0904

TSUBAKI BRASIL

REPRESENTAÇÃO COMERCIAL LTDA.
R. Pamplona, 1018 - C.J. 73/74
Jd. Paulista - 01405-001
São Paulo - S.P. Brazil
Phone : +55-11-3253-5656
Facsimile : +55-11-3253-3384

EUROPE

TSUBAKIMOTO EUROPE B.V.

Aventurijn 1200, 3316 LB Dordrecht
The Netherlands
Phone : +31-78-6204000
Facsimile : +31-78-6204001

TSUBAKIMOTO U.K. LTD.

Osier Drive, Sherwood Park
Annesley, Nottingham
NG15 0DX U.K.
Phone : +44-1623-688-700
Facsimile : +44-1623-688-789

ASIA and OCEANIA

TSUBAKIMOTO SINGAPORE PTE. LTD.

25 Gul Lane
Jurong
Singapore 629419
Phone : +65-6861-0422/3/4
Facsimile : +65-6861-7035

TSUBAKIMOTO SINGAPORE PTE. LTD.

INDIA LIAISON OFFICE
Suite No. 312, 39/12, Haddows Road
Nungambakkam
Chennai - 600006, India
Phone : +91-44-28303112
Facsimile : +91-44-28303102

TSUBAKIMOTO (THAILAND) CO., LTD.

999/9 The Offices at Centralworld
10th Floor, No. 1001, Rama 1 Road
Pathumwan, Bangkok 10330 Thailand
Phone : +66-2-264-5354/5/6
Facsimile : +66-2-251-3912

TSUBAKI AUSTRALIA PTY. LTD.

Unit E, 95-101 Silverwater Road
Silverwater, N.S.W. 2128
Australia
Phone : +61-2-9648-5269
Facsimile : +61-2-9648-3115

TAIWAN TSUBAKIMOTO CO.

No. 33, Lane 17, Zihciang North Road
Gueishan Township, Taoyuan County
Taiwan
Phone : +886-33-293827/8/9
Facsimile : +886-33-293065

TSUBAKIMOTO CHAIN TRADING (SHANGHAI) CO., LTD.

Room 1712, Lippo Plaza
No. 222 Huai Hai Zhong Road
Shanghai 200021, China
Phone : +86-21-5396-6651/2
Facsimile : +86-21-5396-6628

KOREA CONVEYOR IND. CO., LTD.

72-5 Onsoo-Dong
Kuro-Ku, Seoul
Korea
Phone : +82-2-2619-4711
Facsimile : +82-2-2619-0819

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