

# TSUBAKI SMALL SIZE CONVEYOR CHAINS



In Markets Around the World. Only from TSUBAKI.

# TSUBAKI Small Size Conveyor



● ...Overseas Group Companies

## TSUBAKI Group Environmental Policy

### Philosophy

The Tsubaki Group understands that the preservation of the Earth's environment is one of the highest priorities for humankind.

Our aim is to consider the environment in all of our activities to contribute to the creation of a healthy and wealthy tomorrow.

### Basic Policy

- We strive to understand the environmental aspect of our business activities, products, and services, and implement measures to reduce the environmental burden for the conservation of the Earth's environment.
- We have established an organization to ensure environmental conservation and continually strive to improve our environmental management system.
- We abide by all environmental laws, regulations, and agreements.
- We aim to raise employee awareness of environmental conservation and ensure an understanding of our Basic Environmental Policy among all employees through environmental education, corporate publications, and other means.

# Chains

## All For The Global Customer's Delight

### Kyotanabe Plant Concept

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 environmentally 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. Its Chain Division acquired ISO 9001 accreditation in 1995 and ISO 14001 accreditation in 2003.



JQA-0911  
Chain Division  
JQA-QM9640



JQA-EM3392  
Kyotanabe Plant



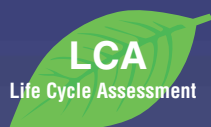
Kyotanabe Plant



# Tsubaki World-Class Quality and an Extensive Line-Up to Satisfy Ever-Changing Needs

Tsubakimoto Chain conducts its business activities with the aim of providing the best value to our customers. We strive to be the world's leading manufacturer of chain and power transmission components.

Tsubaki Small Size Conveyor Chain is indispensable in supporting production lines of every kind around the world.



Tsubaki incorporates Life Cycle Assessment (LCA) in its activities, and develops and manufactures environmentally friendly chain products that have a significant impact on reducing greenhouse gas emissions.



Tsubaki contributes to protecting the environment by eliminating surface treatments that incorporate harmful chemicals.

## Special Small Size Conveyor Chain

Ease of use and new features further broaden selection options.



## Standard Small Size Conveyor Chain

Tsubaki's chain with the widest range of applications. All parts are heat treated, resulting in increased tensile and fatigue strength.



## Lube Free Small Size Conveyor Chain

Special oil-impregnated bushes deliver long life with no lubrication. The result is reduced labor maintenance, better operating environments, and greater productivity.



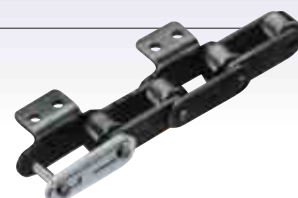
LCA



## Double Pitch Chain

Tsubaki Double Pitch Chains are indicated with this symbol in this catalog.

In contrast to the RS Attachment Chain, the chain pitch is doubled, and the shape of the link plates is flat. Ideal for applications where the conveying distance is relatively long or the speed is low.



# CHAIN DIGEST

## Corrosion Resistant Small Size Conveyor Chain

Stainless steel, engineering plastic, or special surface-treated chain. The ideal choice of chain in corrosive environments.



## High Precision Conveyor Chain

Needle bearings between the pins and bushes almost eliminate pitch elongation. Ideal for applications requiring accurate positioning.



## Plus $\alpha$ Attachment Chain

Tsubaki offers a wide range of customized attachment chains for conveyors to match the application, equipment, environment, and conveying conditions.



## Free Flow Chain

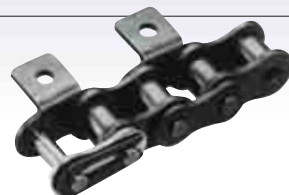
Free Flow Chain is ideal for accumulating conveyors. It allows the product to be stopped at any location using an external stopper while the chain continues to run. When an operation or function is complete, the stopper is removed and conveyance continues.



## RS<sup>®</sup> Attachment Chain

Tsubaki RS type conveyor chains are indicated with this symbol in this catalog.

RS Attachment Chain is an RS Roller Chain with attachments on the plates. Ideal for high-speed, smooth, quiet conveyance.



## Small Size Conveyor Chain

Precautions Before Use	7
Construction	9
Selection Guide	13
How to Order	15
Attachment Spacing and Description	17









### Standard Small Size Conveyor Chain ···19

Double Pitch Chain	19
RS Attachment Chain	21
Additional RS Attachment Chains	23
RF Roller Chain	24
BS Attachment Chain	25

### Special Small Size Conveyor Chain ···27

Hollow Pin Chain	27
Hollow Pin Double Pitch Chain	27
Hollow Pin RS Chain	27
Curved Attachment Chain	28



### Lube Free Small Size Conveyor Chain ···29

 Lambda Chain	29
Lambda Double Pitch Chain	33
Lambda RS Attachment Chain	37
 Surface-Treated Lambda Chain	29
Surface-Treated Lambda Double Pitch Chain	33
Surface-Treated Lambda RS Attachment Chain	37
 Long Life Lambda Chain (X-Λ® [X-Lambda])	30
X-Lambda Double Pitch Chain	35
X-Lambda RS Attachment Chain	39
 BS Lambda Attachment Chain	29, 41
 Lambda RF Roller Chain	29, 43
 Lambda Hollow Pin Chain	29
Lambda Hollow Pin Double Pitch Chain	44
Lambda Hollow Pin RS Chain	44
 Lambda Chain KF Series	31
 Lambda Chain Specialty Attachments (for specialty applications)	45

### Corrosion Resistant Small Size Conveyor Chain ···47

Stainless Steel Attachment Chain	47
Stainless Steel Double Pitch Chain	49
Stainless Steel RS Attachment Chain	51
Surface-Treated Attachment Chain	47
Surface-Treated Double Pitch Chain	49
Surface-Treated RS Attachment Chain	51



	Poly Steel Attachment Chain .....	48, 53
	Plastic Roller Double Pitch Chain .....	48, 49
	Stainless Steel Hollow Pin Chain .....	55
	Stainless Steel Hollow Pin Double Pitch Chain .....	55
	Stainless Steel Hollow Pin RS Chain .....	55

### Plus $\alpha$ Attachment Chain .....56

Plus $\alpha$ Attachments .....	57
Special Specification Attachments .....	76

### High Precision Conveyor Chain .....79

Bearing Bush Chain .....	79, 81
Bearing Cage Chain .....	80, 82
Indexing Table Chain & Sprockets .....	80, 85
Mini Tact Chain & Sprockets .....	80, 84

### Engineering Manual .....88

## Free Flow Chain

Free Flow Chain .....	109
Free Flow Chain Specifications .....	111



### Double Plus Chain .....113

### Center Roller Chain .....119

### Accessories for Double Plus Chain ..120

### Outboard Roller Chain .....125

### Top Roller Chain .....135

### Special Sprockets .....143

### Engineering Manual .....145

Safety/Warranty .....	158
Small Size Conveyor Chain Inquiry Sheet .....	159
Custom Attachment Chain Worksheet .....	160



#### TSUBAKI ECO LINK

The TSUBAKI Eco Link logo is used only on products that satisfy the standards for environmental friendliness set by the Tsubaki Group.

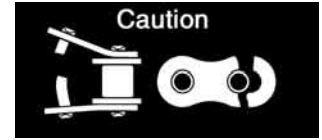


# Small Size Conveyor Chain

## Precautions Before Use

Be sure to read this entire Small Size Conveyor Chain catalog to make the proper chain selection for your application. In addition, be sure to indicate the relevant sections to the persons who will actually be maintaining the conveyor chain.

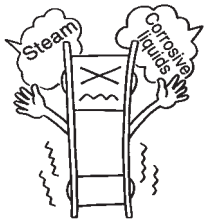
Small Size Conveyor Chain is a convenient, compact mechanical device that can transport goods and materials while taking up a minimal amount of space. However, it does not have an unlimited service life.



1. Conveyor chain must be inspected on a regular basis and replaced as necessary. It is subject to wear and should be regarded as an expendable item.



5. Environmental conditions, such as the presence of corrosive liquids or gases, may cause chain breakage. This can be avoided by selecting a chain material appropriate to the usage conditions.



2. Elongation resulting from wear may cause conveyor chain to ride up on a sprocket or break. Proper lubrication or the use of a lube free chain such as the Lambda Series can minimize chain elongation and extend service life.



6. Improper centering, or problems with layout or design, can shorten chain life or cause chain breakage. This can be avoided by proper positioning and alignment.

7. Wear on chain parts will generate dust (wear dust).

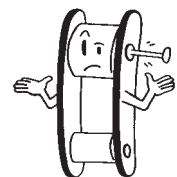
3. Wear between the bushes and the rollers will cause interference between the link plates and guide rails, increasing tension on the chain. This may lead to an increase in motor power consumption, or may cause chain breakage. This situation can be avoided by proper lubrication or by using Lambda Chain or plastic roller chain.

8. When restrictions by law or guidelines exist in selecting chain, select the chain based on those laws and guidelines, and on allowable tension. Choose a chain with an ample margin.



4. Excessive tension may cause chain breakage. This can be avoided through proper selection that anticipates the inertial force the chain will be subject to.

9. When link plate holes are enlarged or pin diameter made smaller to make it easier to insert and remove the pin, chain performance may decrease and cause accidents.





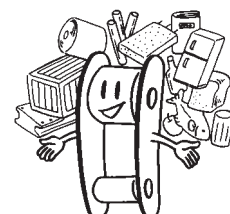
## Features and Important Points of Conveyor Chains

### Features

1. Can move conveyed goods or materials with almost any shape or form.
2. Wide operational range, including conveyor length, transport direction, usage environment, etc.
3. Can reliably convey goods or materials with no slippage.
4. Highly durable, highly efficient.

### Important Points

1. No slippage is a strong advantage of conveyor chain, but consideration must be given in selection when impact resistance is considered.
2. The mechanical nature of the chain engaging the sprocket will cause speed variations.



## Handling Precautions

1. Mishandling the chain may cause a loss of accuracy. Never handle the chain as shown in the photographs to the right.
2. Rough handling such as throwing or dropping the chain will cause twisting deformation and/or a loss of accuracy.
3. Stainless steel chain, in particular, must be handled with care.

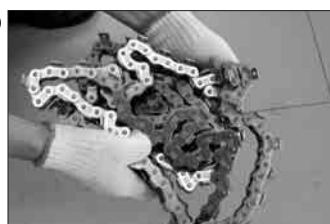
### Chain Handling

①



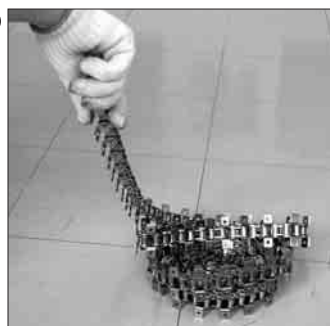
Hold the chain so that it does not become tangled or twisted.

②



Handling the chain in such a way that it becomes tangled or looped around itself will cause it to become twisted and lead to a loss of accuracy.

③



Applying excessive load in the direction that the chain is twisted will cause torsion and lead to a loss of accuracy.

# Small Size Conveyor Chain

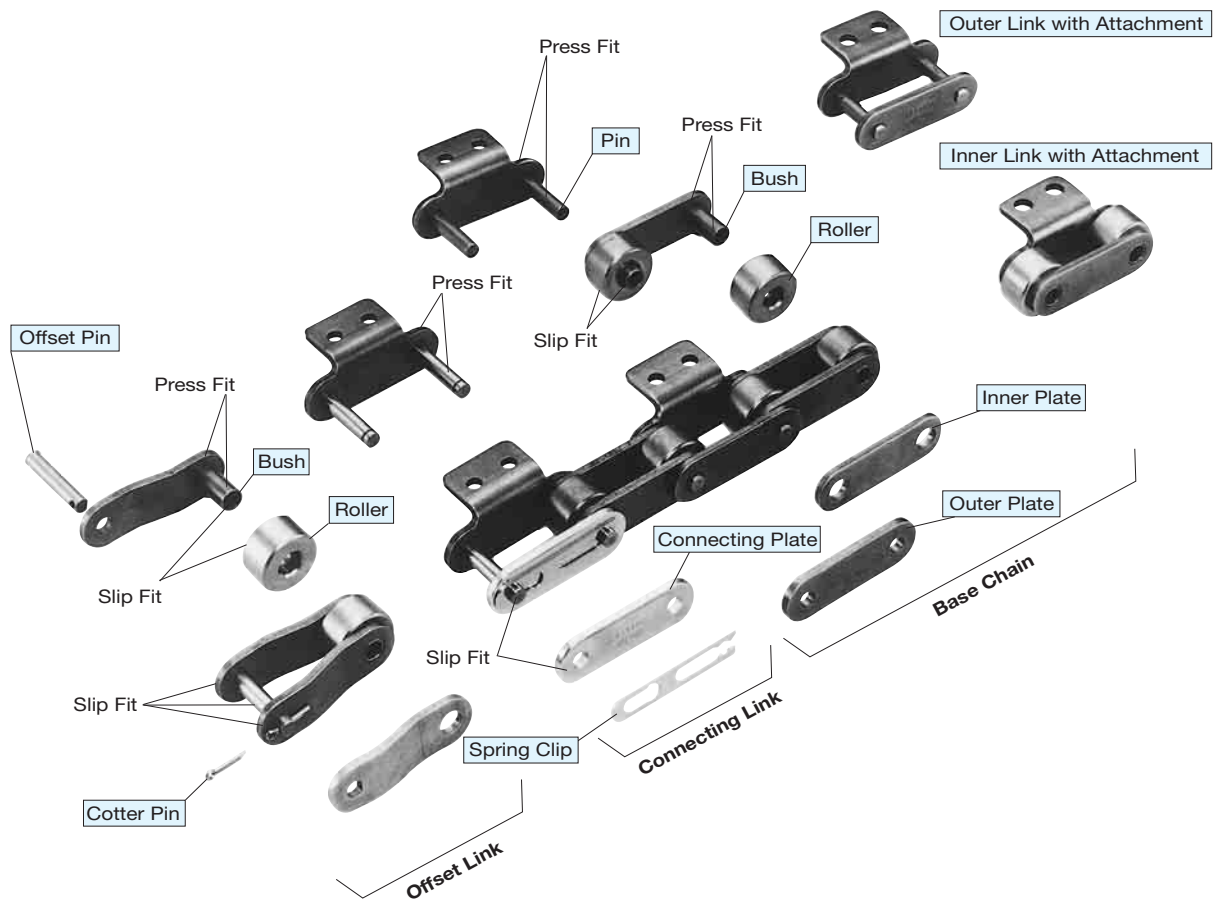
## Construction



Double Pitch

### Double Pitch Chain Construction

- Double Pitch Roller Chain has the same basic construction as standard roller chain, but chain pitch is twice as long, and the chain has flat-shaped link plates with longer attachments.
- R rollers and S rollers are available, with usage depending on application. (See “Roller Type” on page 11.)
- Can be used with double pitch sprockets or RS Roller Chain sprockets (with S rollers, when the number of sprocket teeth is 30 or more).
- Ideal for applications where the conveying distance is relatively long or the speed is low.



#### 1. Plate

The plate bears the tension placed on the chain. Because the accuracy of the holes into which pins or bushes are fit affects chain quality, plates are manufactured with particular precision and finished into tough plates with high fatigue strength and impact resistance.



#### 2. Pin

The two ends of the pin are inserted into holes in the outer plates and riveted in place. For Hollow Pin Chain and Poly Steel Chain, they are inserted only. Because the pins are subject to shearing and bending forces via the plates, and because the bushes rotate and slide along the pins as the chain articulates, they are manufactured with an emphasis on strength and abrasion resistance.



#### 3. Bush

The two ends of the bushes are inserted into the inner plate and function as bearings for the pins and rollers. They are subject to complex forces through the various parts, and are finished to specifications having high wear resistance.



#### 4. Roller

Rollers are slip fit onto the bushes, and lighten mechanical shock when the chain engages the sprocket. In addition, they serve to reduce running resistance by turning while the chain is in motion, making the chain run smoothly. Abrasion resistance is important.



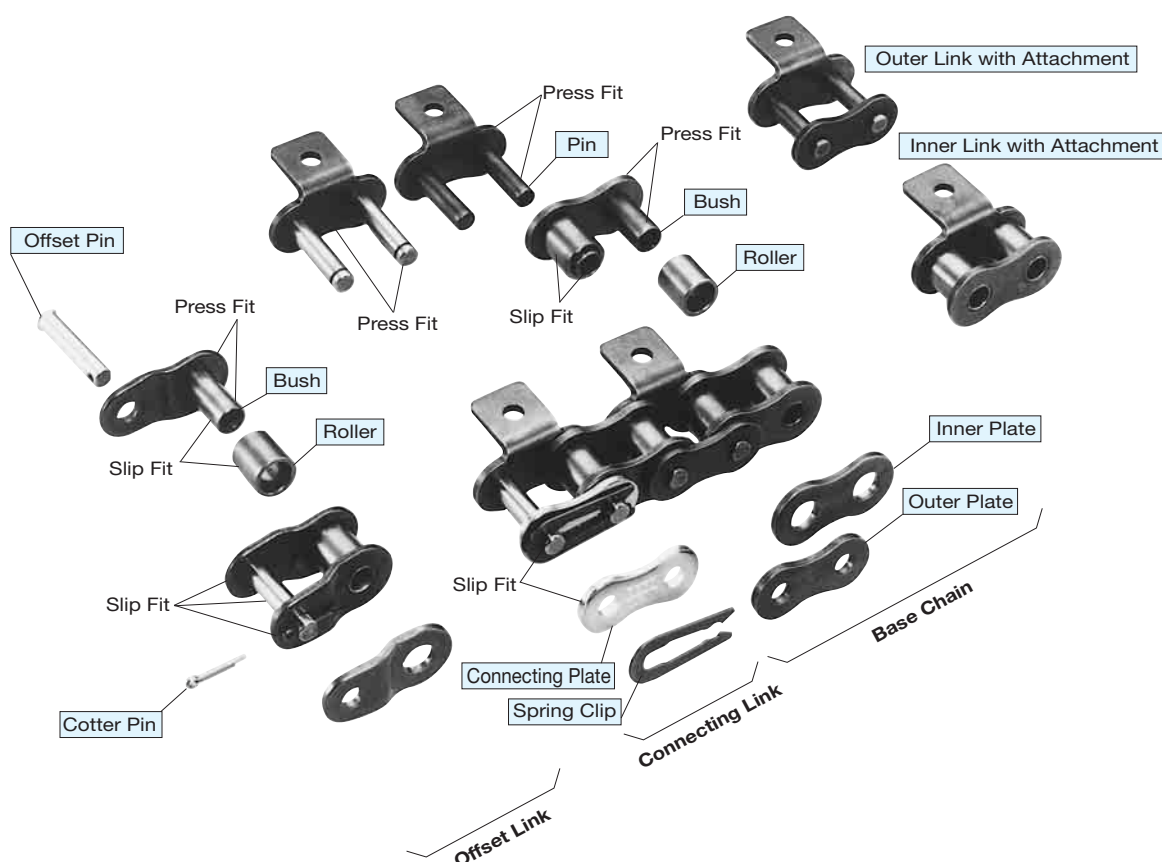
#### 5. Attachment

Bolt holes are drilled for attachments. (For details, see page 12: “Standard Attachments”.)



## RS® Attachment Chain Construction

- This chain is a standard RS Roller Chain with added attachments.
- Because the chain pitch is smaller, it can transport small objects using the small pitch, and is ideal for general applications where conveying distance is short.
- Runs quietly, smoothly and can travel at high speeds.
- RS Roller Chain sprockets can be used in almost all cases.



### 6. Spring Clip/Cotter Pin



Spring clips and cotter pins prevent the connecting plates from detaching and are important components to maintain the intrinsic strength of the chain. Always install these parts.

### 7. Inner Link



The ends of the two bushes are inserted into the inner plate to form the inner link. Rollers are slip fit over the outside of the bushes.

### 8. Outer Link



The ends of the two pins are inserted into the outer plate. The ends of the pins other than those on the connecting links are riveted in place to prevent detachment. For Hollow Pin Chain and Poly Steel Chain, they are inserted only.

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.

#### Note:

##### 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).

# Small Size Conveyor Chain

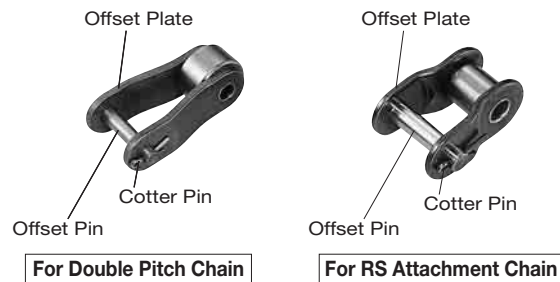
## Connecting Parts

### 1. Connecting Links (symbol: CL)


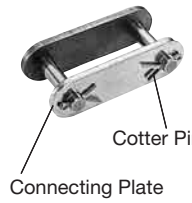

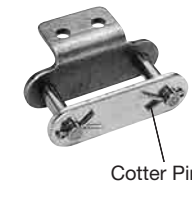

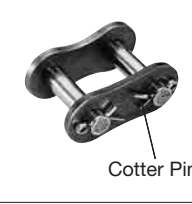

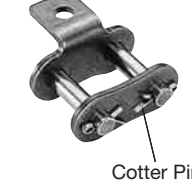
- 1) A chain normally consists of multiple interconnected links and so requires a connecting link.
- 2) Connecting links are available with attachments or without attachments.
- 3) Connecting links are available with either spring clips or cotter pins to prevent the connecting plate from detaching. See chart at right.

### 2. Offset Links (symbol: OL)

- 1) An offset link is used when a strand of chain has an odd number of links.
- 2) Attachment offset links are not available.



■ Connecting Link Application Table

Form		Clip Type	Cotter Pin Type
Chain Size		RF2060 or Smaller R60 or Smaller	RF2080 or Larger R80 or Larger
Double Pitch	Plain CL		
	Attachment CL		
RS	Plain CL		
	Attachment CL		

Note: NS specifications use a cotter pin on the connecting link regardless of size. Please contact a Tsubakimoto representative if a clip is needed.

## Roller Type

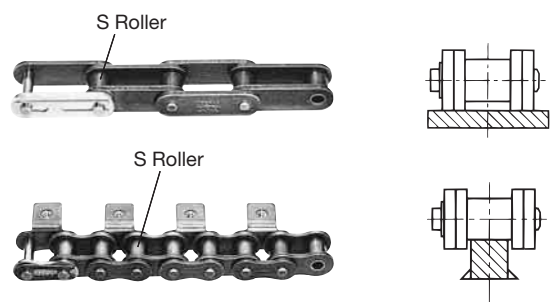
### 1. R Roller

The roller diameter is larger than the plate width, and the roller is used in Double Pitch Chain. R rollers are the most basic and feature high load carrying capacity and low frictional resistance.



### 2. S Roller

The roller diameter is smaller than the plate width. Effectively reduces shock and wear when the chain engages the sprocket.





## Standard Attachments

### 1. A1, A2 Attachments

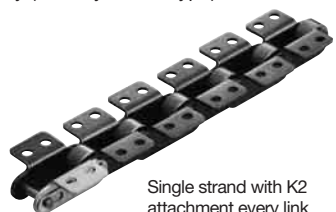
An A attachment has a bent link plate that extends out on one side of the chain, forming an L-shape. The attachment comes with one or two bolt holes and is designated as A1 or A2, respectively (A1 only for RS type).



Single strand with A2 attachment every link

### 2. K1, K2 Attachments

A K attachment has a bent link plate that extends out on both sides of the chain. The attachment comes with one or two bolt holes and is designated as K1 or K2, respectively (K1 only for RS type).



Single strand with K2 attachment every link

### 3. SA1, SA2 Attachments

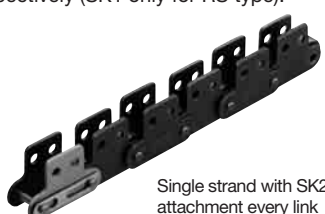
In an SA attachment, the link plate is extended vertically on one side of the chain. The attachment comes with one or two bolt holes and is designated as SA1 or SA2, respectively (SA1 only for RS type).



Single strand with SA2 attachment every link

### 4. SK1, SK2 Attachments

In an SK attachment, the link plate is extended vertically on both sides of the chain. The attachment comes with one or two bolt holes and is designated as SK1 or SK2, respectively (SK1 only for RS type).



Single strand with SK2 attachment every link

### 5. GNK1 Attachment

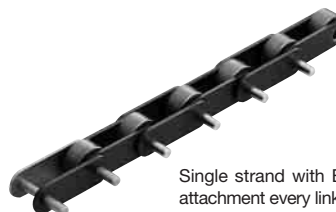
The GNK1 attachment designates a chain with a bolt hole drilled into the center of the link plates on both sides of the chain. (Available only for S rollers on Double Pitch Chains.)



Single strand with GNK1 attachment every link

### 6. EP Attachment (Extended Pin)

One end of the pin is extended on one side of the chain.



Single strand with EP attachment every link

### 7. Hollow Pin Chain

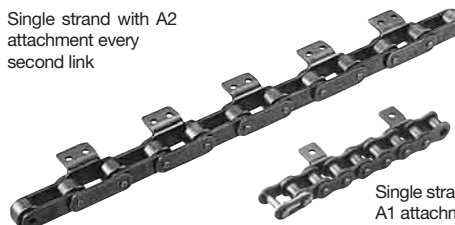
In Hollow Pin Chain, the pin has a hole, allowing for installation of various attachments.



#### Chain Formation

Chains can be assembled with an attachment on every link plate or at intervals of two or more links. However, placing an attachment on an outside link at an interval of an even number of links is convenient for maintenance purposes.

Single strand with A2 attachment every second link



Single strand with A1 attachment every fourth link

## Plus α Attachments

### Speedy Delivery

Tsubakimoto maintains a stock of parts with special dimensions and a proven track record of performance, and can handle stock orders and quick deliveries.

- Speedy delivery service is ideal for situations in which standard dimension products do not fit exactly.
- Lube Free Lambda Chain is also available. (See pages 57 to 62.)
- Please contact a Tsubakimoto representative for details on delivery.

### Stock Designs

Tsubakimoto has a portfolio of reliable designs with a track record of success. Selecting from among these designs will lead to better design efficiency for your application as a whole. (See pages 63 to 75.)

# Small Size Conveyor Chain

## Selection Guide

Series	Product Name		Features, Applications	Features	Operating Temperature Range (°C) *6	
Standard Small Size Conveyor Chain	Double Pitch Chain		General uses	Carbon steel	-10 to 150	
	RS Attachment Chain					
	Additional RS Attachment Chains					
	RF Roller Chain		Direct placement of materials on chain	Plates are flat in shape		
	BS Attachment Chain		General uses	Carbon steel		
Special Small Size Conveyor Chain	Hollow Pin Double Pitch Chain		Conveyance by hollow attachment pin	Ideal for wire mesh conveyors		
	Hollow Pin RS Chain					
	Curved RS Attachment Chain		Curved conveyance	Guide rails required		
Lube Free Small Size Conveyor Chain	Lambda Double Pitch Chain		Special oil-impregnated bushes provide long service life	Dimensionally interchangeable with Standard Small Size Conveyor Chain	-10 to 150	
	Lambda RS Attachment Chain			Lube-free British Standard chain (ISO 606)		
	BS Lambda Attachment Chain			Felt seal improves wear resistance		
	X-Lambda Double Pitch Chain			Nickel-plated (NP)		
	X-Lambda RS Attachment Chain			Special surface treatment (NEP)		
	Surface-Treated Lambda Double Pitch Chain			Lube-free chain with flat plates		
	Surface-Treated Lambda RS Attachment Chain			Uses special oil-impregnated bushes for hollow pin bushes		
	Lambda RF Roller Chain			Uses heat-resistant lubrication for bushes	-10 to 230 *1	
	Lambda Hollow Pin Double Pitch Chain					
	Lambda Hollow Pin RS Chain					
	Lambda KF Series Double Pitch Chain					
	Lambda KF Series RS Attachment Chain					
Corrosion Resistant Small Size Conveyor Chain	Stainless Steel Double Pitch Chain	SS	Water immersion, acids/alkalis and low-/high-temperature environments	All components use 304 stainless steel	-20 to 400	
		AS	Applications requiring higher allowable load than SS chain, as well as corrosion and heat resistance	Uses heat-treated stainless steel in pins and rollers		
		NS	Higher corrosion resistance than SS chain	Components use 316 stainless steel		
		LSC	Water immersion; dry, non-lubricated conditions	Engineering plastic sleeve between pin and bush		-20 to 100 *7
	Stainless Steel RS Attachment Chain	SS	Water immersion, acids/alkalis and low-/high-temperature environments	All components use 304 stainless steel	-20 to 400	
		AS	Applications requiring higher allowable load than SS chain, as well as corrosion and heat resistance	Uses heat-treated stainless steel in pins and rollers		
		NS	Higher corrosion resistance than SS chain	Components use 316 stainless steel		
		LSC	Water immersion; dry, non-lubricated conditions	Engineering plastic sleeve between pin and bush		-20 to 100 *7
	Surface-Treated Double Pitch Chain	NP	Environments requiring mild corrosion resistance	Nickel-plated	-10 to 150	
		NEP	Exposed outdoor environments, exposure to seawater	Special surface treatment		
	Surface-Treated RS Attachment Chain	NP	Environments requiring mild corrosion resistance	Nickel-plated	-20 to 80	
		NEP	Exposed outdoor environments, exposure to seawater	Special surface treatment		
	Poly Steel Attachment Chain (PC)		Environments requiring corrosion resistance and no lubrication	Uses engineering plastic inner links		
	Plastic Roller Double Pitch Chain	Standard	Environments requiring lightweight and low-noise applications	Uses engineering plastic rollers	-10 to 80 *2	
		NP				
		SS				
	Plastic Roller Double Pitch Chain RP-SNP Low-Noise Series	Standard	Even lower noise levels than engineering plastic rollers	Uses special engineering plastic rollers	-10 to 80 *3	
		NP				
		SS				
	Heat-Resistant Plastic Roller Double Pitch Chain (RPKV-SS)		Environments requiring chemical resistance	Uses super engineering plastic rollers	-10 to 180	
Stainless Steel Hollow Pin Double Pitch Chain (SS)		Water immersion, acids/alkalis and low-/high-temperature environments; conveyance by hollow attachment pin	All components use 304 stainless steel; ideal for wire mesh conveyors	-20 to 400		
Stainless Steel Hollow Pin RS Chain (SS)						
High Precision Conveyor Chain	Bearing Bush Chain	Standard	Zero wear elongation*5 (other than initial wear)	Needles between pin and bush control wear elongation in conveyance	-10 to 150 *4	
		High precision				
		SS				
	Bearing Cage Chain		Low-cost alternative to Bearing Bush Chain	Needle cage between pin and bush	-10 to 60	
Indexing Table Chain		For high-precision positioning	Needle bearings used in bearing area, side rollers, and guide rollers			
Mini Tact Chain		For high-precision positioning of small work	Needle bearings used in bearing area	10 to 40		

\*1: Depending on your usage environment, you may need to multiply the allowable load by one of the factors listed on page 94, table 9 when selecting your chain.

\*2: Operating temperature range of Plastic Roller Double Pitch Chain (SS) is -20°C to 80°C.

\*3: Operating temperature range of Plastic Roller Double Pitch Chain, RP-SNP Low-Noise Series (SS) is -20°C to 80°C.

\*4: Operating temperature range of Bearing Bush Chain (SS) is -10°C to 60°C.

\*5: Wear elongation of Bearing Bush Chain (SS) is extremely small.

\*6: Use a lubricant suited to the operating temperature. (See page 101, table 14.)

\*7: LSC stainless steel chains have a -20°C to 100°C operating temperature range when using plastic rollers.

[illegible]

# Small Size Conveyor Chain

## How to Order

When ordering small size conveyor chain, specify chain size and material as well as chain length and the installation position and configuration of attachments.

### 1. Model Identification

To prevent errors, specify the product code and model number for chain, connecting links, and offset links. For product codes and model identification, see the model identification examples on page 16 and dimension tables. Also, use only the model number for ordering products that have no product code.

### 2. Specific Ordering Procedure for Chain

#### 1) Units (stock items) [1 unit = 10 ft/3,048 mm]

- (1) Small size conveyor chain with attachments is stocked in units (standard length). Each unit consists of an even number of links (the number of links is per the dimension table.)
- (2) A connecting link is supplied on one end of each chain unit and an inner link is supplied on the other end. In general, these terminating links can be joined together to make a longer chain.
- (3) When splitting a single unit for use, order the required number of connecting links separately.  
Example: RF2040R-4LA2 ..... n units  
RF2040-A2-CL ..... n pieces

Note: For RS25, 1 unit = 1,000 mm

#### 2) Special Assembly for Made-to-Order Product

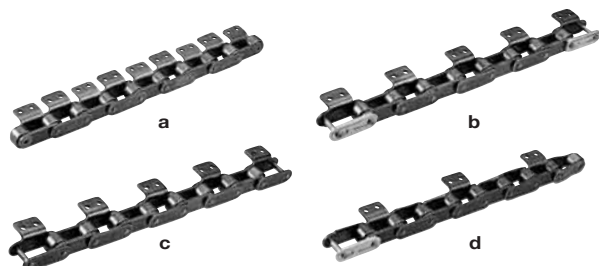
A chain assembled to your specifications based on chain length, termination on both ends, attachment spacing, etc., is called a "special assembly." How to specify the formation is described below.

##### (1) When Total Length Is an Even Number of Links

- (1) A connecting link is supplied on one end of each chain unit and an inner link is supplied on the other end.
- (2) Specify the adding position and spacing for attachments according to "4. Attachment Spacing and Description" on page 17.
- (3) Please contact a Tsubakimoto representative for special chain lengths.

##### (2) When Total Length Is an Odd Number of Links (please refer to the pictures below)

- (1) Specify how both ends will be terminated:
  - a) Inner links on both ends
  - b) Connecting links on both ends
  - c) Outer links on both ends (shipped with the outer links disassembled; after assembling the outer links on both ends, the end surfaces of the pins must be properly secured by riveting)
  - d) Connecting link on one end and offset link on other end
- (2) Specify the adding position and spacing for attachments according to "4. Attachment Spacing and Description" on page 17.
- (3) Please contact a Tsubakimoto representative for special chain lengths.



##### (3) When Chains Are to Be Used as Strands

###### (1) Mirror-Image Strands in Pairs

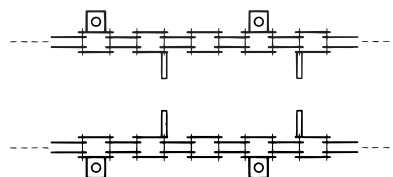
Attachments on a set of chains to be used as strands are manufactured to be symmetrical (see illustration below). [1 unit = 10 ft/3,048 mm]

Specification example:

RF2040S-6LA1-5L EP ..... 6 units

Strand specs: 120 links by 6 strands

(120 links x 2 strands x 3 sets)



###### Mirror-Image Strands in Pairs

Attachments are mirror images on opposite strands

For EP, AA1, KK1, SAA1, SKK1, and GNK1 attachments, instructions for half-assembly in mirror image are unnecessary when using chains in parallel (symmetrical on right and left sides).

###### (2) Matched and Tagged in Pairs

Chain lengths will vary within standard tolerance. When it is desirable to minimize the relative difference in total chain length in a set of chains to be used as strands, the chain is matched and tagged in pairs. [1 unit = 10 ft/3,048 mm]

Specification example:

RF2040R-2LA2 ..... 6 units

Strand specs: 2 strands x 3 sets

Matched and tagged in pairs

Note: There is an extra charge for chains matched and tagged in pairs. Please inquire for an estimate.

###### (4) Long Chain Lengths (long configurations)

Chains consisting of more than one unit are called "long chains." There are limitations on total chain length depending on chain size and conveyor type. Please inquire for details.

### 3. Configurations When Ordering by Total Number of Links

#### 1) For Long Configurations, Be Sure to Specify [see 2-(4) above]

#### 2) When Unspecified:

- (1) We will ship n units, plus one unit having a fractional number of links. However, when the fractional number of links is less than one-fourth of a unit, we will ship only one long configuration chain consisting of one unit plus a fractional number of links.

Example:

RF2040R-2LA2 ..... 380 links

Shipping form: 120 links (length of one unit) ..... 2 strands  
140 links ..... 1 strand

- (2) When a single unit cannot be split at an interval between attachments, we will determine a configuration (length) using a number of links that enable the chain to be split in the range of (1 unit - 1/4 unit). The fractional number of links will be treated in the same way as above.



### Standard Small Size Conveyor Chain

**RF2040R-1LA2**

Chain size \_\_\_\_\_  
Roller type (R or S) \_\_\_\_\_  
Attachment spacing (1L: attachment on every link) \_\_\_\_\_  
Attachment type (A2: with A2 attachments) \_\_\_\_\_

Connecting link (CL)

**RF2040-A2-CL**

Same as above \_\_\_\_\_ Connecting link (CL) \_\_\_\_\_  
Attachment type (enter only when attachment is installed) \_\_\_\_\_

Offset link (OL)

**RF2040R-OL**

Same as above \_\_\_\_\_ Offset link (OL) \_\_\_\_\_

### Lube Free Small Size Conveyor Chain

**RF2040R-LMC-NP-2LK2**

Chain size \_\_\_\_\_  
NP (enter "NP" only for nickel-plated) \_\_\_\_\_  
NEP \_\_\_\_\_  
Roller type (R or S) \_\_\_\_\_  
Chain type: Lambda \_\_\_\_\_  
with attachments \_\_\_\_\_  
Attachment spacing (2L: attachment on every 2nd link) \_\_\_\_\_  
Attachment type (K2: with K2 attachments) \_\_\_\_\_

Connecting link (CL)

**RF2040-LMC-NP-K2-CL**

Same as above \_\_\_\_\_ Connecting link (CL) \_\_\_\_\_  
Attachment type (enter only when attachment is installed) \_\_\_\_\_

Offset link (OL)

**RF2040R-LMC-NP-OL**

Same as above \_\_\_\_\_ Offset link (OL) \_\_\_\_\_

### Long Life Lambda Chain

**RF2040S-LMCX-2LK2**

Chain size \_\_\_\_\_  
Roller type (R or S) \_\_\_\_\_  
Chain type: X-Lambda \_\_\_\_\_  
with attachments \_\_\_\_\_  
Attachment spacing (2L: attachment on every 2nd link) \_\_\_\_\_  
Attachment type (K2: with K2 attachments) \_\_\_\_\_

Connecting link (CL)

**RF2040-LMCX-K2-CL**

Same as above \_\_\_\_\_ Connecting link (CL) \_\_\_\_\_  
Attachment type (enter only when attachment is installed) \_\_\_\_\_

Chain model identification examples for RS Attachment Chain are given in the product pages of this brochure.

### Plastic Roller Chain

**RF2040RP-SNP-SS-4LSK2**

Chain size \_\_\_\_\_  
Roller type (R or S) \_\_\_\_\_  
P: Plastic roller \_\_\_\_\_  
SNP (enter "SNP" only for Low-Noise Series) \_\_\_\_\_  
Chain specification Standard: No symbol  
Nickel-plated: NP Stainless steel: SS  
Attachment spacing (4L: attachment on every 4th link) \_\_\_\_\_  
Attachment type (SK2: with SK2 attachments) \_\_\_\_\_

Connecting link (CL)

**RF2040-SS-SK2-CL**

Same as above \_\_\_\_\_ Connecting link (CL) \_\_\_\_\_  
Attachment type (enter only when attachment is installed) \_\_\_\_\_

Offset link (OL)

**RF2040RP-SNP-SS-OL**

Same as above \_\_\_\_\_ Offset link (OL) \_\_\_\_\_

### Corrosion Resistant Small Size Conveyor Chain

**RF2040R-NP-4LEP**

Chain size \_\_\_\_\_  
Roller type (R or S) \_\_\_\_\_  
Chain specification Nickel-plated: NP Special surface treatment: NEP  
Stainless steel: SS Hardened stainless steel: AS  
Attachment spacing/type \_\_\_\_\_

Connecting link (CL)

**RF2040-NP-E1-CL**

Same as above \_\_\_\_\_ Connecting link (CL) \_\_\_\_\_  
Attachment type (enter only when attachment is installed) \_\_\_\_\_  
E1: Extended pin on every 2nd link E2: Extended pin on every link

Offset link (OL)

**RF2040R-NP-OL**

Same as above \_\_\_\_\_ Offset link (OL) \_\_\_\_\_

### Hollow Pin Chain

**RF2040S-HP-NP**

Chain size \_\_\_\_\_  
Roller type (S: S roller, R: R roller) \_\_\_\_\_  
Chain type: Hollow pin \_\_\_\_\_  
Chain specification Standard: No symbol Nickel-plated: NP  
Stainless steel: SS Lambda: LMC  
(LMC and SS combination not available)

Connecting link (CL)

**RF2040-HP-NP-CL**

Same as above \_\_\_\_\_ Connecting link (CL) \_\_\_\_\_

Offset link (OL)

**RF2040S-HP-NP-OL**

Same as above \_\_\_\_\_ Offset link (OL) \_\_\_\_\_

# Small Size Conveyor Chain

## 4. Attachment Spacing and Description

Chain Numbering Example	Base Attachment Description	Connecting Link (CL) Type	Attachment Formation
<i>RS40-1LA1</i> $\bigcirc = 1$	<u><math>\bigcirc</math></u> LA1	A1-CL	<p>1LA1 repeat</p>
<i>RS40-2LA1</i> $\bigcirc = 2$	<u><math>\bigcirc</math></u> LA1	A1-CL	<p>2LA1 repeat</p>
<i>RS40-2LA1RL</i> $\bigcirc = 2$	<u><math>\bigcirc</math></u> LA1RL	Plain CL	<p>2LA1 repeat</p> <p>Attachment is on inner link (RL).</p>
<i>RS40-3LA1</i> $\bigcirc = 3$	<u><math>\bigcirc</math></u> LA1	Plain CL	<p>3LA1 repeat</p> <p>See note</p>
<i>RS40-1L2LA1</i> $\bigcirc = 1, \triangle = 2$	<u><math>\bigcirc</math></u> <u><math>\triangle</math></u> LA1	A1-CL	<p>1L, 2LA1 repeat</p>
<i>RS40-1L3LA1</i> $\bigcirc = 1, \triangle = 3$	<u><math>\bigcirc</math></u> <u><math>\triangle</math></u> LA1	Plain CL	<p>1L, 3LA1 repeat</p> <p>See note</p>

Chain Numbering Example	Base Attachment Description	Connecting Link (CL) Type	Attachment Formation
<p>RS40-2L4LA1</p> <p>○ = 2, △ = 4</p>	<p>○△△LA1</p>	Plain CL	<p>See note</p> <p>CL</p> <p>2L 2L 4L 2L, 4L A1 repeat</p>
<p>RS40-2L2L4LA1</p> <p>○ = 2, △ = 2, □ = 4</p>	<p>○△△□LA1</p>	Plain CL	<p>See note</p> <p>CL</p> <p>2L 2L 4L 2L, 2L, 4L A1 repeat</p>
<p>RS40-2L3L1L4LA1</p> <p>○ = 2, △ = 3, □ = 1</p> <p>☆ = 4</p>	<p>○△△□L☆LA1</p>	Plain CL	<p>See note</p> <p>CL</p> <p>2L 3L 1L 4L 10L</p>
<p>RS40-2LEP</p> <p>○ = 2</p>	<p>○LEP</p>	E1-CL	<p>See note</p> <p>E1-CL</p> <p>2L 2L 2L 2L EP repeat</p>
<p>RS40-1L3LEP</p> <p>○ = 1, △ = 3</p>	<p>○△LEP</p>	Plain CL	<p>See note</p> <p>CL</p> <p>2L 1L 3L 1L 3L 1L, 3L EP repeat</p>
<p>RS40-3LEP</p> <p>○ = 3</p>	<p>○LEP</p>	Plain CL	<p>See note</p> <p>CL</p> <p>1L 3L 3L 3L EP repeat</p> <p>6L</p>

Note: When attachment spacing is four links or more, attachments are provided on the chain beginning at the outer link following the connecting link (CL).

If there is no repeatability in the spacing of the attachments, please specify chain formation using the form on the back page.

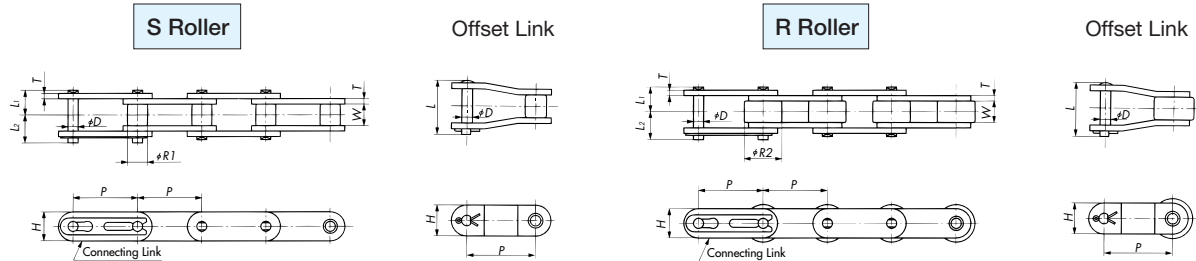
# Double Pitch Chain

Double Pitch Chain has the same basic construction as standard roller chain, but chain pitch is twice as long, and the chain has flat-shaped link plates. This series is regulated by ISO 1275-A, ASME B29.100, and JIS B 1803.

Features:

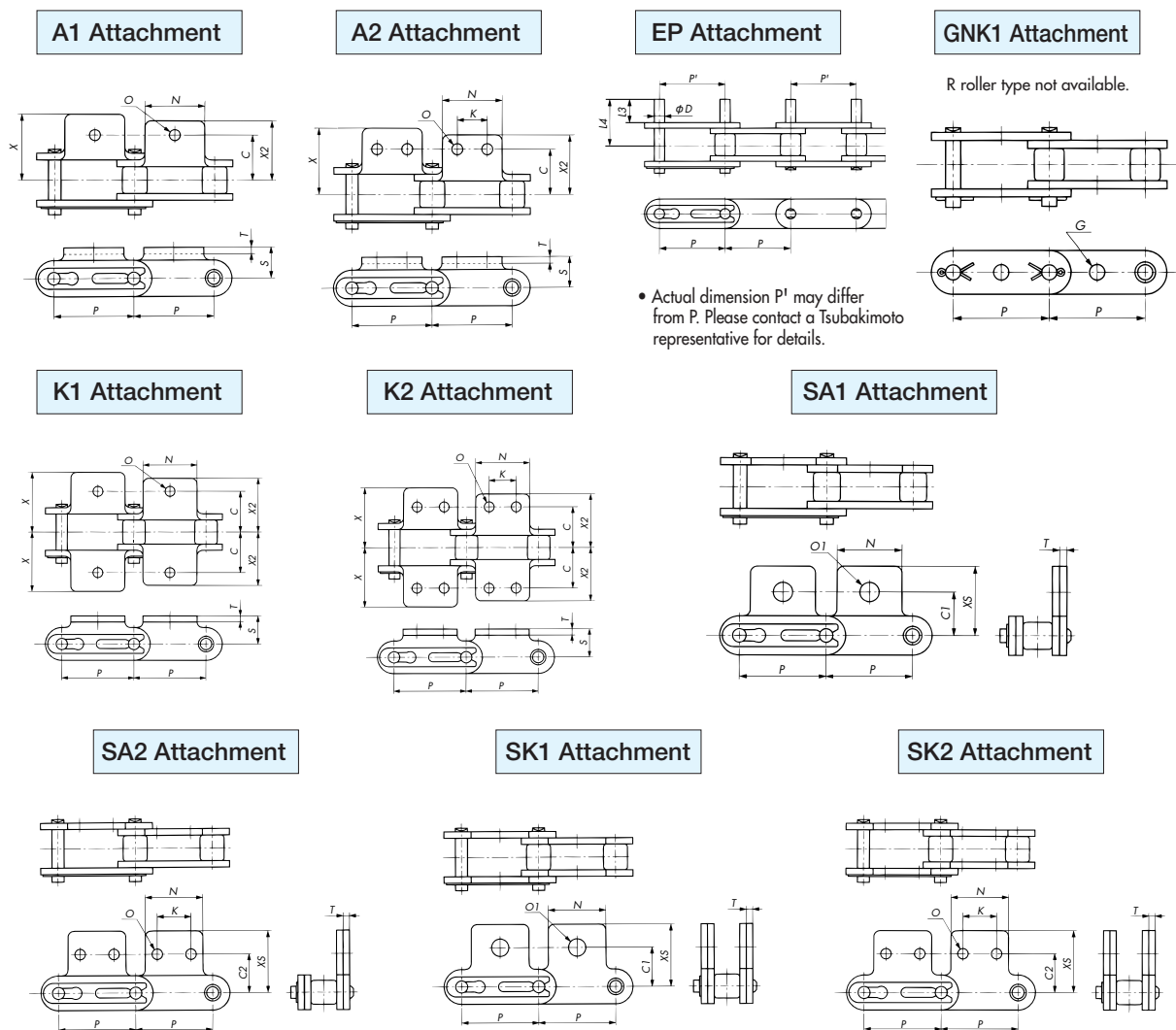
1. Accurate tolerances for overall length.
2. Both R rollers and S rollers are available and can be selected to match the application.

## Base Chain



- Connecting links: RF2040 to RF2060 use spring clips. RF2080 and larger as well as chains with GNK1 attachments (all sizes) use cotter pins. Base chain pins are riveted.

## Attachments



- Pins other than those on connecting links are riveted regardless of whether attachments are present.
- Attachments shown are S roller type. However, the dimensions for attachments are the same when R rollers are used. Also, the drawings show attachments added on every link.

Note: RS sprockets can be used with S rollers if the sprocket has more than 30 teeth.  
A Double Pitch chain sprocket will be needed if the sprocket has fewer than 30 teeth.  
Please refer to separate Tsubaki Drive Chain catalog for more information on RS sprockets.





## Base Chain Dimensions

Tsubaki Chain No.	Roller Type	Pitch <i>P</i>	Roller Dia.		Width Between Inner Link Plates <i>W</i>	Pin			Offset Pin Length <i>L</i>	Plate		Approx. Mass kg/m		No. of Links per Unit
			S Roller <i>R1</i>	R Roller <i>R2</i>		Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>		Thickness <i>T</i>	Width <i>H</i>	Steel		
												S Roller	R Roller	
RF2040	S • R	25.40	7.92	15.88	7.95	3.97	8.25	9.95	18.2	1.5	12.0	0.51	0.87	120
RF2050		31.75	10.16	19.05	9.53	5.09	10.30	12.0	22.6	2.0	15.0	0.84	1.30	96
RF2060		38.10	11.91	22.23	12.70	5.96	14.55	16.55	31.5	3.2	17.2	1.51	2.19	80
RF2080		50.80	15.88	28.58	15.88	7.94	18.30	20.90	39.9	4.0	23.0	2.41	3.52	60
RF2100		63.50	19.05	39.69	19.05	9.54	21.80	24.50	47.5	4.8	28.6	3.54	5.80	48
RF2120		76.20	22.23	44.45	25.40	11.11	26.95	30.55	59.0	5.6	34.4	5.08	8.13	40
RF2160		101.60	28.58	57.15	31.75	14.29	33.95	38.45	74.1	7.15	48.2	8.96	13.70	30

Chain strength: Please see pages 91 and 92.

## Attachment Dimensions

Tsubaki Chain No.	Roller Type	Pitch <i>P'</i>	<i>C</i>	<i>C1</i>	<i>C2</i>	<i>K</i>	<i>N</i>	<i>O</i>	<i>O1</i>	<i>S</i>
RF2040	S • R	Contact a Tsubakimoto representative for details.	12.7	11.1	13.6	9.5	19.1	3.6	5.2	9.1
RF2050			15.9	14.3	15.9	11.9	23.8	5.2	6.8	11.1
RF2060			21.45	17.5	19.1	14.3	28.6	5.2	8.7	14.7
RF2080			27.8	22.2	25.4	19.1	38.1	6.8	10.3	19.1
RF2100			33.35	28.6	31.8	23.8	47.6	8.7	14.3	23.4
RF2120			39.7	33.3	37.3	28.6	57.2	14	16	27.8
RF2160			52.4	44.5	50.8	38.1	76.2	18	22	36.5

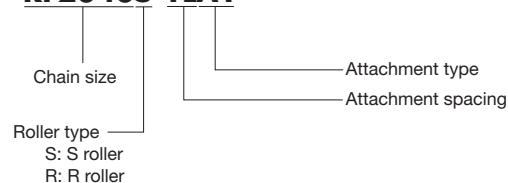
Tsubaki Chain No.	<i>X</i>	<i>X2</i>	<i>XS</i>	<i>D</i>	<i>L3</i>	<i>L4</i>	<i>G</i>	Additional Weight per Attachment kg		
								A, SA	K, SK	EP
RF2040	19.3	17.6	19.8	3.97	9.5	16.75	4.1	0.003	0.006	0.001
RF2050	24.2	22.0	24.6	5.09	11.9	21.0	5.1	0.006	0.012	0.002
RF2060	31.5	28.2	30.6	5.96	14.3	27.45	6.1	0.017	0.034	0.003
RF2080	40.7	36.6	40.5	7.94	19.1	35.5	8.1	0.032	0.064	0.007
RF2100	49.9	44.9	50.4	9.54	23.8	43.4	10.1	0.060	0.120	0.012
RF2120	60.7	54.4	59.9	—	—	—	—	0.100	0.200	—
RF2160	77.8	70.0	78.6	—	—	—	—	0.203	0.400	—

## Operating Temperature Range: -10°C to 150°C

Use a lubricant suited to the operating temperature. (See page 101, table 14.)

## Chain Numbering

**RF2040S-1LA1**



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

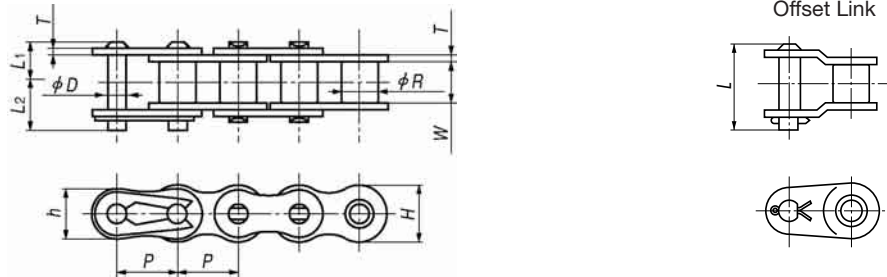
High Precision  
Conveyor Chain

Engineering Manual

# RS® Attachment Chain

RS Attachment Chain is used for short conveyors (usually less than 10 m) of small products. This chain is also suitable for low-noise environments.

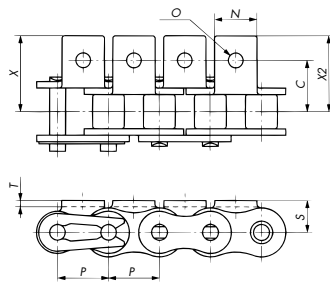
## Base Chain



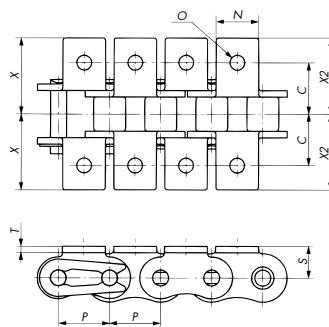
- Connecting links: RS25 to RS60 use spring clips. RS80 and larger use cotter pins. Base chain pins are riveted.

## Attachments

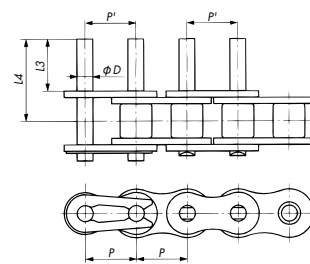
A1 Attachment



K1 Attachment

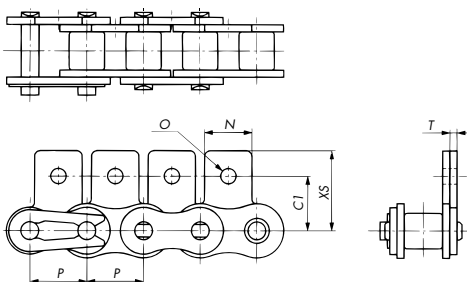


EP Attachment

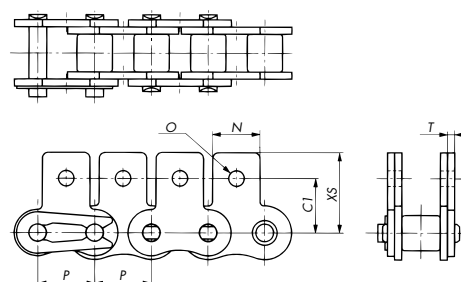


- Actual dimension P' may differ from P. Please contact a Tsubakimoto representative for details.

SA1 Attachment



SK1 Attachment



- Pins other than those on connecting links are riveted regardless of whether attachments are present.
- The drawings above show attachments added on every link.

Note: RS sprockets can be used. Please refer to separate Tsubaki Drive Chain catalog for information on RS sprockets.



## Base Chain Dimensions

Tsubaki Chain No.	Pitch $P$	$P'$	Roller Dia. (Bush) $R$	Width Between Inner Link Plates $W$	Plate			Pin				Approx. Mass kg/m	No. of Links per Unit
					Thickness $T$	Width $H$	Width $h$	Dia. $D$	$L_1$	$L_2$	$L$		
RS25	6.35	Contact a Tsubakimoto representative for details.	( 3.30)	3.18	0.75	5.84	5.05	2.31	3.80	4.8	—	0.14	160
RS35	9.525		( 5.08)	4.78	1.25	9.0	7.8	3.59	5.85	6.85	13.5	0.33	320
RS40	12.70		7.92	7.95	1.5	12.0	10.4	3.97	8.25	9.95	18.2	0.64	240
RS50	15.875		10.16	9.53	2.0	15.0	13.0	5.09	10.3	12.0	22.6	1.04	192
RS60	19.05		11.91	12.70	2.4	18.1	15.6	5.96	12.85	14.75	28.2	1.53	160
RS80	25.40		15.88	15.88	3.2	24.1	20.8	7.94	16.25	19.25	36.6	2.66	120
RS100	31.75		19.05	19.05	4.0	30.1	26.0	9.54	19.75	22.85	43.7	3.99	96
RS120	38.10		22.23	25.40	4.8	36.2	31.2	11.11	24.90	28.90	55.0	5.93	80
RS140	44.45		25.40	25.40	5.6	42.2	36.4	12.71	26.90	31.70	59.5	7.49	68
RS160	50.80		28.58	31.75	6.4	48.2	41.6	14.29	31.85	36.85	70.2	10.10	60

Chain strength: Please see pages 91 and 92.

## Attachment Dimensions

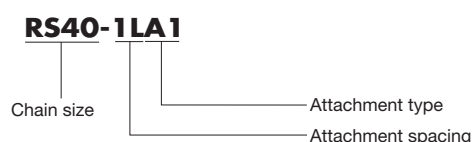
Tsubaki Chain No.	$C$	$C1$	$N$	$O$	$S$	$T$	$X$	$X2$	$XS$	$D$	$L3$	$L4$	Additional Weight per Attachment kg		
													A, SA	K, SK	EP
RS25	7.15	7.95	5.6	3.4	4.75	0.75	10.7	10.7	11.65	2.31	6.0	9.3	0.0003	0.0006	—
RS35	9.5	9.5	7.9	3.4	6.35	1.25	14.3	14.3	14.55	3.59	9.5	14.6	0.0008	0.0016	0.001
RS40	12.7	12.7	9.5	3.6	8.0	1.5	17.8	17.8	17.40	3.97	9.5	16.75	0.002	0.004	0.001
RS50	15.9	15.9	12.7	5.2	10.3	2.0	23.4	23.4	23.05	5.09	11.9	21.0	0.003	0.006	0.002
RS60	19.05	18.3	15.9	5.2	11.9	2.4	28.2	28.2	26.85	5.96	14.3	25.75	0.007	0.014	0.003
RS80	25.4	24.6	19.1	6.8	15.9	3.2	36.6	36.6	35.45	7.94	19.1	33.85	0.013	0.026	0.007
RS100	31.75	31.8	25.4	8.7	19.8	4.0	44.9	44.9	44.0	9.54	23.8	41.75	0.026	0.052	0.012
RS120	38.1	36.5	28.6	10.3	23.0	4.8	55.8	50.8	52.9	11.11	28.6	51.4	0.044	0.088	0.020
RS140	44.5	44.5	34.9	11.9	28.6	5.6	63.1	57.2	63.5	12.71	33.3	57.9	0.071	0.142	0.030
RS160	50.8	50.8	38.1	14.3	31.8	6.4	71.8	65.1	70.1	14.29	38.1	67.45	0.097	0.194	0.045

Note: Pin diameters for RS35 and RS35-LMC (Lambda) chain are different. The two cannot be combined.

## Operating Temperature Range: -10°C to 150°C

Use a lubricant suited to the operating temperature. (See page 101, table 14.)

## Chain Numbering



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

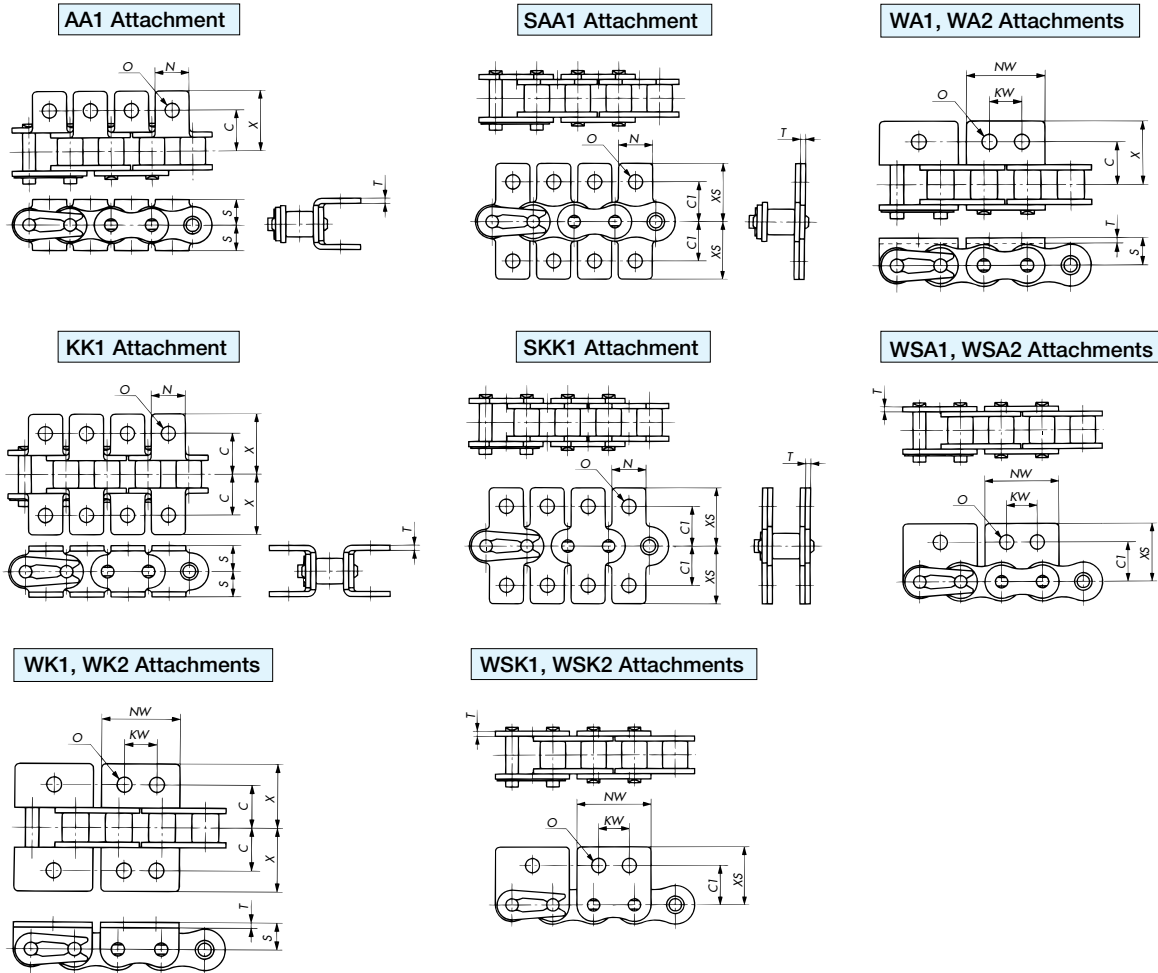
Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Additional RS® Attachment Chains

## Attachments



## Attachment Dimensions

Tsubaki Chain No.	Pitch	C	C1	N	O	S	T	X	XS	NW	NW (when on inner link; see Note 5 below)	KW	Additional Weight per Attachment kg			
													AA, SAA	KK, SKK	WA, WSA	WK, WSK
RS40	12.70	12.7	12.7	9.5	4.5	8.0	1.5	17.8	17.4	23.0	24.7	9.5	0.003	0.006	0.003	0.006
RS50	15.875	15.9	15.9	12.7	5.5	10.3	2.0	23.4	23.05	28.8	30.9	11.9	0.006	0.012	0.007	0.014
RS60	19.05	19.05	18.3	15.9	6.6	11.9	2.4	28.2	26.85	34.6	37.2	14.3	0.011	0.022	0.012	0.024
RS80	25.40	25.4	24.6	19.1	9.0	15.9	3.2	36.6	35.45	46.1	49.5	19.1	0.023	0.046	0.028	0.056
RS100	31.75	31.75	31.8	25.4	11.0	19.8	4.0	44.9	44.0	57.7	61.9	23.8	0.048	0.096	0.055	0.110

- Note: 1. Base chain dimensions are the same as those of RS Attachment Chain.  
 2. Connecting links: RS40 to RS60 use spring clips. RS80 and RS100 use cotter pins.  
 3. Check sprocket hub dimensions to ensure that attachments AA, KK, SAA, and SKK will not make contact with the hub.  
 4. Check clearances between AA and KK attachments to ensure that no contact occurs on curved sections of the conveyor path.  
 5. In the table above, NW (when on inner link) refers to the case when attachments are provided on inner links.

## Operating Temperature Range: -10°C to 150°C

Use a lubricant suited to the operating temperature. (See page 101, table 14.)

## Chain Numbering

**RS80-1LAA1**

Chain size      Attachment type  
Attachment spacing

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

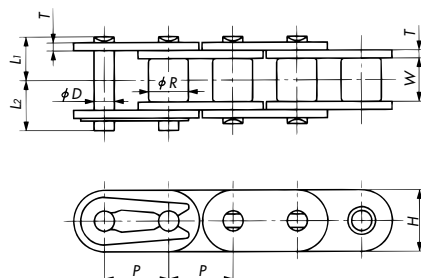
Engineering Manual

# RF Roller Chain

RF Roller Chain is identical to RS Attachment Chain except that the link plates have flattened sides to allow conveyed materials to be placed directly on the chain.



## Base Chain



- Connecting links: RF35 to RF60 use spring clips. RF80 and larger use cotter pins. • Offset links are not available.

## Base Chain Dimensions

Tsubaki Chain No.	Pitch $P$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Plate		Pin			Max. Allowable Load kN {kgf}	Approx. Mass kg/m	No. of Links per Unit
				Thickness $T$	Width $H$	Dia. $D$	$L_1$	$L_2$			
RF35	9.525	( 5.08)	4.78	1.25	9.0	3.59	5.85	6.85	1.52{ 155}	0.41	320
RF40	12.70	7.92	7.95	1.5	12.0	3.97	8.25	9.95	2.65{ 270}	0.74	240
RF50	15.875	10.16	9.53	2.0	15.0	5.09	10.3	12.0	4.31{ 440}	1.22	192
RF60	19.05	11.91	12.70	2.4	18.1	5.96	12.85	14.75	6.28{ 640}	1.78	160
RF80	25.40	15.88	15.88	3.2	24.1	7.94	16.25	19.25	10.7{ 1090}	3.09	120
RF100	31.75	19.05	19.05	4.0	28.6	9.54	19.75	22.85	17.1{ 1740}	4.43	96
RF120	38.10	22.23	25.40	4.8	34.4	11.11	24.9	28.9	23.9{ 2440}	6.49	80

Note: Roller diameter  $R$  (in parentheses) for RF35 is the bush diameter.

## Operating Temperature Range: -10°C to 150°C

Use a lubricant suited to the operating temperature. (See page 101, table 14.)

## Chain Numbering

**RF60**

Chain size

- Stainless steel and Lambda chains are also available. Please consult a Tsubakimoto representative for more information.
- RS sprockets can be used. Please refer to separate Tsubaki Drive Chain catalog for information on RS sprockets.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

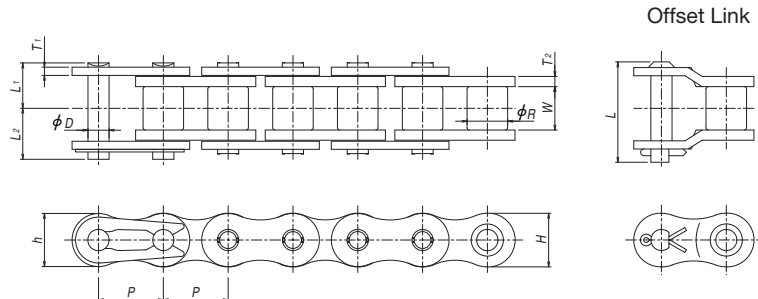
Engineering Manual



# BS Attachment Chain

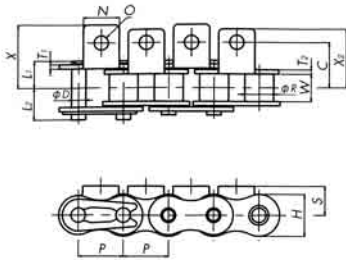
BS Attachment Chain conforms to ISO 606 "B" series standards. The dimensions are fully interchangeable with existing BS chains used in equipment manufactured in Europe, without the need to replace sprockets.

## Base Chain

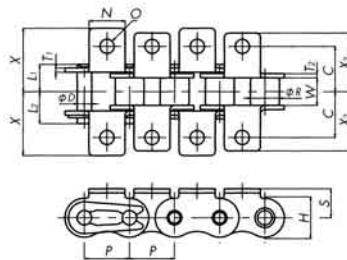


## Attachments

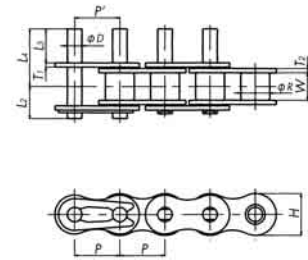
A1 Attachment



K1 Attachment

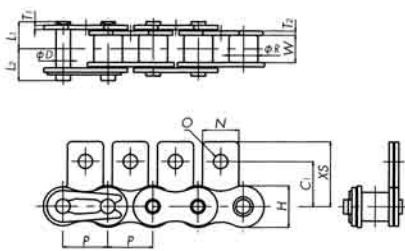


EP Attachment

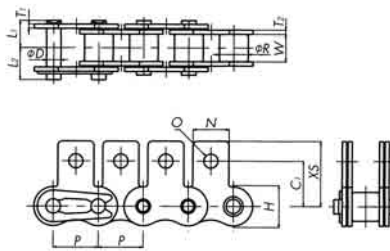


• Actual dimension P' may differ from P.  
Please contact a Tsubakimoto representative for details.

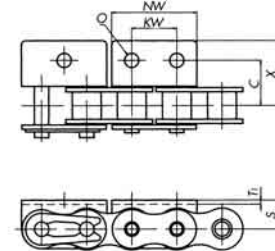
SA1 Attachment



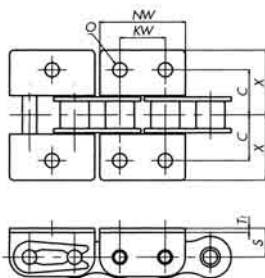
SK1 Attachment



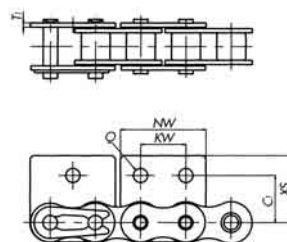
WA1, WA2 Attachments



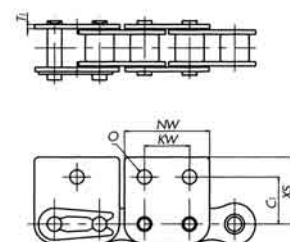
WK1, WK2 Attachments



WSA1, WSA2 Attachments



WSK1, WSK2 Attachments





## Base Chain Dimensions

Tsubaki Chain No.	ISO No.	Pitch <i>P</i>	Roller Dia. <i>R</i>	Width Between Inner Link Plates <i>W</i>	Plate			
					Thickness <i>T<sub>2</sub></i>	Thickness <i>T<sub>1</sub></i>	Width <i>H</i>	Width <i>h</i>
RS08B	08B	12.70	8.51	7.75	1.6	1.6	12.0	10.4
RS10B	10B	15.875	10.16	9.65	1.5	1.5	14.7	13.7
RS12B	12B	19.05	12.07	11.68	1.8	1.8	16.1	16.1
RS16B	16B	25.40	15.88	17.02	4.0	3.2	21.0	21.0

Tsubaki Chain No.	Pin				Min. Tensile Strength kN {kgf}	Approx. Mass kg/m	No. of Links per Unit
	Dia. <i>D</i>	<i>L<sub>1</sub></i>	<i>L<sub>2</sub></i>	<i>L</i>			
RS08B	4.45	8.4	10.0	18.6	12.9{1320}	0.70	240
RS10B	5.08	9.55	11.25	20.8	15.7{1600}	0.95	192
RS12B	5.72	11.1	13.0	24.4	22.1{2250}	1.25	160
RS16B	8.28	17.75	19.95	39.3	56.2{5730}	2.70	120

## Attachment Dimensions

Tsubaki Chain No.	A1, SA1, K1, SK1 Attachments								Additional Weight per Attachment kg	
	<i>C</i>	<i>C1</i>	<i>N</i>	<i>O</i>	<i>S</i>	<i>X</i>	<i>X2</i>	<i>XS</i>	<i>A, SA</i>	<i>K, SK</i>
RS08B	11.9	12.7	11.4	4.2	8.9	19.05	17.15	19.3	0.002	0.004
RS10B	15.9	15.9	12.7	5.0	10.2	22.25	20.6	22.9	0.003	0.006
RS12B	19.05	22.2	16.5	7.1	13.5	29.85	27.8	32.05	0.006	0.012
RS16B	23.8	23.9	24.3	6.7	15.2	37.35	34.4	34.1	0.014	0.028

Tsubaki Chain No.	WA2, WSA2, WK2, WSK2 Attachments WA1, WSA1, WK1, WSK1 Attachments								EP Attachment				Additional Weight per Attachment kg		
	<i>C</i>	<i>C1</i>	<i>NW</i>	<i>O</i>	<i>S</i>	<i>X</i>	<i>XS</i>	<i>KW</i>	<i>P'</i>	<i>D</i>	<i>L3</i>	<i>L4</i>	<i>WA, WSA</i>	<i>WK, WSK</i>	<i>EP</i>
RS08B	12.7	13.1	24.6	4.9	8.9	20.3	20.7	12.7	Contact a Tsubakimoto representative for details.	4.45	9.5	17.0	0.005	0.010	0.001
RS10B	15.9	16.6	30.0	5.0	10.2	22.85	23.6	15.9		5.08	11.9	20.25	0.006	0.012	0.002
RS12B	17.45	17.6	34.8	5.5	11.4	25.65	25.75	19.1		5.72	14.3	24.1	0.009	0.018	0.003
RS16B	28.6	26.0	46.0	8.1	15.9	39.25	36.7	25.4		8.28	19.1	35.25	0.030	0.060	0.008

## Operating Temperature Range: -10°C to 150°C

Use a lubricant suited to the operating temperature. (See page 101, table 14.)

## Pin Shape

Single-strand chains in sizes RS08B through RS16B use easy disassembly pins (with center sink riveting). All other sizes, including multi-strand chains, use double stake riveting.

## Sprockets

Use BS Roller Chain (ISO B Series) sprockets (made-to-order item).

## Chain Selection

Please contact a Tsubakimoto representative regarding chain selection.

## Special Orders

Tsubaki can manufacture special attachments and special extended pins, as well as RF06B, RS20B, and RS24B Attachment Chain having dimensions other than those given above. Please inquire for details.

## Chain Numbering

**RS08B-1LA1**

Chain size  
Attachment type  
Attachment spacing

Note: Stainless steel and Lambda chains are also available. Please consult a Tsubakimoto representative for more information.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Hollow Pin Chain

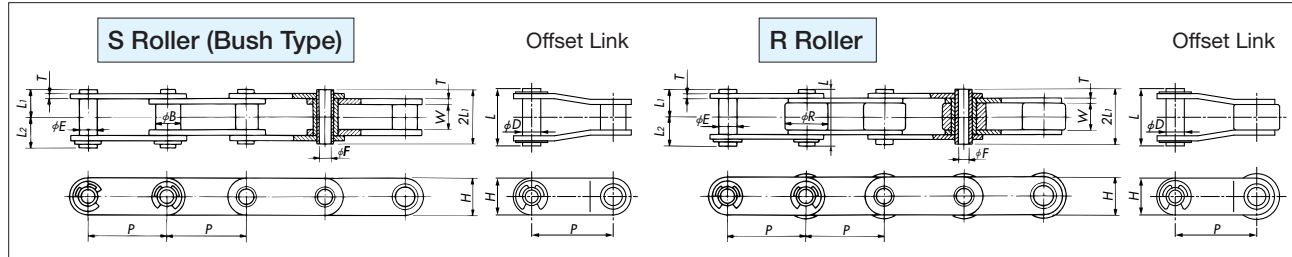
In Hollow Pin Chain, the pin is made with a hole, enabling various attachments to be installed simply and easily. This type of chain is used for general-purpose conveyance.

Features:

- Regardless of whether the chain is straight or wrapped around a sprocket, the center distance between attachments is always the same.
- The load from the attachments is distributed equally to both sides of the link plates. This provides advantages in terms of strength, and the chain has less tendency to wind while running.
- It is easy to replace attachments, do maintenance, or adjust attachment spacing even while the chain is installed on equipment.

## Hollow Pin Double Pitch Chain

### Base Chain



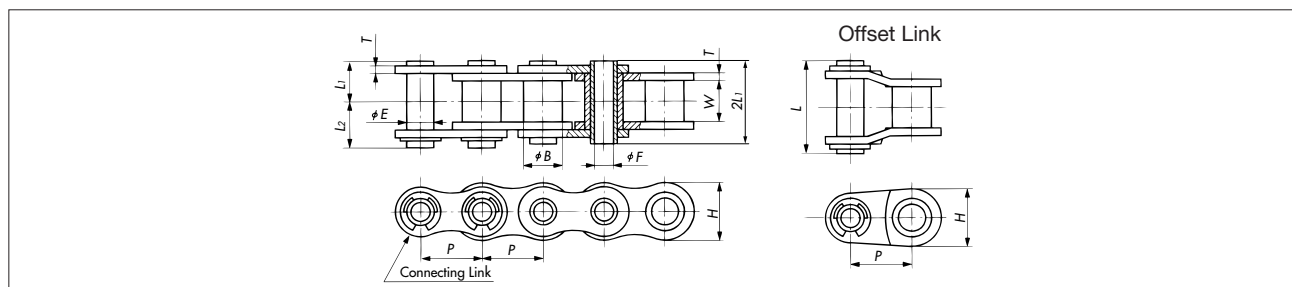
### Base Chain Dimensions

Tsubaki Chain No.	Roller Type	Pitch P	Bush Dia. B	Roller Dia. R	Width Between Inner Link Plates W	Plate		Pin				Offset Pin Length L	Approx. Mass kg/m		No. of Links per Unit
						Thickness T	Width H	Outer Dia. E	Inner Dia. F (min.)	L1	L2		Bush Type	R Roller	
RF2040-HP	S • R	25.40	7.92	15.88	7.95	1.5	12.0	5.68	4.00	8.00	9.50	19.1	0.46	0.82	120
RF2050-HP		31.75	10.16	19.05	9.53	2.0	15.0	7.22	5.12	10.05	11.65	23.4	0.75	1.21	96
RF2060-HP		38.10	11.91	22.23	12.70	2.4	17.2	8.38	5.99	12.55	14.25	28.7	1.38	2.06	80
RF2080-HP		50.80	15.88	28.58	15.88	3.2	23.0	11.375	8.02	16.25	17.80	35.7	1.80	2.81	60

Chain strength: Please see page 92.

## Hollow Pin RS Chain

### Base Chain



### Base Chain Dimensions

Tsubaki Chain No.	Pitch P	Bush Dia. B	Width Between Inner Link Plates W	Plate		Pin				Offset Pin Length L	Approx. Mass kg/m	No. of Links per Unit
				Thickness T	Width H	Outer Dia. E	Inner Dia. F (min.)	L1	L2			
RS40-HP	12.70	7.92	7.95	1.5	12.0	5.68	4.00	8.00	9.50	19.1	0.53	240
RS50-HP	15.875	10.16	9.53	2.0	15.0	7.22	5.12	10.05	11.65	23.4	0.86	192
RS60-HP	19.05	11.91	12.70	2.4	18.1	8.38	5.99	12.55	14.25	28.7	1.27	160
RS80-HP	25.40	15.88	15.88	3.2	24.1	11.375	8.02	16.25	17.80	35.7	2.15	120

Chain strength: Please see page 92.

### Operating Temperature Range: -10°C to 150°C

Use a lubricant suited to the operating temperature. (See page 101, table 14.)

### Chain Numbering

**RF2040S-HP-NP**

Chain size \_\_\_\_\_

Roller type (S: S roller, R: R roller) \_\_\_\_\_

Chain type: Hollow pin \_\_\_\_\_

Chain specification  
Standard: No symbol  
Nickel-plated: NP

**RS40-HP-NP**

Chain size \_\_\_\_\_

Chain type: Hollow pin \_\_\_\_\_

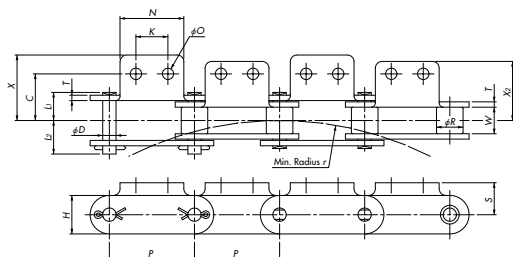
Chain specification  
Standard: No symbol  
Nickel-plated: NP

# Curved Attachment Chain

Curved Attachment Chain has additional clearance between the pins and bushes to permit extra flexibility. Guide rails to control the chain enable it to be used for curved conveyance. This chain can be used for power transmission purposes, as well as conveyance when attachments are installed. (Contact a Tsubakimoto representative for details.)

## Curved Double Pitch Chain

### Base Chain and Attachments



- Drawing shows S roller chain. Dimensions are the same for R roller chain, excluding roller dimensions.
- When attachments are to be installed on each even-numbered link, attachments will be provided on inner links unless otherwise specified.

### Chain Numbering

**RF2040S-CU-1LA2**

Chain size \_\_\_\_\_ Attachment type \_\_\_\_\_  
Roller type \_\_\_\_\_ Attachment spacing \_\_\_\_\_  
(S: S roller, R: R roller) Chain type: Curved

### Base Chain Dimensions

Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R		Plate		Pin			Min. Radius r	Max. Allowable Load kN {kgf}	Approx. Mass kg/m		No. of Links per Unit
			S Roller	R Roller	Thickness T	Width H	Dia. D	L1	L2			S Roller	R Roller	
RF2040-CU	25.40	7.95	7.92	15.88	1.5	12.0	3.97	8.45	9.75	700	1.86{190}	0.51	0.87	120
RF2050-CU	31.75	9.53	10.16	19.05	2.0	15.0	5.09	10.6	12.4	800	2.84{290}	0.84	1.30	96
RF2060-CU	38.10	12.70	11.91	22.23	2.4	17.2	5.96	13.25	15.05	1000	4.02{410}	1.22	1.90	80
RF2080-CU	50.80	15.88	15.88	28.58	3.2	23.0	7.94	16.75	20.05	1200	6.96{710}	2.02	3.13	60

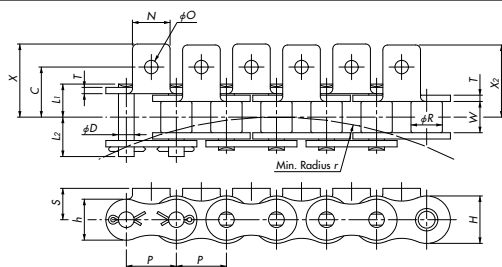
Chain strength: Please see page 92.

### Attachment Dimensions

Tsubaki Chain No.	A1, K1, A2, K2 Attachments							Additional Weight per Attachment kg	
	C	K	N	O	S	X	X2	A	K
RF2040-CU	12.7	9.5	19.1	3.6	9.1	19.5	17.6	0.03	0.06
RF2050-CU	15.9	11.9	23.8	5.2	11.1	24.4	22.0	0.06	0.12
RF2060-CU	21.45	14.3	28.6	5.2	14.7	29.9	27.0	0.013	0.026
RF2080-CU	27.8	19.1	38.1	6.8	19.1	39.1	35.25	0.026	0.052

## Curved RS Attachment Chain

### Base Chain and Attachments



- When attachments are to be installed on each even-numbered link, attachments will be provided on inner links unless otherwise specified.

### Chain Numbering

**RS80-CU-1LA1**

Chain size \_\_\_\_\_ Attachment type \_\_\_\_\_  
Chain type: Curved Attachment spacing \_\_\_\_\_

### Base Chain Dimensions

Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R	Plate			Pin			Min. Radius r	Max. Allowable Load kN {kgf}	Approx. Mass kg/m	No. of Links per Unit
				Thickness T	Width H	Width h	Dia. D	L1	L2				
RS40-CU	12.70	7.95	7.92	1.5	12.0	10.4	3.97	8.45	9.75	350	1.86{190}	0.61	240
RS50-CU	15.875	9.53	10.16	2.0	15.0	13.0	5.09	10.6	12.4	400	2.84{290}	1.01	192
RS60-CU	19.05	12.70	11.91	2.4	18.1	15.6	5.96	13.25	15.05	500	4.02{410}	1.40	160
RS80-CU	25.40	15.88	15.88	3.2	24.1	20.8	7.94	16.75	20.05	600	6.96{710}	2.47	120

Chain strength: Please see page 92.

### Attachment Dimensions

Tsubaki Chain No.	A1, K1 Attachments						Additional Weight per Attachment kg	
	C	N	O	S	X	X2	A	K
RS40-CU	12.7	9.5	3.6	8.0	18.0	17.8	0.002	0.004
RS50-CU	15.9	12.7	5.2	10.3	23.7	23.4	0.003	0.006
RS60-CU	19.05	15.9	5.2	11.9	28.5	28.2	0.007	0.014
RS80-CU	25.4	19.1	6.8	15.9	37.1	36.6	0.013	0.026

### Operating Temperature Range: -10°C to 150°C

Use a lubricant suited to the operating temperature. (See page 101, table 14.)

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Lube Free Small Size Conveyor Chain



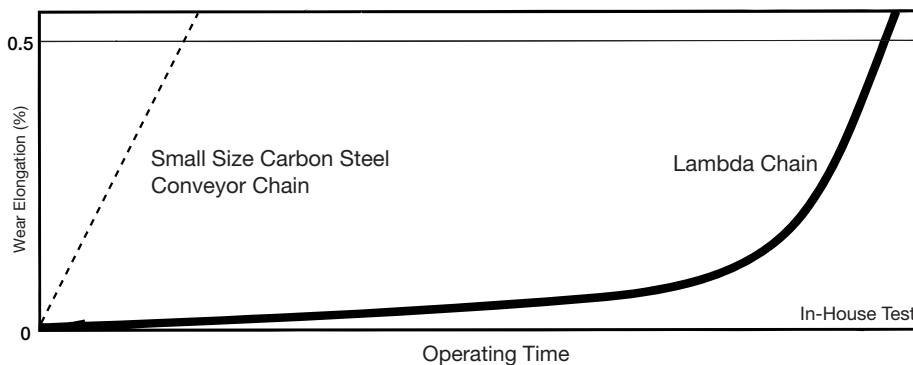
## Tsubaki Lambda<sup>®</sup> Chain



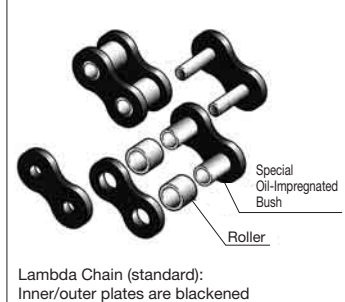
Tsubaki is a pioneer in the industry, being the first to develop a chain that uses special oil-impregnated bushes. Since first being introduced in 1988, Lambda Chain has gained an outstanding reputation in a variety of industries and applications. It is capable of meeting a wide range of customer needs for long life in a lubrication-free environment, resulting in a reduction in overall long-term costs.

- Long life without additional lubrication... Special oil-impregnated bushes provide long service life.
- Interchangeability... Compatible with Standard Small Size Conveyor Chain.
- Operating temperature range... -10°C to 150°C
- More than 14 times the wear elongation life of RS Roller Chain.  
(RS80-LMC and RS100-LMC have seven times and RS35-LMC has five times the life of RS Roller Chain.)

### Performance in Normal Temperatures (-10°C to 60°C)



### Basic Construction



### Lambda Double Pitch Chain, Lambda RS Attachment Chain

Inner and outer link plates are blackened. This treatment provides better corrosion resistance, as well as improving the overall appearance of the chain.



### Surface-Treated Lambda Double Pitch Chain, Surface-Treated Lambda RS Attachment Chain

Standard Lambda Chain with anti-corrosion surface treatments.  
NP: Nickel-plated plates and rollers provide mild corrosion resistance.  
NEP: A special anti-corrosion surface treatment is applied to the plates and rollers to improve corrosion resistance.



### BS Lambda Attachment Chain

Lambda Chain that conforms to ISO 606 B series standards. The dimensions are fully interchangeable with existing BS chains. Specially shaped pins are used on single-strand 08B to 16B sizes to enable easy chain disassembly using a standard chain breaker.



### Lambda Hollow Pin Double Pitch Chain, Lambda Hollow Pin RS Chain

Hollow Pin Chain with all the features of Lambda Chain. (Special oil-impregnated sintered bushes are used on hollow pin bushes.)



### Lambda RF Roller Chain

RF Roller Chain with all the features of Lambda Chain. Designed for lubrication-free applications where conveyed objects are placed directly on the chain.



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual



# Lube Free Small Size Conveyor Chain

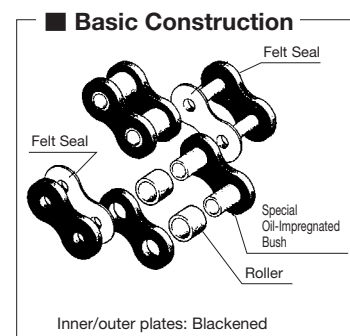
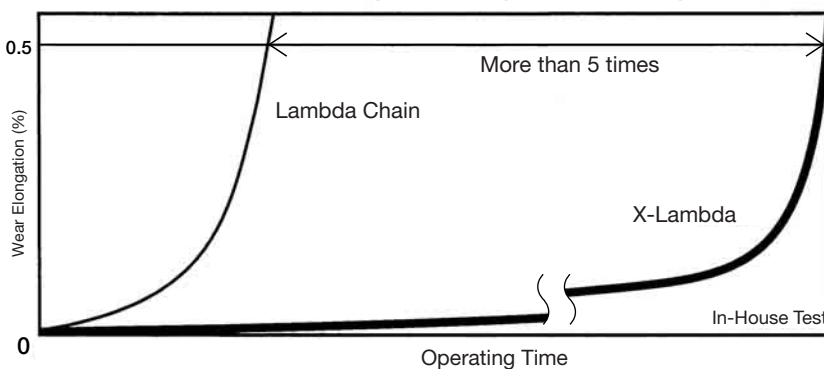
## Long Life Lambda Chain (X- $\Lambda$ <sup>®</sup> [X-Lambda])



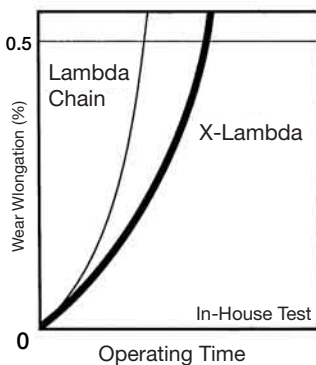
The inclusion of an oil-impregnated felt seal in the construction of X- $\Lambda$ <sup>®</sup> (X-Lambda) Chain significantly improves the anti-wear performance of standard Lambda Chain. Ideal for environments where extended replacement intervals are required when using lube-free chain.

- Ultra long life... The inclusion of an oil-impregnated felt seal in the construction of X-Lambda Chain provides more than five times the anti-wear performance of standard Lambda Chain (Tsubakimoto comparison at  $-10^{\circ}\text{C}$  to  $60^{\circ}\text{C}$ ).
- Ultra long life in a lube-free chain... The combination of a special oil-impregnated bush and felt seal further extends service life.
- Interchangeability... Fully interchangeable with Lambda Chain. However, as the overall pin length is longer than Lambda Chain, please check attachment dimensions and that there will be no interference with machinery or other equipment.
- Operating temperature range...  $-10^{\circ}\text{C}$  to  $150^{\circ}\text{C}$

### Performance in Normal Temperatures ( $-10^{\circ}\text{C}$ to $60^{\circ}\text{C}$ )



### Performance in Mid-Range Temperatures ( $150^{\circ}\text{C}$ )



### X-Lambda Double Pitch Chain, X-Lambda RS Attachment Chain



## Tsubaki Incorporates LCA (Life Cycle Assessment) in Its Activities

Tsubaki Lambda<sup>®</sup> Chain is an eco-friendly chain that requires no lubrication and has a long wear life. It is extremely effective in reducing greenhouse gas emissions.

\* CO<sub>2</sub> emissions comparing RS80-LMD-1 Lambda Chain and RS80-1 Roller Chain

89.4%  
reduction in  
CO<sub>2</sub>  
emissions\*

### LCA (Life Cycle Assessment)

Life Cycle Assessment (LCA) is a tool for the systematic evaluation of the environmental aspects of a product through all stages of its life cycle, from raw materials to waste management including recycling and final disposal.



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Lube Free Small Size Conveyor Chain



## Lambda Chain KF Series

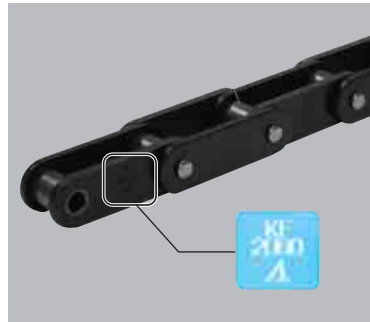
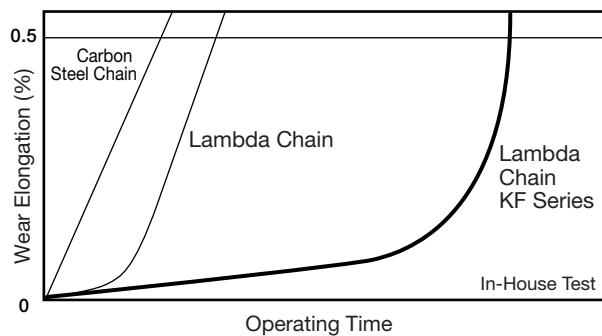


Lambda Chain KF Series uses special bushes impregnated with a lubricant that does not deteriorate or disperse at high temperatures to deliver “lube-free” operation and long service life in high-temperature environments where maintenance is difficult.

- Outstanding performance at high temperatures.
- Stable lubrication and anti-wear properties at high temperatures.
- Uses NSF-H1 food grade certified lubricating oil and is environmentally friendly.
- Operating temperature range: 150°C to 230°C

Chain size: RS40-LMC-KF to RS80-LMC-KF, RF2040-LMC-KF to RF2080-LMC-KF  
Please contact a Tsubakimoto representative when you need other sizes and specifications.

### Wear Life in 230°C Environment



### Chain Numbering

#### RF2040S-LMC-KF-1LA2

Chain size: RF2040S  
Roller type: S roller, R roller  
Attachment type: LMC  
Attachment spacing: KF  
Chain type: Lambda KF Attachment Chain

#### RS40-LMC-KF-2LK1

Chain size: RS40  
Chain type: LMC  
Attachment type: KF  
Attachment spacing: 2LK1  
Chain type: Lambda KF Attachment Chain

### ⚠ Safety Precautions for Lambda Chains

1. 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 chain or contact a Tsubakimoto representative about chain selection if using in environments where coating flakes or wear dust present problems. Though nickel is not subject to the Japan Food Sanitation Law or the Industrial Safety and Health Law, plating on sliding parts can peel.
2. Do not use Lambda Chain where there is the possibility of exposure to chemicals, water, or cleaning/degreasing vapors.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Tsubaki Lube-Free Lambda Chain

Keeps your application running clean  
No product contamination  
Reduces downtime and maintenance costs

## Application Areas

Food and Beverage, Packaging, Printing, Personal Care,  
Electronic Appliances, Automotive, Lumber, Textile, Lighting  
... and More!



# Lambda Double Pitch Chain, Surface-Treated



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

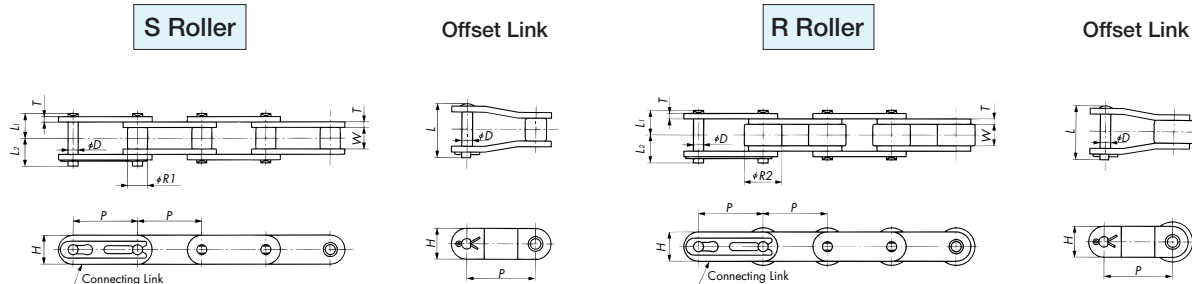
Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

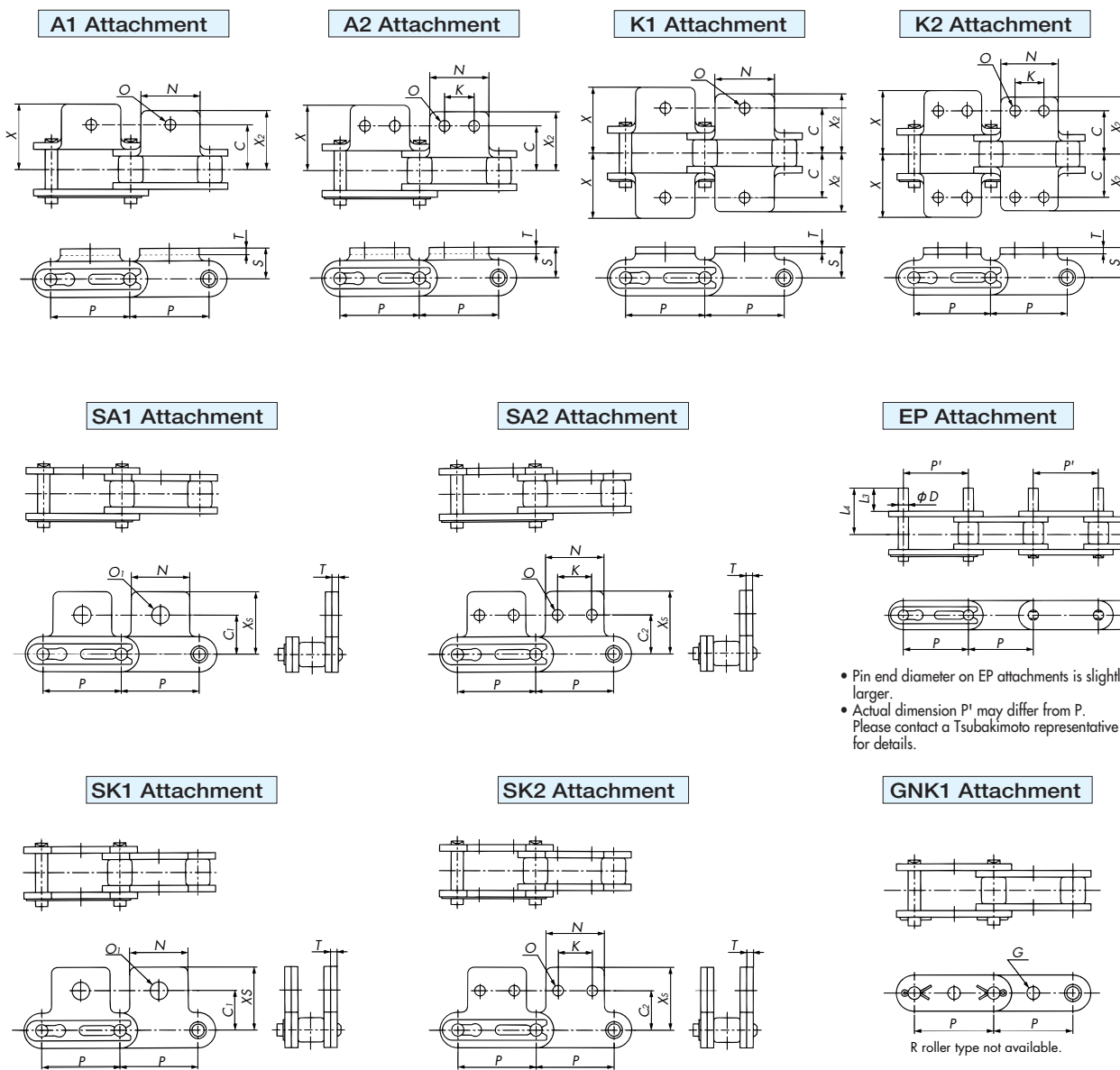
Engineering Manual

## Base Chain



- Connecting links: RF2040-LMC to RF2060-LMC use spring clips. RF2080-LMC and RF2100-LMC as well as chains with GNK1 attachments (all sizes) use cotter pins. Base chain pins are riveted.

## Attachments



- Pins other than those on connecting links are riveted regardless of whether attachments are present.
- Attachments shown are S roller type. However, the dimensions for attachments are the same when R rollers are used. Also, the drawings show attachments added on every link.

Note: RS sprockets can be used with S rollers if the sprocket has more than 30 teeth.  
A Double Pitch chain sprocket will be needed if the sprocket has fewer than 30 teeth.  
Please refer to separate Tsubaki Drive Chain catalog for more information on RS sprockets.

# Lambda Double Pitch Chain

## Base Chain Dimensions

Tsubaki Chain No.	Roller Type	Pitch <i>P</i>	<i>P'</i>	Width Between Inner Link Plates <i>W</i>	Roller Dia.		Pin			Offset Pin Length <i>L</i>	Plate	
					S Roller <i>R</i> <sub>1</sub>	R Roller <i>R</i> <sub>2</sub>	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>		Thickness <i>T</i>	Width <i>H</i>
RF2040-LMC	S • R	25.40	Contact a Tsubakimoto representative for details.	7.95	7.92	15.88	3.97	8.25	9.95	18.2	1.5	12.0
RF2050-LMC		31.75		9.53	10.16	19.05	5.09	10.30	12.0	22.6	2.0	15.0
RF2060-LMC		38.10		12.70	11.91	22.23	5.96	14.55	16.55	31.5	3.2	17.2
RF2080-LMC		50.80		15.88	15.88	28.58	7.94	18.30	20.90	39.9	4.0	23.0
RF2100-LMC		63.50		19.05	19.05	39.69	9.54	21.80	24.50	47.5	4.8	28.6

## Attachment Dimensions

Tsubaki Chain No.	Attachment															
	<i>C</i>	<i>C</i> <sub>1</sub>	<i>C</i> <sub>2</sub>	<i>K</i>	<i>N</i>	<i>O</i>	<i>O</i> <sub>1</sub>	<i>S</i>	<i>T</i>	<i>X</i>	<i>X</i> <sub>2</sub>	<i>X</i> <sub>5</sub>	<i>D</i>	<i>L</i> <sub>3</sub>	<i>L</i> <sub>4</sub>	<i>G</i>
RF2040-LMC	12.7	11.1	13.6	9.5	19.1	3.6	5.2	9.1	1.5	19.3	17.6	19.8	3.97	9.5	16.75	4.1
RF2050-LMC	15.9	14.3	15.9	11.9	23.8	5.2	6.8	11.1	2.0	24.2	22.0	24.6	5.09	11.9	21.0	5.1
RF2060-LMC	21.45	17.5	19.1	14.3	28.6	5.2	8.7	14.7	3.2	31.5	28.2	30.6	5.96	14.3	27.45	6.1
RF2080-LMC	27.8	22.2	25.4	19.1	38.1	6.8	10.3	19.1	4.0	40.7	36.6	40.5	7.94	19.1	35.5	8.1
RF2100-LMC	33.35	28.6	31.8	23.8	47.6	8.7	14.3	23.4	4.8	49.9	44.9	50.4	9.54	23.8	43.4	10.1

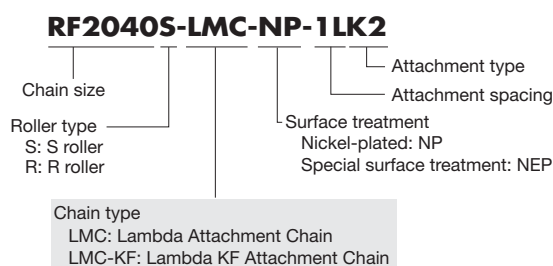
Tsubaki Chain No.	Max. Allowable Load kN {kgf}	Approx. Mass kg/m		Additional Weight per Attachment kg			No. of Links per Unit
		S Roller	R Roller	A, SA	K, SK	EP	
RF2040-LMC	2.65{ 270}	0.51	0.87	0.003	0.006	0.001	120
RF2050-LMC	4.31{ 440}	0.84	1.30	0.006	0.012	0.002	96
RF2060-LMC	6.28{ 640}	1.51	2.19	0.017	0.034	0.003	80
RF2080-LMC	10.7 {1090}	2.41	3.52	0.032	0.064	0.007	60
RF2100-LMC	17.1 {1740}	3.54	5.80	0.06	0.12	0.012	48

Note: Dimensions *O* and *O*<sub>1</sub> are slightly smaller on NEP chains.

## Operating Temperature Range: -10°C to 150°C

Note: -10°C to 230°C for KF chain. (Be sure to factor in temperature when selecting.)

## Chain Numbering



Note: The link plates on Lambda KF Chain are painted black.  
Offset links for Lambda KF Chain are made-to-order. Please contact a Tsubakimoto representative for more information.



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual



# Long Life Lambda Double Pitch Chain (X-Λ<sup>®</sup> [X-Lambda])



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

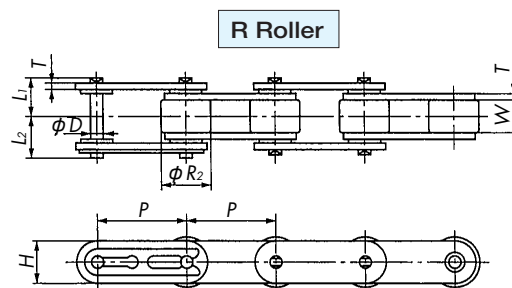
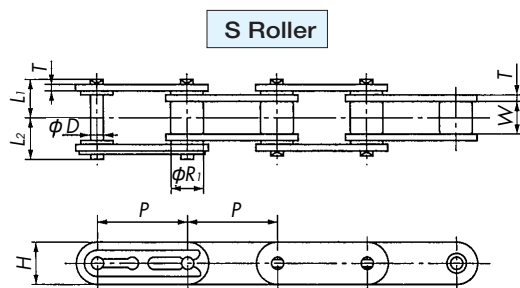
Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

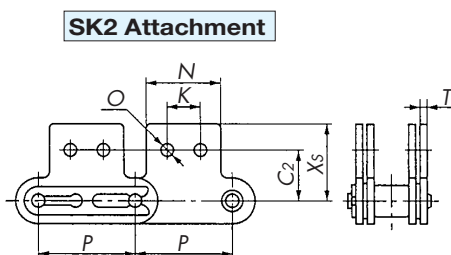
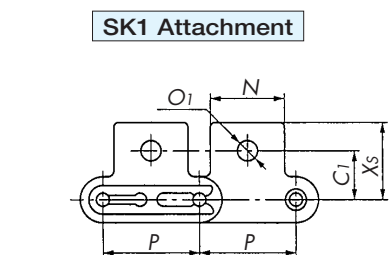
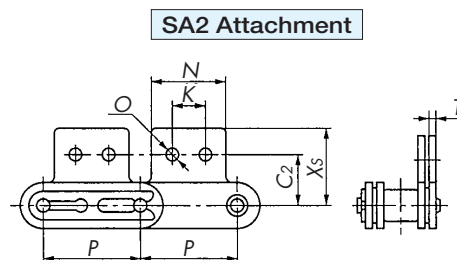
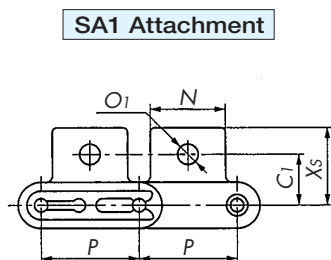
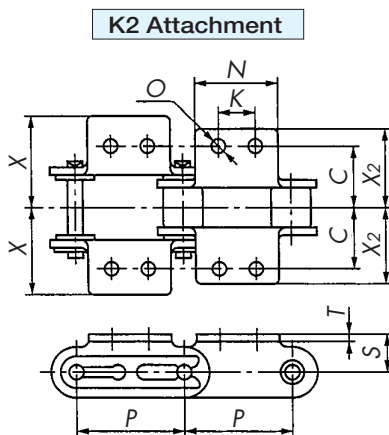
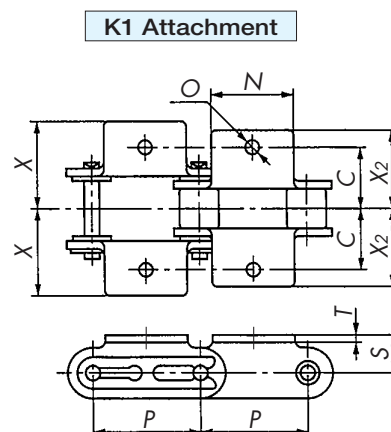
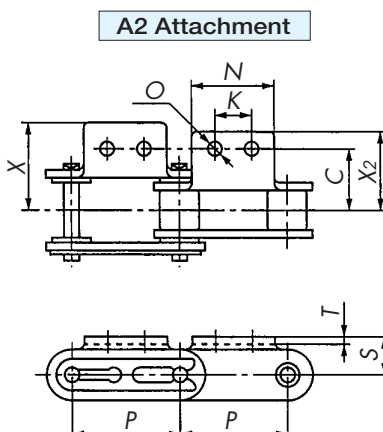
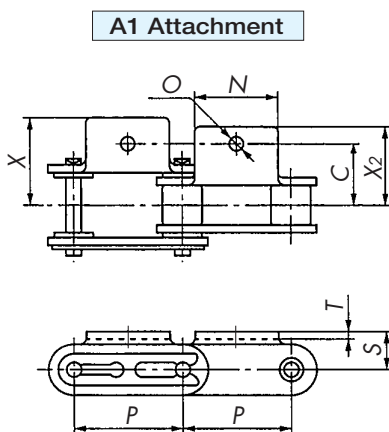
Engineering Manual

## Base Chain



- Connecting links: RF2040-LMCX to RF2060-LMCX use spring clips. RF2080-LMCX and RF2100-LMCX use cotter pins.
- Base chain pins are riveted.

## Attachments



- Attachments shown are S roller type. However, the dimensions for attachments are the same when R rollers are used.
- Also, the drawings show attachments added on every link.
- When attachments are to be installed on each even-numbered link, they will be installed on the inner link. Please specify when they must be installed on the outer link.

Note: RS sprockets can be used with S rollers if the sprocket has more than 30 teeth.  
Please refer to separate Tsubaki Drive Chain catalog for more information on RS sprockets.



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## Base Chain Dimensions

Tsubaki Chain No.	Roller Type	Pitch P	Width Between Inner Link Plates W	Roller Dia.		Pin			Plate		Max. Allowable Load kN {kgf}
				S Roller R <sub>1</sub>	S Roller R <sub>2</sub>	Dia. D	L <sub>1</sub>	L <sub>2</sub>	Thickness T	Width H	
RF2040-LMCX	S • R	25.40	7.95	7.92	15.88	3.97	8.90	10.6	1.5	12.0	2.65 { 270}
RF2050-LMCX		31.75	9.53	10.16	19.05	5.09	11.0	12.7	2.0	15.0	4.31 { 440}
RF2060-LMCX		38.10	12.70	11.91	22.23	5.96	15.25	17.15	3.2	17.2	6.28 { 640}
RF2080-LMCX		50.80	15.88	15.88	28.58	7.94	19.15	21.75	4.0	23.0	10.7 {1090}
RF2100-LMCX		63.50	19.05	19.05	39.69	9.54	22.6	25.3	4.8	28.6	17.1 {1740}

## Attachment Dimensions

Tsubak Chain No.	Attachment												Approx. Mass kg/m		Additional Weight per Attachment kg		No. of Links per Unit
	C	C <sub>1</sub>	C <sub>2</sub>	K	N	O	O <sub>1</sub>	S	T	X	X <sub>2</sub>	X <sub>S</sub>	S Roller	R Roller	A, SA	K, SK	
RF2040-LMCX	12.7	11.1	13.6	9.5	19.1	3.6	5.2	9.1	1.5	19.9	17.6	19.8	0.51	0.87	0.003	0.006	120
RF2050-LMCX	15.9	14.3	15.9	11.9	23.8	5.2	6.8	11.1	2.0	24.85	22.0	24.6	0.84	1.30	0.006	0.012	96
RF2060-LMCX	21.45	17.5	19.1	14.3	28.6	5.2	8.7	14.7	3.2	32.4	28.2	30.6	1.51	2.19	0.017	0.034	80
RF2080-LMCX	27.8	22.2	25.4	19.1	38.1	6.8	10.3	19.1	4.0	41.6	36.6	40.5	2.43	3.54	0.032	0.064	60
RF2100-LMCX	33.35	28.6	31.8	23.8	47.6	8.7	14.3	23.4	4.8	50.8	44.9	50.4	3.56	5.82	0.06	0.12	48

Note: Please inquire regarding OL (outer links).

## Operating Temperature Range: -10°C to 150°C

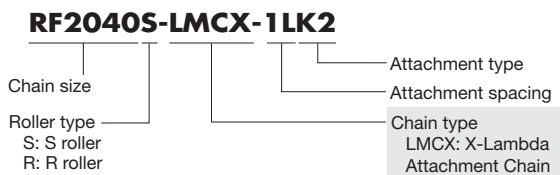
Due to the felt seals, X-Lambda chain pin length is slightly longer than that on standard attachment chain. The X dimension is longer on X-Lambda chain attachments than on standard attachments. Please check that there will be no interference with equipment.

Uses an oil-impregnated felt seal, causing more oil to stick to the surface of the chain when compared to Lambda Chain.

See page 40 for instructions on handling connecting links. Note that the shape of the felt seal is round and differs from the felt seals on RS Chain. Four felt seals are installed on each connecting link.

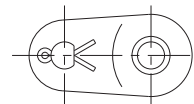
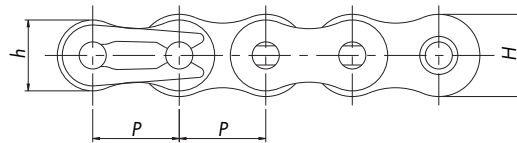
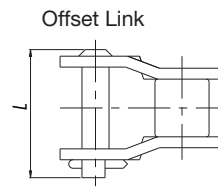
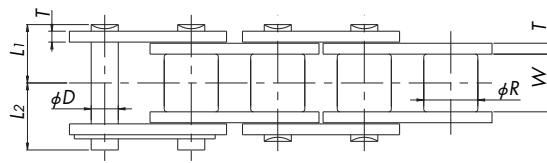
No offset links are available. Please use an even number of links.

## Chain Numbering



# Lambda RS® Attachment Chain, Surface-Treated

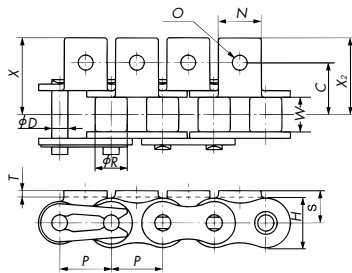
## Base Chain



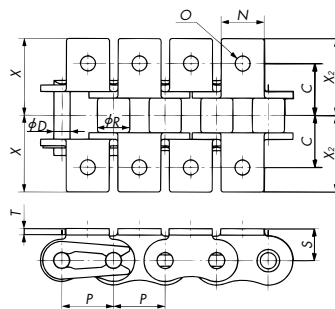
- Connecting links: RS35-LMC to RS60-LMC use spring clips. RS80-LMC and RS100-LMC use cotter pins.
- Base chain pins are riveted.

## Attachments

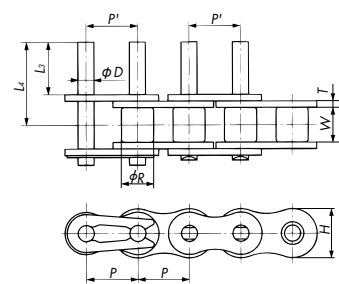
A1 Attachment



K1 Attachment

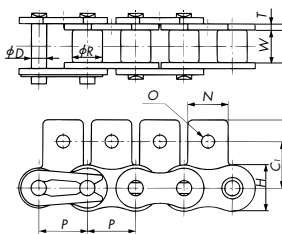


EP Attachment

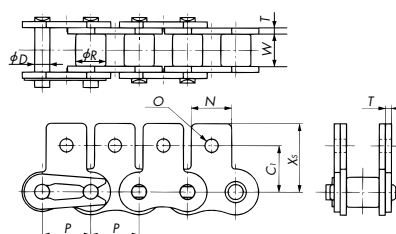


- Pin end diameter on EP attachments is slightly larger.
- Actual dimension P' may differ from P. Please contact a Tsubakimoto representative for details.

SA1 Attachment



SK1 Attachment



- Pins other than those on connecting links are riveted regardless of whether attachments are present.
- Drawings show attachments added on every link.

Note: RS sprockets can be used. Please refer to separate Tsubaki Drive Chain catalog for information on RS sprockets.

# Lambda RS® Attachment Chain



## Base Chain Dimensions

Tsubaki Chain No.	Pitch <i>P</i>	<i>P'</i>	Width Between Inner Link Plates <i>W</i>	Roller Dia. (Bush Dia.) <i>R</i>	Pin				Plate			Max. Allowable Load kN {kgf}	Approx. Mass kg/m	No. of Links per Unit
					Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i>	Thickness <i>T</i>	Width <i>H</i>	Width <i>h</i>			
RS35-LMC	9.525	Contact a Tsubakimoto representative for details.	4.78	(5.08)	3.00	5.85	6.85	13.5	1.25	9.0	7.8	1.52{ 155}	0.33	320
RS40-LMC	12.70		7.95	7.92	3.97	8.25	9.95	18.2	1.5	12.0	10.4	2.65{ 270}	0.64	240
RS50-LMC	15.875		9.53	10.16	5.09	10.3	12.0	22.6	2.0	15.0	13.0	4.31{ 440}	1.04	192
RS60-LMC	19.05		12.70	11.91	5.96	12.85	14.75	28.2	2.4	18.1	15.6	6.28{ 640}	1.53	160
RS80-LMC	25.40		15.88	15.88	7.94	16.25	19.25	36.6	3.2	24.1	20.8	10.7 {1090}	2.66	120
RS100-LMC	31.75		19.05	19.05	9.54	19.75	22.85	43.7	4.0	30.1	26.0	17.1 {1740}	3.99	96

## Attachment Dimensions

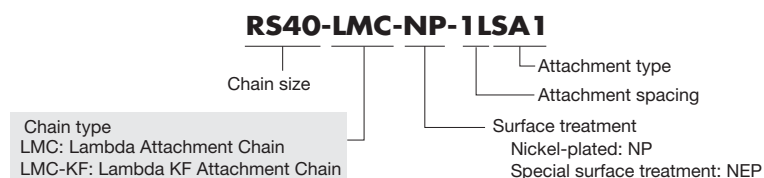
Tsubaki Chain No.	Attachment										Additional Weight per Attachment kg		
	<i>C</i>	<i>C</i> <sub>1</sub>	<i>N</i>	<i>O</i>	<i>S</i>	<i>X</i>	<i>X</i> <sub>2</sub>	<i>X</i> <sub>s</sub>	<i>L</i> <sub>3</sub>	<i>L</i> <sub>4</sub>	<i>A</i> , <i>SA</i>	<i>K</i> , <i>SK</i>	<i>EP</i>
RS35-LMC	9.5	9.5	7.9	3.4	6.35	14.3	14.3	14.55	9.5	14.6	0.0008	0.0016	0.0008
RS40-LMC	12.7	12.7	9.5	3.6	8.0	17.8	17.8	17.40	9.5	16.75	0.002	0.004	0.001
RS50-LMC	15.9	15.9	12.7	5.2	10.3	23.4	23.4	23.05	11.9	21.0	0.003	0.006	0.002
RS60-LMC	19.05	18.3	15.9	5.2	11.9	28.2	28.2	26.85	14.3	25.75	0.007	0.014	0.003
RS80-LMC	25.4	24.6	19.1	6.8	15.9	36.6	36.6	35.45	19.1	33.85	0.013	0.026	0.007
RS100-LMC	31.75	31.8	25.4	8.7	19.8	44.9	44.9	44.0	23.8	41.75	0.026	0.052	0.012

Note: 1. Pin diameters for Lambda RS35-LMC and Standard RS35 are different and therefore they cannot be connected together.  
2. RS35-LMC has no rollers.  
3. Dimension *D* of RS35-LMC EP attachment is 3.0 mm diameter and is smaller than that of Standard RS35.  
4. Dimension *O* is slightly smaller on NEP chains.

## Operating Temperature Range: -10°C to 150°C

Note: -10°C to 230°C for KF chain. (Be sure to factor in temperature when selecting.)

## Chain Numbering



Note: The link plates on Lambda KF Chain are painted black.  
Offset links for Lambda KF Chain are made-to-order. Please contact a Tsubakimoto representative for more information.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Long Life Lambda RS Attachment Chain (X- $\Lambda$ <sup>®</sup> [X-Lambda])



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

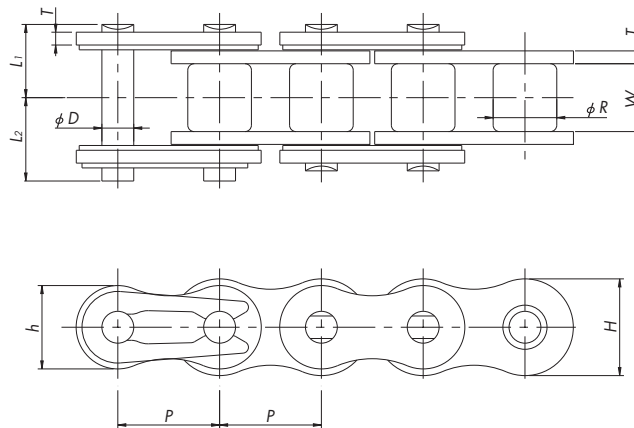
Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

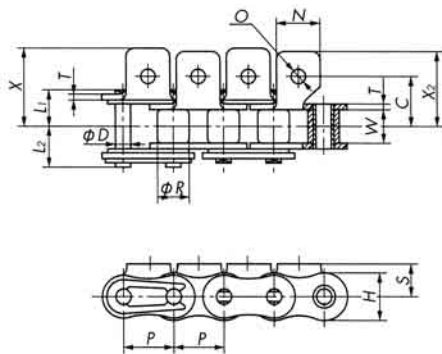
## Base Chain



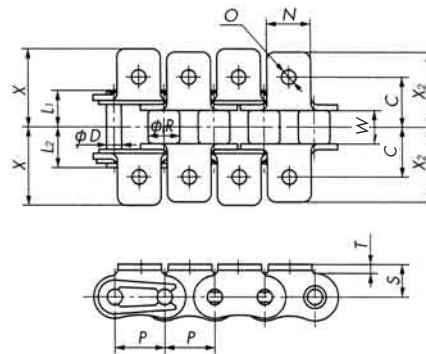
- Connecting links: RS40-LMCX to RS60-LMCX use spring clips. RS80-LMCX and RS100-LMCX use cotter pins. Base chain pins are riveted.
- Offset links are not available.

## Attachments

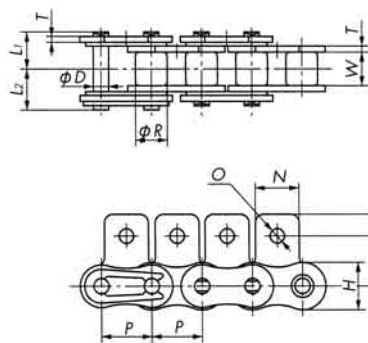
A1 Attachment



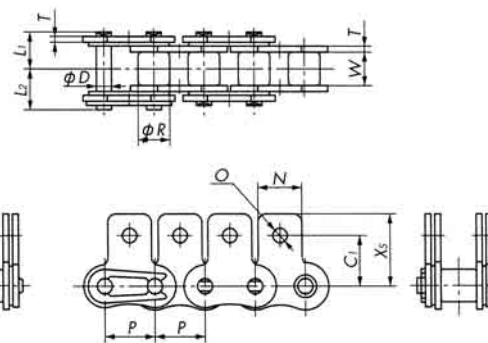
K1 Attachment



SA1 Attachment



SK1 Attachment



- Pins other than those on connecting links are riveted regardless of whether attachments are present.
- Drawings show attachments added on every link.
- When attachments are to be installed on each even-numbered link, they will be installed on the inner link. Please specify when they must be installed on the outer link.

Note: RS sprockets can be used. Please refer to separate Tsubaki Drive Chain catalog for information on RS sprockets.



## Base Chain Dimensions

Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R	Pin			Plate			Max. Allowable Load kN {kgf}	Approx. Mass kg/m	No. of Links per Unit
				Dia. D	L <sub>1</sub>	L <sub>2</sub>	Thickness T	Width H	Width h			
RS40-LMCX	12.70	7.95	7.92	3.97	8.90	10.6	1.5	12.0	10.4	2.65{ 270}	0.64	240
RS50-LMCX	15.875	9.53	10.16	5.09	11.0	12.7	2.0	15.0	13.0	4.31{ 440}	1.04	192
RS60-LMCX	19.05	12.70	11.91	5.96	13.7	15.6	2.4	18.1	15.6	6.28{ 640}	1.53	160
RS80-LMCX	25.40	15.88	15.88	7.94	17.1	20.1	3.2	24.1	20.8	10.7 {1090}	2.69	120
RS100-LMCX	31.75	19.05	19.05	9.54	20.6	23.6	4.0	30.1	26.0	17.1 {1740}	4.02	96

## Attachment Dimensions

Tsubaki Chain No.	Attachment								Additional Weight per Attachment kg	
	C	C <sub>1</sub>	N	O	S	X	X <sub>2</sub>	X <sub>s</sub>	A, SA	K, SK
RS40-LMCX	12.7	12.7	9.5	3.6	8.0	18.40	17.8	17.40	0.002	0.004
RS50-LMCX	15.9	15.9	12.7	5.2	10.3	24.10	23.4	23.05	0.003	0.006
RS60-LMCX	19.05	18.3	15.9	5.2	11.9	29.05	28.2	26.85	0.007	0.014
RS80-LMCX	25.4	24.6	19.1	6.8	15.9	37.5	36.6	35.45	0.013	0.026
RS100-LMCX	31.75	31.8	25.4	8.7	19.8	45.6	44.9	44.0	0.026	0.052

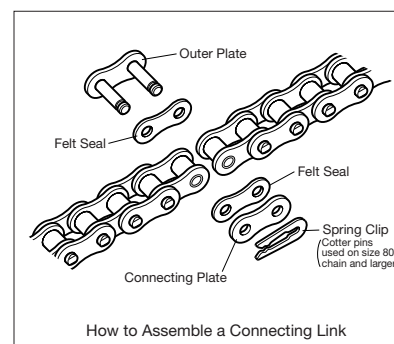
## Operating Temperature Range: -10°C to 150°C

Due to the felt seals, X-Lambda chain pin length is slightly longer than that on standard attachment chain. The X dimension is longer on X-Lambda chain attachments than on standard attachments. Please check that there will be no interference with equipment.

When assembling chain, use connecting links designed for X-Lambda Chain (with felt seals). As shown in the diagram at the right, insert felt seals between the outer plates and connecting plates, and attach the link. The felt seals are impregnated with oil. Be careful to ensure that oil is not squeezed out.

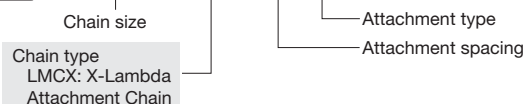
Uses an oil-impregnated felt seal, causing more oil to stick to the surface of the chain when compared to Lambda Chain.

No offset links are available. Please use an even number of links.



## Chain Numbering

### RS40-LMCX-1LSA1



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

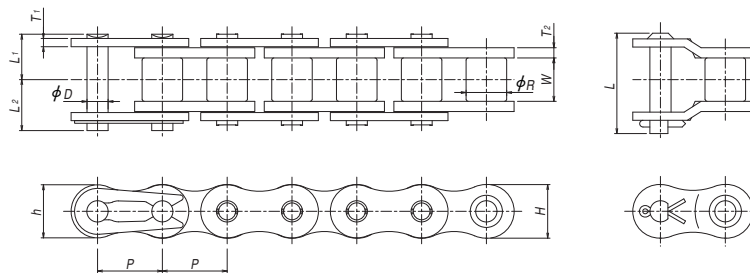
Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

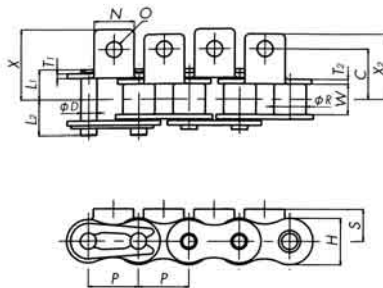
# BS Lambda Attachment Chain

## Base Chain

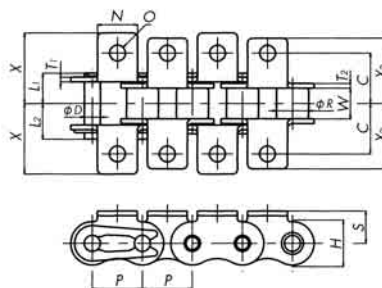


## Attachments

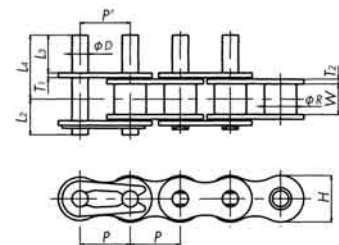
A1 Attachment



K1 Attachment

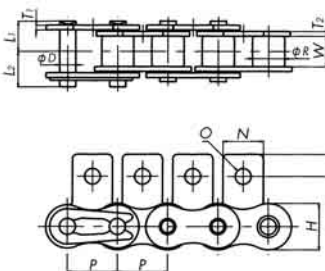


EP Attachment

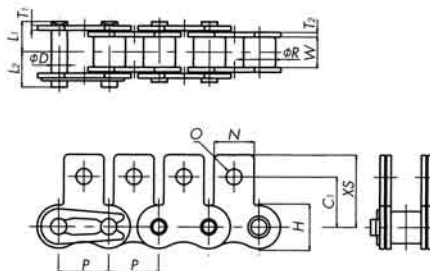


- Pin end diameter on EP attachments is slightly larger.
- Actual dimension P' may differ from P. Please contact a Tsubakimoto representative for details.

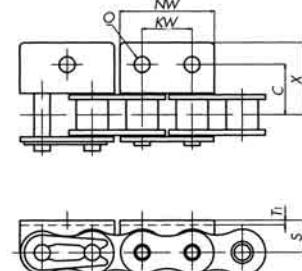
SA1 Attachment



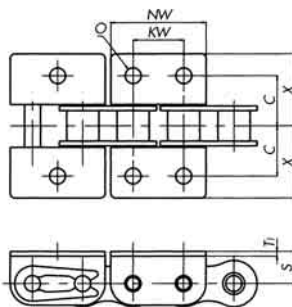
SK1 Attachment



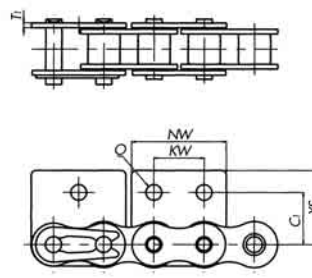
WA1, WA2 Attachments



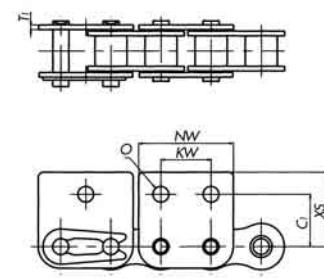
WK1, WK2 Attachments



WSA1, WSA2 Attachments



WSK1, WSK2 Attachments



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## Base Chain Dimensions

Tsubaki Chain No.	Pitch $P$	$p'$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Plate				Pin Dia. $D$
					Thickness $T_2$	Thickness $T_1$	Width $H$	Width $h$	
RS08B-LM	12.70	Contact a Tsubakimoto representative for details.	8.51	7.75	1.6	1.6	12.0	10.4	4.45
RS10B-LM	15.875		10.16	9.65	1.5	1.5	14.7	13.7	5.08
RS12B-LM	19.05		12.07	11.68	1.8	1.8	16.1	16.1	5.72
RS16B-LM	25.40		15.88	17.02	4.0	3.2	21.0	21.0	8.28

Tsubaki Chain No.	Pin Length			Offset Pin Length $L$	Min. Tensile Strength $kN \{kgf\}$	Approx. Mass $kg/m$	No. of Links per Unit
	$L_1+L_2$	$L_1$	$L_2$				
RS08B-LM	18.4	8.4	10.0	18.6	13.7{1400}	0.70	240
RS10B-LM	20.8	9.55	11.25	20.8	16.1{1640}	0.95	192
RS12B-LM	24.1	11.1	13.0	24.4	19.5{1990}	1.25	160
RS16B-LM	37.7	17.75	19.95	39.3	54.1{5520}	2.70	120

## Attachment Dimensions

Tsubaki Chain No.	A1, SA1, K1, SK1 Attachments								Additional Weight per Attachment $kg$	
	$C$	$C_1$	$N$	$O$	$S$	$X$	$X_2$	$X_5$	A, SA	K, SK
RS08B-LM	11.9	12.7	11.4	4.2	8.9	19.05	17.15	19.3	0.002	0.004
RS10B-LM	15.9	15.9	12.7	5.0	10.2	22.25	20.6	22.9	0.003	0.006
RS12B-LM	19.05	22.2	16.5	7.1	13.5	29.85	27.8	32.05	0.006	0.012
RS16B-LM	23.8	23.9	24.3	6.7	15.2	37.35	34.4	34.1	0.014	0.028

Tsubaki Chain No.	WA2, WSA2, WK2, WSK2 Attachments WA1, WSA1, WK1, WSK1 Attachments								EP Attachment			Additional Weight per Attachment kg		
	C	C <sub>1</sub>	NW	O	S	X	X <sub>5</sub>	KW	D	L <sub>3</sub>	L <sub>4</sub>	WA, WSA	WK, WSK	EP
RS08B-LM	12.7	13.1	24.6	4.9	8.9	20.3	20.7	12.7	4.45	9.5	17.0	0.005	0.010	0.001
RS10B-LM	15.9	16.6	30.0	5.0	10.2	22.85	23.6	15.9	5.08	11.9	20.25	0.006	0.012	0.002
RS12B-LM	17.45	17.6	34.8	5.5	11.4	25.65	25.75	19.1	5.72	14.3	24.1	0.009	0.018	0.003
RS16B-LM	28.6	26.0	46.0	8.1	15.9	39.25	36.7	25.4	8.28	19.1	35.25	0.030	0.060	0.008

## Operating Temperature Range: $-10^{\circ}C$ to $150^{\circ}C$

### Sprockets

BS Roller Chain sprockets (conforming to ISO B Series standards) must be used.

### Pin Shape

Single-strand chains in sizes RS08B through RS16B use easy disassembly pins (with center sink riveting). All other sizes, including multi-strand chains, use double stake riveting.

### Chain Selection: Please inquire for chain selection.

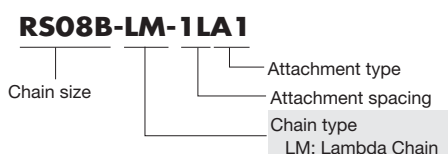
## Made-to-Order Items

Special attachment shapes with dimensions different than above, as well as special extended pins, Lambda KF/NP Chain, and RF06B, RS20B, and RS24B attachment chain are also available. Please contact a Tsubakimoto representative for more information.

## Note

When replacing European standard attachment chain with Lambda Chain, note that dimensions may be different than Tsubaki standard dimensions. Be sure to check attachment dimensions before ordering.

## Chain Numbering



# Lambda RF Roller Chain



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

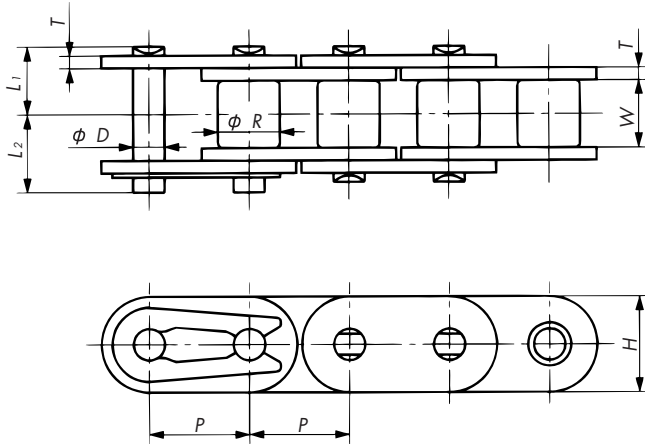
Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## Base Chain



- Connecting links: RF35-LMC to RF60-LMC use spring clips. RS80-LMC and larger use cotter pins. Base chain pins are riveted.
- Offset links are not available.

## Base Chain Dimensions

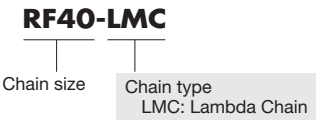
Tsubaki Chain No.	Pitch $P$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Plate		Pin			Max. Allowable Load kN {kgf}	Approx. Mass kg/m	No. of Links per Unit
				Thickness $T$	Width $H$	Dia. $D$	$L_1$	$L_2$			
RF35-LMC	9.525	( 5.08)	4.78	1.25	9.0	3.0	5.85	6.85	1.52{ 155}	0.41	320
RF40-LMC	12.70	7.92	7.95	1.5	12.0	3.97	8.25	9.95	2.65{ 270}	0.74	240
RF50-LMC	15.875	10.16	9.53	2.0	15.0	5.09	10.3	12.0	4.31{ 440}	1.22	192
RF60-LMC	19.05	11.91	12.70	2.4	18.1	5.96	12.85	14.75	6.28{ 640}	1.78	160
RF80-LMC	25.40	15.88	15.88	3.2	24.1	7.94	16.25	19.25	10.7 {1090}	3.09	120
RF100-LMC	31.75	19.05	19.05	4.0	28.6	9.54	19.75	22.85	17.1 {1740}	4.43	96

Note: 1. Pin diameters for RS35 and RS35-LMC are different. The two cannot be connected.  
2. Roller diameter R (in parentheses) for RF35-LMC is the bush diameter.

## Operating Temperature Range: -10°C to 150°C

**Sprockets:** Standard RS sprockets can be used. Please refer to separate Tsubaki Drive Chain catalog for information on RS sprockets.

## Chain Numbering



# Lambda Hollow Pin Chain



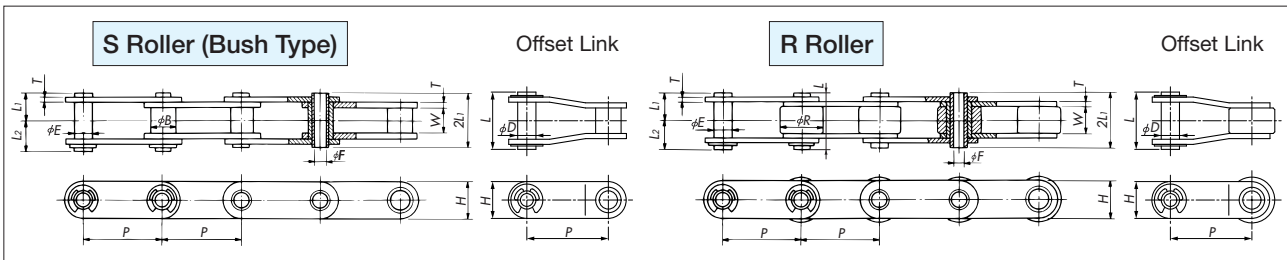
Double Pitch

## Lambda Hollow Pin Double Pitch Chain

Standard  
Small Size Conveyor ChainSpecial  
Small Size Conveyor ChainLube Free  
Small Size Conveyor ChainCorrosion Resistant  
Small Size Conveyor ChainPlus α  
Small Size Conveyor ChainHigh Precision  
Conveyor Chain

Engineering Manual

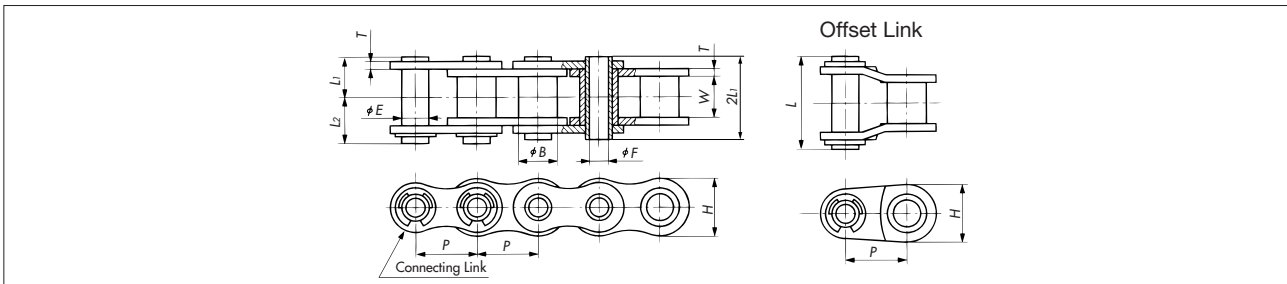
### Base Chain



Tsubaki Chain No.	Roller Type	Pitch $P$	Bush Dia. $B$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Plate		Pin				Offset Pin Length $L$	Approx. Mass kg/m		No. of Links per Unit
						Thickness $T$	Width $H$	Outer Dia. $E$	Inner Dia. $F$ (min.)	$L_1$	$L_2$		Bush Type	R Roller	
RF2040-LMC-HP	S • R	25.40	7.92	15.88	7.95	1.5	12.0	5.68	4.00	8.00	9.50	19.1	0.46	0.82	120
RF2050-LMC-HP		31.75	10.16	19.05	9.53	2.0	15.0	7.22	5.12	10.05	11.65	23.4	0.75	1.21	96
RF2060-LMC-HP		38.10	11.91	22.23	12.70	2.4	17.2	8.38	5.99	12.55	14.25	28.7	1.38	2.06	80
RF2080-LMC-HP		50.80	15.88	28.58	15.88	3.2	23.0	11.375	8.02	16.25	17.80	35.7	1.80	2.81	60

## Lambda Hollow Pin RS Chain

### Base Chain



Tsubaki Chain No.	Pitch $P$	Bush Dia. $B$	Width Between Inner Link Plates $W$	Plate		Pin				Offset Pin Length $L$	Approx. Mass kg/m	No. of Links per Unit
				Thickness $T$	Width $H$	Outer Dia. $E$	Inner Dia. $F$ (min.)	$L_1$	$L_2$			
RS40-LMC-HP	12.70	7.92	7.95	1.5	12.0	5.68	4.00	8.00	9.50	19.1	0.53	240
RS50-LMC-HP	15.875	10.16	9.53	2.0	15.0	7.22	5.12	10.05	11.65	23.4	0.86	192
RS60-LMC-HP	19.05	11.91	12.70	2.4	18.1	8.38	5.99	12.55	14.25	28.7	1.27	160
RS80-LMC-HP	25.40	15.88	15.88	3.2	24.1	11.375	8.02	16.25	17.80	35.7	2.15	120

### Operating Temperature Range: -10°C to 150°C

### Sprockets

Double Pitch... Double Pitch sprockets can be used. RS Roller Chain sprockets can be used provided that the sprockets are of the S roller type and have 30 or more teeth.

RS Chain..... RS Roller Chain sprockets can be used. Please refer to separate Tsubaki Drive Chain catalog for information on RS sprockets.

### Chain Numbering

#### RF2040S-LMC-HP

Chain size  
Roller type:  
S: S roller  
R: R roller

Chain type  
Lambda Hollow Pin Chain

#### RS40-LMC-HP

Chain size

Chain type  
Lambda Hollow Pin Chain

# Lambda Chain Specialty Attachments

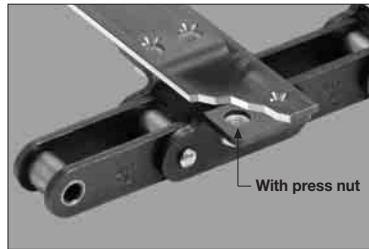
Tsubaki Specialty Attachments take up a wide range of conveying assignments.

If your operations move long, narrow items and stoves, convey items on chains, use slats, or have other unique requirements, consider these benefits.

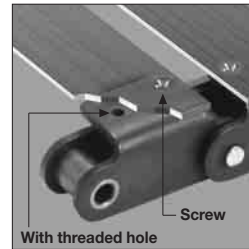
- Custom engineering at a reasonable cost
- High strength
- Proven reliability
- Easy selection
- Quick delivery
- Outstanding performance

## Press Nut and Threaded Hole Chain

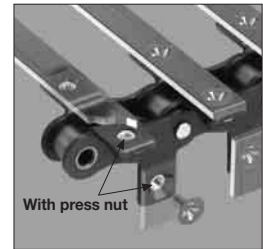
Press nuts can be inserted into holes on chain attachments, or holes can be tapped to provide a threaded hole in chain attachments. This special attachment allows slats or jigs to be attached using only machine screws or bolts, significantly improving work efficiency.



Chain with K2 attachment and press nut



Chain with bent-over A2 attachment and threaded hole



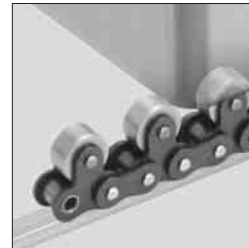
Chain with K1 and SA1 attachments and press nut

## Free Flow Chain

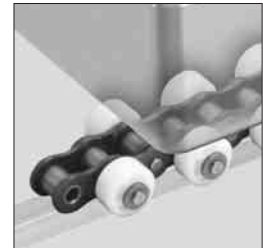
This chain consists of a Lambda base chain with freely rotating rollers. Although the base chain does not require lubrication, steel top rollers and steel outboard rollers must be lubricated. (Plastic top rollers and plastic outboard rollers do not require lubrication.)



Double Plus Chain



Top Roller Chain



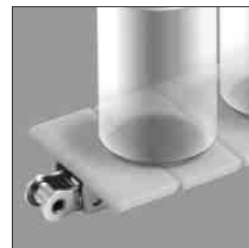
Outboard Roller Chain

## Direct Loading Top Chain

This chain is designed to allow various types of machine parts and container products (such as bottles, cans, and paper packs) to be placed directly on the chain for conveyance. The base chain is Lambda Chain.



TS Top Chain



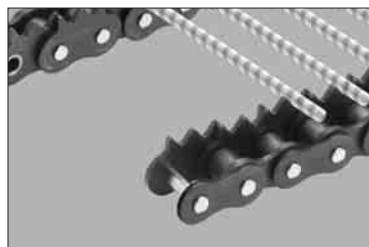
TN Top Chain



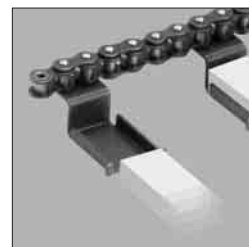
RT Roller Table

## Direct Loading Chain with Special Attachments

This is Lambda Chain with special attachments to match the shape of the workpiece, such as round bars, pipes, small boxes, etc.



Chain with triangle attachments for conveying bar-type objects



Chain with tray attachments for conveying small boxes

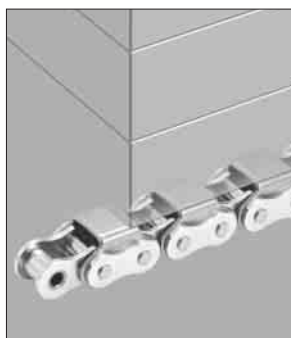


Chain with V-shaped attachments for conveying pipes

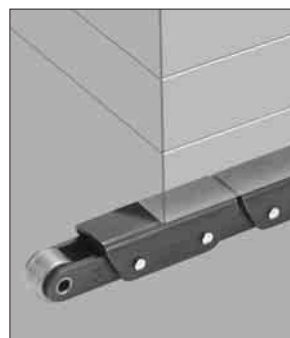


## Direct Loading Bent Attachment Chain

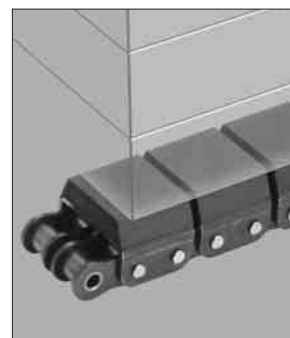
This chain is designed to allow pallets, cardboard boxes, plastic containers, etc., to be placed directly on the chain for conveyance. Stainless steel attachments, upper-layer attachments, and rubber attachments can be custom made according to the application.



Chain with upper-layer attachments (stainless steel)



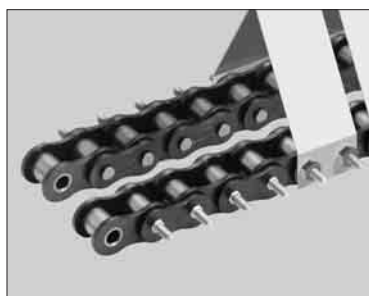
Double Pitch Chain with upper-layer attachments



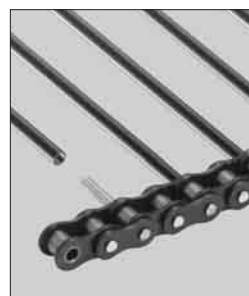
Double-strand chain with rubber attachments

## Extended Pin with Thread Chain

This chain features extended pins, threaded extended pins, or extended pins with spring clips to enable installation of various attachments. The attachments can be secured by nuts, inserted into tubing, or attached to spring clips.



Chain with threaded extended pins



Extended pin chain



Extended pin chain with spring clips

## Bar, Slat, and Wire Mesh Conveyor Chain

Special attachment chain to match the shape of attached tools or jigs such as slats with holes, stepped bars, square bars, round bars, etc.



Chain for conveyor with slats with holes (Chain center and slats are at the same level)



Stepped bar chain (Ends are inserted into holes in attachments)



Square bar chain



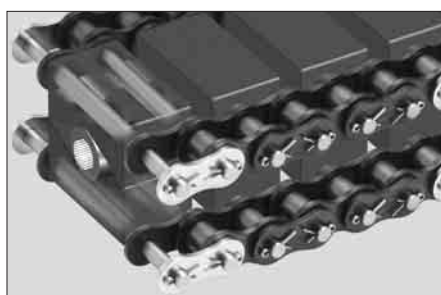
Hollow Pin Chain for wire mesh conveyor with guide rollers



Round bar attachment bush chain

## Chains That Convey by Sandwiching Workpieces Between Chains

These chains form two conveyors that sandwich an object between them using the stay pins of the chain, or a bent-over open-box-shaped attachment.



Stay-pin chain (with blocks attached to the stay pins)



Chain with bent-over attachments

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Corrosion Resistant Small Size Conveyor Chain



## Stainless Steel Attachment Chain

Combinations of various materials allow these chains to be used in water and in corrosive atmospheres that are acidic or alkaline, as well as in special environments such as low and high temperatures. Double Pitch and RS Attachment Chains are available. For further details, see page 96: "Corrosion Resistance Guide for Corrosion Resistant Chains and Sprockets."

### SS Series\*1 304 stainless steel

1. Standard corrosion-resistant chain.
2. Can be used in water and special atmospheres that are acidic or alkaline, and at low and high temperatures (−20°C to 400°C).
3. Marginally magnetic due only to the cold-forging process.

### NS Series 316 stainless steel (spring clips are 301 stainless steel and cotter pins are 304 stainless steel)

1. Used for applications that require higher corrosion resistance than SS chains.
2. Can be used in water and special atmospheres that are acidic or alkaline, and at low and high temperatures (−20°C to 400°C).
3. Non-magnetic except for spring clips.

### AS Series Combination of heat-treated stainless steel and 304 stainless steel

1. Maximum allowable tension 1.5 times greater than SS chains.
2. Corrosion resistance is slightly less than that of SS chains.
3. AS chains are suitable for applications that require corrosion resistance and heat resistance (−20°C to 400°C) and smaller sizes and/or higher load capacity than SS chains. Chain is magnetic.

### LSC Series 304 stainless steel + special engineering plastic sleeve between pin and bush



1. Ideal for when a longer-life stainless steel chain is need (longer than with SS chain). Has 4 times the wear life of SS chain (in-house testing comparison).
2. Operating temperature range: −20°C to 100°C (−20°C to 80°C when using plastic rollers).
3. Marginally magnetic due only to the cold-forging process.

**Caution** \*1: Certain chemicals at some concentrations will cause corrosion even though these chains are made of stainless steel.

## Surface-Treated Attachment Chain



A surface treatment has been applied to standard small size conveyor chain for improved corrosion resistance. Double Pitch and RS Attachment Chains are available.

### NP Series\*2 Nickel plating on steel (all components heat-treated steel)

1. Nickel plating not only improves appearance but also adds a small degree of corrosion resistance. Therefore, can be used in applications where there is exposure to water.
2. Operating temperature range: −10°C to 150°C.

### NEP Series\*2 Special surface treatment on steel (all components heat-treated steel)

1. Highest level of corrosion resistance among various plated and surface-treated chains. Can be used outdoors or in environments involving exposure to seawater.
2. Next-generation chain that uses no toxic substances such as hexavalent chromium, reducing the impact on the environment.
3. Operating temperature range: −10°C to 150°C.

**Caution** \*2: Do not use Corrosion Resistant 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 chain or contact a Tsubakimoto representative about chain selection if using in environments where coating flakes or wear dust present problems. Though nickel is not subject to the Japan Food Sanitation Law or the Industrial Safety and Health Law, plating on sliding parts can peel.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual



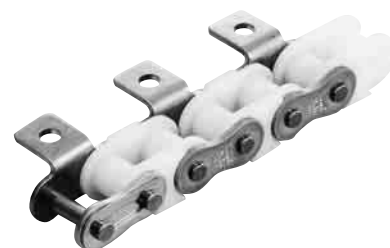
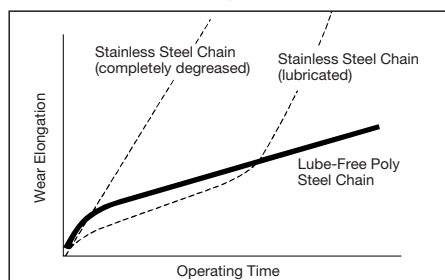
## Poly Steel Attachment Chain



The combination of polyacetal inner links and 304 stainless steel pins and outer link plates effectively incorporates the advantages of materials into one chain.

1. Lube-free and corrosion resistant.
2. Low noise (approximately 5 dB less than standard steel chain).
3. Lightweight (approximately 50% less than standard steel chain).
4. Operating temperature range:  $-20^{\circ}\text{C}$  to  $80^{\circ}\text{C}$ .
5. Engineering plastic color: White.
6. ANSI and BIS/DN chains are available.

### Wear Resistance Comparison



**Standard**  
Small Size Conveyor Chain

**Special**  
Small Size Conveyor Chain

**Lube Free**  
Small Size Conveyor Chain

**Corrosion Resistant**  
Small Size Conveyor Chain

**Plus α**  
Small Size Conveyor Chain

**High Precision**  
Conveyor Chain

**Engineering Manual**



## Plastic Roller Double Pitch Chain



1. Lightweight (approximately 30% less than standard steel chain).
2. Low noise (approximately 5 to 7 dB less than standard steel chain).
3. Low running resistance (approximately 30% less than standard steel chain).
4. Engineering plastic roller color: White (P).

**Standard Series** Engineering plastic rollers (polyacetal) on steel base chain (heat-treated)

1. Engineering plastic rollers.
2. Operating temperature range:  $-10^{\circ}\text{C}$  to  $80^{\circ}\text{C}$ .

**NP Series** Parts are nickel-plated except for plastic rollers

1. Mild corrosion resistance.
2. Operating temperature range:  $-10^{\circ}\text{C}$  to  $80^{\circ}\text{C}$ .

**SS Series** Engineering plastic rollers (polyacetal) on 304 stainless steel base chain

1. Corrosion resistant.
2. Operating temperature range:  $-20^{\circ}\text{C}$  to  $80^{\circ}\text{C}$ .

**LSC Series** Special engineering plastic sleeve used between pin and bush on SS chain.

1. Ideal for when a longer-life stainless steel chain is need (longer than with SS chain).
2. Operating temperature range:  $-20^{\circ}\text{C}$  to  $80^{\circ}\text{C}$  ( $-20^{\circ}\text{C}$  to  $80^{\circ}\text{C}$  when using plastic rollers).
3. Marginally magnetic due only to the cold-forging process.



## Heat-Resistant Plastic Roller Double Pitch Chain



1. Excellent heat, chemical, and fire resistance. Conforms to the Japan Food Sanitation Law.
2. Operating temperature range:  $-20^{\circ}\text{C}$  to  $180^{\circ}\text{C}$ .
3. Super engineering plastic roller color: Black.
4. Base chain is only available in SS series.



## Low-Noise Plastic Roller Double Pitch Chain



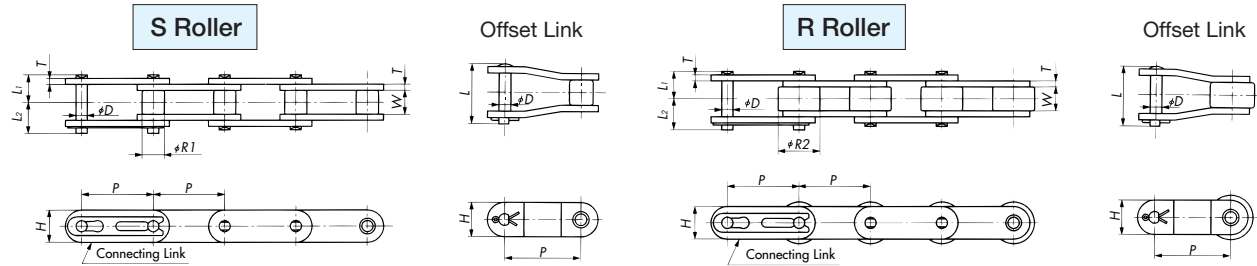
1. Special engineering plastic rollers emit even less noise ( $-7$  dB quieter) than standard engineering plastic rollers.
2. Operating temperature range:  $-10^{\circ}\text{C}$  to  $80^{\circ}\text{C}$  (standard and NP series),  $-20^{\circ}\text{C}$  to  $80^{\circ}\text{C}$  (SS series).
3. Special engineering plastic roller color: Light cream.
4. Base chain is available in standard, NP, and SS series.



# Stainless Steel/Surface-Treated/Plastic Roller

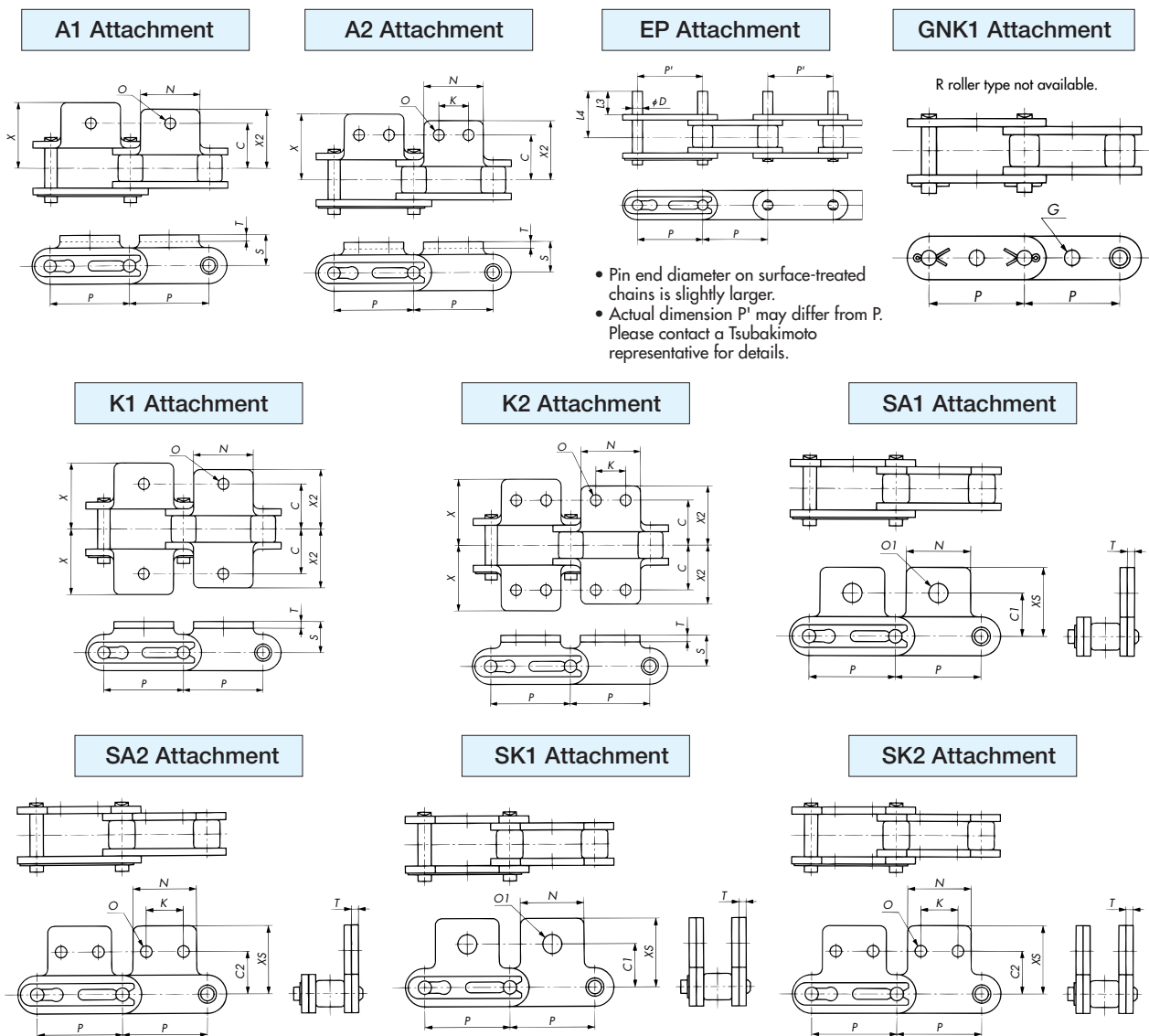


## Base Chain



- Connecting links: RF2040 to RF2060 use spring clips. RF2080 and larger as well as chains with GNK1 attachments (all sizes) use cotter pins. Base chain pins are riveted.
- Offset links for Stainless Steel Double Pitch Chain and Plastic Roller Double Pitch Chain (SS specification) are secured by cotter pins on both sides.
- NS chains use a cotter pin on the connecting link regardless of size. Please contact a Tsubakimoto representative if a clip is needed.
- Cotter pins are used on both sides of the offset link for stainless steel Double Pitch chain and plastic roller Double Pitch chain (SS specifications).

## Attachments



- Pins other than those on connecting links are riveted regardless of whether attachments are present.
- Drawings show attachments added on every link.

Note: RS sprockets can be used with S rollers if the sprocket has more than 30 teeth.  
A Double Pitch chain sprocket will be needed if the sprocket has fewer than 30 teeth.  
Please refer to separate Tsubaki Drive Chain catalog for more information on RS sprockets.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Double Pitch Chain

Note: For sizes of Stainless Steel Double Pitch Chain, Surface-Treated Double Pitch Chain, and Plastic Roller Double Pitch Chain, refer to "Selection Guide" on pages 13 and 14.

## Base Chain Dimensions

Tsubaki Chain No.	Roller Type	Pitch <i>P</i>	Roller Dia.		Width Between Inner Link Plates <i>W</i>	Pin			Offset Pin Length <i>L</i>	Plate		Approx. Mass kg/m			No. of Links per Unit
			S Roller <i>R1</i>	R Roller <i>R2</i>		Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>		Thickness <i>T</i>	Width <i>H</i>	Steel		Plastic Roller	
												S Roller	R Roller	R Roller	
RF2040	S • R	25.40	7.92	15.88	7.95	3.97	8.25	9.95	18.2〈18.6〉	1.5	12.0	0.51	0.87	0.52	120
RF2050		31.75	10.16	19.05	9.53	5.09	10.30	12.0	22.6〈23.9〉	2.0	15.0	0.84	1.30	0.83	96
RF2060		38.10	11.91	22.23	12.70	5.96	14.55	16.55	31.5〈32.8〉	3.2	17.2	1.51	2.19	1.48	80
RF2080		50.80	15.88	28.58	15.88	7.94	18.30	20.90	39.9〈42.1〉	4.0	23.0	2.41	3.52	2.64	60
RF2100		63.50	19.05	39.69	19.05	9.54	21.80〈22.30〉	24.50〈24.90〉	47.5〈50.0〉	4.8 〈5.0〉	28.6	3.54〈3.66〉	5.80〈 5.92〉	3.63〈3.75〉	48
RF2120		76.20	22.23	44.45	25.40	11.11	26.95〈28.05〉	30.55〈31.75〉	59.0〈63.5〉	5.6 〈6.0〉	34.4	5.08〈5.37〉	8.13〈 8.42〉	—	40
RF2160		101.60	28.58	57.15	31.75	14.29	33.95〈35.70〉	38.45〈41.10〉	74.1〈81.3〉	7.15〈8.0〉	48.2	8.96〈9.84〉	13.70〈14.58〉	—	30

Note: Figures inside < > are for stainless steel chain.

Chain strength: Please see pages 91 and 92.

## A, K, SA, SK, EP, GNK1 Attachment Dimensions

Tsubaki Chain No.	Roller Type	Pitch P'	C	C1	C2	K	N	O	O1	S
RF2040	S • R	Contact a Tsubakimoto representative for details.	12.7	11.1	13.6	9.5	19.1	3.6	5.2	9.1
RF2050			15.9	14.3	15.9	11.9	23.8	5.2	6.8	11.1
RF2060			21.45	17.5	19.1	14.3	28.6	5.2	8.7	14.7
RF2080			27.8	22.2	25.4	19.1	38.1	6.8	10.3	19.1
RF2100			33.35	28.6	31.8	23.8	47.6	8.7	14.3	23.4
RF2120			39.7	33.3	37.3	28.6	57.2	14.0	16.0	27.8
RF2160			52.4	44.5	50.8	38.1	76.2	18.0	22.0	36.5

Tsubaki Chain No.	X	X2	XS	D	L3	L4	G	Additional Weight per Attachment kg		
								A, SA	K, SK	EP
RF2040	19.3	17.6	19.8	3.97	9.5	16.75	4.1	0.003	0.006	0.001
RF2050	24.2	22.0	24.6	5.09	11.9	21.0	5.1	0.006	0.012	0.002
RF2060	31.5	28.2	30.6	5.96	14.3	27.45	6.1	0.017	0.034	0.003
RF2080	40.7	36.6	40.5	7.94	19.1	35.5	8.1	0.032	0.064	0.007
RF2100	49.9	44.9	50.4	9.54	23.8	43.4	10.1	0.060<0.063>	0.120<0.126>	0.012
RF2120	60.7<61.8>	54.4<55.2>	59.9	—	—	—	—	0.100<0.107>	0.200<0.214>	—
RF2160	77.8<80.35>	70.0<71.65>	78.6	—	—	—	—	0.203<0.227>	0.400<0.454>	—

Note: 1. Dimensions O and O1 are slightly smaller on NEP chains. 2. Figures inside < > are for stainless steel chain.

3. SS and NS chains are not pre-lubricated before shipping. Always lubricate the chain before use, except when using underwater or when the chain will contact water. Using a chain without lubrication may result in premature articulation problems. Maximum allowable loads are based on lubricated (including water lubricated) conditions.

## Chain Numbering

### RF2040S-SS-1LK2

Chain size ————  
Roller type ————  
(R or S)  
Plastic rollers: RP  
Heat resistant: RPKV  
Low noise: RP-SNP  
Attachment type ————  
Attachment spacing ————  
Chain specification  
Stainless steel: SS  
Heat-treated stainless steel: AS  
Nickel-plated: NP  
Special surface treatment: NEP

## Operating Temperature Range: -10°C to 150°C

Note: Operating temperature range is -10°C to 80°C for plastic rollers, but -20°C to 180°C for KV chain.  
Use a lubricant suited to the operating temperature. (See page 101, table 14.)

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

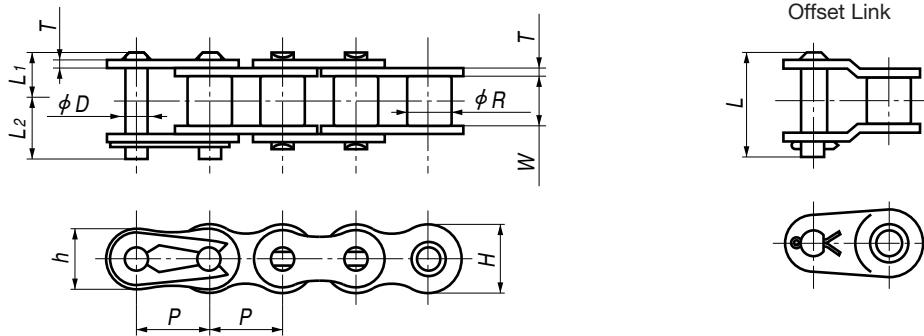
Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

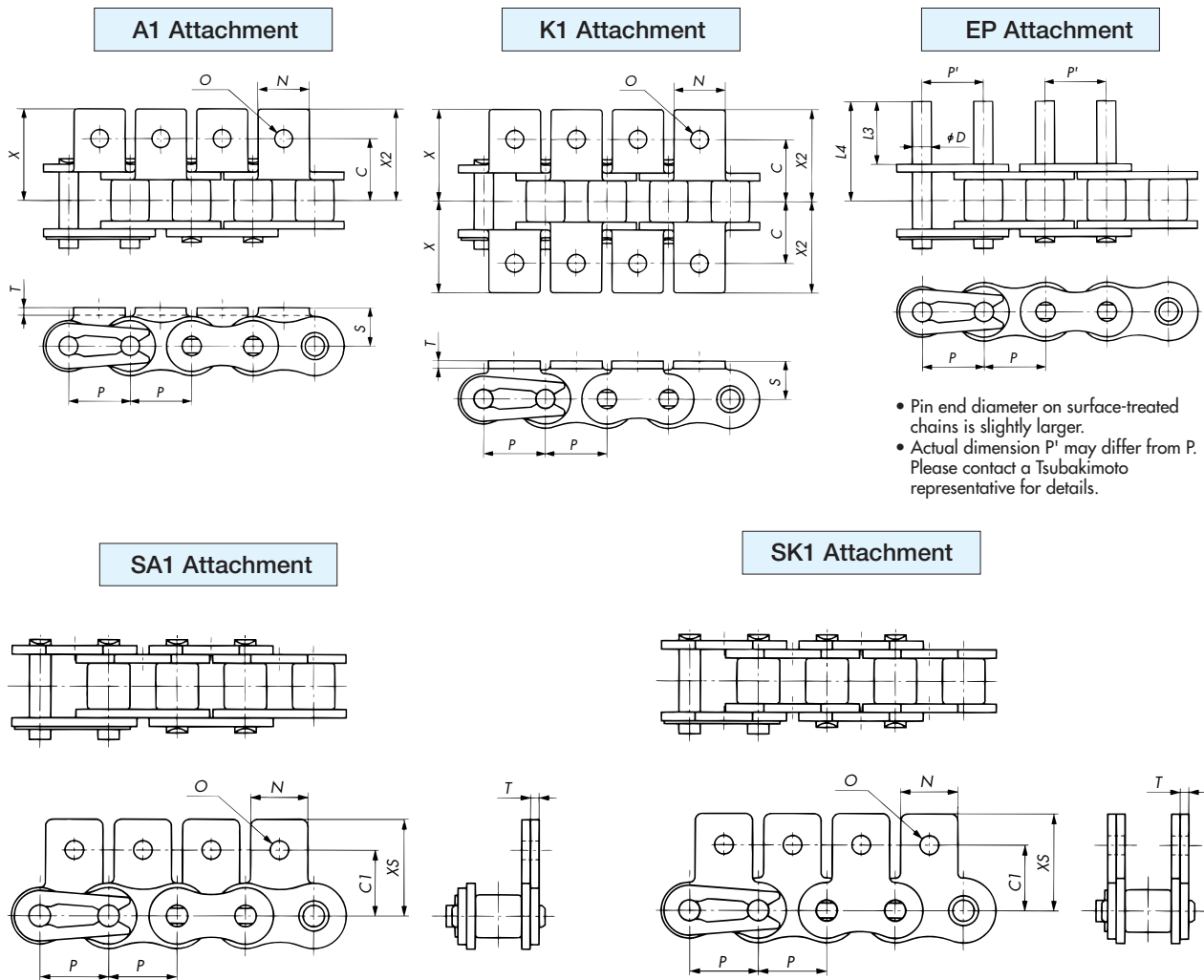
# Stainless Steel RS® Attachment Chain, Surface-

## Base Chain



- Connecting links: RS25 to RS60 use spring clips. RS80 and larger use cotter pins. Base chain pins are riveted.
- Offset links for Stainless Steel RS Attachment Chain are secured by cotter pins on both sides.
- NS chains use a cotter pin on the connecting link regardless of size. Please contact a Tsubakimoto representative if a clip is needed.
- Cotter pins are used on both sides of the offset links on RS stainless steel attachment chain.
- The offset link for RS25 is double pitch.

## Attachments



Note: RS sprockets can be used. Please refer to separate Tsubaki Drive Chain catalog for information on RS sprockets.



# Treated RS® Attachment Chain

Note: For sizes of Stainless Steel RS Attachment Chain and Surface-Treated RS Attachment Chain, refer to “Selection Guide” on pages 13 and 14.

## Base Chain Dimensions

Tsubaki Chain No.	Pitch P	Roller Dia. (Bush) R	Width Between Inner Link Plates W	Plate			Pin				Approx. Mass kg/m	No. of Links per Unit
				Thickness T	Width H	Width h	Dia. D	L <sub>1</sub>	L <sub>2</sub>	L		
RS25	6.35	(3.30)	3.18	0.75	5.84	5.05	2.31	3.80	4.8	—	0.14	160
RS35	9.525	(5.08)	4.78	1.25	9.0	7.8	3.59	5.85	6.85	13.5 (14.7)	0.33	320
RS40	12.70	7.92	7.95	1.5	12.0	10.4	3.97	8.25	9.95	18.2 (18.6)	0.64	240
RS50	15.875	10.16	9.53	2.0	15.0	13.0	5.09	10.3	12.0	22.6 (23.9)	1.04	192
RS60	19.05	11.91	12.70	2.4	18.1	15.6	5.96	12.85	14.75	28.2 (29.4)	1.53	160
RS80	25.40	15.88	15.88	3.2	24.1	20.8	7.94	16.25	19.25	36.6 (39.0)	2.66	120
RS100	31.75	19.05	19.05	4.0	30.1	26.0	9.54	19.75	22.85	43.7 (45.7)	3.99	96
RS120	38.10	22.23	25.40	4.8 (5.0)	36.2	31.2	11.11	24.90 (25.75)	28.90 (29.8)	55.8 (59.7)	5.93 (6.13)	80
RS140	44.45	25.40	25.40	5.6 (6.0)	42.2	36.4	12.71	26.90 (28.15)	31.70 (32.95)	60.5 (66.2)	7.49 (7.91)	68
RS160	50.80	28.58	31.75	6.4 (7.0)	48.2	41.6	14.29	31.85 (33.55)	36.85 (38.55)	70.2 (77.3)	10.10 (10.86)	60

Note: Figures inside < > are for stainless steel chain.

Chain strength: Please see pages 91 and 92.

## Attachment Dimensions

Tsubaki Chain No.	C	C1	N	O	S	T	X	X2	XS	D	L3	L4	Additional Weight per Attachment kg		
													A, SA	K, SK	EP
RS25	7.15	7.95	5.6	3.4	4.75	0.75	10.7	10.7	11.65	2.31	6.0	9.3	0.0003	0.0006	—
RS35	9.5	9.5	7.9	3.4	6.35	1.25	14.3	14.3	14.55	3.59	9.5	14.6	0.0008	0.0016	0.001
RS40	12.7	12.7	9.5	3.6	8.0	1.5	17.8	17.8	17.40	3.97	9.5	16.75	0.002	0.004	0.001
RS50	15.9	15.9	12.7	5.2	10.3	2.0	23.4	23.4	23.05	5.09	11.9	21.0	0.003	0.006	0.002
RS60	19.05	18.3	15.9	5.2	11.9	2.4	28.2	28.2	26.85	5.96	14.3	25.75	0.007	0.014	0.003
RS80	25.4	24.6	19.1	6.8	15.9	3.2	36.6	36.6	35.45	7.94	19.1	33.85	0.013	0.026	0.007
RS100	31.75	31.8	25.4	8.7	19.8	4.0	44.9	44.9	44.0	9.54	23.8	41.75	0.026	0.052	0.012
RS120	38.1	36.5	28.6	10.3	23.0	4.8 (5.0)	55.8 (56.7)	50.8 (51.5)	52.9	11.11	28.6	51.4	0.044 (0.046)	0.088 (0.092)	0.020
RS140	44.5	44.5	34.9	11.9	28.6	5.6 (6.0)	63.1 (64.6)	57.2 (58.0)	63.5	12.71	33.3	57.9	0.071 (0.076)	0.142 (0.152)	0.030
RS160	50.8	50.8	38.1	14.3	31.8	6.4 (7.0)	71.8 (73.7)	65.1 (66.0)	70.1	14.29	38.1	67.45	0.097 (0.106)	0.194 (0.212)	0.045

Note: 1. Dimension O is slightly smaller on NEP chains. 2. Figures inside < > are for stainless steel chain.

3. SS and NS chains are not pre-lubricated before shipping. Always lubricate the chain before use, except when using underwater or when the chain will contact water. Using a chain without lubrication may result in premature articulation problems. Maximum allowable loads are based on lubricated (including water lubricated) conditions.

## Chain Numbering

**RS40-AS-1LK1**

Chain size —  
Chain specification —  
Stainless steel: SS  
Heat-treated stainless steel: AS  
Nickel-plated: NP  
Special surface treatment: NEP

Attachment type —  
Attachment spacing —

## Operating Temperature Range: -10°C to 150°C (-10°C to 80°C for plastic rollers)

Use a lubricant suited to the operating temperature. (See page 101, table 14.)

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Poly Steel Attachment Chain



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

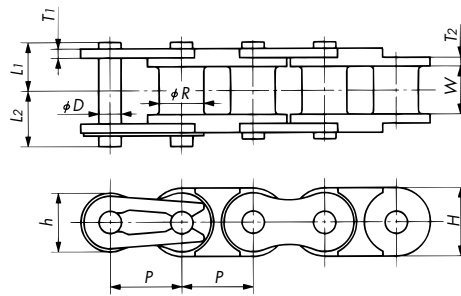
Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

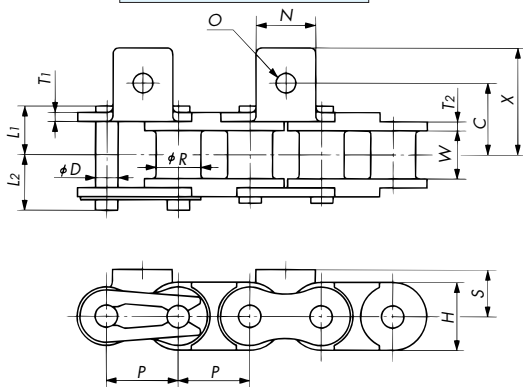
## Base Chain



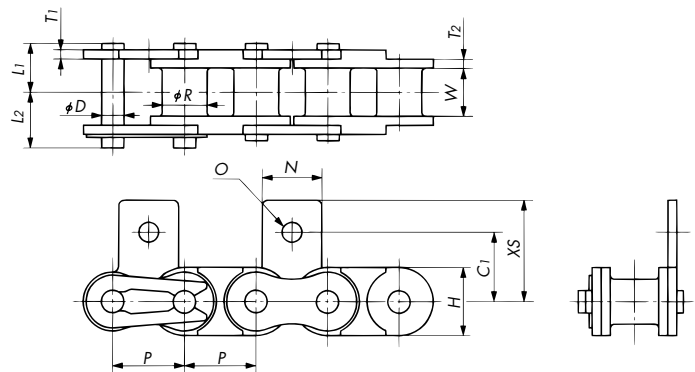
- Pin ends on the base chain are not riveted.
- Offset links are not available.
- The rivet on the flat part is dual-staked on RS25, not riveted on RS35, and round on RS40 – 60.

## Attachments

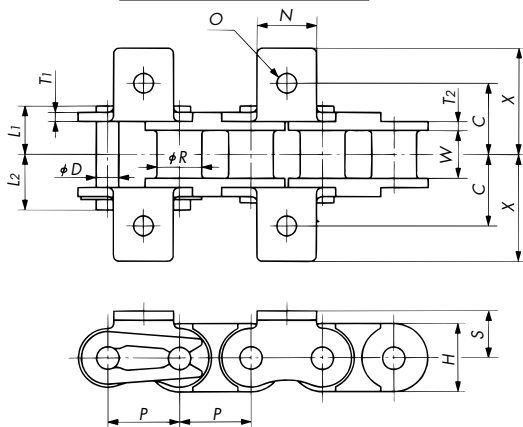
### A1 Attachment



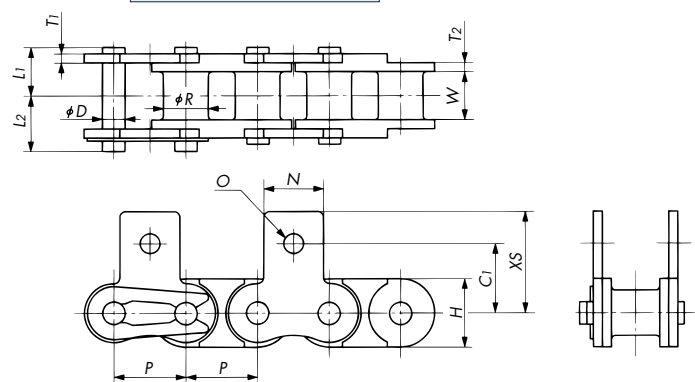
### SA1 Attachment



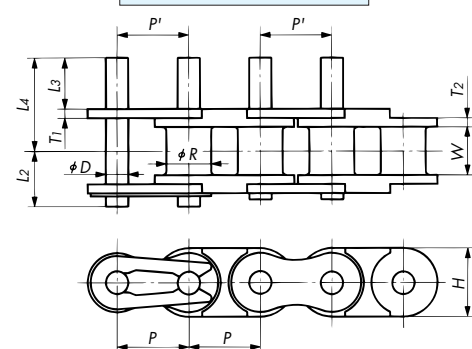
### K1 Attachment



### SK1 Attachment



### EP Attachment



#### Note concerning EP attachment:

- Actual dimension P' may differ from P. Please contact a Tsubakimoto representative for details.
- Drawing shows attachments added on every link.

## Base Chain Dimensions

Tsubaki Chain No.	Pitch <i>P</i>	Bush Dia. <i>R</i>	Width Between Inner Link Plates <i>W</i>	Plate				Pin			Max. Allowable Load kN {kgf}	Approx. Mass kg/m	No. of Links per Unit
				Thickness <i>T</i> <sub>1</sub>	Thickness <i>T</i> <sub>2</sub>	Width <i>H</i>	Width <i>h</i>	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>			
RS25-PC	6.35	3.30	3.18	0.75	1.3	6.0	5.05	2.31	4.5	5.5	0.08{ 8}	0.095	160
RS35-PC	9.525	5.08	4.78	1.25	2.2	9.0	7.8	3.59	6.85	7.85	0.18{18}	0.22	320
RS40-PC	12.70	7.92	7.95	1.5	1.5	12.0	10.4	3.97	8.25	9.95	0.44{45}	0.39	240
RS50-PC	15.875	10.16	9.53	2.0	2.0	15.0	13.0	5.09	10.3	12.0	0.69{70}	0.58	192
RS60-PC	19.05	11.91	12.70	2.4	2.4	18.1	15.6	5.96	12.85	14.75	0.88{90}	0.82	160

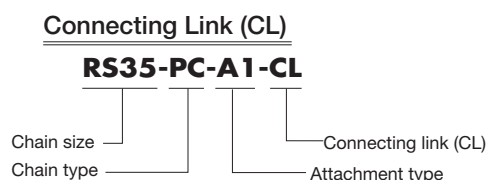
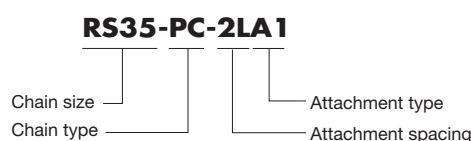
## Attachment Dimensions

Tsubaki Chain No.	<i>C</i>	<i>C</i> <sub>1</sub>	<i>N</i>	<i>O</i>	<i>S</i>	<i>X</i>	<i>X</i> <sub>S</sub>	<i>L</i> <sub>3</sub>	<i>L</i> <sub>4</sub>	Additional Weight per Attachment kg		
										<i>A</i> , <i>SA</i>	<i>K</i> , <i>SK</i>	<i>EP</i>
RS25-PC	7.95	7.95	5.6	3.4	4.75	11.45	11.65	—	—	0.0003	0.0006	—
RS35-PC	10.5	9.5	7.9	3.4	6.35	15.35	14.55	—	—	0.0008	0.0016	—
RS40-PC	12.75	12.7	9.5	3.6	8.0	17.8	17.4	9.4	16.75	0.002	0.004	0.001
RS50-PC	16.0	15.9	12.7	5.2	10.3	23.55	23.05	11.9	21.0	0.003	0.006	0.002
RS60-PC	19.15	18.3	15.9	5.2	11.9	28.35	26.85	14.2	25.75	0.007	0.014	0.003

Note: Poly Steel Chain in BS specifications is made-to-order. Please contact a Tsubakimoto representative for more information.  
Available sizes: RS08B-PC, RS10B-PC, RS12B-PC

- Offset links are not available for Poly Steel Attachment Chain.  
Chains should be designed with an even number of links.
- RS Roller Chain sprockets can be used.
- RS40-PC to RS60-PC use the same connecting links as Stainless Steel Drive Chain (SS specification).  
RS25-PC and RS35-PC use special connecting links.
- When replacing Stainless Steel RS Attachment Chain with Poly Steel Attachment Chain, please check the chain tension. Poly Steel Attachment Chain tension should be less than the maximum allowable tension.
- Guide rails should support the bottom side of the inner links.
- Attachments other than EP attachments cannot be installed on inner links and will be attached to even-numbered links.
- The ends of the pins on the actual chain are not riveted.

## Chain Numbering



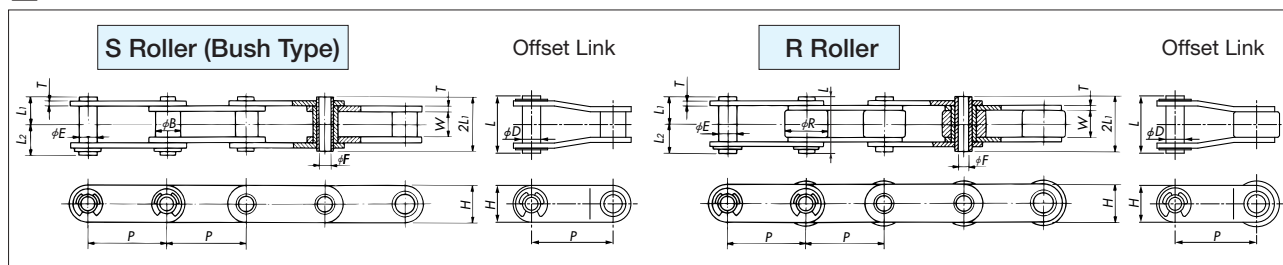
# Stainless Steel Hollow Pin Chain

In Hollow Pin Chain, the pin is made with a hole, enabling various attachments to be installed simply and easily. This type of chain is used for general-purpose conveyance.

- Features:
1. Regardless of whether the chain is straight or wrapped around a sprocket, the center distance between attachments is always the same.
  2. The load from the attachments is distributed equally to both sides of the link plates. This provides advantages in terms of strength, and the chain has less of a tendency to wind while running.
  3. It is easy to replace attachments, do maintenance, or adjust attachment spacing even while the chain is installed on equipment.

## Stainless Steel Hollow Pin Double Pitch Chain

### Base Chain



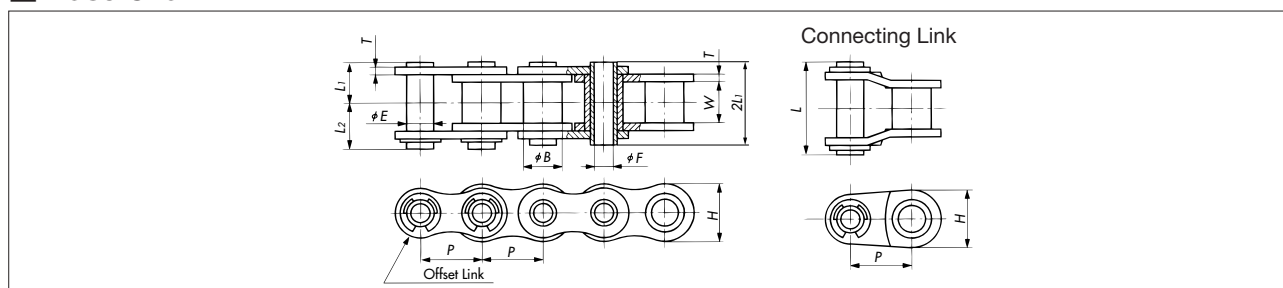
### Base Chain Dimensions

Tsubaki Chain No.	Roller Type	Pitch $P$	Bush Dia. $B$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Plate		Pin				Offset Pin Length $L$	Approx. Mass kg/m		No. of Links per Unit
						Thickness $T$	Width $H$	Outer Dia. $E$	Inner Dia. $F$ (Min.)	$L_1$	$L_2$		Bush Type	R Roller	
RF2040-HP-SS	S · R	25.40	7.92	15.88	7.95	1.5	12.0	5.68	4.00	8.00	9.50	19.1	0.46	0.82	120
RF2050-HP-SS		31.75	10.16	19.05	9.53	2.0	15.0	7.22	5.12	10.05	11.65	23.4	0.75	1.21	96
RF2060-HP-SS		38.10	11.91	22.23	12.70	2.4	17.2	8.38	5.99	12.55	14.25	28.7	1.38	2.06	80
RF2080-HP-SS		50.80	15.88	28.58	15.88	3.2	23.0	11.375	8.02	16.25	17.80	35.7	1.80	2.81	60

Chain strength: Please see pages 91 and 92.

## Stainless Steel Hollow Pin RS Chain

### Base Chain



### Base Chain Dimensions

Tsubaki Chain No.	Pitch $P$	Bush Dia. $B$	Width Between Inner Link Plates $W$	Plate		Pin				Offset Pin Length $L$	Approx. Mass kg/m	No. of Links per Unit
				Thickness $T$	Width $H$	Outer Dia. $E$	Inner Dia. $F$ (Min.)	$L_1$	$L_2$			
RS40-HP-SS	12.70	7.92	7.95	1.5	12.0	5.68	4.00	8.00	9.50	19.1	0.53	240
RS50-HP-SS	15.875	10.16	9.53	2.0	15.0	7.22	5.12	10.05	11.65	23.4	0.86	192
RS60-HP-SS	19.05	11.91	12.70	2.4	18.1	8.38	5.99	12.55	14.25	28.7	1.27	160
RS80-HP-SS	25.40	15.88	15.88	3.2	24.1	11.375	8.02	16.25	17.80	35.7	2.15	120

Chain strength: Please see pages 91 and 92.

Note: SS and NS chains are not pre-lubricated before shipping. Always lubricate the chain before use, except when using underwater or when the chain will contact water. Using a chain without lubrication may result in premature articulation problems. Maximum allowable loads are based on lubricated (including water lubricated) conditions.

### Chain Numbering

**RF2040S-HP-SS**

Chain size \_\_\_\_\_

Roller type (S: S roller, R: R roller) \_\_\_\_\_

Chain type: Hollow pin \_\_\_\_\_

Chain specification  
Stainless steel: SS

**RS40-HP-SS**

Chain size \_\_\_\_\_

Chain type: Hollow pin \_\_\_\_\_

Chain specification  
Stainless steel: SS

# Plus α Attachment Chain

Plus α Attachments	Specification	Description	Page
	Special Hole Diameter Attachment (Attachment Types: A, K)	Attachment with special hole diameters.	57, 58
	Press Nut Attachment (Attachment Types: A-NM, K-NM)	Nuts are added on the attachment to enable slats to be installed simply and easily.	59, 60
	Special Extended Pin (Attachment Type: EPL)	Chain with extended pins projecting to a customer-specified length can be manufactured with a short leadtime for perfect compatibility with your attachments or parts.	61, 62
	Ground Attachment (Attachment Type: PG)	The upper surface of the link plate is ground to provide a smooth conveying surface and to protect the conveyed material from damage.	63
	Large Size Chain with Attachment	Attachment for chain sizes RS180 and larger.	64
	Double Pitch Deep Link (Attachment Type: DL)	Height of the link plates (dimension H1) is higher than the top of the roller on double pitch base chain. Allows materials to be placed directly on the chain even with R rollers.	65
	Bent-Over Attachment (Attachment Type: UM)	The top edges of the bent-over attachment are chamfered to protect conveyed materials from scratches. Allows conveyed materials to be placed directly on the chain, or be conveyed by sandwiching between chains.	65
	Guide Roller (Attachment Type: GR)	Guide rollers prevent meandering and can be used as running rollers. (Not for curved chain.)	66
	Extended Pin with Thread (Attachment Type: EN)	Extended pins (high-strength/hardened steel) are threaded to enable tools, jigs, etc. to be attached.	67
	Extended Pin with Spring Clip (Attachment Type: EC)	The spring clip allows the attachment of tools, etc. A tool attachment for two pins can only be placed on the pin link.	68
	Stay Pin (Attachment Type: ST)	Pins are made longer to form parallel strands. Conveyed materials can be placed directly on the pins. Installing wire mesh is one example of use.	69, 70
	Triangle Attachment (Attachment Type: RE)	For conveying various types of bar-like objects.	71
	Sticker Attachment (Attachment Type: FS)	The attachment is topped with a sharp barb-like spike to grip flat objects such as film.	71
	Gripper Attachment (Attachment Types: KU, KUM)	Gripper attachment for conveying film, etc., held by a friction clip.	72
	Magnetic Attachment (Attachment Type: MG)	A magnet mounted on the attachment holds conveyed objects. Can be used for conveyance on a slope.	73
	Rubber Attachment (Attachment Type: RSG)	A layer of rubber is bonded to the attachment. The elasticity of the rubber allows objects to be conveyed between chains.	73
	Crescent Top Plate (Attachment Type: CL)	For circulating-loop conveyors operating on a horizontal plane.	74
	Slat (Attachment Type: SLT [Riveted])	Slats are installed on tough RF Double Pitch Chains. Ideal for conveying relatively heavy material.	74
	Slat (Attachment Type: SLW [Welded])	Slats are installed on RF Double Pitch Chains. Ideal for conveying relatively heavy material.	75
	RS Slat (Attachment Type: SLT [Riveted])	This single pitch chain with a short internally set slat is suitable for smooth conveyance of small objects.	75

**Standard**  
 Small Size Conveyor Chain

**Special**  
 Small Size Conveyor Chain

**Lube Free**  
 Small Size Conveyor Chain

**Corrosion Resistant**  
 Small Size Conveyor Chain

**Plus α**  
 Small Size Conveyor Chain

**High Precision**  
 Conveyor Chain

**Engineering Manual**

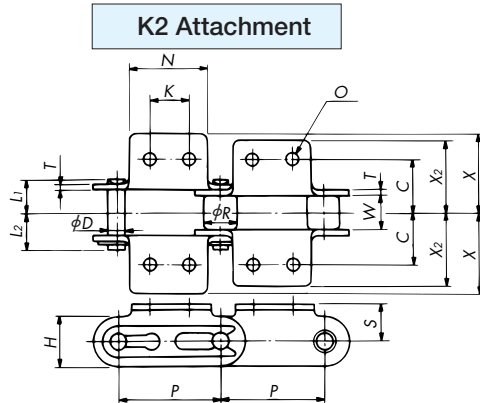
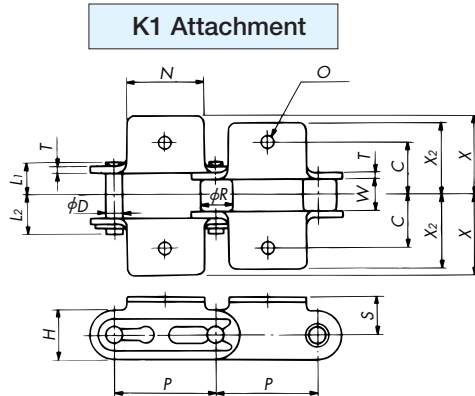
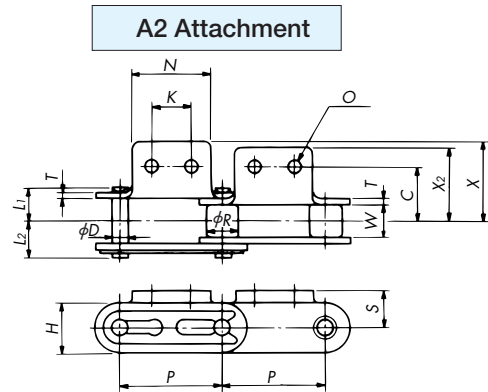
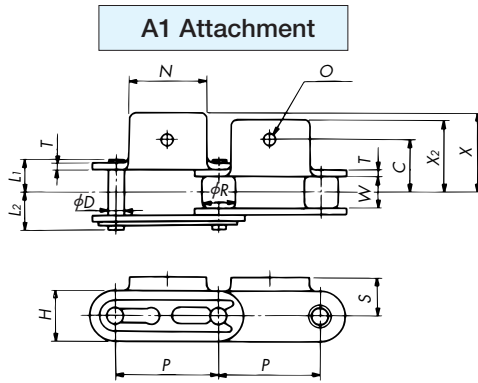
# Plus $\alpha$ Attachments

Speedy delivery available (1)

Attachments with special hole diameters.

## Special Hole Diameter Attachment (Attachment Types: A, K)

- Standard Chain
- Lambda Chain (lube free)



- Connecting links: RF2040 to RF2060 use spring clips. RF2080 and larger use cotter pins. Base chain pins are riveted.
- Attachments shown are S roller type. However, the dimensions for attachments are the same when R rollers are used. Also, the drawings show attachments added on every link.
- Pins other than those on connecting links are riveted regardless of whether attachments are present.
- X and X<sub>2</sub> are the width of the attachments installed on the outer (pin) link and inner (roller) link, respectively.

## Attachment Dimensions

Tsubaki Chain No.		Pitch P	Width Between Inner Link Plates W	Roller Dia. R		Pin			Plate		Attachment						
Standard	Lambda			S Roller	R Roller	Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T	C	K	N	S	X	X <sub>2</sub>	O
RF2040	RF2040-LMC	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	12.7	9.5	19.1	9.1	19.3	17.6	4.5 · 5.5
RF2050	RF2050-LMC	31.75	9.53	10.16	19.05	5.09	10.30	12.0	15.0	2.0	15.9	11.9	23.8	11.1	24.2	22.0	4.5 · 5.5
RF2060	RF2060-LMC	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	21.45	14.3	28.6	14.7	31.5	28.2	5.5 · 6.5
RF2080	RF2080-LMC	50.80	15.88	15.88	28.58	7.94	18.30	20.90	23.0	4.0	27.8	19.1	38.1	19.1	40.7	36.6	9.0
RF2100	RF2100-LMC	63.50	19.05	19.05	39.69	9.54	21.80	24.50	28.6	4.8	33.35	23.8	47.6	23.4	49.9	44.9	11.0

## Chain Numbering

### Special Hole Diameter

**RF2040R-LMC-1LK1-5.5**

Chain size  
Roller type  
S: S roller  
R: R roller

Attachment spacing and type  
Chain type  
LMC: Lambda Attachment Chain  
No symbol: Standard

Special hole diameter  
(Dimension O in mm)

### Connecting Link (CL)

**RF2040-LMC-K1-5.5-CL**

Same as at left

Attachment type  
(enter only when attachment is installed)

Connecting link (CL)



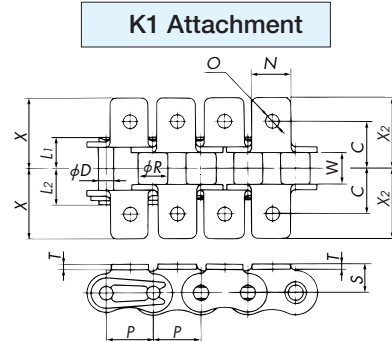
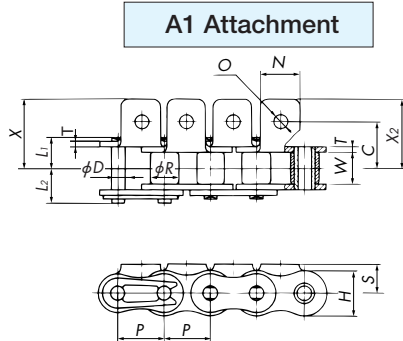
# Plus α Attachments

Speedy delivery available (2)



## Special Hole Diameter Attachment (Attachment Types: A, K)

- Standard Chain
- Lambda Chain (lube free)



- Connecting links: RS35 to RS60 use spring clips. RS80 and larger use cotter pins. Base chain pins are riveted.
- X and X<sub>2</sub> are the width of the attachments installed on the outer (pin) link and inner (roller) link, respectively.
- Drawings show attachments added on every link.
- Pins other than those on connecting links are riveted regardless of whether attachments are present.

### Attachment Dimensions

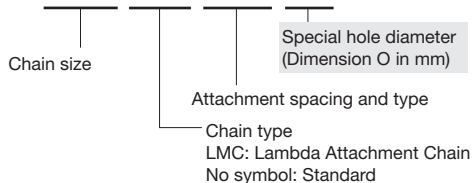
Tsubaki Chain No.		Pitch P	Width Between Inner Link Plates W	Roller (Bush) Dia. R	Pin			Plate		Attachment					
Standard	Lambda				Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T	C	N	S	X	X <sub>2</sub>	O
RS35	RS35-LMC	9.525	4.78	(5.08)	3.59 <3.00>	5.85	6.85	9.0	1.25	9.5	7.9	6.35	14.3	14.3	2.6
RS40	RS40-LMC	12.70	7.95	7.92	3.97	8.25	9.95	12.0	1.5	12.7	9.5	8.0	17.8	17.8	4.5 · 5.5
RS50	RS50-LMC	15.875	9.53	10.16	5.09	10.3	12.0	15.0	2.0	15.9	12.7	10.3	23.4	23.4	4.5 · 5.5
RS60	RS60-LMC	19.05	12.70	11.91	5.96	12.85	14.75	18.1	2.4	19.05	15.9	11.9	28.2	28.2	5.5 · 6.5
RS80	RS80-LMC	25.40	15.88	15.88	7.94	16.25	19.25	24.1	3.2	25.4	19.1	15.9	36.6	36.6	9.0
RS100	RS100-LMC	31.75	19.05	19.05	9.54	19.75	22.85	30.1	4.0	31.75	25.4	19.8	44.9	44.9	11.0

Note: The figure inside < > is for Lambda Chain.

### Chain Numbering

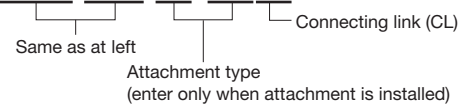
#### Special Hole Diameter

**RS40-LMC-1LA1-4.5**



#### Connecting Link (CL)

**RS40-LMC-A1-4.5CL**



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

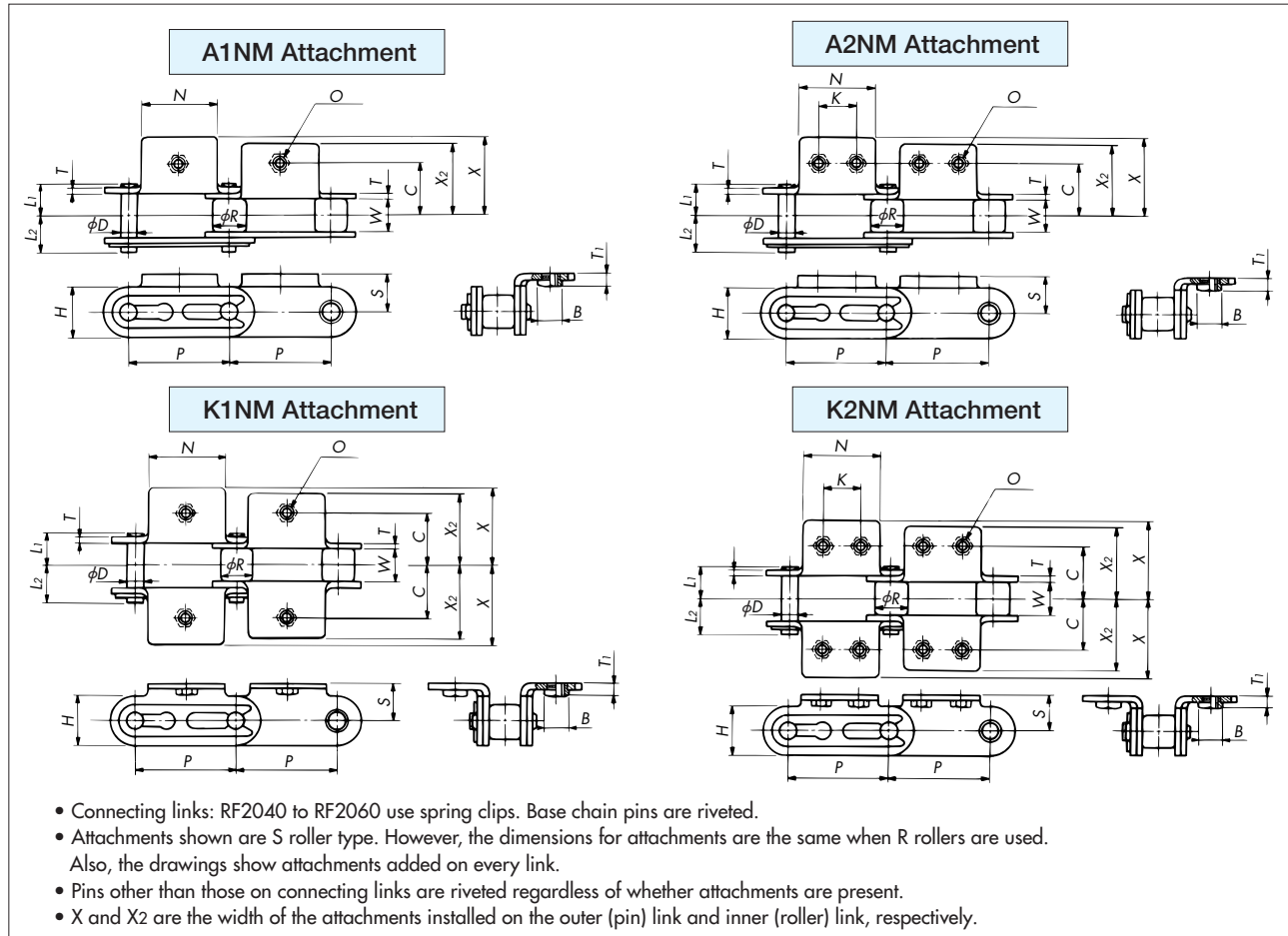
# Plus $\alpha$ Attachments

Speedy delivery available (3)

Nuts are added on the attachment to enable slats to be installed simply and easily. Both the attachment and nut are heat-treated for ample strength.

## Press Nut Attachment (Attachment Types: A-NM, K-NM)

- Standard Chain
- Lambda Chain (lube free)



## Attachment Dimensions

Tsubaki Chain No.		Pitch <i>P</i>	Width Between Inner Link Plates <i>W</i>	Roller Dia. <i>R</i>		Pin			Plate		Attachment								
Standard	Lambda			S Roller	R Roller	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	Width <i>H</i>	Thickness <i>T</i>	<i>C</i>	<i>K</i>	<i>N</i>	<i>B</i>	<i>S</i>	<i>X</i>	<i>X</i> <sub>2</sub>	<i>T</i> <sub>1</sub>	<i>O</i>
RF2040-NM3	RF2040-LMC-NM3	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	12.7	9.5	19.1	5.5	9.1	19.3	17.6	3.6	M3
RF2040-NM4	RF2040-LMC-NM4	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	12.7	9.5	19.1	7.0	9.1	19.3	17.6	3.8	M4
RF2050-NM4	RF2050-LMC-NM4	31.75	9.53	10.16	19.05	5.09	10.3	12.0	15.0	2.0	15.9	11.9	23.8	7.0	11.1	24.2	22.0	4.3	M4
RF2050-NM5	RF2050-LMC-NM5	31.75	9.53	10.16	19.05	5.09	10.3	12.0	15.0	2.0	15.9	11.9	23.8	8.0	11.1	24.2	22.0	5.1	M5
RF2060-NM5	RF2060-LMC-NM5	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	21.45	14.3	28.6	8.0	14.7	31.5	28.0	6.3	M5
RF2060-NM6	RF2060-LMC-NM6	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	21.45	14.3	28.6	10.0	14.7	31.5	28.0	7.3	M6

Dimension B is the width when nuts are installed on upper and lower surfaces.

## Chain Numbering

### Press Nut (Double Pitch)

**RF2040R-LMC-1LK1-NM4**

Chain size  
 Roller type  
 S: S roller  
 R: R roller  
 Press nut dimension  
 (Dimension O in mm)  
 With press nut  
 Attachment spacing and type  
 Chain type  
 LMC: Lambda Attachment Chain  
 No symbol: Standard

### Connecting Link (CL)

**RF2040-LMC-K1-NM4-CL**

Same as at left  
 Attachment type  
 (enter only when attachment is installed)  
 Connecting link (CL)

# Plus $\alpha$ Attachments

Speedy delivery available (4)



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

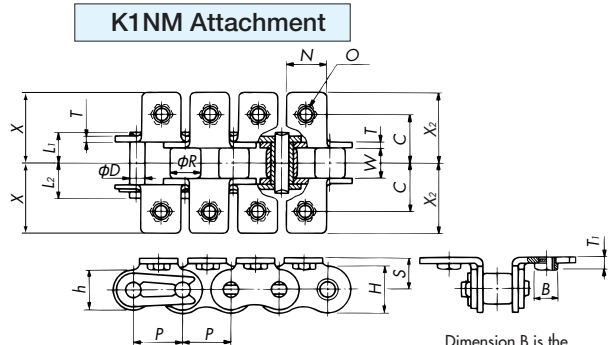
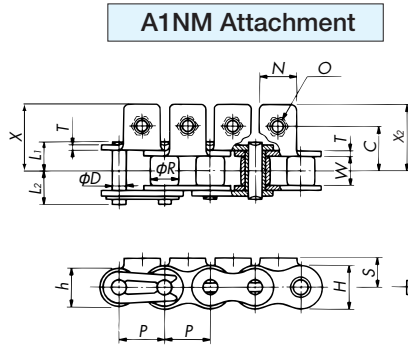
High Precision  
Conveyor Chain

Engineering Manual



## Press Nut Attachment (Attachment Types: A-NM, K-NM)

- Standard Chain
- Lambda Chain (lube free)



- Connecting links: RS40 to RS60 use spring clips. Base chain pins are riveted.
- Drawings show attachments added on every link.
- Pins other than those on connecting links are riveted regardless of whether attachments are present.
- X and X2 are the width of the attachments installed on the outer (pin) link and inner (roller) link, respectively.

Dimension B is the width when nuts are installed on upper and lower surfaces.

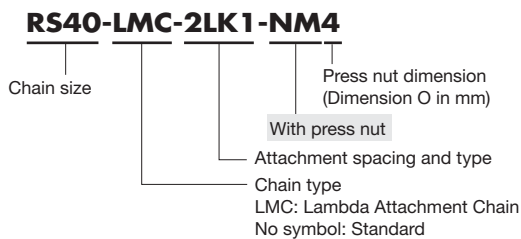
## Attachment Dimensions

Tsubaki Chain No.		Pitch <i>P</i>	Width Between Inner Link Plates <i>W</i>	Roller Dia. <i>R</i>	Pin			Plate			Attachment							
Standard	Lambda				Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	Width <i>h</i>	Width <i>H</i>	Thickness <i>T</i>	<i>C</i>	<i>N</i>	<i>B</i>	<i>S</i>	<i>X</i>	<i>X</i> <sub>2</sub>	<i>T</i> <sub>1</sub>	<i>O</i>
RS40-NM3	RS40-LMC-NM3	12.70	7.95	7.92	3.97	8.25	9.95	10.4	12.0	1.5	12.7	9.5	5.5	8.0	17.8	17.8	3.6	M3
RS40-NM4	RS40-LMC-NM4	12.70	7.95	7.92	3.97	8.25	9.95	10.4	12.0	1.5	12.7	9.5	7.0	8.0	17.8	17.8	3.8	M4
RS50-NM4	RS50-LMC-NM4	15.875	9.53	10.16	5.09	10.3	12.0	13.0	15.0	2.0	15.9	12.7	7.0	10.3	23.4	23.4	4.3	M4
RS50-NM5	RS50-LMC-NM5	15.875	9.53	10.16	5.09	10.3	12.0	13.0	15.0	2.0	15.9	12.7	8.0	10.3	23.4	23.4	5.1	M5
RS60-NM5	RS60-LMC-NM5	19.05	12.70	11.91	5.96	12.85	14.75	15.6	18.1	2.4	19.05	15.9	8.0	11.9	28.2	28.2	5.5	M5
RS60-NM6	RS60-LMC-NM6	19.05	12.70	11.91	5.96	12.85	14.75	15.6	18.1	2.4	19.05	15.9	10.0	11.9	28.2	28.2	6.5	M6

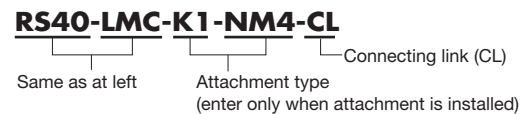
Dimension B is the width when nuts are installed on upper and lower surfaces.

## Chain Numbering

### Press Nut (RS)



### Connecting Link (CL)



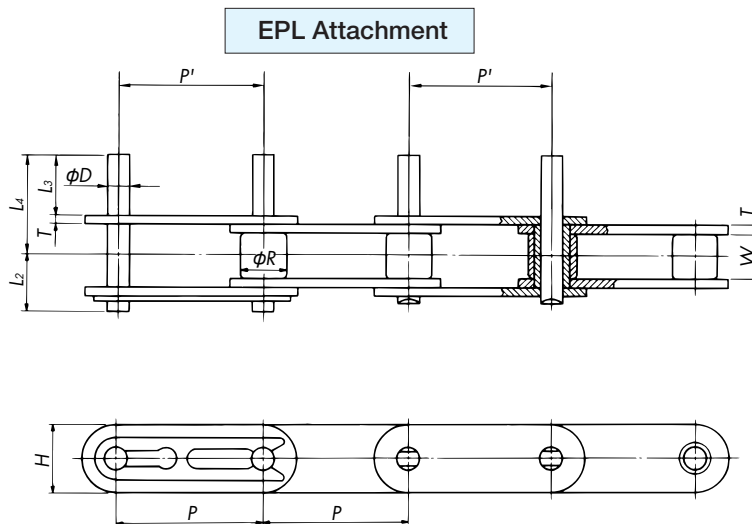
# Plus α Attachments

Speedy delivery available (5)

Chain with extended pins projecting to a customer-specified length can be manufactured with a short leadtime for perfect compatibility with your attachments or parts.

## Special Extended Pin (Attachment Type: EPL)

- Standard Chain
- Lambda Chain (lube free)



- Actual dimension  $P'$  may differ from  $P$ . Please contact a Tsubakimoto representative for details.
- Extended pins on standard Lambda Chain are nickel-plated. Consequently, pin end diameter will be slightly larger.
- Connecting links: RF2040 to RF2060 use spring clips. RF2080 and larger use cotter pins. Base chain pins are riveted.
- Attachments shown are S roller type. However, the dimensions for attachments are the same when R rollers are used. Also, the drawings show attachments added on every link.
- Pins other than those on connecting links are riveted regardless of whether attachments are present.

## Attachment Dimensions

Tsubaki Chain No.		Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$		Pin		Plate		Pin	
Standard	Lambda			S Roller	R Roller	Dia. $D$	$L_2$	Width $H$	Thickness $T$	$L_3$	$L_4$
RF2040-EPL15.4	RF2040-LMC-EPL15.4	25.40	7.95	7.92	15.88	3.97	9.95	12.0	1.5	15.4	22.65
RF2040-EPL20.3	RF2040-LMC-EPL20.3	25.40	7.95	7.92	15.88	3.97	9.95	12.0	1.5	20.3	27.55
RF2040-EPL29.8	RF2040-LMC-EPL29.8	25.40	7.95	7.92	15.88	3.97	9.95	12.0	1.5	29.8	37.05
RF2050-EPL19.3	RF2050-LMC-EPL19.3	31.75	9.53	10.16	19.05	5.09	12.0	15.0	2.0	19.3	28.4
RF2050-EPL23.8	RF2050-LMC-EPL23.8	31.75	9.53	10.16	19.05	5.09	12.0	15.0	2.0	23.8	32.9
RF2050-EPL31.2	RF2050-LMC-EPL31.2	31.75	9.53	10.16	19.05	5.09	12.0	15.0	2.0	31.2	40.3
RF2060-EPL16.5	RF2060-LMC-EPL16.5	38.10	12.70	11.91	22.23	5.96	16.55	17.2	3.2	16.5	29.65
RF2060-EPL20.8	RF2060-LMC-EPL20.8	38.10	12.70	11.91	22.23	5.96	16.55	17.2	3.2	20.8	33.95
RF2060-EPL28.2	RF2060-LMC-EPL28.2	38.10	12.70	11.91	22.23	5.96	16.55	17.2	3.2	28.2	41.35
RF2080-EPL27.1	RF2080-LMC-EPL27.1	50.80	15.88	15.88	28.58	7.94	20.90	23.0	4.0	27.1	43.5
RF2080-EPL35.4	RF2080-LMC-EPL35.4	50.80	15.88	15.88	28.58	7.94	20.90	23.0	4.0	35.4	51.8
RF2080-EPL56.5	RF2080-LMC-EPL56.5	50.80	15.88	15.88	28.58	7.94	20.90	23.0	4.0	56.5	72.9
RF2100-EPL34.0	RF2100-LMC-EPL34.0	63.50	19.05	19.05	39.69	9.54	24.50	28.6	4.8	34.0	53.6
RF2100-EPL43.7	RF2100-LMC-EPL43.7	63.50	19.05	19.05	39.69	9.54	24.50	28.6	4.8	43.7	63.3
RF2100-EPL69.9	RF2100-LMC-EPL69.9	63.50	19.05	19.05	39.69	9.54	24.50	28.6	4.8	69.9	89.5

## Chain Numbering

### Special Extended Pin (Double Pitch)

**RF2040S-LMC-2LEPL15.4**

- Chain size
- Roller type  
S: S roller  
R: R roller
- Extended pin projection  
(Dimension  $L_3$  in mm)
- With extended pin
- Extended pin spacing
- Chain type  
LMC: Lambda Attachment Chain  
No symbol: Standard

### Connecting Link (CL)

**RF2040-LMC-E1-L15.4-CL**

- Same as at left
- Same as at left
- Connecting link (CL)
- E1: One extended pin  
E2: Two extended pins

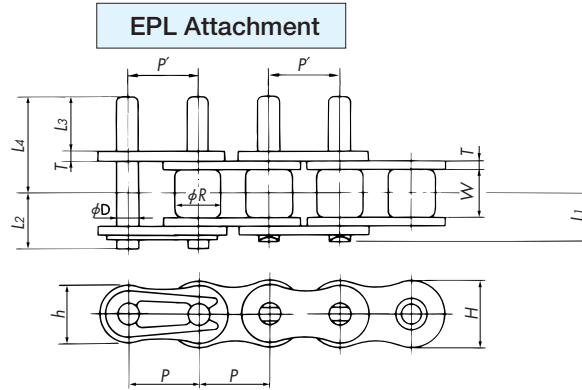
# Plus α Attachments

Speedy delivery available (6)



## Special Extended Pin (Attachment Type: EPL)

- Standard Chain
- Lambda Chain (lube free)



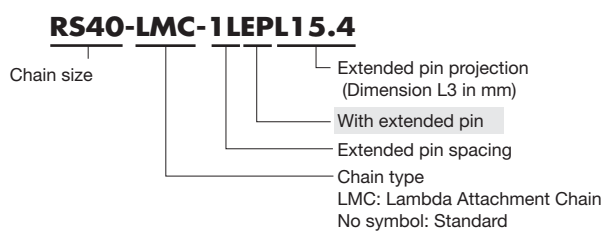
- Actual dimension P' may differ from P. Please contact a Tsubakimoto representative for details.
- Extended pins on standard Lambda Chain are nickel-plated. Consequently, pin end diameter will be slightly larger.
- Connecting links: RS40 to RS60 use spring clips. RS80 and larger use cotter pins. Base chain pins are riveted.
- Drawings show attachments added on every link.
- Pins other than those on connecting links are riveted regardless of whether attachments are present.

### Attachment Dimensions

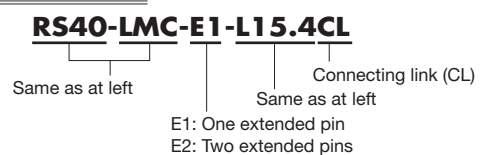
Tsubaki Chain No.		Pitch P	Width Between Inner Link Plates W	Roller Dia. R	Pin			Plate			Pin	
Standard	Lambda				Dia. D	L1	L2	Width h	Width H	Thickness T	L3	L4
RS40-EPL15.4	RS40-LMC-EPL15.4	12.70	7.95	7.92	3.97	8.25	9.95	10.4	12.0	1.5	15.4	22.7
RS40-EPL20.3	RS40-LMC-EPL20.3	12.70	7.95	7.92	3.97	8.25	9.95	10.4	12.0	1.5	20.3	27.6
RS40-EPL29.8	RS40-LMC-EPL29.8	12.70	7.95	7.92	3.97	8.25	9.95	10.4	12.0	1.5	29.8	37.1
RS50-EPL19.3	RS50-LMC-EPL19.3	15.875	9.53	10.16	5.09	10.3	12.0	13.0	15.0	2.0	19.3	28.4
RS50-EPL23.8	RS50-LMC-EPL23.8	15.875	9.53	10.16	5.09	10.3	12.0	13.0	15.0	2.0	23.8	32.9
RS50-EPL31.2	RS50-LMC-EPL31.2	15.875	9.53	10.16	5.09	10.3	12.0	13.0	15.0	2.0	31.2	40.3
RS60-EPL19.9	RS60-LMC-EPL19.9	19.05	12.70	11.91	5.96	12.85	14.75	15.6	18.1	2.4	19.9	31.45
RS60-EPL24.2	RS60-LMC-EPL24.2	19.05	12.70	11.91	5.96	12.85	14.75	15.6	18.1	2.4	24.2	35.75
RS60-EPL31.6	RS60-LMC-EPL31.6	19.05	12.70	11.91	5.96	12.85	14.75	15.6	18.1	2.4	31.6	43.15
RS80-EPL30.8	RS80-LMC-EPL30.8	25.40	15.88	15.88	7.94	16.25	19.25	20.8	24.1	3.2	30.8	45.55
RS80-EPL39.1	RS80-LMC-EPL39.1	25.40	15.88	15.88	7.94	16.25	19.25	20.8	24.1	3.2	39.1	53.9
RS80-EPL42.3	RS80-LMC-EPL42.3	25.40	15.88	15.88	7.94	16.25	19.25	20.8	24.1	3.2	42.3	57.1
RS100-EPL37.7	RS100-LMC-EPL37.7	31.75	19.05	19.05	9.54	19.75	22.85	26.0	30.1	4.0	37.7	55.65
RS100-EPL45.0	RS100-LMC-EPL45.0	31.75	19.05	19.05	9.54	19.75	22.85	26.0	30.1	4.0	45.0	62.95
RS100-EPL50.7	RS100-LMC-EPL50.7	31.75	19.05	19.05	9.54	19.75	22.85	26.0	30.1	4.0	50.7	68.65

### Chain Numbering

#### Special Extended Pin (RS)



#### Connecting Link (CL)

Standard  
Small Size Conveyor ChainSpecial  
Small Size Conveyor ChainLube Free  
Small Size Conveyor ChainCorrosion Resistant  
Small Size Conveyor ChainPlus α  
Small Size Conveyor ChainHigh Precision  
Conveyor Chain

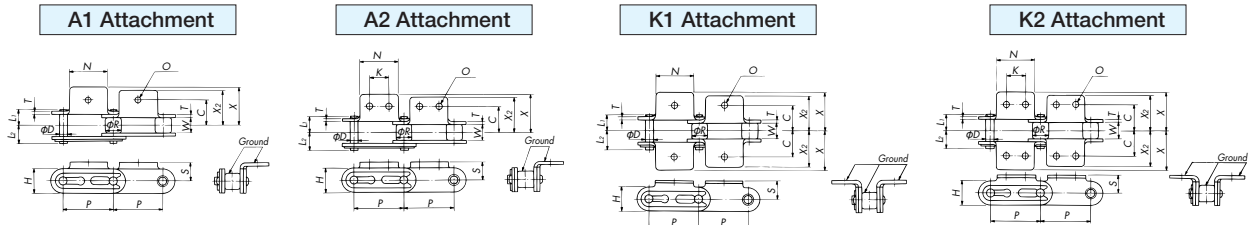
Engineering Manual

# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.

The upper surface of the link plate is ground to provide a smooth conveying surface and to protect the conveyed material from damage.

## Ground Attachment (Attachment Type: PG)



- X and X<sub>2</sub> are the width of the attachments installed on the outer (pin) link and inner (roller) link, respectively.
- Drawings show attachments added on every link.
- Pins other than those on connecting links are riveted regardless of whether attachments are present.

### Chain Numbering

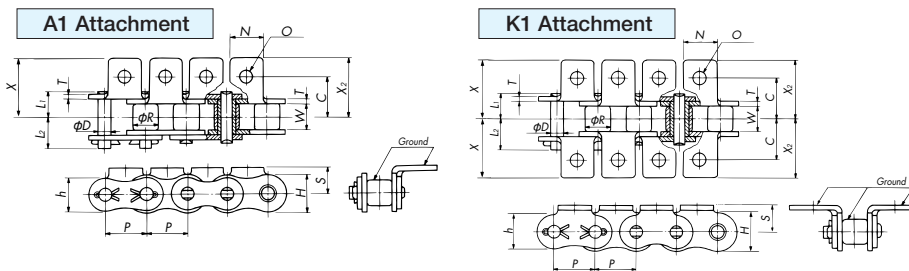
**RF2040S-1LK1-PG**

### Attachment Dimensions

Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R		Pin			Plate		Attachment							Connecting Link Type
			S Roller	R Roller	Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T	C	K	N	O	S	X	X <sub>2</sub>	
RF2040-PG	25.40	7.95	7.90	15.80	3.97	8.25	9.95	12.0	1.5	12.7	9.5	19.1	3.6	8.9	19.3	17.6	Spring clip
RF2050-PG	31.75	9.53	10.12	18.97	5.09	10.30	12.0	15.0	2.0	15.9	11.9	23.8	5.2	10.9	24.2	22.0	Spring clip
RF2060-PG	38.10	12.70	11.88	22.15	5.96	14.55	16.55	17.2	3.2	21.45	14.3	28.6	5.2	14.4	31.5	28.2	Spring clip
RF2080-PG	50.80	15.88	15.71	28.50	7.94	18.30	20.9	23.0	4.0	27.8	19.1	38.1	6.8	18.8	40.7	36.6	Cotter pin

- Note: 1. Chains without attachments are available only with S rollers.  
 2. On chains without attachments, the outer surface of rollers is not ground. In this case, the roller diameter will differ from the dimensions given above. Roller diameter (R) for RF2040S is 7.92, RF2050S is 10.16, RF2060S is 11.91, and RF2080S is 15.88.  
 3. The top surface of link plates is ground on chains without attachments. In this case, the plate width H will differ from the dimensions given above. Width (H) for RF2040S is 11.9, RF2050S is 14.9, RF2060S is 17.1, and RF2080S is 22.7.

## Ground Attachment (Attachment Type: PG)



### Chain Numbering

**RS40-1LK1-PG**

Chain size      Top surface ground  
Attachment spacing  
Attachment type

- X and X<sub>2</sub> are the width of the attachments installed on the outer (pin) link and inner (roller) link, respectively.
- Drawings show attachments added on every link.
- Pins other than those on connecting links are riveted regardless of whether attachments are present.

### Attachment Dimensions

Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R	Pin			Plate			Attachment					Connecting Link Type
				Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width h	Width H	Thickness T	C	N	O	S	X	
RS40-PG	12.70	7.95	7.90	3.97	8.25	9.95	10.4	12.0	1.5	12.7	9.5	3.6	7.8	17.8	Spring clip
RS50-PG	15.875	9.53	10.12	5.09	10.3	12.0	13.0	15.0	2.0	15.9	12.7	5.2	10.1	23.4	Spring clip
RS60-PG	19.05	12.70	11.88	5.96	12.85	14.75	15.6	18.1	2.4	19.05	15.9	5.2	11.6	28.2	Spring clip
RS80-PG	25.40	15.88	15.71	7.94	16.25	19.25	20.8	24.1	3.2	25.4	19.1	6.8	15.6	36.6	Cotter pin
RS100-PG	31.75	19.05	18.83	9.54	19.75	22.85	26.0	30.1	4.0	31.75	25.4	8.7	19.4	44.9	Cotter pin
RS120-PG	38.10	25.40	22.01	11.11	24.9	28.9	31.2	36.2	4.8	38.1	28.6	10.3	22.6	55.8	Cotter pin
RS140-PG	44.45	25.40	25.18	12.71	26.9	31.7	36.4	42.2	5.6	44.5	34.9	11.9	28.2	64.6	Cotter pin
RS160-PG	50.80	31.75	28.36	14.29	31.85	36.85	41.6	48.2	6.4	50.8	38.1	14.3	31.4	73.7	Cotter pin

- Note: X and X<sub>2</sub> are the width of the attachments installed on the outer (pin) link and inner (roller) link, respectively.  
 (For RS40 to RS100, X = X<sub>2</sub>; for RS120, X<sub>2</sub> = 51.2; for RS140, X<sub>2</sub> = 58.0; and for RS160, X<sub>2</sub> = 66.0)



# Plus α Attachments

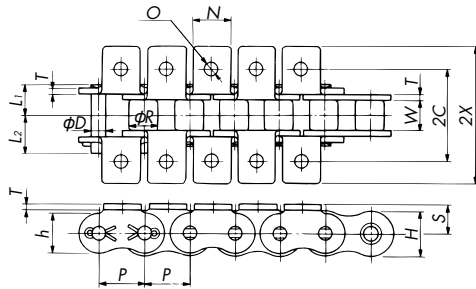
Selecting from among these designs will improve overall design efficiency for your application.



## Large Size Chain with Attachment

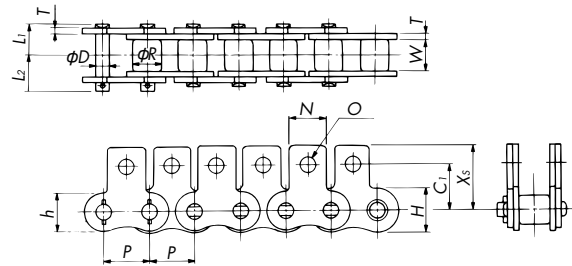
Attachment for chain sizes RS180 and larger.

**K1 Attachment**



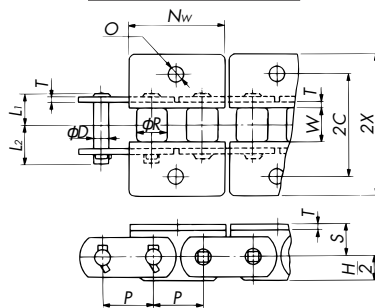
Applicable chain sizes are RS180, RS200, RS240, RF320-T, and RF400-T. Drawing shows RS180/RS200. External appearance will differ for sizes RS240 and larger.

**SK1 Attachment**



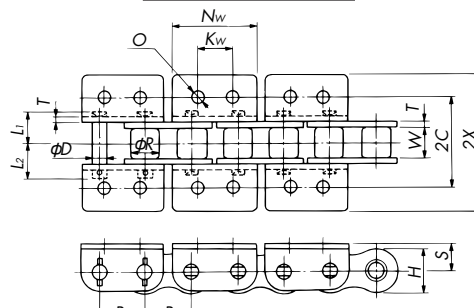
Applicable chain sizes are RS200 and RS240. Drawing shows RS240. Connecting links for RS200 use cotter pins.

**WK1 Attachment**



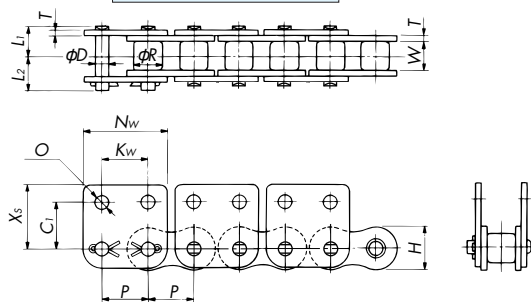
Applicable chain size is RF400-T.

**WK2 Attachment**



Applicable chain sizes are RS200 and RS240.

**WSK2 Attachment**



Applicable chain sizes are RS200, RS240, and RF400-T. Drawing shows RS200. External appearance for other sizes will differ.

### Chain Numbering

#### RS180-1LK1

Chain size      Attachment type  
Attachment spacing

#### Attachment Types and Attaching Links

Tsubaki Chain No.	K1	SK1	WK1	WK2	WSK2
RS180	PL or RL	—	—	—	—
RS200	PL or RL	PL	—	PL	PL
RS240	PL or RL	PL or RL	—	PL	PL
RF320-T	PL	—	—	—	—
RF400-T	PL	—	RL	—	PL

Note: PL: pin (outer) link; RL: roller (inner) link

### Attachment Dimensions

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Inner Link Plates W	Pin			Plate			2C	C1	N	O	S	2X	Xs	Nw	Kw
				Dia. D	L1	L2	h	H	T									
RS180	57.15	35.71	35.72	17.46	35.65	42.45	46.8	54.2	7.15	114.3	—	42.0	15.0	35.8	160.3	—	—	—
RS200	63.50	39.68	38.10	19.85	39.0	44.8	52.0	60.3	8.0	127.0	63.5	48.0	17.5	42.9	167.0	85.5	115.4	63.5
RS240	76.20	47.63	47.63	23.81	47.9	55.5	62.4	72.4	9.5	152.4	76.2	57.2	21.0	47.7	195.8	106.7	138.5	57.0
RF320-T	101.6	63.5	63.65	31.75	63.8	77.6	—	92	12.7	203.2	—	76.2	25.4	85.5	281.3	—	—	—
RF400-T	127.0	79.38	79.3	39.68	79.65	92.65	—	120	16.0	254.0	120	101.6	38.0	79.4	356.0	180	245	127

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

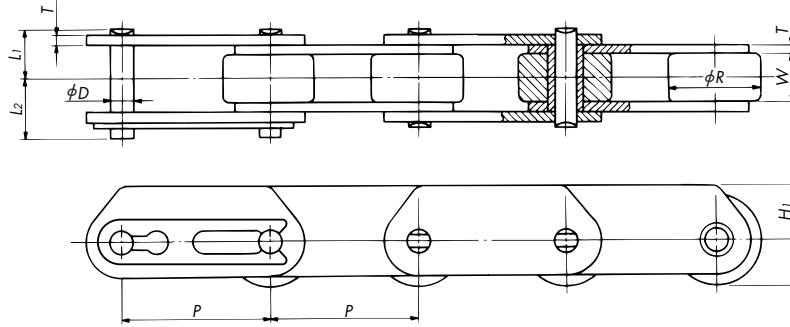
Engineering Manual

# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.

## Double Pitch Deep Link (Attachment Type: DL)

Height of the link plates (dimension  $H_1$ ) is higher than the top of the roller on double pitch base chain. Allows materials to be placed directly on the chain, even with R rollers.



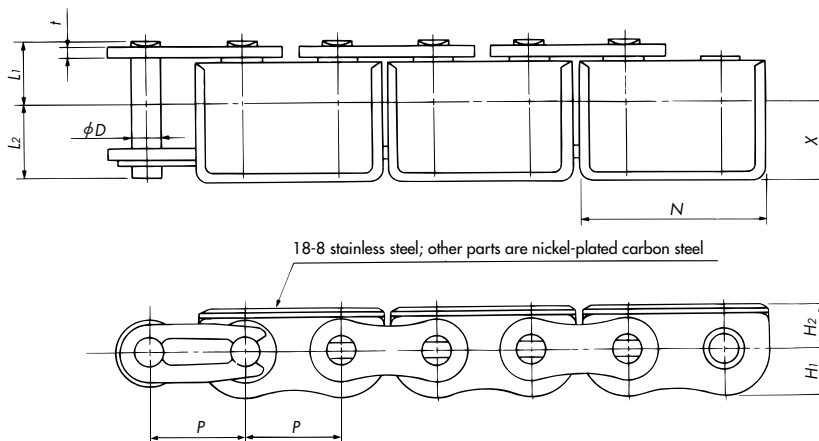
**Chain Numbering**  
**RF2040R-DL**

### Attachment Dimensions

Tsubaki Chain No.	Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$	Chain Height $H$	Pin			Plate		Connecting Link Type
					Dia. $D$	$L_1$	$L_2$	Width $H_1$	Thickness $T$	
RF2040R-DL	25.40	7.95	15.88	(17.9)	3.97	8.25	9.95	10.0	1.5	Spring clip
RF2050R-DL	31.75	9.53	19.05	(21.5)	5.09	10.3	12.0	12.0	2.0	Spring clip
RF2060R-DL	38.10	12.70	22.23	(25.1)	5.96	14.55	16.55	14.0	3.2	Spring clip
RF2080R-DL	50.80	15.88	28.58	(32.2)	7.94	18.3	20.9	18.0	4.0	Cotter pin

## Bent-Over Attachment (Attachment Type: UM)

The top edges of the bent-over attachment are chamfered to protect conveyed materials from scratches. Allows conveyed materials to be placed directly on the chain, or be conveyed by sandwiching between chains.



**Chain Numbering**  
**RS40-UM**

### Attachment Dimensions

Tsubaki Chain No.	Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$	Pin			Plate						
				Dia. $D$	$L_1$	$L_2$	$H_1$	$H_2$	$N$	$X$	$T$	$t$	$T_o$
RS40-UM	12.70	7.95	7.92	3.97	8.25	9.95	7.0	5.7	24.4	11.3	1.5	1.5	1.25
RS50-UM	15.875	9.53	10.16	5.09	10.3	12.0	8.5	7.1	30.5	13.1	2.0	2.0	1.5

- When used as a replacement chain, carefully check dimension  $H_2$  to avoid possible interference.
- Max. allowable load is not the same as RS Attachment Chain.

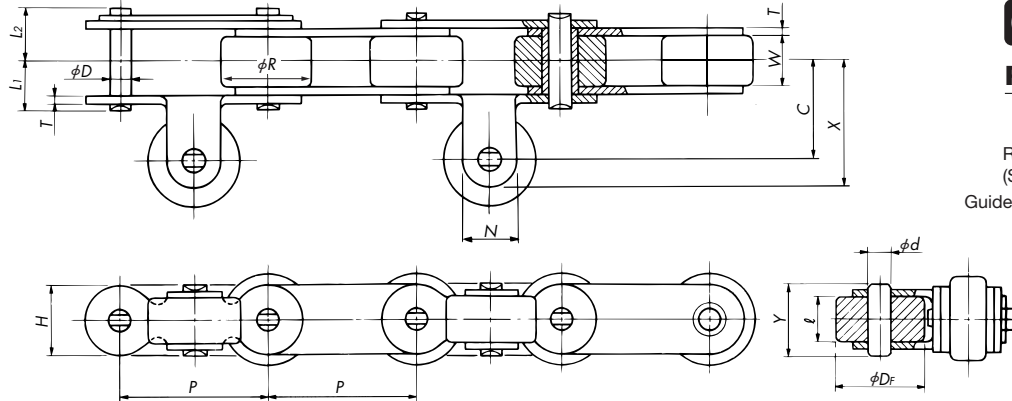
# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.

Guide rollers prevent meandering and can be used as running rollers. (Not for curved chain.)



## Guide Roller (Attachment Type: GR)

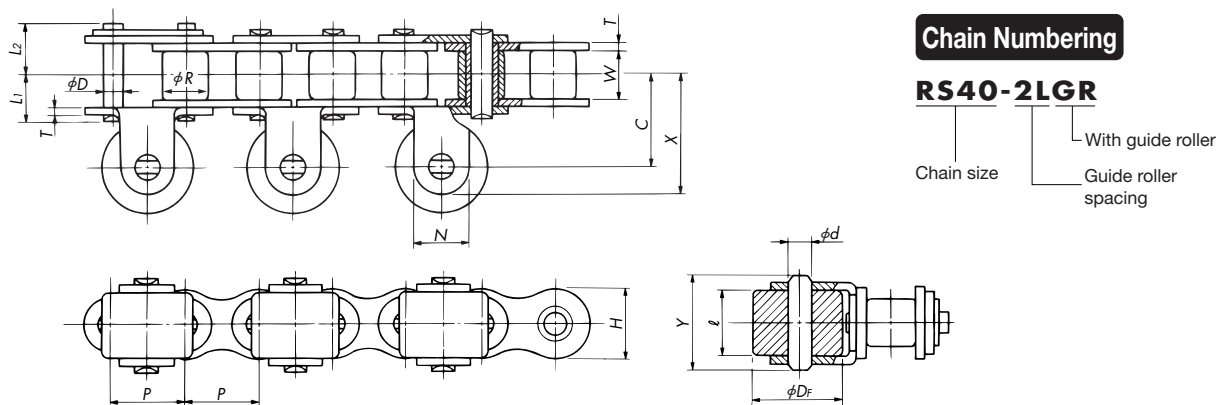


- Connecting links: RF2040 to RF2060 use spring clips. RF2080 and RF2100 use cotter pins.
- Attachments shown are R roller type. However, the dimensions for attachments are the same when S rollers are used.

### Attachment Dimensions

Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R		Pin			Plate		Attachment					Guide Roller	
			S Roller	R Roller	Dia. D	L1	L2	Width H	Thickness T	C	X	N	Y	d	Df	Q
RF2040-GR	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	17.45	22.2	9.5	13.2	3.97	15.88	7.8
RF2050-GR	31.75	9.53	10.16	19.05	5.09	10.3	12.0	15.0	2.0	21.15	27.5	12.7	16.2	5.09	19.05	9.4
RF2060-GR	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	27.0	34.95	15.9	22.2	5.96	22.23	12.6
RF2080-GR	50.80	15.88	15.88	28.58	7.94	18.3	20.9	23.0	4.0	33.35	42.9	19.1	27.4	7.94	28.58	15.8
RF2100-GR	63.50	19.05	19.05	39.69	9.54	21.8	24.5	28.6	4.8	42.85	55.55	25.4	32.7	9.54	39.69	19.0

## Guide Roller (Attachment Type: GR)



- Connecting links: RS40 to RS60 use spring clips. RS80 and RS100 use cotter pins.

### Attachment Dimensions

Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R	Pin			Plate		Attachment					Guide Roller	
				Dia. D	L1	L2	Width H	Thickness T	C	X	N	Y	d	Df	Q
RS40-GR	12.70	7.95	7.92	3.97	8.25	9.95	12.0	1.5	17.45	22.2	9.5	16.5	3.97	15.88	11.05
RS50-GR	15.875	9.53	10.16	5.09	10.3	12.0	15.0	2.0	21.15	27.5	12.7	20.6	5.09	19.05	13.75
RS60-GR	19.05	12.70	11.91	5.96	12.85	14.75	18.1	2.4	25.4	33.35	15.9	25.7	5.96	22.23	17.65
RS80-GR	25.40	15.88	15.88	7.94	16.25	19.25	24.1	3.2	31.75	41.3	19.1	32.5	7.94	28.58	22.5
RS100-GR	31.75	19.05	19.05	9.54	19.75	22.85	30.1	4.0	41.3	54.0	25.4	39.5	9.54	39.69	27.4



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.

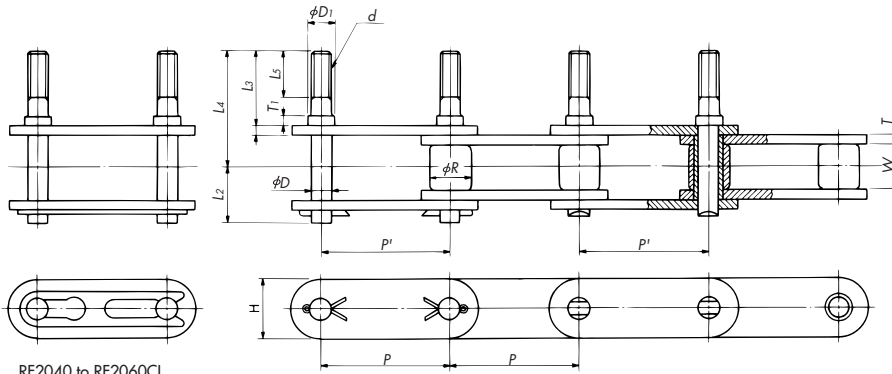
Extended pins (high-strength/hardened steel) are threaded to enable tools, jigs, etc. to be attached.

Mounting a tool or jig that straddles two pins is constrained by  $P'$ , the distance between pin centerlines.

Please contact a Tsubakimoto representative about dimension  $P'$ .



## Extended Pin with Thread (Attachment Type: EN)



RF2040 to RF2060CL

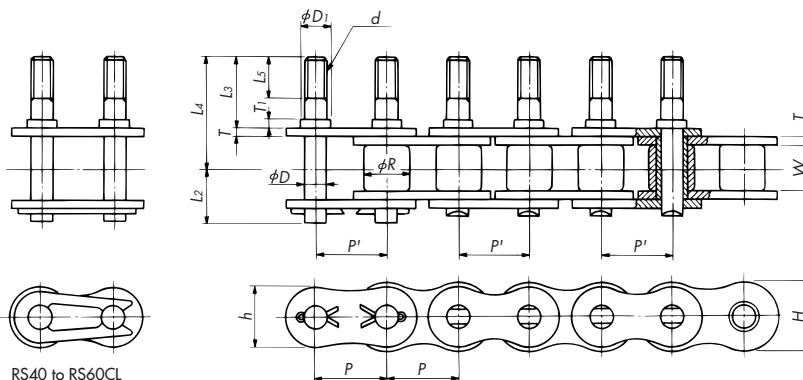
Note: Please specify dimensions  $L_3$  and  $L_5$ , or  $L_4$  and  $L_5$ .

- Attachments shown are S roller type. However, the dimensions for attachments are the same when R rollers are used.

### Attachment Dimensions

Tsubaki Chain No.		Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$		Pin					Plate		Connecting Link Type
				S Roller	R Roller	Dia. $D$	$D_1$	$d$	$T_1$	$L_2$	Width $H$	Thickness $T$	
RF2040S-EN	RF2040R-EN	25.40	7.95	7.92	15.88	3.97	5.00	M4	1.5	9.95	12.0	1.5	Spring clip
RF2050S-EN	RF2050R-EN	31.75	9.53	10.16	19.05	5.09	6.35	M5	2.0	12.0	15.0	2.0	Spring clip
RF2060S-EN	RF2060R-EN	38.10	12.70	11.91	22.23	5.96	8.35	M6	2.4	16.55	17.2	3.2	Spring clip
RF2080S-EN	RF2080R-EN	50.80	15.88	15.88	28.58	7.94	9.88	M8	3.2	20.90	23.0	4.0	Cotter pin
RF2100S-EN	RF2100R-EN	63.50	19.05	19.05	39.69	9.54	11.46	M10	4.0	24.50	28.6	4.8	Cotter pin

## Extended Pin with Thread (Attachment Type: EN)



RS40 to RS60CL

Note: Please specify dimensions  $L_3$  and  $L_5$ , or  $L_4$  and  $L_5$ .

### Attachment Dimensions

Tsubaki Chain No.	Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$	Pin					Plate			Connecting Link Type
				Dia. $D$	$D_1$	$d$	$T_1$	$L_2$	Width $h$	Width $H$	Thickness $T$	
RS40-EN	12.70	7.95	7.92	3.97	5.00	M4	1.5	9.95	10.4	12.0	1.5	Spring clip
RS50-EN	15.875	9.53	10.16	5.09	6.35	M5	2.0	12.0	13.0	15.0	2.0	Spring clip
RS60-EN	19.05	12.70	11.91	5.96	8.35	M6	2.4	14.75	15.6	18.1	2.4	Spring clip
RS80-EN	25.40	15.88	15.88	7.94	9.88	M8	3.2	19.25	20.8	24.1	3.2	Cotter pin
RS100-EN	31.75	19.05	19.05	9.54	11.46	M10	4.0	22.85	26.0	30.1	4.0	Cotter pin
RS120-EN	38.10	25.40	22.23	11.11	13.07	M12	4.8	28.90	31.2	36.2	4.8	Cotter pin

# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.

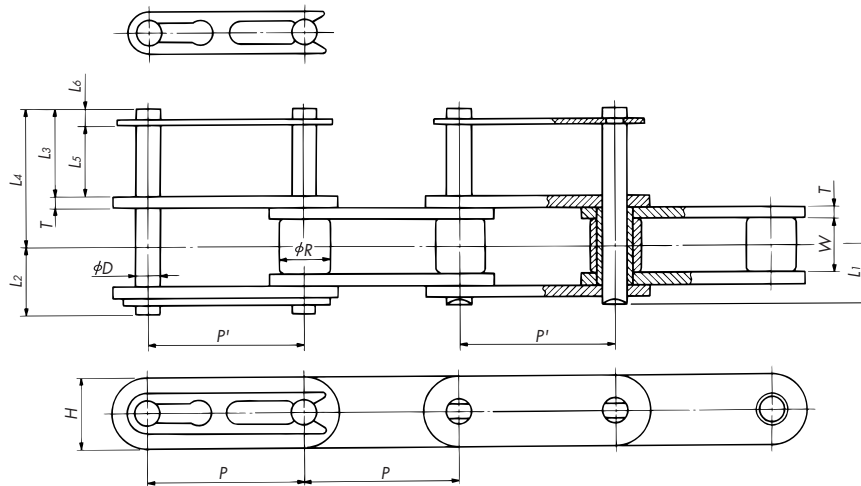
The spring clip allows the attachment of tools, etc.

Mounting a tool or jig that straddles two pins is constrained by  $P'$ , the distance between pin centerlines.

Please contact a Tsubakimoto representative about dimension  $P'$ .



## Extended Pin with Spring Clip (Attachment Type: EC)



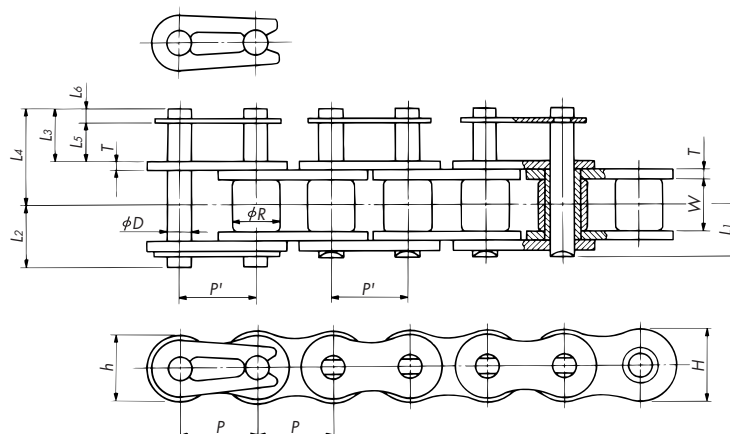
Note: 1. Please specify dimensions  $L_3$  and  $L_5$ , or  $L_4$  and  $L_5$ .  
2. Please specify the spacing of the extended pins (with spring clip).

• Attachments shown are S roller type. However, the dimensions for attachments are the same when R rollers are used.

### Attachment Dimensions

Tsubaki Chain No.		Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$		Pin				Plate		Connecting Link Type
				S Roller	R Roller	Dia. $D$	$L_1$	$L_2$	$L_6$	Width $H$	Thickness $T$	
RF2040S-EC	RF2040R-EC	25.40	7.95	7.92	15.88	3.97	8.25	9.95	(2.8)	12.0	1.5	Spring clip
RF2050S-EC	RF2050R-EC	31.75	9.53	10.16	19.05	5.09	10.3	12.0	(3.0)	15.0	2.0	Spring clip
RF2060S-EC	RF2060R-EC	38.10	12.70	11.91	22.23	5.96	14.55	16.55	(3.4)	17.2	3.2	Spring clip

## Extended Pin with Spring Clip (Attachment Type: EC)



Note: 1. Please specify dimensions  $L_3$  and  $L_5$ , or  $L_4$  and  $L_5$ .  
2. Please specify the spacing of the extended pins (with spring clip).

### Attachment Dimensions

Tsubaki Chain No.		Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$	Pin				Plate			Connecting Link Type
					Dia. $D$	$L_1$	$L_2$	$L_6$	Width $h$	Width $H$	Thickness $T$	
RS40-EC		12.70	7.95	7.92	3.97	8.25	9.95	(2.8)	10.4	12.0	1.5	Spring clip
RS50-EC		15.875	9.53	10.16	5.09	10.3	12.0	(3.0)	13.0	15.0	2.0	Spring clip
RS60-EC		19.05	12.70	11.91	5.96	12.85	14.75	(3.4)	15.6	18.1	2.4	Spring clip

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

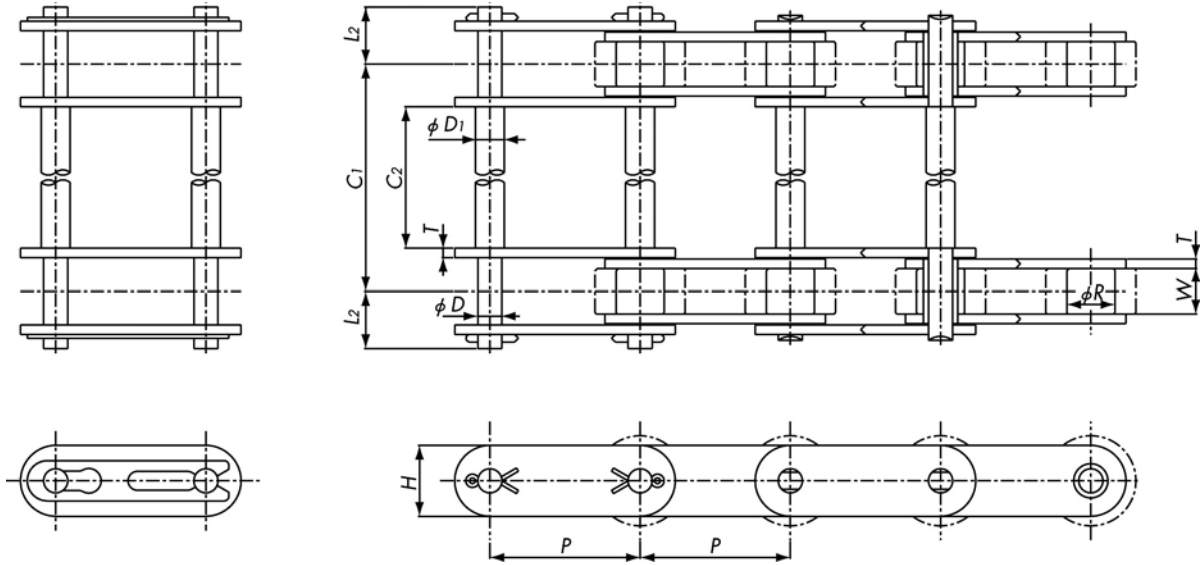
Engineering Manual

# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.

Pins are made longer to form parallel strands. Conveyed materials can be placed directly on the pins. Installing wire mesh is one example of use.

## Stay Pin (Attachment Type: ST)



- Note:
1. Base chain may be secured by spring clips or cotter pins depending on the length of the stay pins.
  2. Total width ( $C_1 + 2L_2$ ) should be less than 400 mm. Chain with this dimension wider than 400 mm can be manufactured provided that hardened pin components are used only on the base chain.
  3. Dimension  $D_1$  differs for stainless steel chain. Please inquire for details.
  4. This chain is provided with connecting links on both ends.
  5. The solid line shows S rollers and the dotted line shows R rollers.

### Attachment Dimensions

Tsubaki Chain No.		Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$		Pin				Plate		Connecting Link Type
				S Roller	R Roller	Dia. $D$	$D_1$	$L_2$	$C_1, C_2$	Width $H$	Thickness $T$	
RF2040S-ST	RF2040R-ST	25.40	7.95	7.92	15.88	3.97	5.84 (5.2)	9.95	Please specify dimension $C_1$ or $C_2$ .	12.0	1.5	Spring clip
RF2050S-ST	RF2050R-ST	31.75	9.53	10.16	19.05	5.09	6.35 (6.1)	12.0		15.0	2.0	Spring clip
RF2060S-ST	RF2060R-ST	38.10	12.70	11.91	22.23	5.96	8.35 (8.07)	16.55		17.2	3.2	Spring clip
RF2080S-ST	RF2080R-ST	50.80	15.88	15.88	28.58	7.94	9.88	20.90		23.0	4.0	Cotter pin
RF2100S-ST	RF2100R-ST	63.50	19.05	19.05	39.69	9.54	11.46	24.50		28.6	4.8	Cotter pin
RF2120S-ST	RF2120R-ST	76.20	25.40	22.23	44.45	11.11	13.07	30.55		34.4	5.6	Cotter pin
RF2160S-ST	RF2160R-ST	101.60	31.75	28.58	57.15	14.29	17.90	38.45		48.2	7.15	Cotter pin

Note: Figures inside < > are for stainless steel chain.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

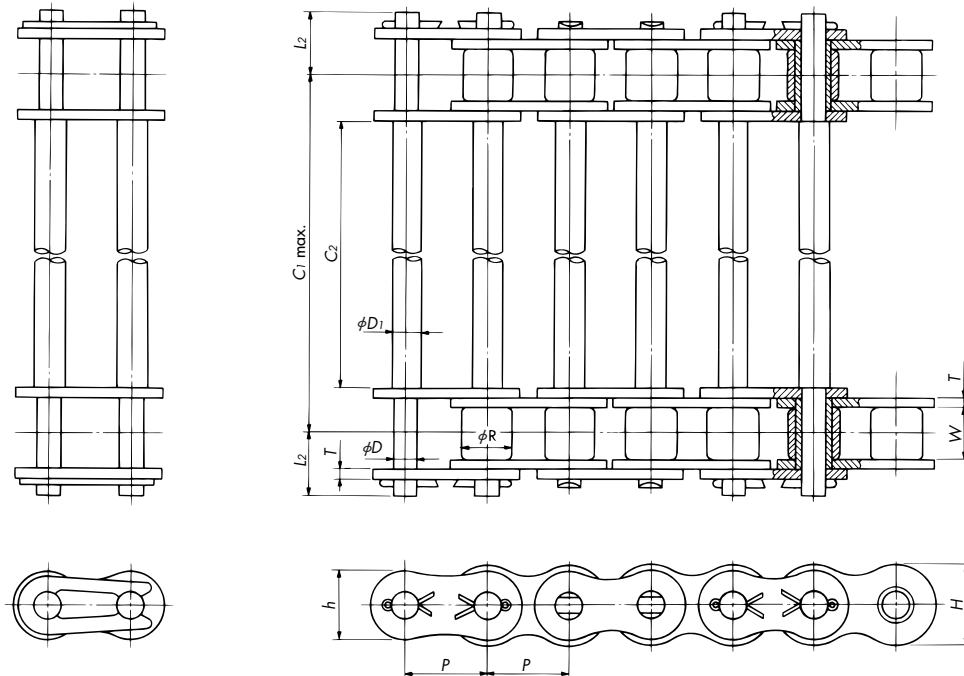


# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.



## Stay Pin (Attachment Type: ST)



- Note: 1. Base chain may be secured by spring clips or cotter pins depending on the length of the stay pins.  
 2. Total width ( $C_1 + 2L_2$ ) should be less than 400 mm. Chain with this dimension wider than 400 mm can be manufactured provided that hardened pin components are used only on the base chain.  
 3. Dimension  $D_1$  differs for stainless steel chain. Please inquire for details.  
 4. This chain is provided with connecting links on both ends.

### Attachment Dimensions

Tsubaki Chain No.	Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$	Pin				Plate			Connecting Link Type
				Dia. $D$	$D_1$	$L_2$	$C_1, C_2$	Width $h$	Width $H$	Thickness $T$	
RS35-ST	9.525	4.78	(5.08)	3.59	5.0	6.85	Please specify dimension $C_1$ or $C_2$ .	7.8	9.0	1.25	Spring clip
RS40-ST	12.70	7.95	7.92	3.97	5.84 (5.2)	9.95		10.4	12.0	1.5	Spring clip
RS50-ST	15.875	9.53	10.16	5.09	6.35 (6.1)	12.0		13.0	15.0	2.0	Spring clip
RS60-ST	19.05	12.70	11.91	5.96	8.35 (8.07)	14.75		15.6	18.1	2.4	Spring clip
RS80-ST	25.40	15.88	15.88	7.94	9.88	19.25		20.8	24.1	3.2	Cotter pin
RS100-ST	31.75	19.05	19.05	9.54	11.46	22.85		26.0	30.1	4.0	Cotter pin
RS120-ST	38.10	25.40	22.23	11.11	13.07	28.9		31.2	36.2	4.8	Cotter pin
RS140-ST	44.45	25.40	25.40	12.71	14.67	31.7		36.4	42.2	5.6	Cotter pin
RS160-ST	50.80	31.75	28.58	14.29	17.90	36.85		41.6	48.2	6.4	Cotter pin

Note: Roller diameter  $R$  (in parentheses) for RS35-ST is the bush diameter.  
 Figures inside < > are for stainless steel chain.



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

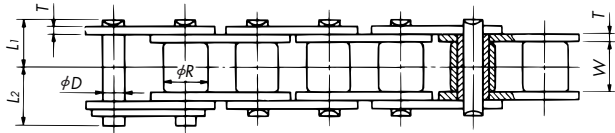
# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.



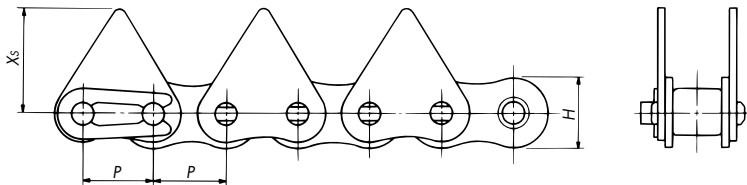
## Triangle Attachment (Attachment Type: RE)

For conveying various types of bar-like objects.



### Chain Numbering

**RS40-RE**



- Other types of attachments are available. Please inquire for details.
- Connecting links: RS40 to RS60 use spring clips. Other sizes use cotter pins.

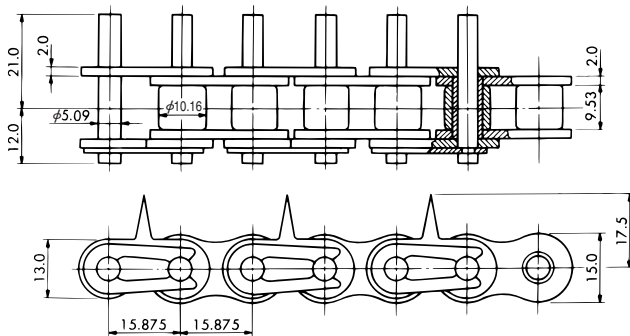
### Attachment Dimensions

Tsubaki Chain No.	Pitch <i>P</i>	Width Between Inner Link Plates <i>W</i>	Roller Dia. <i>R</i>	Pin			Plate		
				Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	Width <i>H</i>	Thickness <i>T</i>	Height <i>X</i> <sub>s</sub>
RS40-RE	12.70	7.95	7.92	3.97	8.25	9.95	12.0	1.5	17.9
RS50-RE	15.875	9.53	10.16	5.09	10.3	12.0	15.0	2.0	23.5
RS60-RE	19.05	12.70	11.91	5.96	12.85	14.75	18.1	2.4	20.8
RS80-RE	25.40	15.88	15.88	7.94	16.25	19.25	24.1	3.2	29.0
RS100-RE	31.75	19.05	19.05	9.54	19.75	22.85	30.1	4.0	34.6

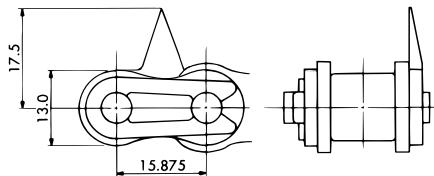
## Sticker Attachment (Attachment Type: FS)

The attachment is topped with a sharp barb-like spike to grip flat objects such as film. Please specify the shape of the attachment and the form to which the tip is to be machined (shape left as punched, chamfered edges, ground edges, etc.)

### Shape 1 (RS50)



### Shape 2 (RS50)



Note: The tip of the attachment is sharp. Take care when handling.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

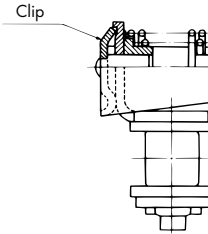
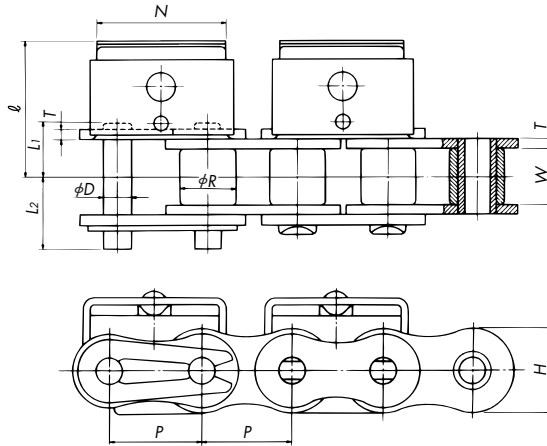
# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.

Gripper attachment for conveying film, etc., held by a friction clip.



## Gripper Attachment (Attachment Types: KU, KUM)



### Chain Numbering

**RS50-KU**

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

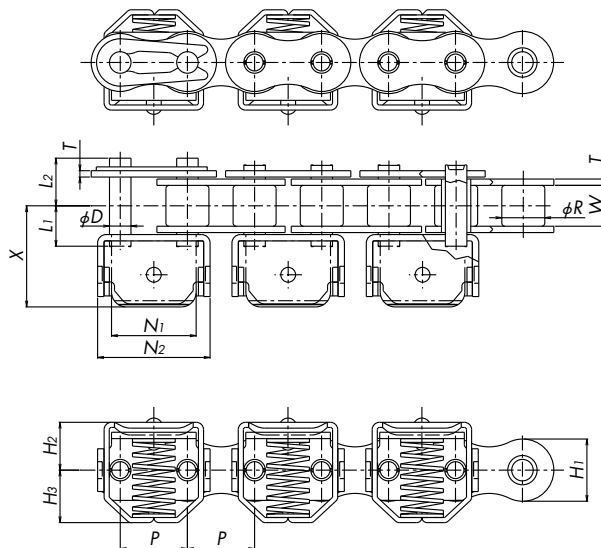
High Precision  
Conveyor Chain

Engineering Manual

### Attachment Dimensions

Tsubaki Chain No.	Pitch $P$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Pin			Plate		Clip	
				Dia. $D$	$L_1$	$L_2$	Width $H$	Thickness $T$	$\phi$	$N$
RS08B-KU	12.70	8.51	7.75	4.45	8.53	10.05	11.8	1.5	20.15	18.0
RS50-KU	15.875	10.16	9.53	5.09	12.0	15.0	15.0	2.0	26.7	18.0

Note: Available in steel, nickel-plated steel, or stainless steel.

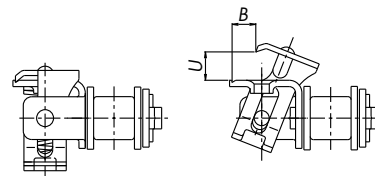


### Chain Numbering

**RS10B-KUM**



Sprocket is also available.



### Attachment Dimensions

Tsubaki Chain No.	Pitch $P$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Pin			Plate		$X$	$N_1$	$N_2$	$H_2$	$H_3$	$U$	$B$	Spring Load $N$
				Dia. $D$	$L_1$	$L_2$	Width $H_1$	Thickness $T$								
RS08B-KUM	12.70	8.51	7.75	4.45	8.4	10.0	12.0	1.6	20.3	16.8	22.8	10.5	10.8	(4.2)	(3.7)	50
RS10B-KUM	15.875	10.16	9.65	5.08	9.55	11.25	14.7	1.5	23.9	20.0	26.6	11.3	12.4	(6.7)	(5.6)	70

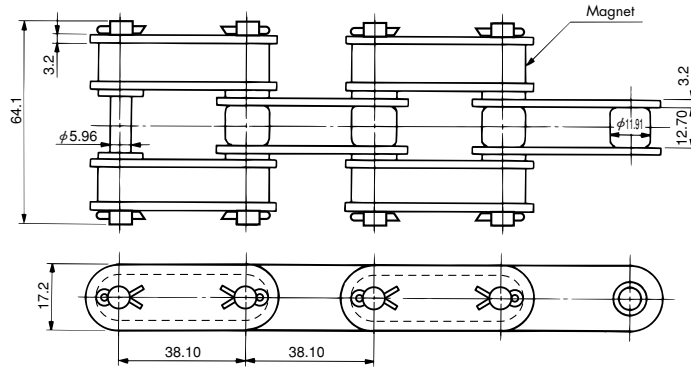
- Note: 1. Steel, nickel-plated steel, and stainless steel types are available.  
2. Spring load values are for when the spring is closed.  
3. Lambda chain is also available. Please contact a Tsubakimoto representative for more information.

# Plus $\alpha$ Attachments

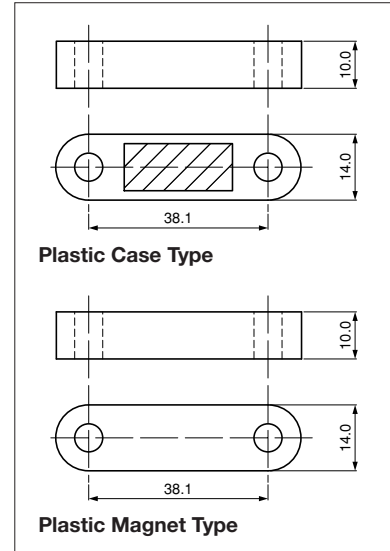
Selecting from among these designs will improve overall design efficiency for your application.

## Magnetic Attachment (Attachment Type: MG)

A magnet mounted on the attachment holds conveyed objects. Can be used for conveyance on a slope.



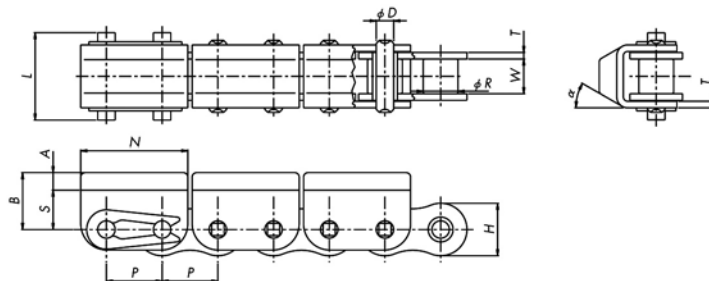
- Two types of magnets are available.



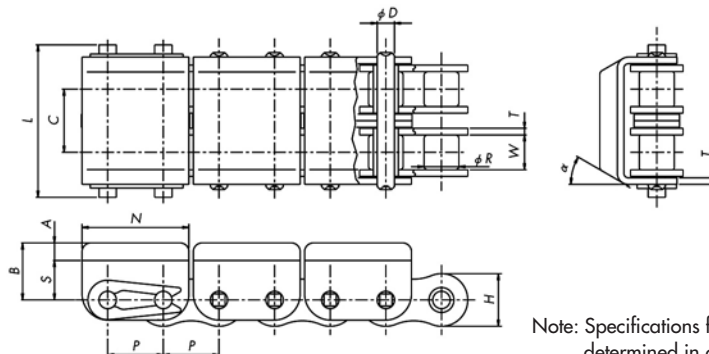
## Rubber Attachment (Attachment Type: RSG)

A layer of rubber is bonded to the attachment. The elasticity of the rubber allows objects to be conveyed between chains.

### Single strand



### Double strand



Note: Specifications for the rubber material will be determined in consultation with the customer.

## Attachment Dimensions

Tsubaki Chain No.	No. of Strands	Pitch P	Roller Dia. $\phi R$	Width Between Inner Link Plates W	Transverse Pitch C	Pin		Plate		Attachment				
						Dia. $\phi D$	Length L	Width H	Thickness T	N	S	A	B	$\alpha$
RS40	1	12.70	7.92	7.95	—	3.97	20.0	12.0	1.5	24.4	9.0	4.0	13.0	30°
RS40-2	2	12.70	7.92	7.95	14.4	3.97	34.6	12.0	1.5	24.4	9.0	4.0	13.0	30°
RS40-3	3	12.70	7.92	7.95	14.4	3.97	48.8	12.0	1.5	24.4	9.0	6.0	15.0	0°
RS50-2	2	15.875	10.16	9.53	18.1	5.09	42.0	15.0	2.0	28.8	13.0	10.0	23.0	20°
RS60	1	19.05	11.91	12.7	—	5.96	29.5	18.1	2.4	34.6	13.0	10.0	23.0	0°
RS60-2	2	19.05	11.91	12.7	22.8	5.96	52.4	18.1	2.4	34.6	13.0	10.0	23.0	20°

Note: Dimensions L are all calculated as both ends of the pin being CL secured.

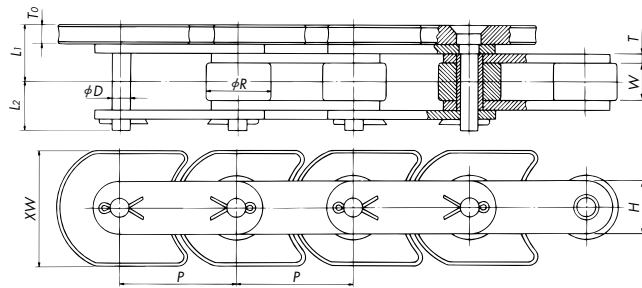
# Plus $\alpha$ Attachments

Selecting from among these designs will improve overall design efficiency for your application.



## Crescent Top Plate (Attachment Type: CL)

For circulating-loop conveyors operating on a horizontal plane.



### Chain Numbering

**RF2040R-CL**

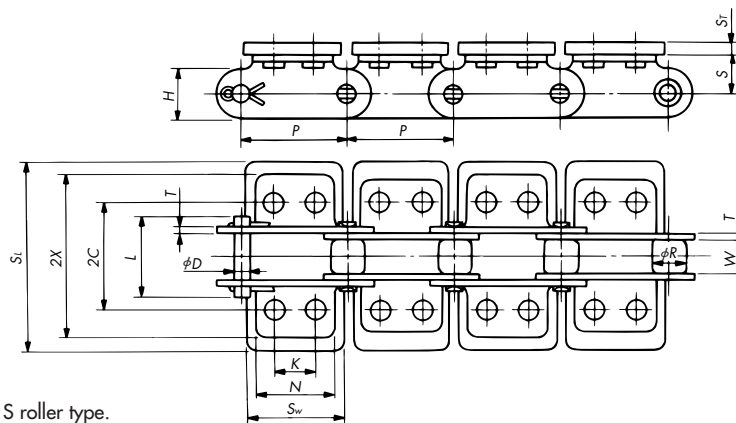
### Attachment Dimensions

Tsubaki Chain No.	Pitch $P$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Pin			Plate		Top Plate	
				Dia. $D$	$L_1$	$L_2$	Width $H$	Thickness $T$	Width $XW$	Thickness $T_0$
RF2050R-CL	31.75	19.05	9.53	5.09	15.05	11.9	15.0	2.0	32	6.0
RF2060R-CL	38.10	22.23	12.70	5.96	19.5	16.95	17.2	3.2	38.1	6.35
RF2080R-CL	50.80	28.58	15.88	7.94	24.2	21.1	23.0	4.0	50	8.0
RF2100R-CL	63.50	39.69	19.05	9.54	25.9	24.3	28.6	4.8	63.5	6.35



## Slat (Attachment Type: SLT [Riveted])

Slats are installed on tough RF Double Pitch Chains. Ideal for conveying relatively heavy material.



### Chain Numbering

**RF2040S-SLT**

- Attachments shown are S roller type.

### Attachment Dimensions

Tsubaki Chain No.		Pitch $P$	Width Between Inner Link Plates $W$	Roller Dia. $R$		Pin		Plate	
				S Roller	R Roller	$L$	Dia. $D$	Width $H$	Thickness $T$
RF2040S-SLT	RF2040R-SLT	25.40	7.95	7.92	15.88	19.3	3.97	12.0	1.5
RF2050S-SLT	RF2050R-SLT	31.75	9.53	10.16	19.05	23.8	5.09	15.0	2.0
RF2060S-SLT	RF2060R-SLT	38.10	12.70	11.91	22.23	33.9	5.96	17.2	3.2
RF2080S-SLT	RF2080R-SLT	50.80	15.88	15.88	28.58	41.8	7.94	23.0	4.0

Tsubaki Chain No.		$2C$	$2X$	$K$	$N$	$S$	$S_r$	$S_L$	$S_w$
RF2040S-SLT	RF2040R-SLT	25.4	38.6	9.5	19.1	9.1	3.2	50.8	24.0
RF2050S-SLT	RF2050R-SLT	31.8	48.4	11.9	23.8	11.1	4.0	63.5	30.0
RF2060S-SLT	RF2060R-SLT	42.9	63.0	14.3	28.6	14.7	4.8	76.2	36.0
RF2080S-SLT	RF2080R-SLT	55.6	81.4	19.1	38.1	19.1	5.6	101.6	48.0



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

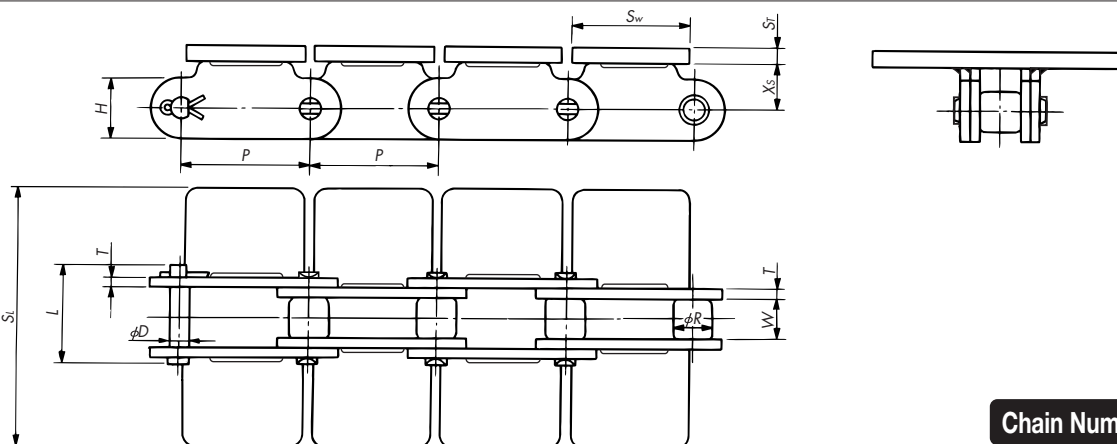
# Plus α Attachments

Selecting from among these designs will improve overall design efficiency for your application.



## Slat (Attachment Type: SLW [Welded])

Slats are installed on RF Double Pitch Chains. Ideal for conveying relatively heavy material.



• Attachments shown are S roller type.

Chain Numbering

**RF2060S-SLW**

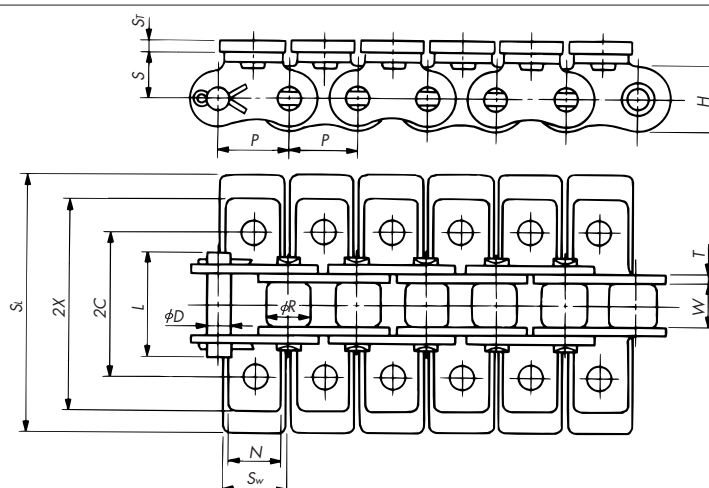
### Attachment Dimensions

Tsubaki Chain No.		Pitch <i>P</i>	Width Between Inner Link Plates <i>W</i>	Roller Dia. <i>R</i>		Pin		Plate		<i>S<sub>T</sub></i>	<i>S<sub>L</sub></i>	<i>S<sub>W</sub></i>	<i>X<sub>S</sub></i>
				S Roller	R Roller	<i>L</i>	Dia. <i>D</i>	Width <i>H</i>	Thickness <i>T</i>				
RF2060S-SLW	RF2060R-SLW	38.10	12.70	11.91	22.23	31.5	5.96	17.2	3.2	3.2	76.2	36.0	14.7
RF2080S-SLW	RF2080R-SLW	50.80	15.88	15.88	28.58	39.9	7.94	23.0	4.0	4.5	101.6	48.0	19.1



## RS Slat (Attachment Type: SLT [Riveted])

This single pitch chain with a short internally set slat is suitable for smooth conveyance of small objects.



Chain Numbering

**RS40-SLT**

### Attachment Dimensions

Tsubaki Chain No.	Pitch <i>P</i>	Width Between Inner Link Plates <i>W</i>	Roller Dia. <i>R</i>	Pin		Plate		2C	2X	<i>N</i>	<i>S</i>	<i>S<sub>T</sub></i>	<i>S<sub>L</sub></i>	<i>S<sub>W</sub></i>
				Dia. <i>D</i>	<i>L</i>	Width <i>H</i>	Thickness <i>T</i>							
RS40-SLT	12.70	7.95	7.92	3.97	19.3	12.0	1.5	25.4	35.6	9.5	8.0	3.2	50.8	12.0
RS50-SLT	15.875	19.53	10.16	5.09	23.8	15.0	2.0	31.8	46.8	12.7	10.3	3.2	63.5	15.0
RS60-SLT	19.05	12.70	11.91	5.96	30.5	18.1	2.4	38.1	56.4	15.9	11.9	4.0	76.2	18.0
RS80-SLT	25.40	15.88	15.88	7.94	38.5	24.1	3.2	50.8	73.2	19.1	15.9	4.8	101.6	24.0

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

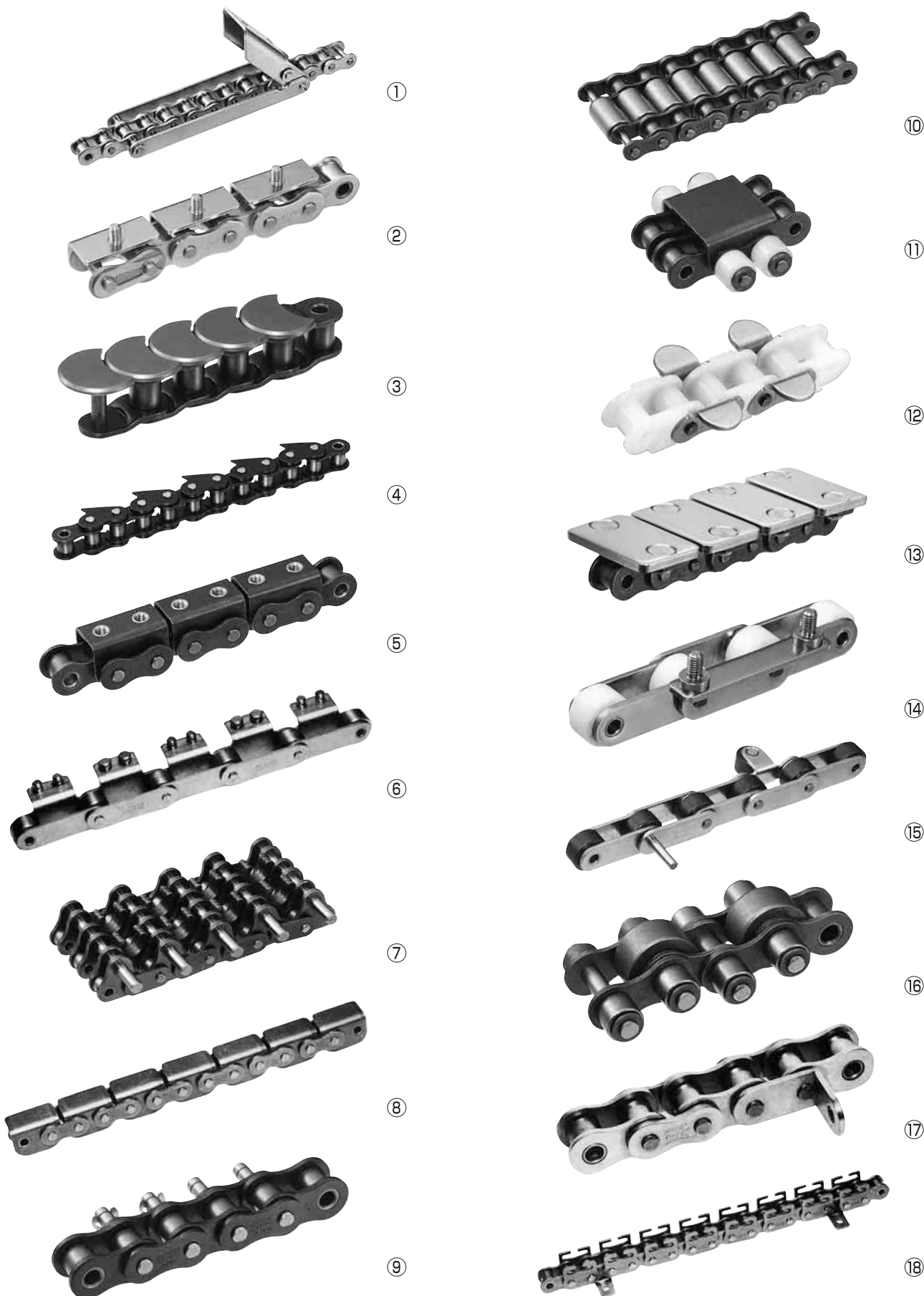
High Precision  
Conveyor Chain

Engineering Manual



# Special Specification Attachments

## Examples of Special Specification Attachments



**Standard**  
Small Size Conveyor Chain

**Special**  
Small Size Conveyor Chain

**Lube Free**  
Small Size Conveyor Chain

**Corrosion Resistant**  
Small Size Conveyor Chain

**Plus  $\alpha$**   
Small Size Conveyor Chain

**High Precision**  
Conveyor Chain

**Engineering Manual**

# Special Specification Attachments

**Standard**  
Small Size Conveyor Chain



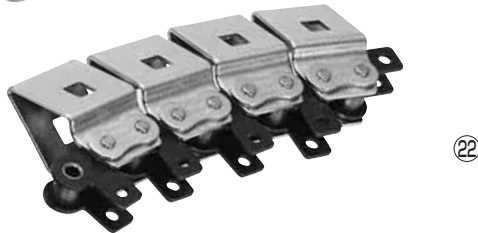
**Special**  
Small Size Conveyor Chain



**Lube Free**  
Small Size Conveyor Chain



**Corrosion Resistant**  
Small Size Conveyor Chain



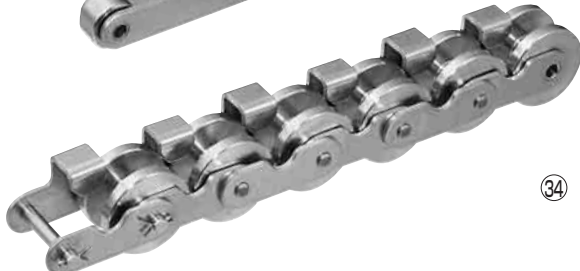
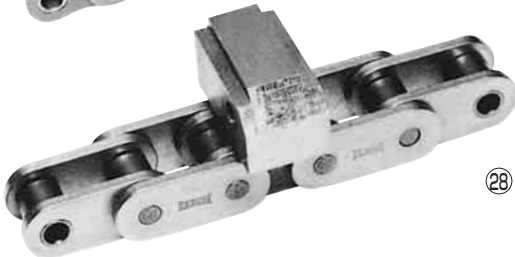
**Plus  $\alpha$**   
Small Size Conveyor Chain



**High Precision**  
Conveyor Chain



**Engineering Manual**



**Standard**  
Small Size Conveyor Chain



(41)

**Special**  
Small Size Conveyor Chain



(42)

**Lube Free**  
Small Size Conveyor Chain



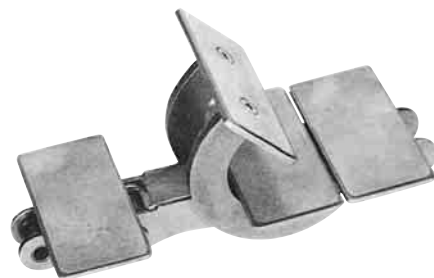
(43)

**Corrosion Resistant**  
Small Size Conveyor Chain



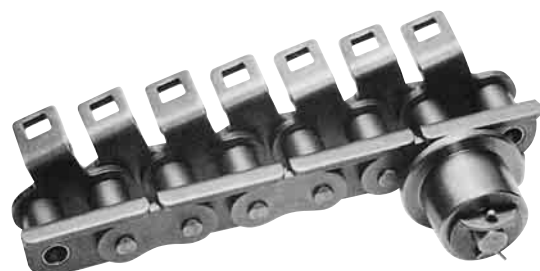
(44)

**Plus α**  
Small Size Conveyor Chain



(45)

**High Precision**  
Conveyor Chain



(46)



(35)



(36)



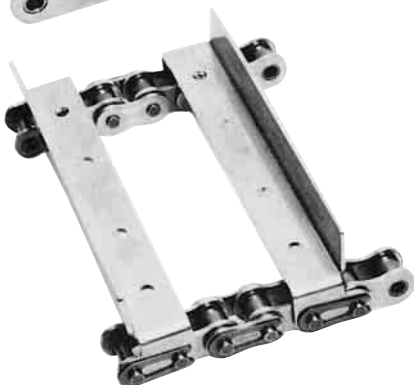
(37)



(38)



(39)



(40)

Engineering Manual



# High Precision Conveyor Chain

## Bearing Bush Chain

Tsubaki Bearing Bush Chain enables chains to be used in conveyance systems considered impossible up to now. Ideal for automated, laborsaving, or high-speed applications for improved productivity.

**RF-NB** Steel needles placed between the pin and bush;  
**Standard Series** steel base chain (link plates only are nickel-plated)

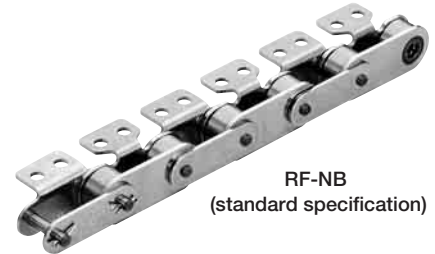
1. Initial elongation (0.02%) is less than bearing cage chain.  
Thereafter, there is no wear elongation. See graphs below.
2. A wealth of custom configurations is available to meet your needs.
3. Operating temperature range: -10°C to 150°C

**RF-NBH** High-precision specification

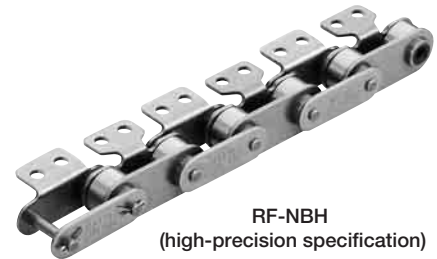
1. Top surfaces of attachments are ground smooth.
2. Link plates are nickel-plated except for top surfaces of attachments.
3. Space between bushes and rollers is smaller.
4. Operating temperature range: -10°C to 150°C

**RF-NB-SS** Stainless steel

1. All parts except needles are stainless steel.
2. Bearings are sealed to allow use where dripping water is present.
3. Minimum chain wear elongation. See graphs below.
4. Operating temperature range: -10°C to 60°C

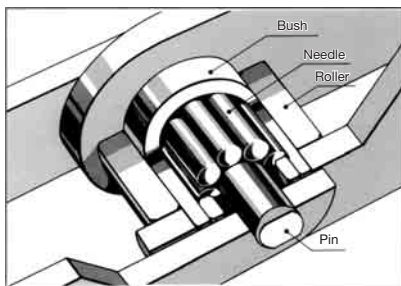


RF-NB  
(standard specification)



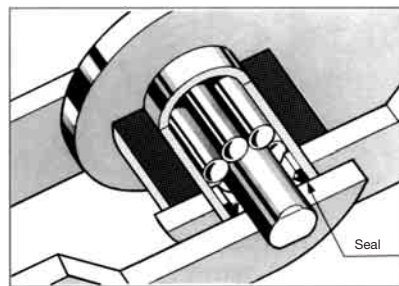
RF-NBH  
(high-precision specification)

### Standard/High-Precision Specifications



Space between pin and bush is filled with grease

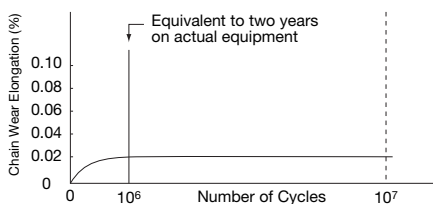
### Stainless Steel Specifications



Space between pin and bush is filled with grease. Seal prevents grease from leaking out.

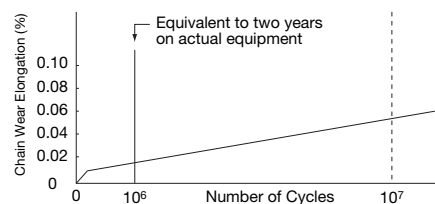
Virtually no chain wear elongation after initial elongation (0.02%) following start of operation.

#### Wear Elongation Diagram



Wear elongation is just 0.06% after  $10^7$  flexing cycles, an extremely low value.

#### Wear Elongation Diagram



### Application Examples

Process	Material/Object Conveyed
Assembly	Condensers, cassettes, batteries, stoves, automotive parts, limit switches, watches, solenoid valves
Inspection	ICs, cables, automotive parts
Processing	Medical products, cables, building material boards
Packaging	Brushes, batteries, confections
Filling	Detergent
Printing	Beverage containers, drinking glasses, printed materials

#### [Test Conditions]

##### Standard/High-Precision/Stainless Steel Specifications

- Chain size: RF2040R
- Chain tension: Standard/High-Precision = 0.78 kN {80 kgf}  
Stainless Steel = 0.44 kN {45 kgf}
- Chain speed: 70 m/min (accelerated test)
- Sprocket teeth:  $12^T \times 12^T$
- Number of links: 44
- Continuous operation

#### Selection Example:

##### Calculating Number of Cycles from Actual Conditions

- Chain: RF2040R
- Number of links: 232 links=5,892.8 mm  
Feed length per takt time=101.6 mm/1.1 second
- Sprocket teeth:  $12^T \times 12^T$
- Assuming 4 flexing cycles per chain revolution:  
Therefore, the number of cycles in two years  
(8 hours/day x 300 days/year) under the above conditions yields:  
 $5,892.8 \text{ mm} \div 101.6 \text{ mm} \times 1.1 \text{ seconds} = 63.8 \text{ seconds/revolution}$   
 $60 \text{ seconds} \div 63.8 \text{ seconds} \times 60 \text{ minutes} \times 8 \text{ hours} \times 300 \text{ days} \times 2 \text{ years} \times 4 \text{ cycles}$   
 $= 1.08 \times 10^6 \text{ cycles}$

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

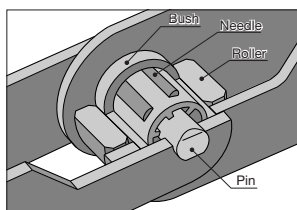
Engineering Manual

## Bearing Cage Chain

### RF-NC

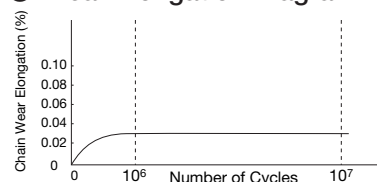
Uses a needle bearing cage (of engineering plastic) between the pin and bush; steel base chain (outer plates are blackened; inner plates are nickel-plated)

1. Virtually no chain wear elongation after initial elongation (0.03%) following start of operation (see graph below).
2. Operating temperature range: -10°C to 60°C



Space between pin and bush is filled with grease

### Wear Elongation Diagram



### [Test Conditions]

- Chain model: RF2040R-NC
- Chain tension: 0.44 kN {45 kgf}
- Chain speed: 70 m/min (accelerated test)
- Sprocket teeth: 12T × 12T
- Number of links: 44
- Continuous operation



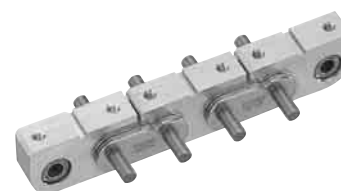
## Mini Tact Chain

Custom designs and manufacturing are available to match your application needs. Please contact a Tsubakimoto representative for more information.

### BCM

Uses steel needle bearings; aluminum inner blocks and steel base chain

1. Virtually no chain wear elongation after initial elongation (0.01%) following start of operation.
2. Chain pitch accuracy is  $\pm 0.05$  mm. Plus, small pitch makes this chain ideal for accurate positioning of small work.
3. Aluminum inner blocks mean lighter weight, enabling a compact design that includes drive components.
4. Operating temperature range: -10°C to 40°C



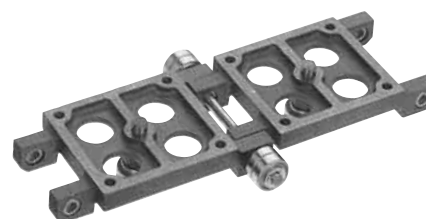
## Indexing Table Chain

### BC

Uses needle bearings; outboard rollers and guide rollers use steel bearings; steel base chain (links are blackened)

1. Virtually no chain wear elongation after initial elongation (0.01%) following start of operation.
2. Chain pitch accuracy is  $\pm 0.05$  mm, enabling high positioning accuracy.
3. Operating temperature range: -10°C to 60°C

- Two types of outboard rollers are available: single (S) and double (D).
  - Double outboard rollers (D type) draw the guide rail up to the sides of the sprockets, enabling smooth conveyance. This type is for general applications.
  - Single outboard rollers (S type) are used as replacements when this type is currently in use.



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus  $\alpha$   
Small Size Conveyor Chain

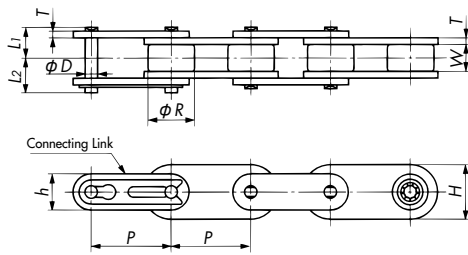
High Precision  
Conveyor Chain

Engineering Manual

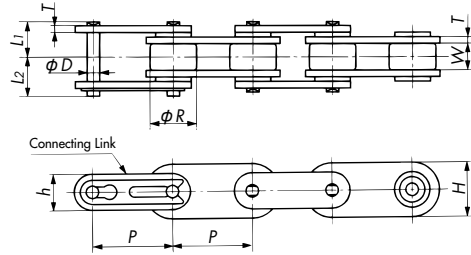
# Bearing Bush Chain

## Base Chain

Standard/High-Precision Chain



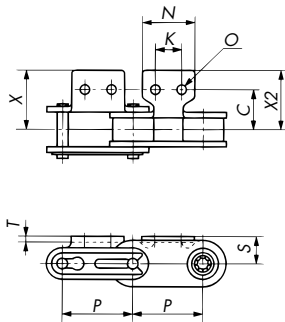
Stainless Steel Chain



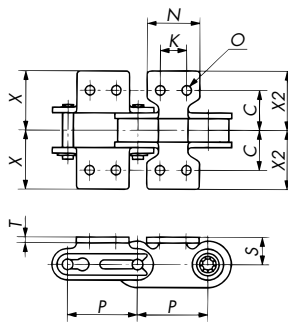
- Connecting links: RF2050 and RF2080 use cotter pins. Base chain pins are riveted on all sizes.

## Attachments

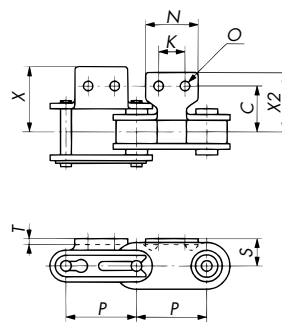
A2 Attachment



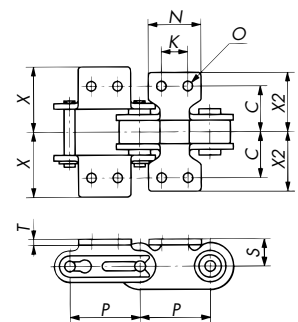
K2 Attachment



A2 Attachment



K2 Attachment



## Base Chain/Attachment Dimensions

Tsubaki Chain No.		Pitch P	Roller Dia. R	Width Between Inner Link Plates W	Plate			Pin			Max. Allowable Load kN {kgf}	Approx. Mass kg/m
Standard	High-Precision				Thickness T	Width h	Width H	Dia. D	L <sub>1</sub>	L <sub>2</sub>		
RF2040R-NB	RF2040R-NBH	25.40	15.88	7.95	1.5	12.0	17.5	3.97	8.25	9.95	0.78{ 80}	0.99
RF2050R-NB	RF2050R-NBH	31.75	19.05	9.53	2.0	15.0	21.0	4.97	10.30	12.00	1.27{130}	1.72
RF2060R-NB	RF2060R-NBH	38.10	22.23	12.70	3.2	17.2	26.0	5.96	14.55	16.55	1.77{180}	2.57
RF2080R-NB	RF2080R-NBH	50.80	28.58	15.88	4.0	23.0	35.0	7.94	18.30	20.90	2.94{300}	3.88

Tsubaki Chain No.		Attachment							Additional Weight per Attachment kg	
Standard	High-Precision	S	C	X · X2	N	K	T	O	A2	K2
RF2040R-NB	RF2040R-NBH	9.1{ 8.9}	12.70	19.3	19.1	9.5	1.5	3.6	0.003	0.006
RF2050R-NB	RF2050R-NBH	11.1{10.9}	15.90	24.2	23.8	11.9	2.0	5.2	0.006	0.012
RF2060R-NB	RF2060R-NBH	14.7{14.4}	21.45	31.5	28.6	14.3	3.2	5.2	0.017	0.034
RF2080R-NB	RF2080R-NBH	19.1{18.8}	27.80	40.7	38.1	19.1	4.0	6.8	0.032	0.064

Note: Dimension S differs for High-Precision chain, and is given inside parentheses.

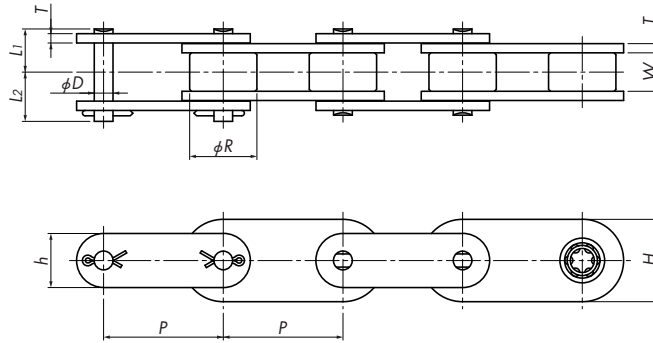
Tsubaki Chain No.		Pitch P	Roller Dia. R	Width Between Inner Link Plates W	Plate			Pin			Max. Allowable Load kN {kgf}	Approx. Mass kg/m
Standard	High-Precision				Thickness T	Width h	Width H	Dia. D	L <sub>1</sub>	L <sub>2</sub>		
RF2040R-NB-SS	RF2040R-NBH-SS	25.40	15.88	7.95	1.5	12.0	17.5	3.97	10.45	12.15	0.44{ 45}	1.06
RF2050R-NB-SS	RF2050R-NBH-SS	31.75	19.05	9.53	2.0	15.0	21.0	4.97	12.60	14.30	0.69{ 70}	1.82
RF2060R-NB-SS	RF2060R-NBH-SS	38.10	22.23	12.70	3.2	17.2	26.0	5.96	16.80	18.70	1.03{105}	2.68
RF2080R-NB-SS	RF2080R-NBH-SS	50.80	28.58	15.88	4.0	23.0	35.0	7.94	21.50	24.40	1.77{180}	4.07

Tsubaki Chain No.	Attachment								Additional Weight per Attachment kg	
Stainless Steel	S	C	X	X2	N	K	T	O	A2	K2
RF2040R-NB-SS	9.1	14.9	21.5	19.3	19.1	9.5	1.5	3.6	0.003	0.006
RF2050R-NB-SS	11.1	18.2	26.5	24.2	23.8	11.9	2.0	5.2	0.006	0.012
RF2060R-NB-SS	14.7	23.7	33.95	31.5	28.6	14.3	3.2	5.2	0.017	0.034
RF2080R-NB-SS	19.1	31.0	43.9	40.7	38.1	19.1	4.0	6.8	0.032	0.064



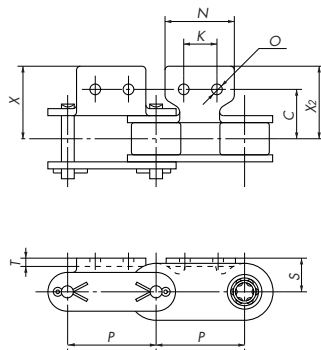
# Bearing Cage Chain

## Base Chain

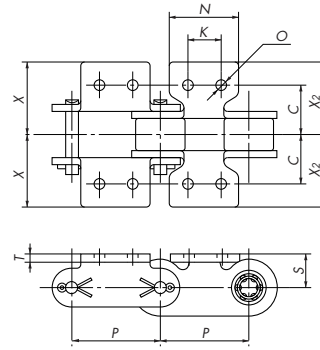


- Connecting links: RF2040 to RF2060 use spring clips.

## Attachments



A2 Attachment



K2 Attachment

## Base Chain Dimensions

Tsubaki Chain No.	Pitch $P$	Roller Dia. $R$	Width Between Inner Link Plates $W$	Plate			Pin			Max. Allowable Load kN {kgf}	Approx. Mass kg/m
				Thickness $T$	Width $h$	Width $H$	Dia. $D$	$L_1$	$L_2$		
RF2040R-NC	25.40	15.88	7.95	1.5	12.0	17.5	3.97	8.25	9.95	0.44{ 45}	0.99
RF2050R-NC	31.75	19.05	9.53	2.0	15.0	21.0	5.09	10.30	12.00	0.69{ 70}	1.72
RF2060R-NC	38.10	22.23	12.70	3.2	17.2	26.0	5.96	14.55	16.55	1.03{105}	2.57
RF2080R-NC	50.80	28.58	15.88	4.0	23.0	35.0	7.94	18.30	20.90	1.77{180}	3.88

## Attachment Dimensions

Tsubaki Chain No.	Attachment							Additional Weight per Attachment kg	
	$S$	$C$	$X \cdot X_2$	$N$	$K$	$T$	$O$	A2	K2
RF2040R-NC	9.1	12.70	19.3	19.1	9.5	1.5	3.6	0.003	0.006
RF2050R-NC	11.1	15.90	24.2	23.8	11.9	2.0	5.2	0.006	0.012
RF2060R-NC	14.7	21.45	31.5	28.6	14.3	3.2	5.2	0.017	0.034
RF2080R-NC	19.1	27.80	40.7	38.1	19.1	4.0	6.8	0.032	0.064

Standard  
Small Size Conveyor ChainSpecial  
Small Size Conveyor ChainLube Free  
Small Size Conveyor ChainCorrosion Resistant  
Small Size Conveyor ChainPlus α  
Small Size Conveyor ChainHigh Precision  
Conveyor Chain

Engineering Manual

# Bearing Bush Chain, Bearing Cage Chain

## Sprockets

RF Double Pitch sprockets for R rollers can be used.

## Max. Allowable Loads for Bearing Bush Chain (NB) and Bearing Cage Chain (NC)

(Unit: kN {kgf} per attachment or per roller)

Tsubaki Chain No.	Allowable A2 Attachment Load		Allowable Roller Load	
	Outer Plate	Inner Plate	NC/NB/NBH Specification	NB-SS Specification
RF2040R	0.12{12}	0.03{ 3}	0.15{15}	0.05{ 5}
RF2050R	0.18{18}	0.05{ 5}	0.20{20}	0.06{ 6}
RF2060R	0.47{48}	0.13{13}	0.29{30}	0.09{ 9}
RF2080R	0.72{73}	0.21{21}	0.54{55}	0.15{15}

## Precautions for Use

- Chain speed must be less than 30 m/minute.
- Operating temperatures: Bearing Cage Chain: -10°C to 60°C  
Bearing Bush Chain (Standard/High-Precision): -10°C to 150°C  
Bearing Bush Chain (Stainless Steel): -10°C to 60°C
- Chain must be handled carefully when the pins have been removed, for example, while connecting the chain, as the needles in the bearings (or in the needle cage) may fall out.

## Lubrication

The space between the pin and bush is filled with grease, but the sprocket teeth and the gap between the bush and roller should be lubricated with ISO VG100 to VG150 (SAE30 to SAE40) machine oil.

## Chain Numbering

### Bearing Bush Chain (Standard)

#### RF2040R-NB-1LA2



## Bearing Bush Chain Custom Shape Examples

Custom Attachments			Custom Pitches		Custom Extended Pins	S Rollers (with Bushes)
<b>Triangle Attachment</b> <ul style="list-style-type: none"><li>Profile of attachment is matched to the shape of the conveyed objects, which are cradled by the attachment as they are conveyed.</li></ul>	<b>Press Nut</b> <ul style="list-style-type: none"><li>Nuts are added on the attachment.</li><li>Enables jigs or tools to be installed easily.</li><li>Standard type only.</li></ul>	<b>Stay Pin</b> <ul style="list-style-type: none"><li>Pins are extended to form parallel strands. Allows wider objects to be conveyed.</li><li>Standard type only.</li></ul>	<b>RSN (Single Pitch Bush Type)</b> <ul style="list-style-type: none"><li>Chain pitch is the same as RS roller chain.</li><li>Generally interchangeable with RS roller chain. (However, certain sizes may not fit. Please inquire for details.)</li></ul>	<b>Metric Pitch</b> <ul style="list-style-type: none"><li>Standard type chain having metric pitch (in mm).</li><li>Provides chain pitches matched to indexing distances. Note: Special sprockets are required.</li></ul>	<b>Threaded Extended Pin</b> <ul style="list-style-type: none"><li>Extended pins are threaded to enable tools, jigs, etc., to be attached.</li></ul>	<b>S Rollers (with Bushes)</b> <ul style="list-style-type: none"><li>Base chain rollers are S rollers (with bushes).</li><li>Interchangeable with double pitch S roller chain.</li><li>Can be replaced with Double Pitch Chain S rollers. Not available in all sizes. Please contact a Tsubakimoto representative for more information.</li></ul>

Outboard Rollers	Guide Rollers	Multiple Strands	Dust-Proof
<ul style="list-style-type: none"><li>Outboard rollers are mounted on one or both sides.</li><li>Installing outboard rollers stabilizes chain travel. Also, building bearings into the outboard rollers enables even higher precision conveyance.</li></ul>	<ul style="list-style-type: none"><li>Installing guide rollers enables side surface guiding and horizontal conveyance.</li><li>Please inquire regarding use of the stainless steel type in environments where chain would be exposed to water.</li></ul>	<ul style="list-style-type: none"><li>Can be fabricated in multiple strands, for example, double-strand or triple-strand configurations.</li><li>For applications where the maximum allowable tension of a single strand is inadequate.</li><li>Standard type only. Note: Special sprockets are required.</li></ul>	<ul style="list-style-type: none"><li>A seal is incorporated into the bearing components.</li><li>Prevents bearings from being contaminated by foreign substances.</li></ul>

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

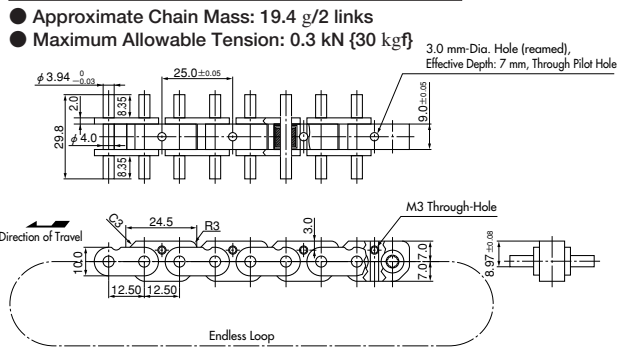
Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

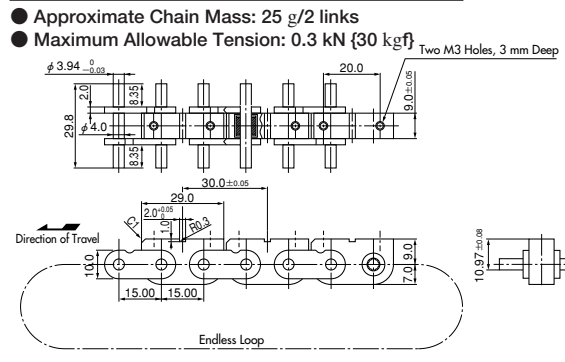
Engineering Manual

# Mini Tact Chain

## Model: BCM12.5-9 (12.5 mm pitch)



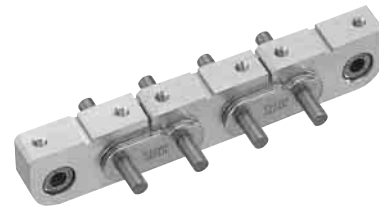
## Model: BCM15-9 (15 mm pitch)



■ **Operating Temperature Range:** 10°C to 40°C

■ **Chain Speed:** Less than 30 m/min (recommended range)

Tsubaki can design and manufacture these chains to match your application and requirements. Please contact us when considering indexing conveyor chain.

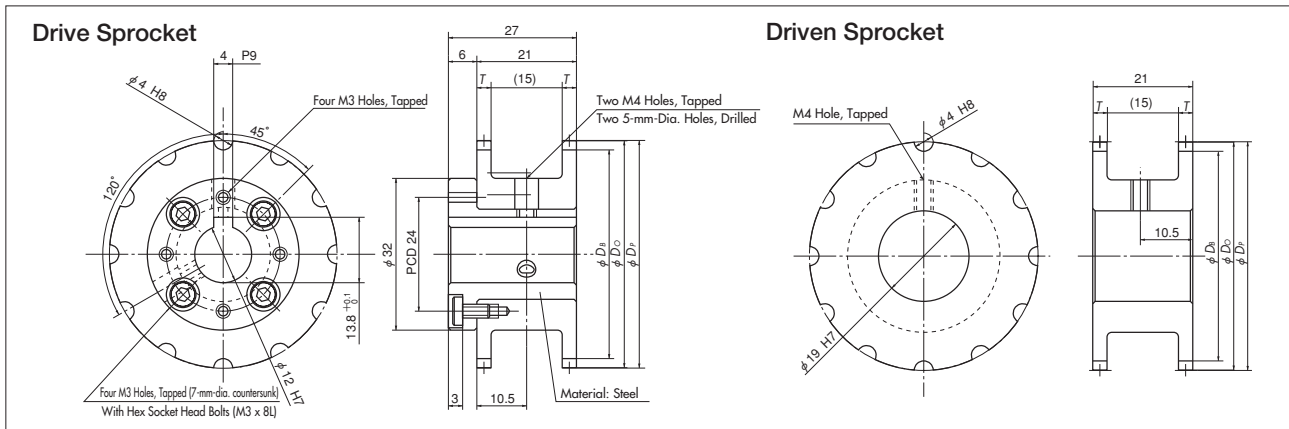


## Chain Numbering

### BCM12.5-9

Chain type: BCM  
Chain pitch: 12.5 mm, 15 mm  
Inner width dimension: 9 mm

## ■ Sprockets (for BCM Chain)



Note: Drawings show 12-tooth sprockets, but 16-tooth sprockets are also available. All dimensions are the same as above.

Tsubaki Chain No.	Sprocket								
	Sprocket No.	Type	No. of Teeth	Pitch Dia. $D_p$	Outside Dia. $D_o$	Root Circle Dia. $D_b$	Facewidth $F$	Approx. Mass kg	Material
BCM12.5-9	BCM12.5-9 D 12T	Drive	12T	48.296	48	44.296	3	0.090	Plastic + steel
	BCM12.5-9 A 12T	Driven	12T	48.296	48	44.296	3	0.025	Plastic
	BCM12.5-9 D 16T	Drive	16T	64.073	63.5	60.073	3	0.130	Plastic + steel
	BCM12.5-9 A 16T	Driven	16T	64.073	63.5	60.073	3	0.062	Plastic
BCM15-9	BCM15-9 D 12T	Drive	12T	57.956	57.5	53.956	3	0.110	Plastic + steel
	BCM15-9 A 12T	Driven	12T	57.956	57.5	53.956	3	0.050	Plastic
	BCM15-9 D 16T	Drive	16T	76.888	76.5	72.888	3	0.170	Plastic + steel
	BCM15-9 A 16T	Driven	16T	76.888	76.5	72.888	3	0.100	Plastic

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

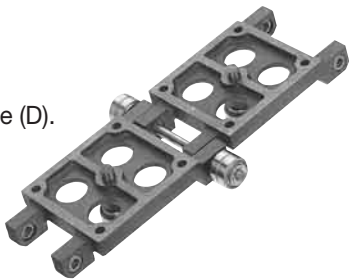
High Precision  
Conveyor Chain

Engineering Manual

# Indexing Table Chain

## Specifications

- Link plate material: Carbon steel
- Link surface treatment: Blackened
- Outboard rollers: Two types of outboard rollers are available: single (S) and double (D).
  - Double outboard rollers draw the guide rail up to the sides of the sprockets, enabling smooth conveyance. This type is for general applications.
  - Single outboard rollers are used as replacements when this type is currently in use.

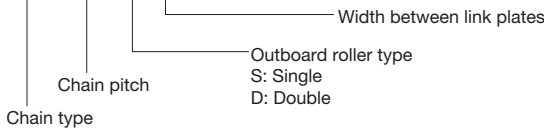


Tsubaki Chain No.	Pitch mm	Mass/Link kg	Max. Allowable Load per Link kN/link {kg/link}	Allowable Load kN {kgf}	Allowable Speed mm/s
BC050 <sup>S</sup> <sub>D</sub> 45	50	0.14	0.05 { 5 }	0.49 { 50 }	500
BC075 <sup>S</sup> <sub>D</sub> 60	75	0.32	0.08 { 8 }	0.69 { 70 }	500
BC100 <sup>S</sup> <sub>D</sub> 70	100	0.44	0.08 { 8 }	0.69 { 70 }	500
BC150 <sup>S</sup> <sub>D</sub> 90	150	1.16	0.12 { 12 }	1.27 { 130 }	500

Note: Allowable speed is index pitch (mm) ÷ index time (seconds)

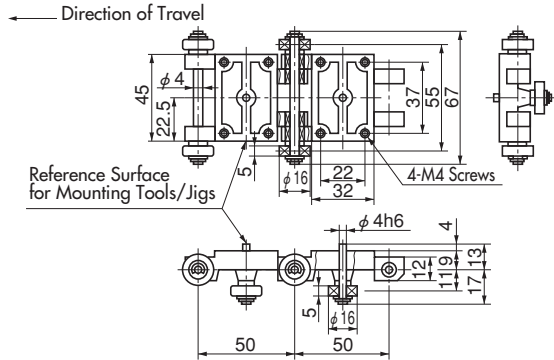
## Chain Numbering

**BC050S45**

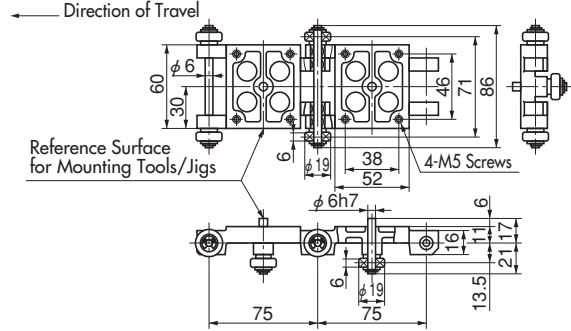


## Chain Outside Dimensions (Single Roller)

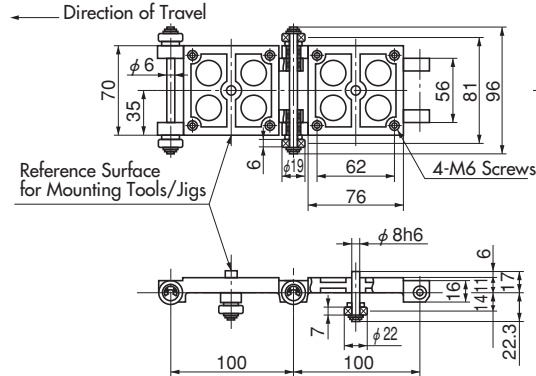
**BC050S45**



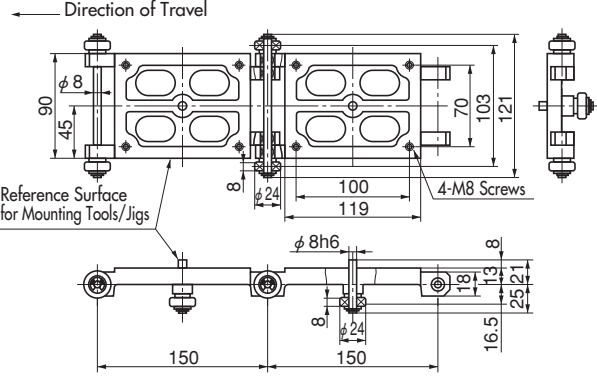
**BC075S60**



**BC100S70**



**BC150S90**



Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

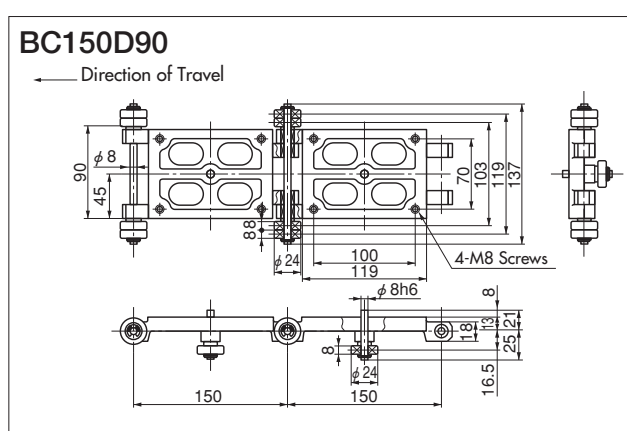
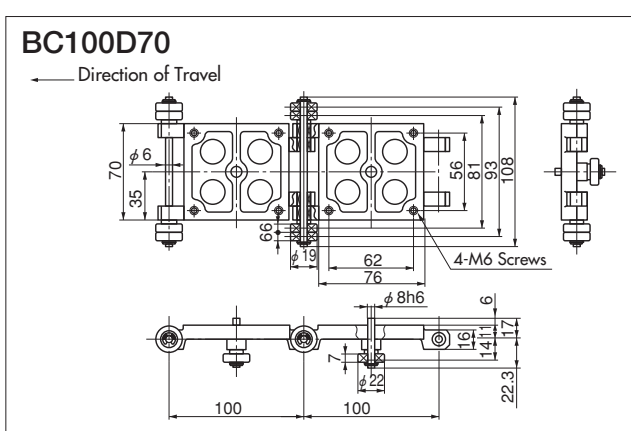
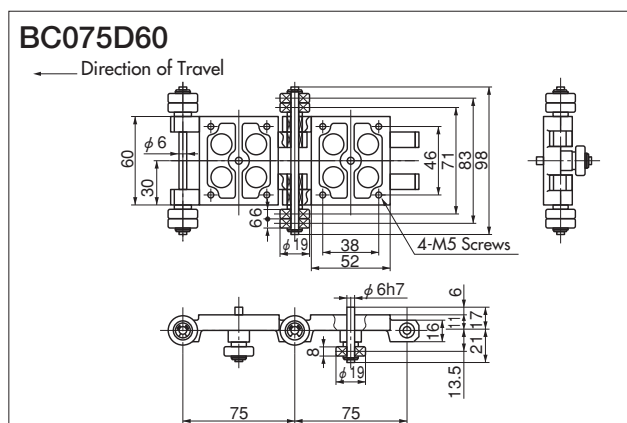
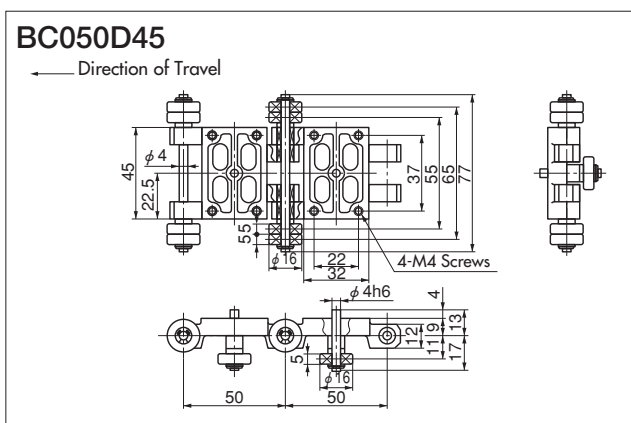
Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## Chain Outside Dimensions (Double Roller)



Note: Made-to-order product.

## Sprockets (for BC Chain)

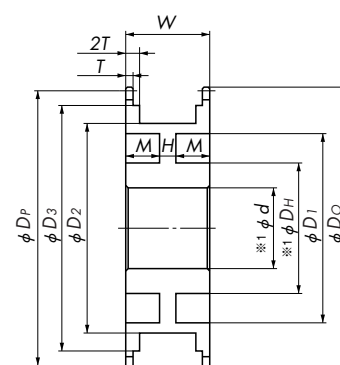
### Specifications

Tooth profile: Special round tooth profile  
Material: Carbon steel for machine structural use  
Surface treatment: Blackened

### Available Types

Sizes: 50, 75, 100, and 150 mm widths  
Number of teeth: 8T or 12T

Note: Same sprockets are used for Single Roller and Double Roller types.



Tsubaki Chain No.	Sprocket												
	Sprocket No.	No. of Teeth	Dimensions									Mass kg	Moment of Inertia I (kg·m <sup>2</sup> ) {GD <sup>2</sup> (kgf·m <sup>2</sup> ) }
			D <sub>p</sub>	D <sub>o</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	W	T	H	M		
BC050 <sup>S</sup> <sub>D</sub> 45	BC050-45-08T	8T	130.66	131	64	80	110	60	5	10	25	2.4	0.005{0.02}
	BC050-45-12T	12T	193.19	194	130	146	170	60	5	10	25	4.7	0.02 {0.08}
BC075 <sup>S</sup> <sub>D</sub> 60	BC075-60-08T	8T	195.98	196	116	134	170	77	6	11	33	6.5	0.025{0.1}
	BC075-60-12T	12T	289.78	290	214	232	265	77	6	11	33	12.6	0.13 {0.5}
BC100 <sup>S</sup> <sub>D</sub> 70	BC100-70-08T	8T	261.31	262	172	192	230	87	6	13	37	11	0.085{0.34}
	BC100-70-12T	12T	386.37	387	305	325	360	87	6	13	37	21	0.4 {1.6}
BC150 <sup>S</sup> <sub>D</sub> 90	BC150-90-08T	8T	391.97	392	280	305	338	111	8	15	48	28	0.52 {2.1}
	BC150-90-12T	12T	579.56	580	480	505	536	111	8	15	48	52	2.4 {9.6}

Note: The size and shape of bore diameter (d) and hub diameter (DH) are determined by conveyor layout. Please indicate.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

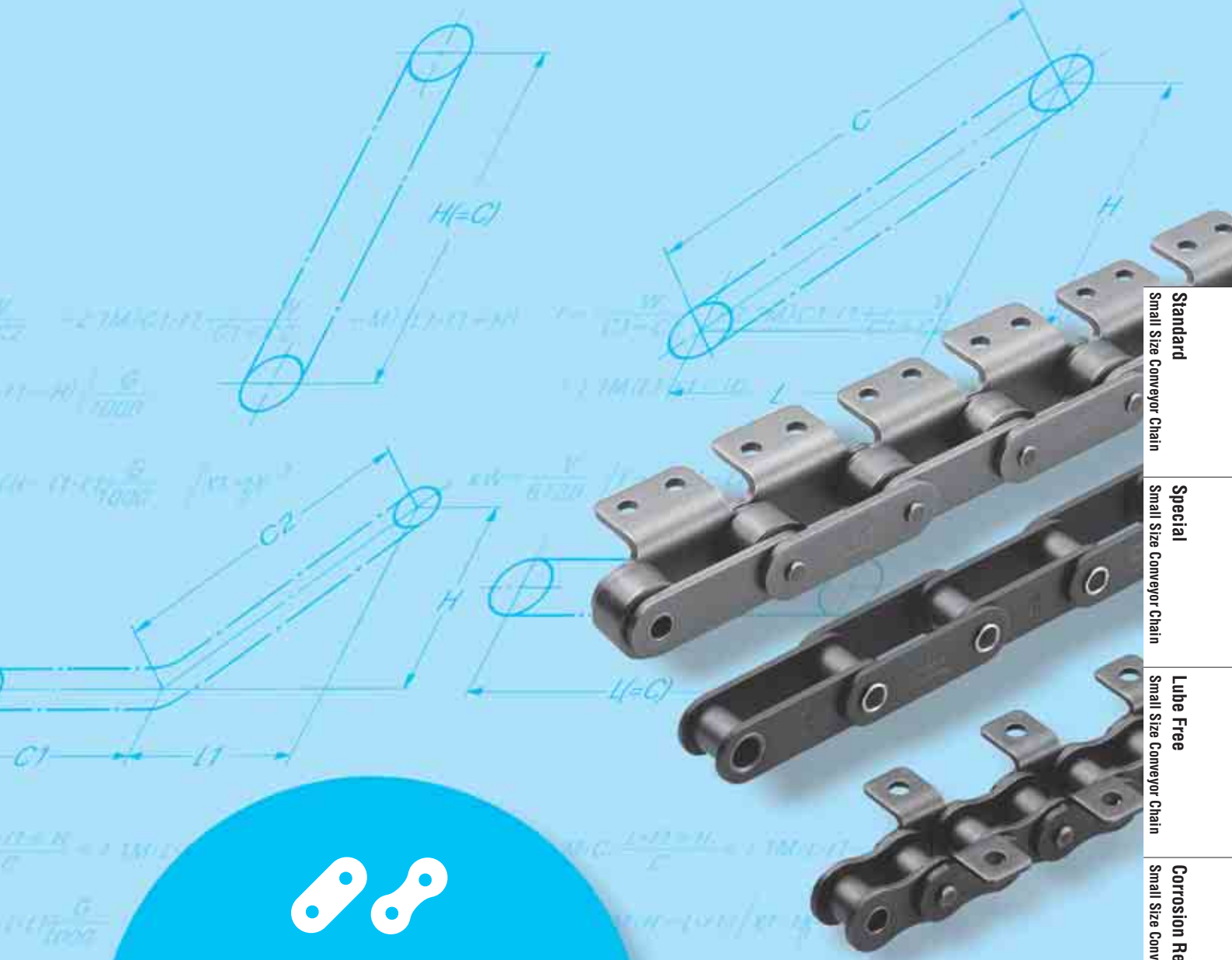
Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## MEMO





Small Size Conveyor Chain

# Engineering Manual

Chain Selection .....	89
Conveyor Design Guidelines .....	94
Installation .....	97
How to Cut Chain .....	98
How to Connect Chain .....	100
Lubrication .....	101
Tension Adjustment .....	102
Trial Run .....	103
Inspection .....	103
Usage Limits .....	104
Other Precautions .....	104
Troubleshooting .....	105

**Standard**  
Small Size Conveyor Chain

**Special**  
Small Size Conveyor Chain

**Lube Free**  
Small Size Conveyor Chain

**Corrosion Resistant**  
Small Size Conveyor Chain

**Plus α**  
Small Size Conveyor Chain

**High Precision**  
Conveyor Chain

**Engineering Manual**

## Chain Selection

An appropriate chain size and type can be selected based upon the type and capacity of the conveyor. In some cases, it may be difficult to determine the most appropriate chain size and type, since there are a variety of operating conditions for the conveyor. The general procedure for chain selection is as follows:

Step 1: Check Conveyance Conditions → Step 2: Tentatively Determine Chain Type → Step 3: Check Allowable Load → Step 4: Calculate Max. Chain Tension → Step 5: Determine Chain Size → Step 6: How to Select Indexing Chain

### Step 1: Check Conveyance Conditions

- 1) Type of conveyor (slat conveyor, bucket elevator, etc.)
- 2) Method of chain travel (horizontal, inclined, or vertical conveyor)
- 3) Type, mass, and size of materials to be conveyed
- 4) Conveyor capacity, interval between conveyed objects
- 5) Conveying speed
- 6) Conveyor length
- 7) Lubrication status
- 8) Considerations for special environments (high/low temperature, presence of corrosive substances)

### Step 2: Tentatively Determine Chain Type

Use the following formula to determine maximum static chain tension (F) for tentative selection of chain type.

$$\text{SI Units: } F(\text{kN}) = W \times f_1 \times K_v \times \frac{G}{1000} \quad G = 9.80665 \text{ m/s}^2$$

$$\text{Gravimetric Units: } F(\text{kgf}) = W \times f_1 \times K_v$$

W: Total mass (weight) of conveyed objects on conveyor kg {kgf}  
f<sub>1</sub>: Coefficient of friction (Table 3) K<sub>v</sub>: Speed coefficient (Table 4)

**Tentatively select a chain that has maximum allowable tension of F (for two parallel strands, use F X 0.6) or more.**

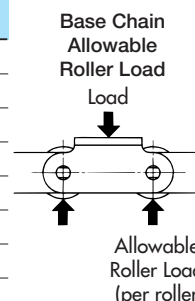
### Step 3: Check Allowable Load

The load applied to rollers or attachments should not exceed the allowable loads shown in Table 1 and Table 2.

Table 1: Base Chain Allowable Roller Load

Unit: kN {kgf}/roller

Tsubaki Chain No.	Double Pitch RS Attachment (Standard) Lambda/X-Lambda		Stainless Steel Roller (SS, AS)		Plastic Roller	Heat-Resistant Plastic Roller	Low-Noise Plastic Roller	Poly Steel Chain
	R Roller	S Roller	R Roller	S Roller	R Roller	R Roller	R Roller	
RS25	—	—	—	—	—	—	—	0.005{0.5}
RS35	—	—	—	—	—	—	—	0.015{1.5}
RF2040 · RS40	0.64{ 65}	0.15{ 15}	0.20{ 20}	0.05{ 5}	0.20{ 20}	0.20{ 20}	0.14{14}	0.02 {2.0}
RF2050 · RS50	0.98{100}	0.20{ 20}	0.29{ 30}	0.06{ 6}	0.29{ 30}	0.29{ 30}	0.21{21}	0.04 {4.0}
RF2060 · RS60	1.57{160}	0.29{ 30}	0.49{ 50}	0.09{ 9}	0.49{ 50}	0.49{ 50}	0.34{35}	0.06 {6.0}
RF2080 · RS80	2.65{270}	0.54{ 55}	0.79{ 80}	0.15{15}	0.88{ 90}	—	0.62{63}	—
RF2100 · RS100	3.92{400}	0.79{ 80}	1.17{120}	0.25{25}	1.27{130}	—	—	—
RF2120 · RS120	5.88{600}	1.18{120}	—	—	—	—	—	—
— · RS140	—	1.32{135}	—	—	—	—	—	—
RF2160 · RS160	9.61{980}	1.91{195}	—	—	—	—	—	—



Note: 1. Values are for lubricated chain. Values for Double Pitch and RS Attachment Chain include corrosion-resistant chains (NP/NEP series).  
2. Values for Poly Steel Chain are for the case in which the roller supports the bottom surface of the inner link.  
3. The material used for standard R roller guide rail should be a high tensile strength material at least S45C (JIS), 1045 (AISI) or better.  
4. See page 83 for details on Bearing Cage Chain and Bearing Bush Chain.

Table 2: A Attachment Allowable Load

Double Pitch Chain Unit: kN {kgf}/attachment

Tsubaki Chain No.	Double Pitch Chain*	Stainless Steel Chain
RF2040	0.262{ 26.7}	0.108{11.0}
RF2050	0.455{ 46.4}	0.189{19.3}
RF2060	1.06 {108 }	0.419{42.7}
RF2080	1.67 {170 }	0.646{65.9}
RF2100	2.51 {256 }	1.15{117 }
RF2120	3.68 {375 }	1.79{183 }
RF2160	5.84 {596 }	3.13{319 }

Note: \* Includes corrosion-resistant chain (NP/NEP series).

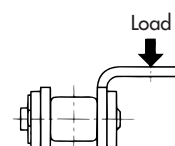
See page 83 for details on Bearing Cage Chain and Bearing Bush Chain.

RS Chain Unit: kN {kgf}/attachment

Tsubaki Chain No.	RS Attachment Chain*	Stainless Steel Chain
RS25	0.028{ 2.9}	0.012{ 1.2}
RS35	0.094{ 9.6}	0.036{ 3.7}
RS40	0.130{ 13.3}	0.054{ 5.5}
RS50	0.243{ 24.8}	0.101{ 10.3}
RS60	0.376{ 38.3}	0.148{ 15.1}
RS80	0.591{ 60.3}	0.233{ 23.8}
RS100	0.933{ 95.1}	0.361{ 36.8}
RS120	1.39 {142 }	0.629{ 64.1}
RS140	1.82 {186 }	0.869{ 88.6}
RS160	2.36 {241 }	1.19 {121 }

\* Includes corrosion-resistant chain (NP/NEP series).

- 1) The mounting hole of an A attachment is regarded as the point where the allowable vertical load acts on the attachment.
- 2) For K attachments, double the values shown for A attachments.
- 3) Load should not exceed maximum allowable roller load.



## Step 4: Calculate Max. Chain Tension (F)

In this catalog, values are indicated in both SI and gravimetric units. The weight (kgf) used to calculate the max. tension in the gravimetric units is the same value as the mass (kg).

F : Max. static tension applied to chain : kN {kgf}

V : Conveying speed (chain speed) : m/min

H : Center distance between sprockets (vertical direction) : m

L : Center distance between sprockets (horizontal direction) : m

C : Center distance between sprockets : m

M : Mass {weight} of moving parts  
(chain, bucket, apron, etc.) : kg/m {kgf/m}

W : Total mass {weight} of conveyed objects on conveyor  
(max. value) : kg {kgf}

For countable items:  $W = \frac{C}{\text{Loading interval}} \times \text{Mass \{weight\} of conveyed items}$

kW : Power required

f<sub>1</sub> : Coefficient of friction between chain and guide rail (Table 3)

η : Transmission efficiency of drive unit

G : Acceleration of gravity: 9.80665 m/s<sup>2</sup>

Table 3-1: f<sub>1</sub>: Coefficient of Rolling Friction of Base Chain Rollers on Rail

Roller Type	Steel Roller		Lambda Chain	Plastic Roller*	Low-Noise Plastic Roller	Bearing Bush Chain
	Dry	Lubricated		Dry		Dry
R roller	0.12	0.08	0.08	0.08	0.1	0.21
S roller	0.21	0.14	0.14	—	—	—

\* Includes heat-resistant plastic rollers.

Table 3-2: f<sub>1</sub>: Coefficient of Rolling Friction of Chain Plates on Rail

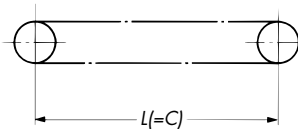
Steel Plate		Poly Steel Chain
Dry	Lubricated	
0.3	0.2	0.25

### Formula

SI Units	{Gravimetric Units}
----------	---------------------

#### Horizontal Conveyance

Goods are directly loaded on the conveyor



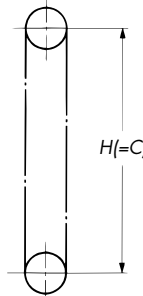
$$F = (W + 2.1M \cdot C) f_1 \cdot \frac{G}{1000}$$

$$kW = \frac{F \cdot V}{60} \times 1 \cdot 1 \times \frac{1}{\eta}$$

$$F = (W + 2.1M \cdot C) f_1$$

$$kW = \frac{F \cdot V}{6120} \times 1 \cdot 1 \times \frac{1}{\eta}$$

#### Vertical Conveyance



$$F = (W + M \cdot C) \cdot \frac{G}{1000}$$

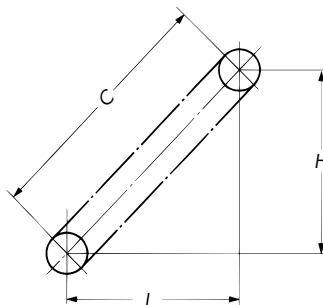
$$kW = \frac{W \cdot V}{60} \cdot \frac{G}{1000} \times 1 \cdot 1 \times \frac{1}{\eta}$$

$$F = W + M \cdot C$$

$$kW = \frac{W \cdot V}{6120} \times 1 \cdot 1 \times \frac{1}{\eta}$$

#### Inclined Conveyance\*

Goods are directly loaded on the conveyor



$$F = \left\{ (W + M \cdot C) \frac{L \cdot f_1 + H}{C} + 1.1M(L \cdot f_1 - H) \right\} \frac{G}{1000}$$

$$kW = \frac{V}{60} \left\{ F - M(H - L \cdot f_1) \frac{G}{1000} \right\} \times 1 \cdot 1 \times \frac{1}{\eta}$$

$$F = (W + M \cdot C) \frac{L \cdot f_1 + H}{C} + 1.1M(L \cdot f_1 - H)$$

$$kW = \frac{V}{6120} \left\{ F - M(H - L \cdot f_1) \right\} \times 1 \cdot 1 \times \frac{1}{\eta}$$

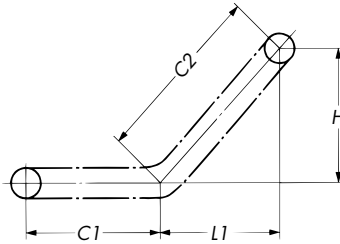
\* When calculating the value for F, if  $L \cdot f_1 - H < 0$ , make  $L \cdot f_1 - H = 0$ . Also when calculating the value for kW, if  $H - L \cdot f_1 < 0$ , make  $H - L \cdot f_1 = 0$ .

SI Units

{Gravimetric Units}

## Horizontal/Inclined Conveyance\*

Goods are directly loaded on the conveyor



$$F = \left\{ \left( \frac{W}{C_1 + C_2} + 2.1M \right) C_1 \cdot f_1 + \left( \frac{W}{C_1 + C_2} + M \right) (L_1 \cdot f_1 + H) + 1.1M(L_1 \cdot f_1 - H) \right\} \frac{G}{1000}$$

$$kW = \frac{V}{60} \left\{ F - M(H - L_1 \cdot f_1) \right\} \frac{G}{1000} \times 1 \cdot X \cdot \frac{1}{\eta}$$

$$F = \left( \frac{W}{C_1 + C_2} + 2.1M \right) C_1 \cdot f_1 + \left( \frac{W}{C_1 + C_2} + M \right) (L_1 \cdot f_1 + H) + 1.1M(L_1 \cdot f_1 - H)$$

$$kW = \frac{V}{6120} \left\{ F - M(H - L_1 \cdot f_1) \right\} \times 1 \cdot X \cdot \frac{1}{\eta}$$

\* When calculating the value for F, if  $L \cdot f_1 - H < 0$ , make  $L \cdot f_1 - H = 0$ . Also when calculating the value for kW, if  $H - L \cdot f_1 < 0$ , make  $H - L \cdot f_1 = 0$ .

## Step 5: Determine Chain Size

Multiply the maximum tension (F) applied to a chain by the speed coefficient (Kv) given in Table 4 for a chain that satisfies the following formula:

$$F \times K_v \leq \text{Max. Allowable Tension}$$

Table 4: Speed Coefficient (Kv)

Chain Speed (m/min)	Speed Coefficient (Kv)	Chain Speed (m/min)	Speed Coefficient (Kv)
15 or less	1.0	70 to 90	2.2
15 to 30	1.2	90 to 110	2.8
30 to 50	1.4	110 to 120	3.2
50 to 70	1.6		

Table 5: Small Size Conveyor Chain Strength

### Double Pitch Unit: kN {kgf}

#### Double Pitch Chain

Tsubaki Chain No.	Standard Chain		
	Average Tensile Strength	Min. Tensile Strength	Max. Allowable Load
RF2040 (S,R)	16.7{ 1700}	14.7{ 1500}	2.65{ 270}
RF2050 (S,R)	27.5{ 2800}	23.5{ 2400}	4.31{ 440}
RF2060 (S,R)	40.2{ 4100}	35.3{ 3600}	6.28{ 640}
RF2080 (S,R)	68.6{ 7000}	60.8{ 6200}	10.7 {1090}
RF2100 (S,R)	108 {11000}	93.2{ 9500}	17.1 {1740}
RF2120 (S,R)	151 {15400}	133 {13600}	23.9 {2440}
RF2160 (S,R)	258 {26300}	230 {23500}	40.9 {4170}

The recommended speed of the following chains is as follows:

Bearing Cage Chain	: 30 m/min or less
Bearing Bush Chain	
Indexing Table Chain, Mini Tact Chain	
Plastic Roller Chain	: 70 m/min or less
Poly Steel Chain	: 70 m/min or less

#### Lambda Chain (Including NP/NEP Series), X-Lambda Chain

Tsubaki Chain No.	Lambda Chain, X-Lambda Chain		
	Average Tensile Strength	Min. Tensile Strength	Max. Allowable Load
RF2040 (S,R)	15.7{ 1600}	13.8{1410}	2.65{ 270}
RF2050 (S,R)	25.5{ 2600}	21.8{2220}	4.31{ 440}
RF2060 (S,R)	37.3{ 3800}	31.1{3170}	6.28{ 640}
RF2080 (S,R)	63.7{ 6500}	55.6{5670}	10.7 {1090}
RF2100 (S,R)	100 {10200}	86.7{8840}	17.1 {1740}

### Corrosion Resistant Small Size Conveyor Chain (Maximum Allowable Load)

Tsubaki Chain No.	Stainless Steel Double Pitch Chain				Surface-Treated Double Pitch Chain	
	SS	AS	NS	LSC	NP	NEP
RF2040 (S,R)	0.44{ 45}	0.69{ 70}	0.44{ 45}	0.44{ 45}	2.65{ 270}	2.65{ 270}
RF2050 (S,R)	0.69{ 70}	1.03{105}	0.69{ 70}	0.69{ 70}	4.31{ 440}	4.31{ 440}
RF2060 (S,R)	1.03{105}	1.57{160}	1.03{105}	1.03{105}	6.28{ 640}	6.28{ 640}
RF2080 (S,R)	1.77{180}	2.65{270}	1.77{180}	1.77{180}	10.7 {1090}	10.7 {1090}
RF2100 (S,R)	2.55{260}	—	—	—	17.1 {1740}	17.1 {1740}
RF2120 (S,R)	3.82{390}	—	—	—	23.9 {2440}	—
RF2160 (S,R)	6.37{650}	—	—	—	40.9 {4170}	—

### Plastic Roller Chain (Maximum Allowable Load)

Tsubaki Chain No.	Standard Series			Low-Noise Series			Heat-Resistant Series
	Standard	NP	SS	Standard	NP	SS	
RF2040 (R)	0.44{ 45}	0.44{ 45}	0.44{ 45}	0.44{ 45}	0.44{ 45}	0.44{ 45}	0.44{ 45}
RF2050 (R)	0.69{ 70}	0.69{ 70}	0.69{ 70}	0.69{ 70}	0.69{ 70}	0.69{ 70}	0.69{ 70}
RF2060 (R)	1.03{105}	1.03{105}	1.03{105}	1.03{105}	1.03{105}	1.03{105}	1.03{105}
RF2080 (R)	1.77{180}	1.77{180}	1.77{180}	1.77{180}	1.77{180}	1.77{180}	—
RF2100 (R)	2.55{260}	2.55{260}	2.55{260}	—	—	—	—

### Hollow Pin Chain (Maximum Allowable Load)

Tsubaki Chain No.	Standard	Lambda	NP	SS
RF2040 (S,R)	1.77{180}	1.47{150}	1.77{180}	0.44{ 45}
RF2050 (S,R)	3.14{320}	2.55{260}	3.14{320}	0.69{ 70}
RF2060 (S,R)	4.22{430}	3.43{350}	4.22{430}	1.03{105}
RF2080 (S,R)	7.65{780}	6.18{630}	7.65{780}	1.77{180}

### Curved Chain (Maximum Allowable Load)

Tsubaki Chain No.	Standard
RF2040 (S,R)	1.86{190}
RF2050 (S,R)	2.84{290}
RF2060 (S,R)	4.02{410}
RF2080 (S,R)	6.96{710}

## High Precision Conveyor Chain

### Bearing Bush Chain (Maximum Allowable Load)

Tsubaki Chain No.	Standard	NBH	NB-SS
RF2040	0.78{ 80}	0.78{ 80}	0.49{ 45}
RF2050	1.27{130}	1.27{130}	0.69{ 70}
RF2060	1.77{180}	1.77{180}	1.03{105}
RF2080	2.94{300}	2.94{300}	1.77{180}

### Bearing Cage Chain

Tsubaki Chain No.	Max. Allowable Load
RF2040 (S,R)	0.45{ 45}
RF2050 (S,R)	0.69{ 70}
RF2060 (S,R)	1.03{105}
RF2080 (S,R)	1.77{180}

### Mini Tact Chain

Tsubaki Chain No.	Max. Allowable Load
BCM12.5-9	0.3{30}
BCM12-9	0.3{30}

### Indexing Table Chain

Tsubaki Chain No.	Max. Allowable Load
BC050 (S,D) 45	0.49{ 50}
BC075 (S,D) 60	0.69{ 70}
BC100 (S,D) 70	0.69{ 70}
BC150 (S,D) 90	1.27{130}

## RS Chain Unit: kN {kgf}

### RS Attachment Chain

Tsubaki Chain No.	Standard Chain		
	Average Tensile Strength	Min. Tensile Strength	Max. Allowable Load
RS25	4.12{ 420}	3.63{ 370}	0.64{ 65}
RS35	9.41{ 960}	7.9 { 805}	1.52{ 155}
RS40	16.7 { 1700}	14.7 { 1500}	2.65{ 270}
RS50	27.5 { 2800}	23.5 { 2400}	4.31{ 440}
RS60	40.2 { 4100}	35.3 { 3600}	6.28{ 640}
RS80	68.6 { 7000}	60.8 { 6200}	10.7 {1090}
RS100	108 {11000}	93.2 { 9500}	17.1 {1740}
RS120	151 {15400}	137 {14000}	23.9 {2440}
RS140	204 {20800}	177 {18000}	32.4 {3300}
RS160	258 {26300}	230 {23500}	40.9 {4170}

### Lambda Chain (Including NP/NEP Series), X-Lambda Chain

Tsubaki Chain No.	Lambda Chain			X-Lambda Chain		
	Average Tensile Strength	Min. Tensile Strength	Max. Allowable Load	Average Tensile Strength	Min. Tensile Strength	Max. Allowable Load
RS35	9.41{ 960}	7.9{ 805}	1.52{ 155}	—	—	—
RS40	15.7 { 1600}	13.8{1410}	2.65{ 270}	15.7{ 1600}	13.8{1410}	2.65{ 270}
RS50	25.5 { 2600}	21.8{2220}	4.31{ 440}	25.5{ 2600}	21.8{2220}	4.31{ 440}
RS60	37.3 { 3800}	31.1{3170}	6.28{ 640}	37.3{ 3800}	31.1{3170}	6.28{ 640}
RS80	63.7 { 6500}	55.6{5670}	10.7 {1090}	63.7{ 6500}	55.6{5670}	10.7 {1090}
RS100	100 {10200}	86.7{8840}	17.1 {1740}	100 {10200}	86.7{8840}	17.1 {1740}

### Corrosion Resistant Small Size Conveyor Chain (Maximum Allowable Load)

Tsubaki Chain No.	Stainless Steel RS Attachment Chain				Surface-Treated RS Attachment Chain		Poly Steel Chain
	SS	AS	NS	LSC	NP	NEP	
RS25 (RS25PC)	0.12{ 12}	—	0.12{ 12}	—	0.64{ 65}	—	0.08{ 8}
RS35 (RS35PC)	0.26{ 27}	—	0.26{ 27}	—	1.52{ 155}	—	0.18{18}
RS40 (RS40PC)	0.44{ 45}	0.69{ 70}	0.44{ 45}	0.44{ 45}	2.65{ 270}	2.65{ 270}	0.44{45}
RS50 (RS50PC)	0.69{ 70}	1.03{105}	0.69{ 70}	0.69{ 70}	4.31{ 440}	4.31{ 440}	0.69{70}
RS60 (RS60PC)	1.03{105}	1.57{160}	1.03{105}	1.03{105}	6.28{ 640}	6.28{ 640}	0.88{90}
RS80	1.77{180}	2.65{270}	1.77{180}	1.77{180}	10.7 {1090}	10.7 {1090}	—
RS100	2.55{260}	—	—	—	17.1 {1740}	17.1 {1740}	—
RS120	3.82{390}	—	—	—	23.9 {2440}	—	—
RS140	4.61{470}	—	—	—	32.4 {3300}	—	—
RS160	6.37{650}	—	—	—	40.9 {4170}	—	—

### Hollow Pin Chain (Maximum Allowable Load)

Tsubaki Chain No.	Standard	Lambda	NP	SS
RS40	1.77{180}	1.47{150}	1.77{180}	0.44{ 45}
RS50	3.14{320}	2.55{260}	3.14{320}	0.69{ 70}
RS60	4.22{430}	3.43{350}	4.22{430}	1.03{105}
RS80	7.65{780}	6.18{630}	7.65{780}	1.77{180}

### Curved Chain (Max. Allowable Load)

Tsubaki Chain No.	Standard
RS40	1.86{190}
RS50	2.84{290}
RS60	4.02{410}
RS80	6.96{710}

Note: SS and NS chains are not pre-lubricated before shipping. Always lubricate the chain before use, except when using underwater or when the chain will contact water. Using a chain without lubrication may result in premature articulation problems. Maximum allowable loads are based on lubricated (including water lubricated) conditions.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

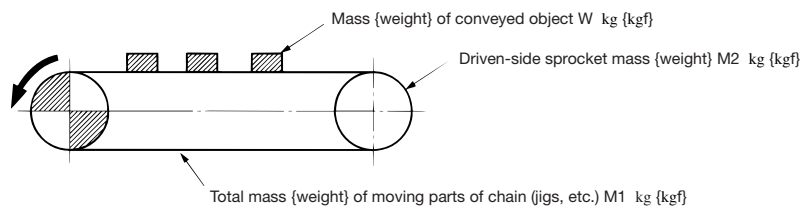
## Step 6: How to Select Indexing Chain

When selecting chain for indexing operations using indexing equipment, in addition to the normal tension based on  $F$  (tension from frictional force), the added tension from inertia ( $F_1$ ) must be taken into account when calculating the total tension acting on the chain. In general, this additional tension  $F_1$  is found from the formula  $F_1 = m\alpha$ . The steps to calculate chain tension based on this formula are explained below.

$m$ : Total mass on driven side (kg)

$\alpha$ : Maximum acceleration (m/s<sup>2</sup>)

SI Units	{Gravimetric Units}
----------	---------------------



1) Find total mass  $m$  on driven side.

$$m = W + M1 + \frac{1}{2} M2$$

1) Find total mass  $m$  on driven side.

$$m = \frac{1}{G} (W + M1 + \frac{1}{2} M2)$$

$G$ : Acceleration of gravity = 9.80665 (m/s<sup>2</sup>)

Note:  $\frac{1}{2} M2$  is an approximate calculated value for the inertial force of the sprocket converted to the mass (weight) of the chain.

2) Find the additional tension from inertia from  $F_1 = m\alpha$  based on the maximum acceleration  $\alpha$  (m/s<sup>2</sup>) and the formula in 1) above.

For example, when using a cam indexing system, maximum acceleration  $\alpha$  can be found by using the following formula:

$$\alpha = Am \frac{L}{t^2} \text{ (m/s}^2\text{)}$$

$L$ : Indexing length of 1 takt (m)

$t$ : Indexing time of 1 takt (s)

$Am$ : Dimensionless maximum acceleration (Table 6)

Use the value for  $Am$  corresponding to the cam curve.

Table 6: Relationship Between Cam Curves and  $Am$

Name	$Am$
Modified sine curve (MS)	$\pm 5.53$
Modified trapezoidal curve (MT)	$\pm 4.89$
Modified sine constant velocity (MSC)	$\pm 8.01$

For details, check with the manufacturer of the indexing equipment.

3) Find  $F_z$ , the total working tension taking the additional tension due to inertia into consideration.

$$F_z = F + F_1/1000$$

$F$ : Chain tension based on frictional force (kN)  
(Maximum static tension)

3) Find  $F_z$ , the total working tension taking the additional tension due to inertia into consideration.

$$F_z = F + F_1/G$$

$F$ : Chain tension based on frictional force (kgf)  
(Maximum static tension)

4) Determine chain size

$$F_z Kv \leq \text{Maximum allowable tension}$$

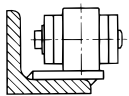
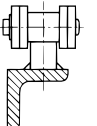
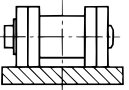
$Kv$ : Speed coefficient (Table 4)

5) Check the allowable roller load of the chain.

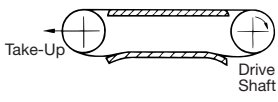
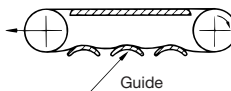
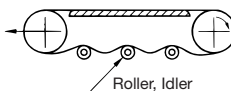


## Conveyor Design Guidelines

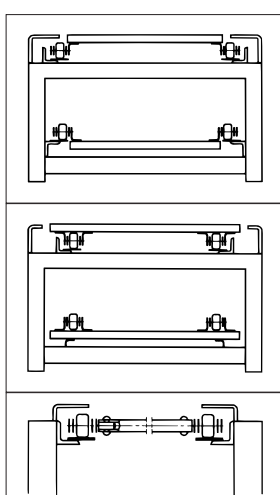
### 1. Conveyor System and Roller Type (Table 7)

Conveyor System	Roller Type	Comments
<b>Chain Rolling</b> (horizontal, inclined)  Double Pitch Chain	<b>R Roller Type</b> Heavy in chain weight Greater allowable roller load Less roller wear	¥ Smooth operation and vibrations are small. ¥ Power required is low since frictional resistance is small. ¥ Center distance between sprockets should be generally over 10 m. ¥ Applicable for speeds over 20 m/min.
<b>Chain Rolling</b>  Double Pitch Chain	<b>S Roller Type</b> Lightweight	¥ Center distance between sprockets should be generally less than 10 m. ¥ Applicable for speeds under 20 m/min.
<b>Chain Sliding</b>  Double Pitch Chain	Lower allowable roller load	¥ Resistant to loading shocks and bad environments; however, the rail damages quickly. ¥ Construction is simple. ¥ Power required is large.

### 2. Conveyor Arrangement (Table 8)

 Take-Up	Both the conveying and return sides are supported by rails. The most recommended and streamlined layout. A sag is produced on the take-off side of the sprocket.
 Guide	The return side is supported by guides, rollers, or idlers. Since the chain bends when it comes into contact with the rollers or guides, an increase in friction occurs, allowing for easy wear. Also, vibrations of the chain exert a bad effect on overall running. Consequently it is not desirable to have a long center distance between sprockets.
 Roller, Idler	The return side is not supported. The tension due to the mass of the chain on the return side produces vibrations causing rough conveying.

Examples showing slat conveyors and a cross rod conveyor that are most commonly used:



The slat is installed using the A attachment and the rollers roll over the rails on both the conveying and return sides.

The slat is installed using the K attachment. In comparison to the above example, this type of arrangement is suitable for wide slat conveyors where the mass of the conveyed goods is heavy. However, on the return side the slat slides on the rail.

This is a cross rod conveyor where a pipe is installed by means of an EP attachment, GNK attachment, or Hollow Pin Chain. The rollers roll on the rails on both the conveying and return sides.

### 3. Use of Standard Small Size Conveyor Chain at High/Low Temperatures

As a general rule, standard small size conveyor chain can be operated in clean air environments and in ambient temperatures between -10°C and 60°C. When the chain is operated in environments outside this range, the following points should be taken into consideration.

#### 1. Operation at very low or high temperatures:

Chain must be selected or used in a different manner when it is operated in freezing chambers, cold areas, when it passes through dryers or heat-treatment furnaces, or when it is affected by heat from the material being conveyed. Table 9 below provides guidelines for the relationship between allowable tension and temperature for standard chains.

Table 9: Temperature Corrected Working Load

Temperature Range	Allowable Tension
-30°C to -20°C	(Max. allowable load in catalog) x 0.25
-20°C to -10°C	(Max. allowable load in catalog) x 0.33
-10°C to 150°C	(Max. allowable load in catalog) x 1.0
150°C to 200°C	(Max. allowable load in catalog) x 0.75
200°C to 250°C	(Max. allowable load in catalog) x 0.5

Table 10: Temperature Environment and Points of Concern

Temperature Range	Usage Conditions	Potential Problems
-50°C to -30°C	Under -30°C or lower conditions, corrosion-resistant SS and AS stainless steel chains are suggested. Standard steel chains cannot be used.	(1) Low-temperature embrittlement may occur on standard steel chain, reducing impact resistance.
-30°C to -10°C	Standard steel chain should be selected on the basis of the corrected working load, above (Table 9).	(2) Congealing of lubricant. (3) Rust due to condensation. (4) Seizure due to frost formation.
60°C to 150°C	Special lubrication is required.	
150°C to 250°C	Because wear resistance is reduced in this temperature range, selection of the next larger pitch chain size over the one originally selected to reduce bearing pressures is suggested. When standard chain is to be used, evaluate whether or not the chain can be used at a reduced allowable tension (see Table 9 above).	(1) Excessive wear due to decrease of hardness of pin and bush. (2) Excessive elongation due to softening. (3) Poor lubrication and chain seizure due to deterioration of lubricant.
250°C to 400°C	Corrosion-resistant SS and AS stainless steel chains are suggested.	(4) Excessive wear and chain seizure due to formation of scale.

### 4. Lubricants and High/Low Temperatures

Special low-temperature or high-temperature lubricants are required if a chain will be exposed to temperatures outside the range of -10°C to 60°C. See page 101 for details on recommended lubricants.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## 5. Cautions on Use in Special Environments

As a general rule, conveyor chain should be used in clean air environments. When used in a special environment, reference should be made to the following items.

### 1. Use in Wet Conditions

If the chain is splashed with water or goes through heated vapor, the following problems may occur.

- 1) Increase in wear elongation due to improper or insufficient lubrication.
- 2) Decrease in fatigue strength from rust and corrosion (pitting) of the chain.

#### Countermeasures

- Reduce bearing pressure using a larger sized chain to improve wear resistance.
- Use corrosion-resistant small size conveyor chain for rust prevention.

### 2. Use in Acidic or Alkaline Conditions

If the 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 chain will corrode. The photograph below shows an example of chain that was used in a plating apparatus. The chain fell to pieces within one month due to the effects of acid.



Corrosion of Stainless Steel Drive Chain

### 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.

### Countermeasures for Corrosion

- Use surface-treated attachment 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 occur even when there is no tension on the chain. Conveyor 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.



Hydrogen Embrittlement Cracking

### 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 abrasive materials penetrate between the link plates, poor articulation occurs.

#### Countermeasures

- Apply a dust-protection casing.
- Remove foreign particles by regularly washing the chain.
- Reduce bearing pressure using a larger sized chain to improve wear resistance.
- Adopt a chain that has specially processed parts where abrasion is a problem.

## 6. Other Precautions

- 1) To keep long conveyors consistently operating in top condition, use take-up devices to eliminate chain slack.  
Take-up stroke = (center distance between sprockets X 0.02) + catenary sag allowance  
The "0.02" factor represents a 2% allowable wear elongation of chain.
- 2) Chain must always be engaged with at least three sprocket teeth.
- 3) When operating with multiple strands of conveyor chain, sprockets should be mounted on the same shaft and all sprocket teeth should be properly aligned.
- 4) When operating a long conveyor with two or more strands of

chain, and when especially high pitch accuracy is required, Tsubaki can provide specially configured chain to minimize the relative difference in length. Also, special sprockets can be manufactured to ensure that sprocket teeth are properly aligned.

## 7. Corrosion Resistance Guide for Corrosion Resistant Chains and Sprockets (Table 11)

Corrosion resistance varies accordingly depending on application conditions. This table should not be considered a guarantee. Using this table as a reference, be sure to check the corrosion resistance of the chain in advance according to actual operating conditions in determining chain type.

Table 11

Chemical, Food Product		Corrosion Resistant Roller Chain							Sprocket	
		SS	AS	NS	TI	PC	PC-SY	Engineering Plastic	SS	
Acetone	20°C	A	A	A	A	A	×	A	A	
Oils (vegetable, mineral)	20°C	A	A	A	A	A	A	A	A	
Linseed oil	100% 20°C	A	B	A	A	A	—	A	A	
Sulfur dioxide (wet)	20°C	A	×	A	A	—	—	—	A	
Alcohol (methyl, ethyl, propyl, butyl)	A	A	A	A	A	A	A	A	A	
Aqueous ammonia	20°C	A	A	A	A	A	A	A	A	
Whiskey	20°C	A	A	A	A	A	A	A	A	
Ether (ethyl ether)	20°C	A	A	A	A	A	A	A	A	
Zinc chloride	50% 20°C	B	×	B	A	B	A	×	B	
Ammonium chloride	50% Boiling point	B	×	A	A	—	—	—	B	
Potassium chloride	Saturated 20°C	A	B	A	A	—	—	A	A	
Calcium chloride	// 20°C	B	×	A	A	B	A	A	B	
Ferric chloride	5% 20°C	B	×	B	A	—	—	×	B	
Sodium chloride	// 20°C	A	B	A	A	A	A	A	A	
Hydrochloric acid	2% 20°C	×	×	×	A	×	A	×	×	
Chlorine gas (dry)	20°C	B	×	B	A	—	A	×	B	
Chlorine gas (wet)	20°C	×	×	B	A	—	A	×	×	
Chlorine water		×	×	A	A	×	—	×	×	
Oleic acid	20°C	A	A	A	A	A	—	A	A	
Seawater	20°C	B	×	A	A	B	A	A	B	
Sodium perchlorate	10% Boiling point	A	×	A	A	—	—	—	A	
Hydrogen peroxide	30% 20°C	A	B	A	A	×	A	×	A	
Gasoline	20°C	A	A	A	A	A	A	A	A	
Potassium permanganate	Saturated 20°C	A	A	A	A	—	A	×	A	
Formic acid	50% 20°C	A	A	A	A	×	A	×	A	
Milk	20°C	A	A	A	A	A	A	A	A	
Citric acid	50% 20°C	A	A	A	A	—	A	A	A	
Glycerin	20°C	A	A	A	A	A	A	A	A	
Creosote	20°C	A	A	A	A	—	—	—	A	
Chromic acid	5% 20°C	A	B	A	A	×	A	×	A	
Ketchup	20°C	A	A	A	A	A	A	A	A	
Developer (photo)	20°C	A	B	A	A	A	A	A	A	
Synthetic detergent		A	A	A	A	A	A	A	A	
Coffee	Boiling	A	A	A	A	A	A	A	A	
Cola syrup		A	A	A	A	A	A	A	A	
Acetic acid	10% 20°C	A	A	A	A	A	A	B	A	
Sugar solution	20°C	A	A	A	A	A	A	A	A	
Calcium hypochlorite (bleaching powder)	Available chlorine 11 to 14% 20°C	A	×	A	A	×	A	B	A	
Sodium hypochlorite	10% 20°C	×	×	A	A	×	A	B	×	
Sodium cyanide	20°C	A	—	A	A	—	—	—	A	
Carbon tetrachloride (dry)	20°C	A	A	A	A	A	A	A	A	
Potassium dichromate	10% 20°C	A	A	A	A	—	A	A	A	
Oxalic acid	10% 20°C	A	B	A	A	—	A	A	A	
Tartaric acid	10% 20°C	A	A	A	A	A	A	A	A	
Nitric acid	5% 20°C	A	B	A	A	×	A	×	A	
Ammonium nitrate	Saturated boiling	A	A	A	A	B	A	A	A	

Chemical, Food Product		Corrosion Resistant Roller Chain							Sprocket	
		SS	AS	NS	TI	PC	PC-SY	Engineering Plastic	SS	
Potassium nitrate	25% 20°C	A	A	A	A	A	—	A	A	
//	25% Boiling point	A	×	A	A	—	—	—	A	
Vinegar	20°C	B	×	A	A	B	A	B	B	
Potassium hydroxide (caustic potash)	20% 20°C	A	A	A	A	A	A	A	A	
Calcium hydroxide (hydrated lime)	20% Boiling	A	A	A	A	A	A	—	A	
Sodium hydroxide (caustic soda)	25% 20°C	A	A	A	A	A	A	A	A	
Stearic acid	100% Boiling point	×	×	A	A	×	—	A	×	
Soft drinks	20°C	A	A	A	A	A	A	A	A	
Carbolic acid	20°C	A	A	A	A	×	A	×	A	
Petroleum	20°C	A	A	A	A	A	—	A	A	
Soapy water	20°C	A	A	A	A	A	A	A	A	
Carbonated water		A	A	A	A	—	—	—	A	
Sodium hydrogen carbonate	20°C	A	A	A	A	A	—	A	A	
Sodium carbonate	Saturated boiling point	A	A	A	A	—	A	B	A	
Sodium thiosulfate	25% Boiling point	A	A	A	A	—	—	—	A	
Turpentine oil	35°C	A	A	A	A	—	—	—	A	
Kerosene	20°C	A	A	A	A	—	A	—	A	
Varnish		A	A	A	A	—	—	—	A	
Concentrated nitric acid	65% 20°C	A	×	A	A	×	A	×	A	
//	Boiling	B	×	B	A	×	×	×	B	
Lactic acid	10% 20°C	A	B	A	A	A	—	A	A	
Honey, syrup		A	A	A	A	A	A	A	A	
Paraffin	20°C	A	A	A	A	A	A	A	A	
Beer	20°C	A	A	A	A	A	A	A	A	
Picric acid	Saturated 20°C	A	A	A	A	—	—	—	A	
Fruit juice	20°C	A	B	A	A	A	A	A	A	
Benzene	20°C	A	A	A	A	A	A	A	A	
Boric acid	50% 100°C	A	A	A	A	—	—	—	A	
Formalin (formaldehyde)	40% 20°C	A	A	A	A	—	—	B	A	
Mayonnaise	20°C	A	B	A	A	A	A	A	A	
Water		A	A	A	A	A	A	A	A	
Vegetable juice	20°C	A	A	A	A	A	A	A	A	
Lard		A	A	A	A	—	—	—	A	
Butyric acid	20°C	A	A	A	A	A	—	A	A	
Hydrogen sulfide (dry)		A	A	A	A	A	A	A	A	
Hydrogen sulfide (wet)		×	×	×	A	×	—	—	×	
Sulfuric acid	5% 20°C	×	×	A	A	×	A	×	×	
Zinc sulfate	25% Saturated 20°C	A	A	A	A	—	A	—	A	
Aluminum sulfate	Saturated 20°C	A	×	A	A	—	—	—	A	
Ammonium sulfate	// 20°C	A	B	A	A	—	—	—	A	
Sodium sulfate	Saturated 20°C	A	A	A	A	—	—	—	A	
Malic acid	50% 50°C	A	A	A	A	A	A	A	A	
Phosphoric acid	5% 20°C	A	B	A	A	×	A	×	A	
//	10% 20°C	B	B	B	A	×	A	×	B	
Wine	20°C	A	A	A	A	A	A	A	A	

Chemical, Food Product	Standard (Steel Chain)
Acetone	×
Oils (vegetable, mineral)	A
Alcohol	A
Aqueous ammonia	B
Sodium chloride	×
Hydrochloric acid (2%)	×
Seawater	×
Hydrogen peroxide	×
Caustic soda (25%)	×
Gasoline	A
Formic acid	×
Formic acid aldehyde	A
Milk	A
Lactic acid	×
Citric acid	×
Chromic acid (10%)	×
Acetic acid (5%)	×
Carbon tetrachloride	B
Potassium hydroxide	B
Sodium hydroxide (20%)	×
Nitric acid (5%)	×
Vinegar	×
Hypochlorite soda	×
Soft drinks	A
Soapy water	B
Paraffin	A
Beer	A
Fruit juice	×
Wine	A
Whiskey	A
Benzene	A
Water	×
Vegetable juice	B
Iodine	×
Sulfuric acid	×
Phosphoric acid (10%)	×

A: Totally resistant  
B: Partially resistant  
(depending on operating conditions)  
×: Not resistant  
—: Unknown

For information on KV rollers, please contact a Tsubakimoto representative.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## Installation

### 1. Sprocket Installation

Proper installation of the sprockets is critical to smooth operation of a conveyor, and it also affects chain life. The installation should be properly carried out in accordance with the procedure described below.

- 1) Check the horizontal positioning of the shafts with a level. Adjust the level to within the tolerance of  $\pm \frac{1}{300}$ .

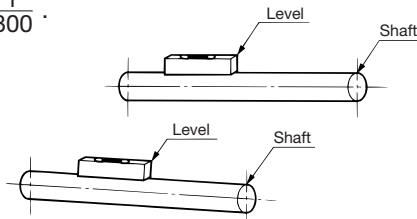


Figure 1: Horizontal Positioning of Shafts

- 2) Check the parallelism of the shafts with a scale. Adjust the shafts so that the parallelism as calculated with a formula  $\frac{A-B}{L}$  is to within  $\pm \frac{1}{100}$ .

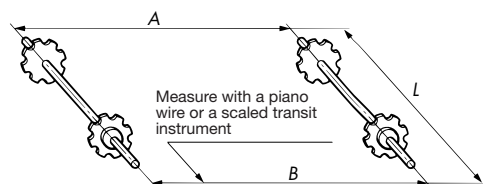


Figure 2: Parallelism of Shafts

- 3) Align the sprocket axis to match.

Tolerance relative to center distance:

Up to 1 m: within  $\pm 1$  mm

1 to 10 m: within  $\frac{\text{Distance between shafts (mm)}}{1000}$

10 m or longer: within  $\pm 10$  mm

Measure misalignment with:

- A straight edge when the distance is short
- A piano wire when the distance is long
- A leveling string or a piano wire when the sprocket positions are different from each other in terms of height

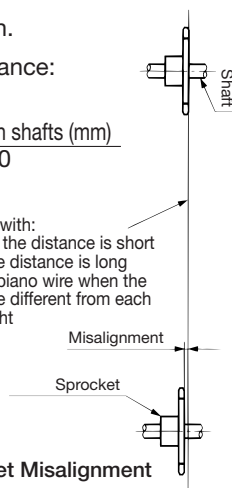


Figure 3: Sprocket Misalignment

- 4) After processes 1) to 3) have been completed, lock each of the sprockets to the shaft(s) by means of keys or Tsubaki POWER-LOCKS. Lock the sprockets that are installed and used on the same shaft so that the teeth of both sprockets align in terms of phase.

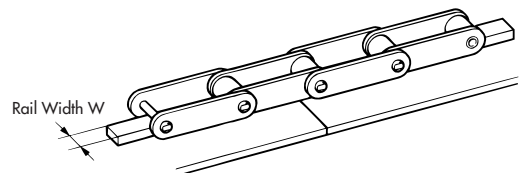
### 2. Centering

Because the conveyor chain runs on a guide rail, the precision of the guide rail must be especially high and the conveyor properly centered. In cases like vertical bucket elevators where there are no guide rails, if the conveyor is not precisely centered, the chain will wobble and weave. This will have a significant impact on the life of the conveyor chain.

### 3. Rails

In general, rails wear faster than chain. While it is important that the rail material be matched to the chain material, in general, rolled steel for general structures (SS400) or plastic material (ultra-high molecular weight polyethylene) is recommended.

- 1) Wear is a complex phenomenon and is influenced by a variety of factors, including corrosion, lubrication, load speed, and operating time. Deducing the precise relationship between chain life and rail material is difficult.
- 2) Chain life is influenced by the rail. For new installations, verify the wear state by selecting rail material that is slightly softer than the chain. The smoother the finish on the rail surface, the better.
- 3) Operating conditions must be taken into consideration when selecting materials. In environments involving mechanical impact and other special conditions, there may be cases when plastic should not be used.
- 4) Precautions before putting rails into operation
  1. Lubricate all rail connecting parts, chamfer edges, and eliminate uneven levels and gaps. (See Figure 4.)
  2. After welding rail, remove sputter or scale.
  3. During the trial run, run the conveyor unloaded. Lubricate the chain and check the condition of chain and rails.



Rail width W is generally set to the sprocket facewidth.

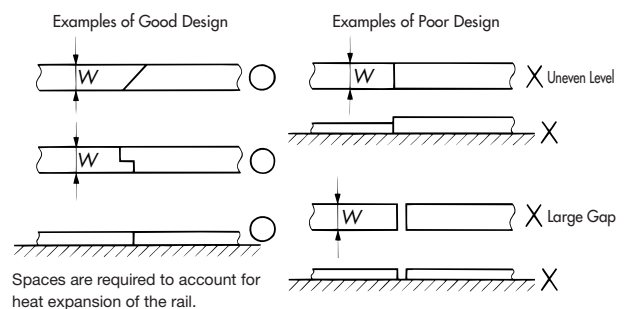


Figure 4: Rail Joints

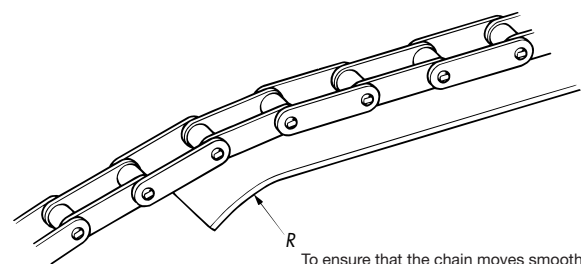


Figure 5: Chain Entrance/Exit from Guide Rail



## How to Cut Chain

Attachment chains are generally sold in 1-unit sections (1 unit = 10 ft/3,048 mm). Configuring chain to a specific length will require cutting units.

### 1. Grinding Riveted Pin

Using a grinder, grind down the ends of the two pins on the outer link (on the attachment side) until they are level with the outer plate. Take care that the grinder does not overheat (see Figures 6 and 7). Particularly in the case of Lambda Chain, work on the chain slowly so that the oil-impregnated bush does not become too hot.

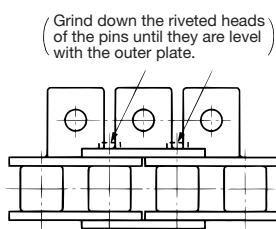


Figure 6: Attachment Chain



Figure 7: Grinding Down Pin Ends

### 2. Setting Chain on Vise and Cradle

#### 1) S Roller (A, SA, EP, GNK1 attachments)

Place the chain in the jaws of the vise with the attachment side facing up and gently tighten the vise to secure the chain (Figures 8 and 9).



Figure 8: Setting Chain in Chain Vise

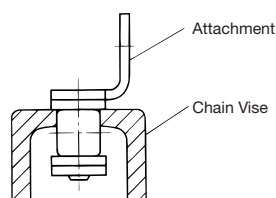


Figure 9: Cross Section of Chain Set in Chain Vise

#### 2) S Roller (K, SK attachments), R Roller (K, SK attachments), Plastic R Roller, Poly Steel Chain (with attachments)

For these types, the chain is set in a cradle (Figure 11-1). Another method, used only for steel S rollers (Figure 11-2), is to set the pin to be removed on the edge of the chain vise.

Whichever method is used, support blocks should be placed under the chain on either side of the vise to ensure that the chain remains stable (Figure 10). Any attachment can be cut using this method. However more force will be required to remove the pin as mentioned in "3. Pin Removal" on the next page.

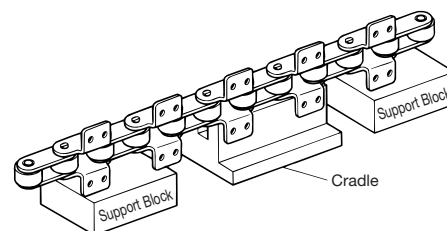


Figure 10: Cradle and Support Blocks

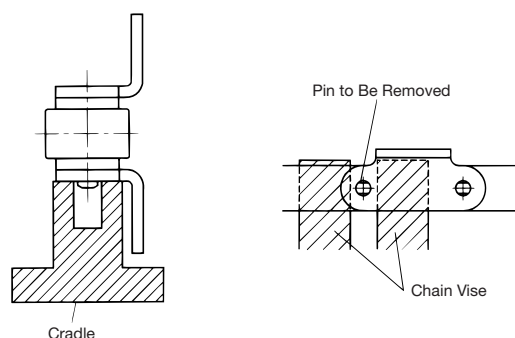


Figure 11-1: Cradle Cross Section Figure 11-2: Chain Vise Usage

#### 3) R Roller (A, SA, EP attachments)

This method cannot be used for plastic rollers.

Secure the non-attachment side plate of the chain in the vise and support the R rollers on the vise (Figure 13). Ensure that the chain is supported on both sides of the vise (Figure 12).

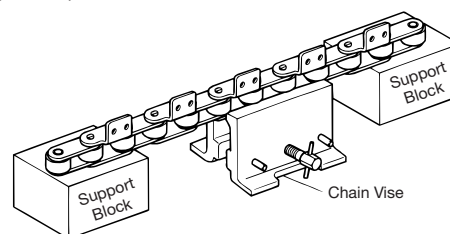


Figure 12: Chain Vise and Support Blocks

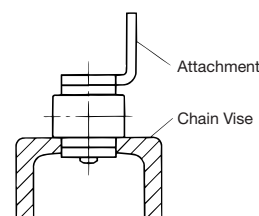


Figure 13: Cross Section of Chain Set in Chain Vise

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

### 3. Pin Removal

- 1) Using a primary punch suitable for the chain size (refer to the Tsubaki Drive Chain Accessories section in a separate catalog), place the punch on the head of the pin that was ground down and strike with a hammer. Be sure to strike the pins on the outer link alternately to remove them evenly and at the same time. Strike the pins until they are just about to release from the outer plate (Figure 14).

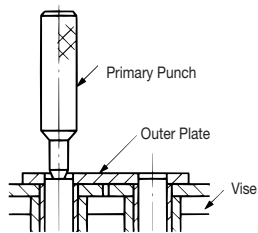


Figure 14: Tapping Pin with Primary Punch

- 2) Using a secondary punch (refer to the Tsubaki Drive Chain Accessories section in a separate catalog) and a hammer, completely remove the pair of pins from the outer link. Check that the bush of the removed pins has not come loose from the inner plate, and that the bush has not become deformed in the process. If the bush has come loose or is deformed, do not continue to use it.

### 4. Poly Steel Chain (Without Attachments)

- 1) Place the outer plate of the chain in the cradle, position the special punch on the head of the pin (see photo in Figure 16 below), and lightly strike with a hammer (Figure 15).
- 2) Work carefully, as there is a risk of damage if excessive force is applied to engineering plastic components in this process.

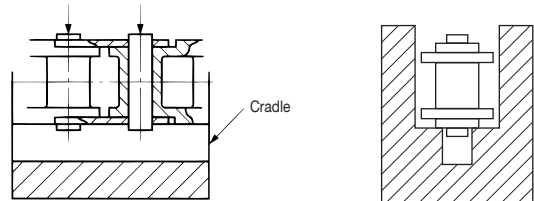


Figure 15: Cross Section Showing Poly Steel Chain Set in Cradle



Figure 16: Disconnecting Poly Steel Chain

#### ⚠ Safety Points

1. Use the grinder to grind down only the riveted portion of the pin head. Removing the pin without grinding the riveted head off will require additional time and effort, and may damage the chain.
2. Do not re-use parts removed from the chain.



## How to Connect Chain

### 1. Assembling with a Connecting Link

- 1) Insert the pins of the connecting link into the bushes of the free inner links. Place the free link plate over the pin ends and secure using a spring clip or cotter pins.
- 2) The pins are slip-fit into the connecting plate, meaning the pins can be inserted manually.

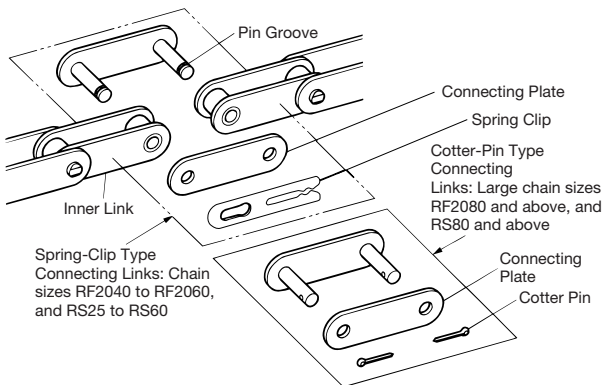


Figure 17: How to Connect Attachment Chain

### 2. Installing Spring Clips

Check that the spring clip is securely attached. Failure to install the spring clip or improper installation may result in an accident.

- 1) Spring clips are used to secure the connecting link of chain sizes smaller than RF2060 and RS60. Insert the pins of the connecting link into the bushes of the free inner links, place the link plate over the pin ends, and slide the spring clip over the ends of the pins so that the slot and the fingers of the clip engage the grooves securely (Figures 18 and 19).
- 2) Pay careful attention to ensure that the fingers of the spring clip are not spread too wide. If the spring clip does not fit securely, it could become detached without warning, leading to an accident (Figures 19 and 20).

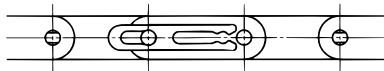


Figure 18: Slide Spring Clip Over Grooves in Pin Ends

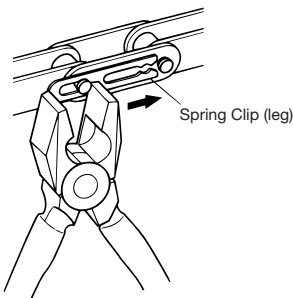


Figure 19: Use a Pair of Pliers to Secure Spring Clip

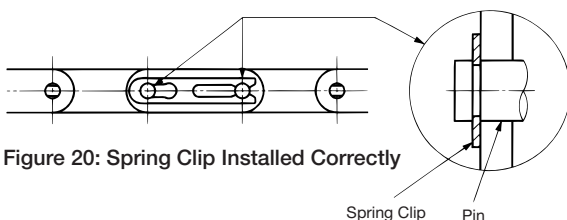


Figure 20: Spring Clip Installed Correctly

- 3) In general, the spring clip should be installed in the direction opposite to chain travel, as shown in the drawing below (Figure 21).

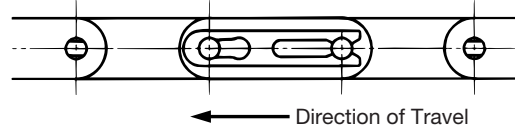


Figure 21: Spring Clip Installation

### 3. Installing Cotter Pins

Securely install the cotter pins in the holes provided on the ends of the pins. Failure to install the cotter pins or improper installation may result in an accident.

- 1) After the cotter pin has been fully inserted into the hole on the end of the pin, open the legs of the cotter pin to an angle of around 60° (Figure 22). Do not re-use cotter pins. Do not use commercially available cotter pins.

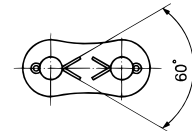


Figure 22: Open Legs of Cotter Pin

- 2) How to Open the Legs of the Cotter Pin

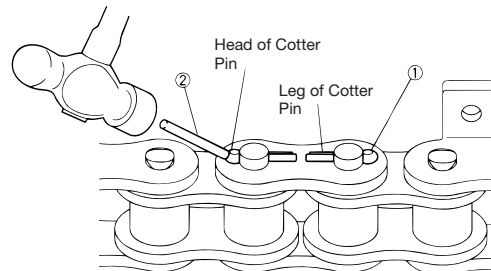


Figure 23

- (1) Insert the cotter pin into the cotter pin hole.
- (2) Use a pin that is somewhat larger in diameter than the cotter pin to lightly tap the head of the cotter pin. The legs of the pin will open slightly.

⊖ Flathead screwdriver

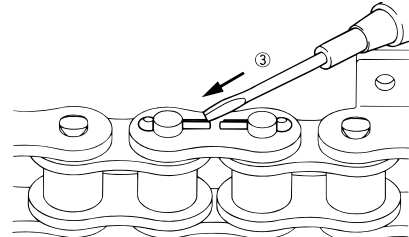


Figure 24

- (3) Insert the blade of a flathead screwdriver at the point where the legs of the cotter pin have opened slightly.

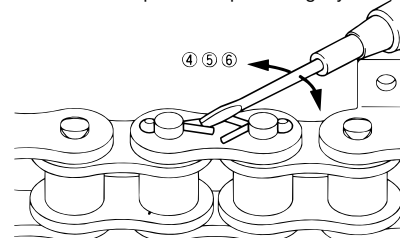


Figure 25

- (4) Insert the blade of the flathead screwdriver at an angle and move the screwdriver back and forth to open the legs of the cotter pin.
- (5) Press down the head of the cotter pin tightly so that the cotter pin will not disengage from the cotter pin hole.
- (6) Bend the cotter pin legs to the 60° angle mentioned above.

#### Caution

Perform this operation with extreme care! If the end of the screwdriver slips, it could puncture the hand or cause other injury.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## Lubrication

Proper lubrication of roller chain is essential for peak performance and full chain life. In particular, the greater the level of performance demanded of the chain, the more the need for lubrication increases.

- 1) The purpose of lubrication is to reduce wear on chain parts, prevent corrosion (rust), and economize on power demands.
- 2) Lubricate the chain periodically (about once a week) so that the chain always remains damp with oil. Perform drip lubrication (using lube listed below) or apply lube with a brush.

### 3) Lubrication locations

Since wear between pins and bushes causes chain elongation, lubrication must be maintained on all contact surfaces. Also, areas where chain parts (plates, etc.) come into contact with guide rails must be lubricated (see Figure 26).

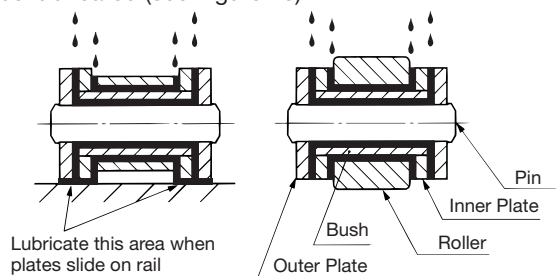


Figure 26: Lubrication points

### Lubricants: SAE Numbers (Table 12)

Lubrication Method	Drip or Brush			
Ambient Temperature	-10°C to 0°C	0°C to 40°C	40°C to 50°C	50°C to 60°C
Tsubaki Chain No.				
RS50 or lower small-pitch chain	SAE10W	SAE20	SAE30	SAE40
RS60/80	SAE20	SAE30	SAE40	SAE50
RS100				
RS120 or higher large-pitch chain	SAE30	SAE40	SAE50	

### Commercially Available Lubricants (Table 13)

SAE	SAE10W	SAE20	SAE30	SAE40	SAE50
ISOVG (CST40°C)	32	68	100	150	220
Manufacturer					
Idemitsu Kosan	Daphne Mechanic Oil 32	⌘ 68	⌘ 100	⌘ 150	⌘ 220
Exxon Mobil	DTE Oil Light	⌘ Heavy medium	⌘ Heavy	⌘ Extra heavy	⌘ BB
Japan Energy (JOMO)	Lathus 32	⌘ 68	⌘ 100	⌘ 150	⌘ 220
Showa Shell Sekiyu	Super MULPUS DX32	⌘ 68	⌘ 100	⌘ 150	⌘ 220
JX Nippon Oil & Energy	Eneos FBK Oil RO32	⌘ 68	⌘ 100	⌘ 150	⌘ 220

### Examples of Lubrication at Low and High Temperatures (Table 14)

The following lubricants can be applied when conveyor 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/ Lubricant	Dow Corning Toray SH510 Shin-Etsu Chemical KF50 Momentive Performance Materials TSF431	Exxon Mobil Arctic Oil C Heavy	See above	Sato Special Oil Hot Bearing Oil #200 Exxon Mobil DTE Oil HH Moresco Moresco Hilube L-150	Sato Special Oil High Thermo Lube #700 Moresco Moresco Hilube R-220

## Tension Adjustment

The correct amount of chain slack is essential for proper operation of the chain. When the chain is too tight, working parts such as chain, sprocket wheel, shaft, bearings, etc., carry a much heavier load, accelerating chain wear. On the other hand, too much slack is also harmful and causes the chain to climb the sprocket teeth.

### 1. Frequency of Adjustment

The chain has a tendency to stretch a certain amount at the beginning of operation due to slight distortion of its components. After such initial elongation, the chain stretches slightly, but constantly, as a result of normal wear. To maintain proper chain tension, adjustments, if necessary, should be made at regular intervals.

Assuming eight hours of operation a day, the frequency schedule for inspection and adjustment is given in the table below. When working hours are increased, the frequency of adjustment should be increased accordingly. Neglect of careful inspection increases the chances of an accident.

1st week after start of operation	Once a day
2nd to 4th week after start of operation	Twice a week
Thereafter	Twice a month

### 2. Insufficient Take-Up Adjustment

If there is still excessive slack in the chain even after the take-up adjustment is fully tightened, shorten the chain by removing two links. See page 98, "How to Cut Chain" for the steps involved.

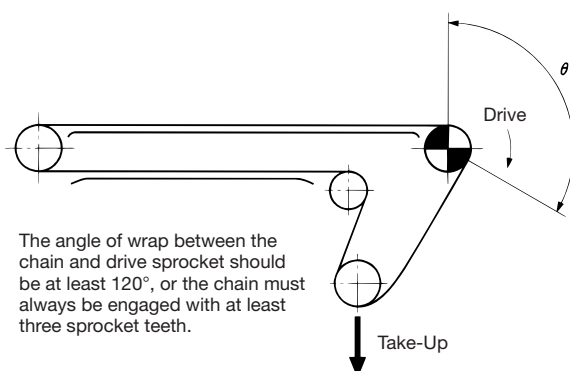
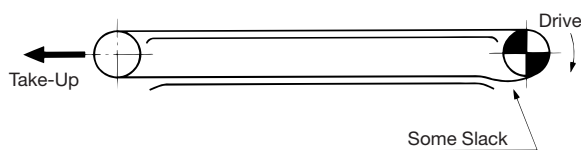


Figure 27: Adjusting Chain Slack

### 3. Even Adjustment of Take-Up on Both Sides

Where two parallel chains are adjusted by two independently operated take-ups, care must be taken to ensure even stroke on both the left and right side (not needed when the take-ups are cooperating screw type or counterweight type). An uneven adjustment will cause the link plate and the side of the sprocket teeth to interfere with each other and result in an overload condition. When the right and left sides are uneven, the two chains should be made even by replacing a portion of the right and left chains.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual

## Trial Run

After installing the chain, carry out a trial run and check the following items before you actually start running the chain.

### 1. Before Trial Run

- 1) Connecting spring clips and cotter pins are installed correctly.
- 2) Chain slack is adjusted properly.
- 3) Lubrication is adequate.
- 4) The chain does not come into contact with casing or covers.

### 2. Trial Run

- 1) There are no strange noises.
- 2) There is no excessive chain vibration.
- 3) The chain does not run up on the sprockets.
- 4) The chain is not jammed into the sprockets.
- 5) The rails and sprockets are installed correctly.
- 6) The rollers rotate smoothly.
- 7) There are no stiff areas during chain articulation.

#### Caution

An unloaded trial run should be conducted after installation by intermittently switching the system on and off several times. After inspection, a continuous unloaded trial run should be conducted. Prior to the trial run, be sure to lubricate the chain to allow lubricant to work into various components.

## Inspection

Frequently inspect the chain during the initial operating period in order to carry out necessary adjustment. Inspect the following items.

- 1) Unusual wear of chain.
- 2) Slack in chain.
- 3) Vibration and jerking of chain.
- 4) Unusual wear of sprocket, unusual contact of sprocket with other components due to eccentricity, dust accumulated on root of teeth.

When the sprocket properly engages with the chain, even contact is represented by the trace of contact shown as A in the illustration, while uneven trace of contact as B in the illustration represents improper installation of the sprocket or a twisted chain.

Rechecking is needed.

Proper contact should be traced a little above the root. However, when initial tension remains in the slacked side of the chain,

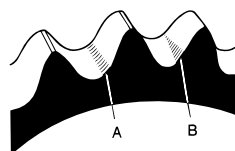


Figure 28: Trace of Contact

the chain slightly contacts the root. However, even in this case, strong contact should be traced around A. In the case of idlers and tighteners, contact happens at the middle of the root.

- 5) Too much wear of guide rail.
- 6) Any abnormality in the lubricating system.

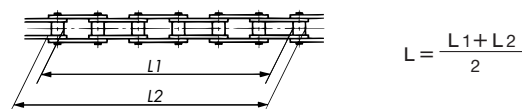
#### ■ Causes of Vibration, Jerking, and Unusual Wear

- 1) Overload, glass fragments caught between components.
- 2) Warping of the chain on the return side.
- 3) Insufficient lubrication or no lubrication.
- 4) Wear of the sprocket.
- 5) Unusual wear or breakage of the chain.

## Usage Limits

### 1. Chain Wear Elongation

The chain should be measured by stretching it slightly to remove any backlash or looseness. Measure the distance of the inside (L1) and outside (L2) of rollers at both ends of the measured links to obtain measurement (L). When measuring, use at least 6 to 10 links to help keep any measuring error to a minimum.



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

**Standard length = Chain pitch X No. of links**

The chain should be replaced when wear elongation is greater than 2% of the chain pitch.

A chain wear measurement scale that allows easy checking of pitch stretch is available from Tsubaki.

For Lambda Chain, if the chain elongation reaches around 0.5%, then the oil has run out. Indicators of this condition are red wear dust between the plates and occurrence of poor chain articulation. In this situation the chain is no longer usable and should be replaced.

### 2. R Rollers

When wear between the bush and roller causes the under surface of the link plate to contact the guide rail, the chain has usually reached the end of its usable service life. When the link plate starts contacting the guide rail, rolling contact suddenly turns into sliding contact between the link plate and rail, resulting in greater wear, an increase in chain tension, and a reduction in transmitted power.

### 3. S Rollers

The chain has reached the end of its service life as soon as holes or cracks appear on the rollers due to wear.

### 4. Link Plates

For conveyor configurations in which link plates move directly on the material to be conveyed or on a guide rail, the service life has come to an end when the worn section equals H/8, as shown in the drawing.

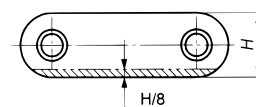


Figure 30: Plate Width Wear

### 5. Sprockets

When the sprocket is worn as illustrated below (to the left), the chain is prone to being caught by the tips of the teeth (A), making the departure of the chain from the sprocket difficult, hence resulting in vibration of the chain. Though wear allowance depends on the type of conveyor and the size of the chain to a certain extent, if the sprocket is replaced when the wear reaches 0.3 to 1.0 mm, damage to the chain can be avoided. When the sprocket is worn in the direction of the facewidth as illustrated below (to the right), the shaft may not be properly aligned, therefore correct it.

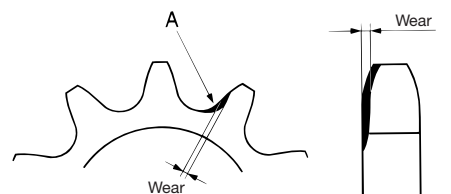


Figure 32: Wear of Sprocket Teeth

## Other Precautions

### 1. Shutdown/Restart

Stop the conveyor under no-load conditions to prevent remaining material from overloading the system when the conveyor starts again. Also, if the conveyor system has been shut down for a long period of time, be sure to inspect the chain before restarting.

### 2. Securing Conveyor Parts

Parts fastened to the conveyor such as buckets, aprons, slats, etc., tend to loosen as a result of vibration. Pay careful attention to fastening nuts and bolts, and check periodically that they are tightly fastened.

### 3. Temperature and Prevention of Freezing

Conveyor damage may occur when differences in temperatures (between day and night in winter) are extreme. Under these circumstances, operate the conveyor carefully, taking into account any variations in temperature as well as appropriate lubrication, the moisture content of the conveyed material, inspections, etc.

### 4. Spare Chain Storage

In the unlikely event of a failure or accident, we recommend that a spare chain be prepared in advance. This spare chain should be stored in a dry space. Also, if the chain is to be stored for a long period of time, it should

be coated with a rust-preventive oil. For convenience, attach a tag noting the product name, model number, date of purchase, and equipment it is intended to be used on.

### 5. Record of Use and Maintenance

Beyond the maintenance and inspection items mentioned above, after installing the conveyor, prepare a record of the expected capacity to be conveyed, conveying speed, r/min. of main shaft, electric current, voltage, power, working hours, actual conveying capacity, inspection dates, lubricating dates, details of problems, and the like. This will serve as protection against unexpected accidents. When updated on a regular basis, this record will also be convenient for maintenance and repairs.

### 6. Cleaning

The chain should be cleaned periodically to remove contamination or particles of conveyed material from the chain and rail.

### 7. Storage of Chain and Sprockets

Chain and sprockets should be stored in a place free of dust and dirt and where they will not be exposed to rain. To prevent rust, use a brush to coat sprockets with oil. No rust-prevention treatment is applied at the time chain is shipped. Therefore, when storing chain, coat with a rust-preventative oil and inspect periodically for corrosion.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

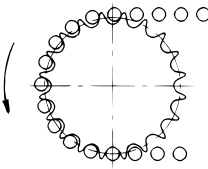
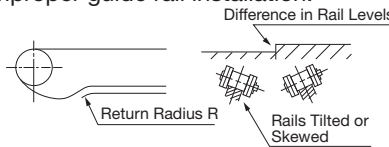
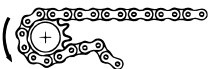
High Precision  
Conveyor Chain

Engineering Manual

## Troubleshooting

When there is significant damage and breakage to the chain and sprockets, please carry out the following procedures.

### 1. General

Symptom	Possible Causes	Remedy
 <p>Chain rides up on the sprocket</p>	The chain and sprocket do not match.	Replace the chain and sprocket with the correct size.
	Excessive load.	Reduce the load, add lubrication, or increase the number of strands or the size of the chain.
	Elongation of the chain due to wear or excessively worn sprocket teeth.	Replace with new chain and sprockets.
	Angle of chain wrap on the sprocket is insufficient.	Angle of chain wrap should be at least 120° or chain must be engaged with at least three sprocket teeth.
	Inadequate back-tension.	Adjust the catenary or take-up idler.
	Distance between the center of the chain and the sprocket do not match.	Inspect and correct.
<p>Unusual noises</p>	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 the shafts to obtain the proper amount of slack.
	Excessively worn chain or sprocket.	Replace with new chain and sprockets.
	Lack of or unsuitable lubrication.	Provide proper lubrication according to the operating conditions.
	Interference of casing with the chain or other moving parts.	Inspect and correct.
	Improper guide rail installation. 	Inspect and correct.
 <p>Chain winds onto the sprocket (poor separation from the sprocket teeth)</p>	Excessive slack in the chain.	Adjust the chain length or distance between shafts. Install a tensioner.
	Elongation of the chain due to wear or excessively worn sprocket teeth.	Replace with new chain and sprockets.
	The chain and sprocket do not match.	Replace with new chain and sprockets.
	Poor chain articulation due to rust. Inappropriate lubrication. Harsh environment.	Remove and replace the chain. Protect the chain from the environment by appropriate lubrication and/or cover.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain


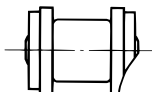

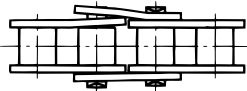
Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual



Symptom	Possible Causes	Remedy
Excessive wear on the inside surface of the link plates and sides of the sprocket teeth	Improper installation.	Correct sprocket and shaft installation.
	The chain is being pushed to the side. 	Remove the cause of the push and/or switch to a chain with guide rollers.
Excessive wear on the sides of the link plates 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 the chain	Deformation of the chain caused by improper installation.	Inspect 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, bent pin, or cracked bush.	Reduce the load or increase the number of strands or the size of the chain.
	Corrosion or rusting.	Install a chain casing to protect the chain.
	Inadequate lubrication.	Provide adequate lubrication.
	Foreign particles stuck in clearance.	Install a casing to protect the chain.
	Use in extremely high temperatures.	Provide adequate clearance. (Consult with Tsubaki regarding this situation.)
Spreading of link plates	Uneven or excessive load caused by improper installation. 	Replace with new chain and correct installation.

**Standard**  
Small Size Conveyor Chain

**Special**  
Small Size Conveyor Chain

**Lube Free**  
Small Size Conveyor Chain

**Corrosion Resistant**  
Small Size Conveyor Chain

**Plus α**  
Small Size Conveyor Chain

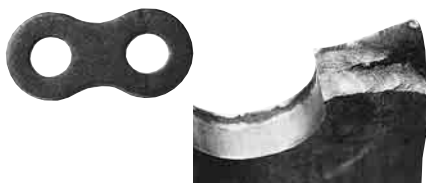
**High Precision**  
Conveyor Chain

2. Link Plates

Symptom	Possible Causes	Remedy
Breakage of link plate	Excessively large shock load.	Reduce shock loads by making start-up, stopping, and other actions smoother. Install a shock absorber. Increase the number of strands or the size of the chain.
	Vibration in the chain.	Install an anti-vibration device such as a tensioner or idler.
	Corrosion.	Replace with new chain. Install a casing to protect the chain. Periodically clean and lubricate 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 cause the chain to 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-pressure 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 repetitive loads. Increase the number of strands or the size of the chain.
	Repetitive load on attachments.	Reduce excessive loads. Increase the size of the chain to increase the allowable load of the attachments.
Deformation of link plate holes	Excessive load.	Replace with new chain. Remove the cause of the excessive load.
Corrosion stress cracks (bow-shaped cracks in the link plate)	The chain is being used in an acidic or alkaline environment (not caused by repetitive loads).	Replace with new chain. Install a casing to protect the chain from the environment. Consider a chain with a high resistance to corrosion stress crack.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

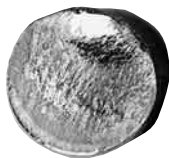
Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

### 3. Pins

Symptom	Possible Causes	Remedy
Breakage of pin	Excessively large shock load.	Reduce shock loads by making 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. Increase the number of strands or the size of the chain.
	Corrosion.	Install a casing to protect the chain. Periodically clean and lubricate the chain.



#### 1) Static Fracture

The type of fracture found when subjecting the chain to the breakage test. Occurs when the chain is subjected to a load greater than its breakage strength.




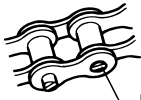
#### 2) Fatigue Fracture

Occurs when the pin is repetitively subjected to loads greater than its fatigue limit. Recheck 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. The 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.

### 4. Bushes/Rollers

Symptom	Possible Causes	Remedy
Roller and/or bush cracks (falls)	Inadequate lubrication.	Provide adequate lubrication according to the operating conditions. Replace with new chain.
Roller does not rotate, roller is corroded on one side	RS25, RS35	These are bushed chains and have no rollers.
	The inner link plate is moving inward, or the bush is cracked.	Replace with new chain. Re-inspect the installation and load conditions.
	Foreign particles have gotten between the bush and roller.	Periodically clean the chain. Install a casing to protect the chain.
	Excessive load on the rollers.	Reduce excessive loads. Increase the size of the chain.
	Particles of the conveyed material or other foreign particles have built up on the frame.	Periodic cleaning. Install a partition to protect the chain.
	Rust on the bush and rollers.	Select the appropriate specifications (materials).
	The inner plate is moving inward.	Replace with new chain. Re-inspect the installation and load conditions.
Roller is opening up	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.

Standard  
Small Size Conveyor Chain

Special  
Small Size Conveyor Chain

Lube Free  
Small Size Conveyor Chain

Corrosion Resistant  
Small Size Conveyor Chain

Plus α  
Small Size Conveyor Chain

High Precision  
Conveyor Chain

Engineering Manual



Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

## Free Flow Chain

**Free Flow Conveyor** — This is a conveyor system where the speed of conveyed objects can be freely controlled and stopped at any time and at any position for accumulation or for performing a job at a station without stopping the conveyor.

### Double Plus Chain



#### 2.5x Speed

This unique construction combining the use of small and large rollers allows high-speed transfer at 2.5 times the speed of the chain.

#### Low Noise

The lower chain speed allows accumulation with low noise.

#### Snap Cover Type

The snap cover prevents small parts from falling into the frame.

- Operating temperature range: -10°C to 60°C



- Operating temperature range: -10°C to 60°C

#### Steel Roller Type

Steel Roller type is capable of higher-load conveyance compared with plastic roller chain. It is operable at temperatures as high as 150°C and achieves quiet operation.

- Operating temperature range: -10°C to 150°C



### Applications

Double Plus Chain is intended for high-speed conveyance. The use of a special rail minimizes chain exposure and thus improves safety. This chain is widely used for assembly and inspection lines in a variety of business fields, such as the automobile and electronics industries.

### Center Roller Chain

#### Same Speed

The speed of the chain and conveyed objects is the same ratio of 1:1.

#### Stable Conveyance

Center Roller Chain allows stable conveyance, as its center of gravity is lower than that of Top Roller Chain and conveyed items are received on rollers on both sides.

#### Snap Cover Type

The snap cover prevents small parts from falling into the frame.

- Operating temperature range: -10°C to 60°C



- Operating temperature range: -10°C to 150°C

### Applications

Center Roller Chain is intended for low-speed conveyance. Steel Roller type is suitable for conveying heavier objects and can be used for conveyance in a furnace.

## Outboard Roller Chain

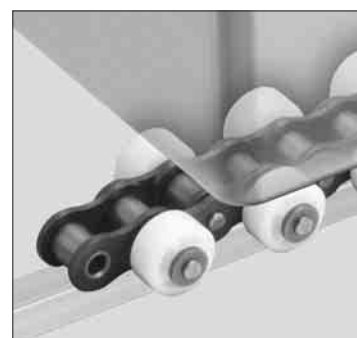
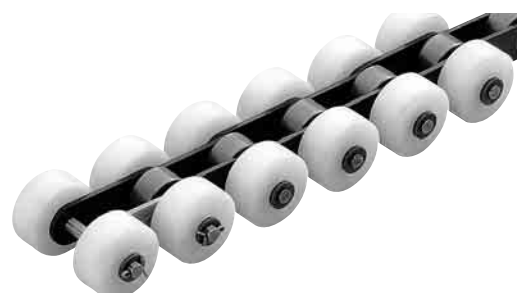
Outboard rollers allow for a more compact conveyor. With its many outboard rollers, this chain is suitable for conveyors on which small objects are placed directly on the conveyor.

### Double Pitch Chain Type

Chain with tab guide attachments (SG) is also available. (See page 132.)

### RS Chain Type

### Poly Steel Chain Type



## Applications

Outboard Roller Chain is used for low-speed conveyance of objects of various sizes in a wide range of business areas.

## Top Roller Chain

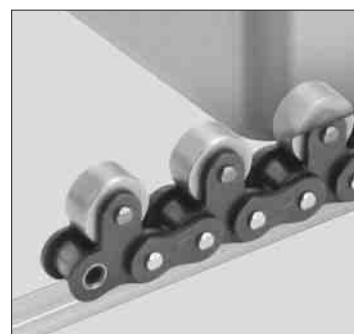
The width of the chain is smaller than that of other types of Free Flow Chain.

With top rollers supported by plates on both sides, this chain is suitable for use with rugged free-flow conveyors.

### Double Pitch Chain Type

### RS Chain Type

Double-strand Top Roller type and topple prevention attachment type (TG) are available. (See pages 140 and 142.)



## Applications

Top Roller Chain is used for low-speed conveyance and is widely adopted in the automobile industry. With its wide roller width, Double-Strand Top Roller Chain is suitable for conveying heavier objects directly placed on the conveyor.



Free Flow Chain Specifications

Double Plus Chain

High-Speed Transfer and Low Noise

VRP  
VR

(Page 113)



Double Plus Chain  
with Snap Cover

VRP-SC  
VR-SC

(Page 118)

Engineering Plastic



A  
Standard



B  
High Friction



C  
Electro-  
Conductive



D  
Electro-Conductive  
High Friction



UA, UB  
Urethane Lining



VR  
Steel

Prevents Small Parts from Falling into Frame  
(High-speed transfer and low noise)



Center Roller Chain

Same Speed and Stable Transfer

CR (Page 119)

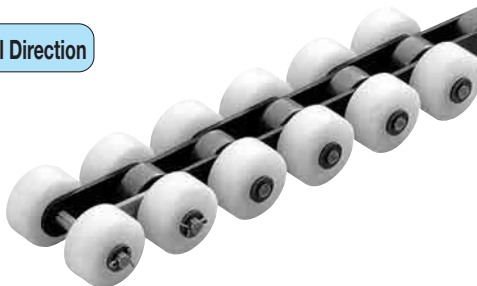


Outboard Roller Chain

Smallest Dimension in a Vertical Direction

SR

(Page 125)

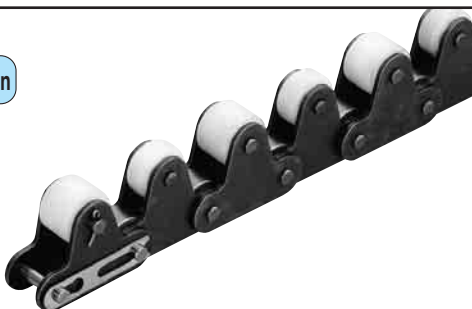


Top Roller Chain


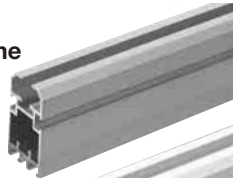
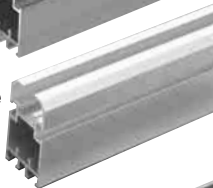





Smaller Chain Width in a Horizontal Direction

TR

(Page 135)





Base Chain*			Large Roller & Small Roller		Related Components	
Standard	Steel		<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>UA</div> <div>UB</div> <div>(Urethane lining)</div> <div>Steel</div> <div>(Work placed directly on conveyor)</div> <div>Available only for RF2030VRP.</div>		<div>Special Sprocket for Double Plus Chain</div> <div></div>	
Anti corrosive	Steel + Hard Chrome Plating	HCP	<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>UA</div> <div>UB</div> <div>(Urethane lining)</div> <div>Steel</div> <div>(Work placed directly on conveyor)</div> <div>Available only for RF2030VRP.</div>		<div>Aluminum Frame</div> <div></div>	
Anti corrosive	Stainless Steel	SS	<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>UA</div> <div>UB</div> <div>(Urethane lining)</div> <div>Steel</div> <div>(Work placed directly on conveyor)</div> <div>Available only for RF2030VRP.</div>		<div>Aluminum Frame with Steel Rail</div> <div></div>	
Lube free, low noise	Steel + Oil-impregnated bush	LMC	<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>UA</div> <div>UB</div> <div>(Urethane lining)</div> <div>Steel</div> <div>(Work placed directly on conveyor)</div> <div>Available only for RF2030VRP.</div>		<div>Aluminum Frame for Drive and Driven Sections</div> <div></div>	
Standard	Steel		<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>UA</div> <div>UB</div> <div>(Urethane lining)</div> <div>Steel</div> <div>(Work placed directly on conveyor)</div> <div>Available only for RF2030VRP.</div>		<div>Pallet Guide Rail &amp; Plastic Rail</div> <div></div>	
Anti corrosive	Steel + Hard Chrome Plating	HCP	<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>UA</div> <div>UB</div> <div>(Urethane lining)</div> <div>Steel</div> <div>(Work placed directly on conveyor)</div> <div>Available only for RF2030VRP.</div>		<div>Return Guide</div> <div></div>	
Anti corrosive	Stainless Steel	SS	<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>UA</div> <div>UB</div> <div>(Urethane lining)</div> <div>Steel</div> <div>(Work placed directly on conveyor)</div> <div>Available only for RF2030VRP.</div>		<div>Bracket</div> <div></div>	
Lube free, low noise	Steel + Oil-impregnated bush	LMC	<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>UA</div> <div>UB</div> <div>(Urethane lining)</div> <div>Steel</div> <div>(Work placed directly on conveyor)</div> <div>Available only for RF2030VRP.</div>		<div>Frame Joint</div> <div></div>	
Standard	Steel		<div>Steel</div>			
Note: Center Roller Chain with Snap Cover is also available.						

		Outboard Roller	
Standard	With steel or plastic R roller	<div> <div>Engineering Plastic</div> <div>Electro-Conductive Engineering Plastic (anti-static)</div> <div>Steel</div> <div>KV</div> </div>	<div> <div>Engineering Plastic</div> <div>Steel</div> <div>Lubrication required on steel outboard rollers.</div> </div>
Lube free, low noise	Steel + Oil-impregnated bush		
Lightweight, low noise	With stainless steel or engineering plastic roller		
Lightweight, lube free, low noise	Stainless steel + Engineering plastic inner link	<div> <div>Engineering Plastic</div> <div>Stainless Steel</div> <div>Engineering Plastic</div> </div>	<div> <div>Engineering Plastic</div> <div>Stainless Steel</div> <div>Engineering Plastic</div> </div>

		Top Roller	
Standard	Steel	<div> <div>Engineering Plastic</div> <div>Stainless Steel</div> <div>KV</div> </div>	<div> <div>Engineering Plastic</div> </div>
Lightweight, low noise	Steel + Plastic R roller		
Lube free, low noise	Steel + Oil-impregnated bush		
		<div> <div>KV</div> <div>Steel</div> <div>Lubrication required on steel top rollers.</div> </div>	

### \* Base Chain

Refers to the part of the chain, excluding the large rollers, small rollers, outboard rollers, and top rollers for the sake of explanation.

### Engineering Plastic Roller

Refers to a roller made of engineering plastic.

Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

Outboard Roller Chain

Top Roller Chain

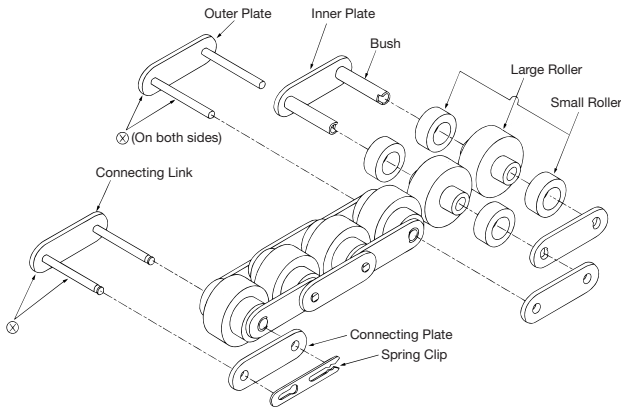
Special Sprockets

Engineering Manual



## Construction

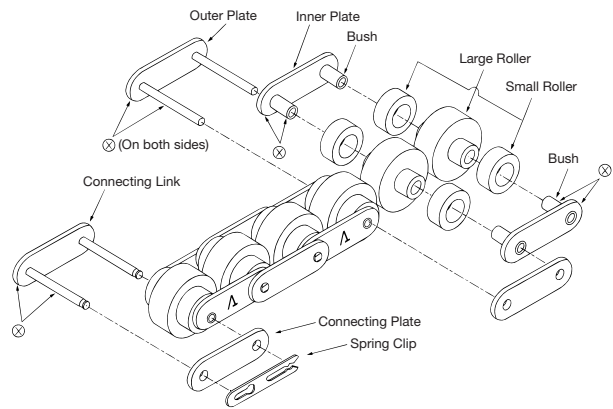
## ■ Standard Type, HCP Type, SS Type



Parts marked with ⊗ are press fit.  
Other parts are slip fit.

## ■ Lambda Type (Lube Free)

(Under patent application)

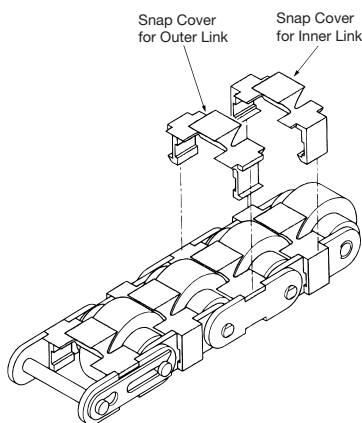


Parts marked with ⊗ are press fit.  
Other parts are slip fit.

- Uses a special oil-impregnated bush.
- The bush is press-fitted into the inner plate.
- The pin is treated with a special nickel plating.
- The inner and outer plates are treated with a black oxide finish.

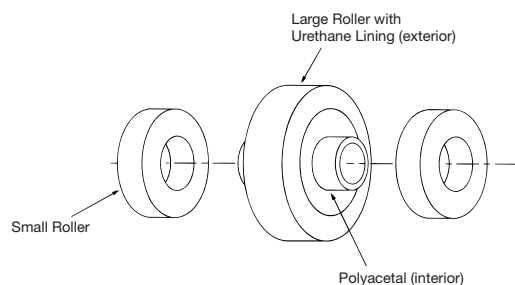
## ■ Double Plus Chain with Snap Cover

(Utility Model Registration No. 2548222)



Double Plus Chain with Snap Cover differs from the Double Plus Chain shown above only in terms of the shape of the plate on which the snap cover is installed. The snap cover is detachable. Double Plus Chain with Snap Cover is available in hard chrome plating, stainless steel, and Lambda types, as well as the standard type.

## ■ Urethane Lining Roller Type



## RF2030VRPUA, RF2030VRPUB

Differs from Double Plus Chain shown above only in the large roller.

## Combination of Base Chain and Roller

The proper combination of base chain (4 types) and roller (7 types) allows the optimum selection for your intended purpose (The mark ○ in the table below shows an allowable combination).

The same combination is also allowed for Double Plus Chain with Snap Cover.

Base Chain Type, Material, Application	Roller Series	Engineering Plastic Roller				Urethane Lining* <sup>1</sup>		Steel Roller
		VRPA Standard	VRPB High Friction	VRPC Electro-Conductive	VRPD Electro-Conductive, High Friction	VRPUA Standard	VRPUB High Friction	VR
Standard (Steel)		○	○	○	○	○	○	○
HCP (Hard Chrome Plating) Rust-inhibitive applications such as in clean rooms		○	○	○	○	○	○	
SS (304 Stainless Steel) Applications requiring non-magnetism and corrosion resistance* <sup>2</sup>		○	○	○	○	○	○	
Lambda (Lube Free) (Base chain is the same as the standard type) Applications where lubrication is not permitted or not preferable		○	○	○	○	○	○	

\*<sup>1</sup> Urethane lining is available only for RF2030VRP.

\*<sup>2</sup> Slight magnetism occurs due to plastic deformation during parts processing and assembly. For an application requiring complete non-magnetism, contact a Tsubakimoto representative for details.

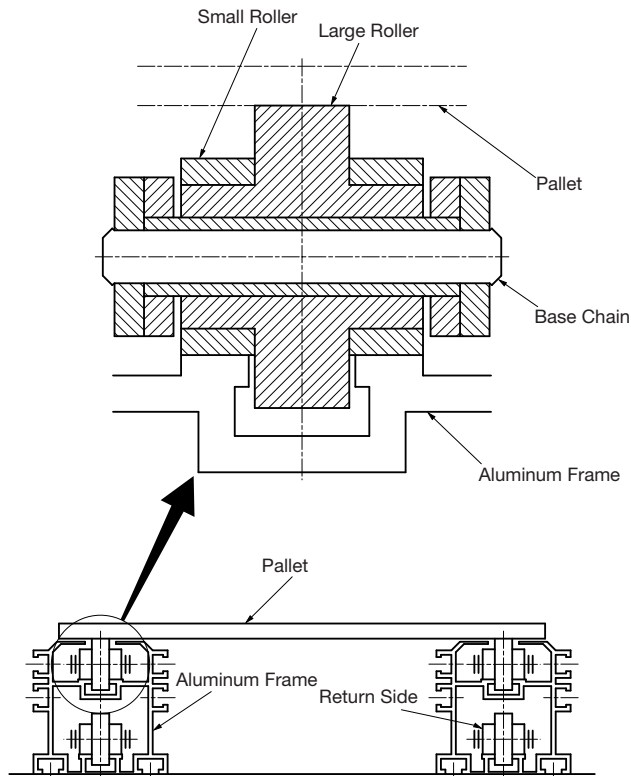
## Roller Classification by Use

Type	Roller		Classification	Lubrication	Environment
	Large Roller (Roller Color)	Small Roller (Roller Color)			
VRPA Standard	Standard (Brown)	Standard (Gray)	10 dB quieter than standard plastic outboard roller chain	No lubrication required. For long-term use, follow the Guidelines for Use on page 151.  Lambda type requires no lubrication.	Even if the base chain is HCP or SS type, the chain cannot be used in a place where it is exposed to water due to the use of engineering plastic rollers.
VRPB High Friction		High Friction (Off-White)	Rapid start-up Low noise		
VRPC Electro-Conductive	Conductive (Black)	Standard (Gray)	Volume resistivity $10^6 \Omega \cdot \text{cm}$		
VRPD Electro-Conductive, High Friction		High Friction (Off-White)	Volume resistivity $10^6 \Omega \cdot \text{cm}$ Rapid start-up Low noise		
VRPUA Standard	Urethane Lining (Off-White)	Standard (Gray)	Direct placement on conveyor		
VRPUB High Friction		High Friction (Off-White)	Direct placement on conveyor Rapid start-up Low noise		
VR	Steel	Steel	High load	Required	Not for use in a humid environment.



# Double Plus Chain

## Principle of 2.5 Times Free-Flow Speed



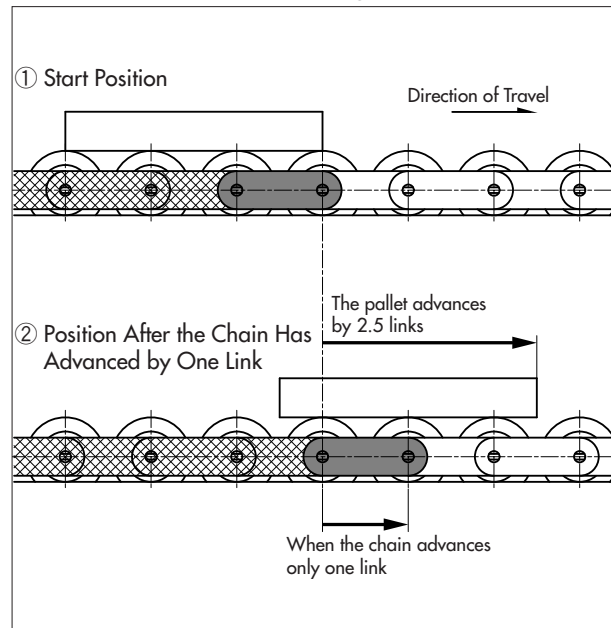
$$V = \left( \frac{R}{r} \right) \cdot \nu + \nu$$

$$V = \left( \frac{R}{r} + 1 \right) \cdot \nu$$

From the ratio of radii  $\left( \frac{R}{r} \right) \approx 1.5$

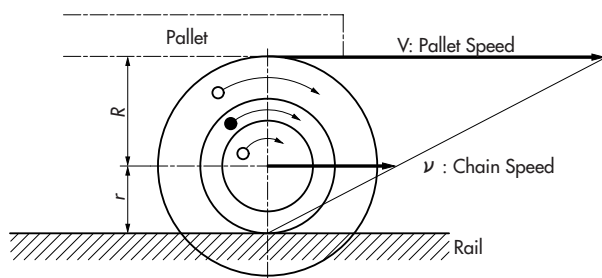
$$V \approx (1.5 + 1) \cdot \nu \approx 2.5 \nu$$

### Position of Chain and Pallet During Conveyance



### 1. Conveyance

Friction between the large roller (○) and the small roller (●) causes the rollers to rotate together. The difference in the diameters of the rollers causes the speed of the conveyed object to be 2.5 times that of the chain.



Chain speed:  $\nu$       Radius of the small roller:  $r$   
Pallet speed:  $V$       Radius of the large roller:  $R$

When the chain runs at speed  $\nu$ , the peripheral speed on the circumference of the small roller (rolling speed on the rail running face) becomes " $\nu$ ".

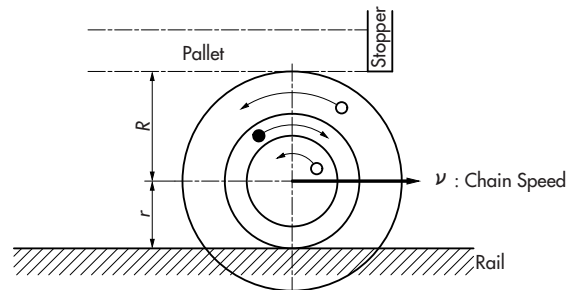
Since the large and small rollers now rotate at the same angular speed, the peripheral speed on the circumference of the large roller is calculated as below, based on the ratio of the radii:

$$\left( \frac{R}{r} \right) \cdot \nu$$

Consequently, the conveying speed  $V$  is the sum of the peripheral speed  $\left( \frac{R}{r} \right) \cdot \nu$  and the chain speed  $\nu$ .

### 2. Accumulation

With a braking force applied to the large roller, a slip occurs between the large (○) and small (●) rollers so as to allow free-flow conveyance.



## How to Order

In placing an order for Double Plus and Center Roller Chains, please specify the chain length as well as the chain size and type.

### 1. Model Identification

In placing an order for a chain, connecting link, or offset link, please specify the product code and chain number to avoid any error. Refer to the information on dimensions for the product code and chain number.

### 2. Information When Placing a Chain Order

- 1) If the number of links on the overall chain is even, the link on one end of the chain will be a connecting link and the link on the other will be an inner link.
- 2) If the number of links on the overall chain is odd, please specify the link type on both ends of the chain as per below.
  - (1) Inner links on both ends
  - (2) Connecting links on both ends
  - (3) Outer links on both ends
  - (4) Connecting link on one end and offset link on the other

### 3. Note for Placing an Order for Peripheral Components

The aluminum frame and pallet guide are offered in standard lengths.

Please use caution when placing an order for the middle-section frame, since the standard length of the middle-section frame differs with size.

Plastic rails are not supplied with the pallet guide rail. Place an order for the plastic rail and pallet guide rail separately by specifying the required number.

## Max. Allowable Tension

### Max. Allowable Tension --- Engineering Plastic Roller Series

		Max. Allowable Load kN {kgf}		Operating Temperature Range °C
Tsubaki Chain No.	Roller Type Base Chain Type	A, C, UA* Type	B, D, UB* Type	
RF2030VRP	Standard	0.55{56}	0.27{28}	-10 to 60
RF2030VRP-SC	Lambda			
	HCP			
	SS	0.27{28}		
RF2040VRP	Standard	0.88{90}	0.44{45}	
RF2040VRP-SC	Lambda			
	HCP			
	SS	0.44{45}		
RF2050VRP	Standard	1.37{140}	0.69{70}	
RF2050VRP-SC	Lambda			
	HCP			
	SS	0.69{70}		
RF2060VRP	Standard	2.06{210}	1.03{105}	
RF2060VRP-SC	Lambda			
	HCP			
	SS	1.03{105}		
RF2080VRP	Standard	5.30{540}	2.65{270}	
RF2080VRP-SC	Lambda			
	HCP			
	SS	2.65{270}		

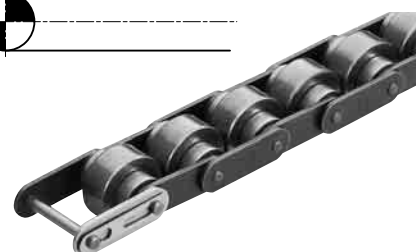
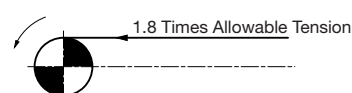
\* Urethane lining is available only for RF2030VRP.

### Max. Allowable Tension --- Steel Roller Series

Tsubaki Chain No.	Max. Allowable Load kN {kgf}	Operating Temperature Range °C
RF2030VR	0.98{100}	-10 to 150 For use at temperatures of 60°C or more, lubricate chain with high-temperature lubricant.
RF2040VR	1.57{160}	
RF2050VR	2.45{250}	
RF2060VR	3.73{380}	
RF2080VR	5.30{540}	

## Steel Roller Series

- 1) The steel roller series is capable of conveying heavier loads compared with the engineering plastic roller series. It has twice the allowable load and 1.8 times the allowable tension.
- 2) Max. operating temperature is 150°C. Use lubricant appropriate for the operating temperature.
- 3) Operating noise is about 10 dB lower compared with that of steel outboard roller chain and steel top roller chain, because the chain speed is 1/2.5 times the conveying speed.



## Special Sprockets for Double Plus Chain

When using Double Plus Chain, there is a need to use dedicated sprockets. Refer to page 143 for the dimensions.



Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

# Double Plus Chain



Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

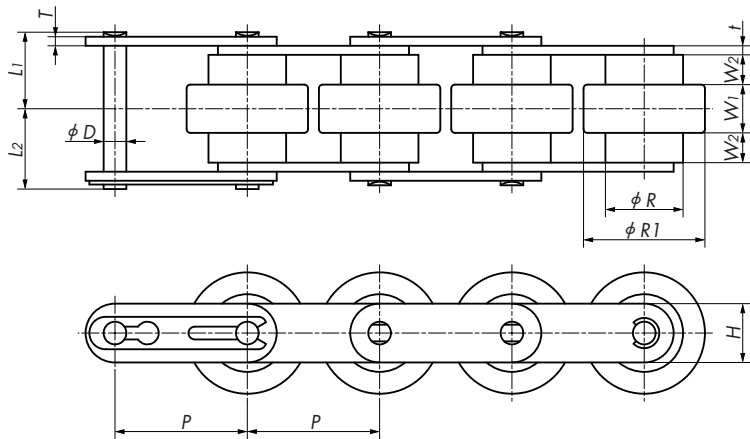
Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

## Base Chain



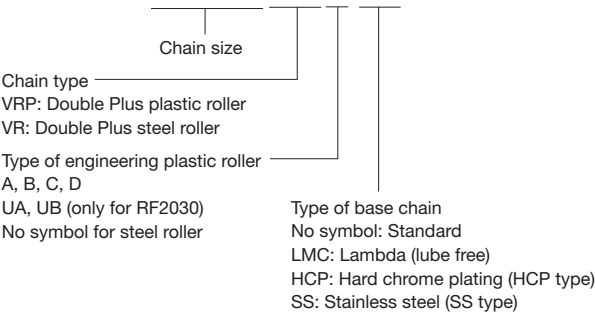
- RF2030VRP-LMC connecting links use a cotter pin.
- RF2080VRP connecting links use a cotter pin.
- Lambda bushes are not notched.

Tsubaki Chain No.		Pitch <i>P</i>	Roller		Width		Plate			Pin			Approx. Mass kg/m		No. of Links per Unit
Plastic Roller	Steel Roller		<i>R</i>	<i>R1</i>	<i>W1</i>	<i>W2</i>	<i>t</i>	<i>T</i>	<i>H</i>	<i>D</i>	<i>L1</i>	<i>L2</i>	Plastic Roller	Steel Roller	
RF2030VRP	RF2030VR	19.05	11.91	18.3	8.0	4.0	1.5	1.5	9.0	3.59 (3.00)	12.05	13.25	0.6	1.4	160
RF2040VRP	RF2040VR	25.40	15.88	24.6	10.3	5.7	2.0	1.5	12.0	3.97	15.8	17.0	1.0	2.5	120
RF2050VRP	RF2050VR	31.75	19.05	30.6	13.0	7.1	2.4	2.0	15.0	5.09	19.55	21.25	1.4	3.7	96
RF2060VRP	RF2060VR	38.10	22.23	36.6	15.5	8.5	3.2	3.2	17.2	5.96	24.5	26.4	2.0	5.6	80
RF2080VRP	RF2080VR	50.80	28.58	48.0	20.0	15.0	4.0	4.0	23.0	7.94	35.8	38.0	3.9	—	60

The figure inside ( ) is for RF2030VRP-LMC.

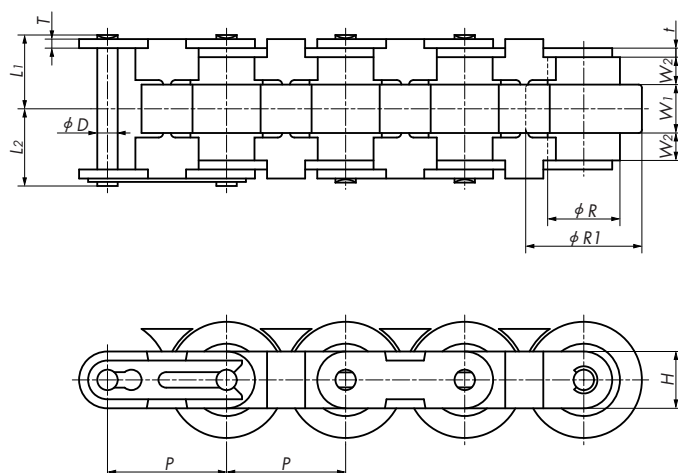
## Chain Numbering

**RF2040VRPA-SS**





## Base Chain (with Snap Cover)



(Utility model registration No. 2548222)



The snap cover prevents small parts from falling into the frame.

- RF2080VRP connecting links use a cotter pin.
- Lambda bushes are not notched.
- The base chain is for dedicated use with snap covers.
- Snap covers cannot be attached onto Double Plus Chain shown on the left page.
- An offset link with a snap cover is not available.

Tsubaki Chain No.		Pitch <i>P</i>	Roller		Width		Plate			Pin			Approx. Mass kg/m		No. of Links per Unit
Engineering Plastic Roller	Steel Roller		<i>R</i>	<i>R1</i>	<i>W1</i>	<i>W2</i>	<i>t</i>	<i>T</i>	<i>H</i>	<i>D</i>	<i>L1</i>	<i>L2</i>	Plastic Roller	Steel Roller	
RF2030VRP-SC	RF2030VR-SC	19.05	11.91	18.3	8.0	4.0	1.5	1.5	9.0	3.59 (3.00)	12.05	13.25	0.6	1.4	160
RF2040VRP-SC	RF2040VR-SC	25.40	15.88	24.6	10.3	5.7	2.0	1.5	12.0	3.97	15.8	17.0	1.0	2.5	120
RF2050VRP-SC	RF2050VR-SC	31.75	19.05	30.6	13.0	7.1	2.4	2.0	15.0	5.09	19.55	21.25	1.4	3.7	96
RF2060VRP-SC	RF2060VR-SC	38.10	22.23	36.6	15.5	8.5	3.2	3.2	17.2	5.96	24.5	26.4	2.0	5.2	80
RF2080VRP-SC	RF2080VR-SC	50.80	28.58	48.0	20.0	15.0	4.0	4.0	23.0	7.94	35.8	38.0	3.9	—	60

The figure inside ( ) is for RF2030VRP-LMC. The snap cover is made of engineering plastic and is light gray in color.

## Chain Numbering

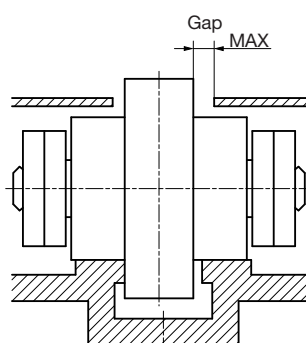
### RF2040VRPA-LMC-SC

Chain size	With Snap Cover
Chain type	
VRP: Double Plus plastic roller	
VR: Double Plus steel roller	
Type of engineering plastic roller	
A, B, C, D	
UA, UB (only for RF2030)	
No symbol for steel roller	
Type of base chain	
No symbol: Standard	
LMC: Lambda (lube free)	
HCP: Hard chrome plating (HCP type)	
SS: Stainless steel (SS type)	

## Gap Between Frame and Snap Cover

Snap covers minimize the gap between the aluminum frame and large rollers and prevent small parts from falling into the frame.

Note: Check for the potential of small parts to fall and get jammed under actual conditions in advance.



Tsubaki Chain No.	Max. Gap
RF2030	1.5
RF2040	2.2
RF2050	2.5
RF2060	3.5
RF2080	4.7

# Center Roller Chain



Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

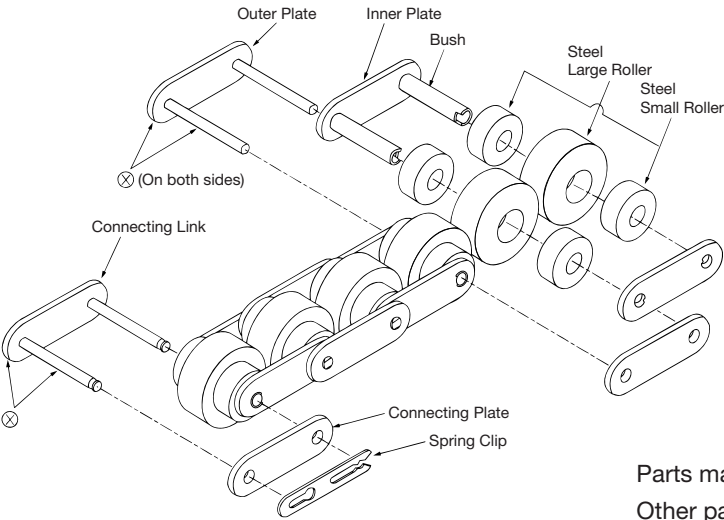
Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

## Construction & Features



Parts marked with ⊗ are press fit.  
Other parts are slip fit.

### Same Speed

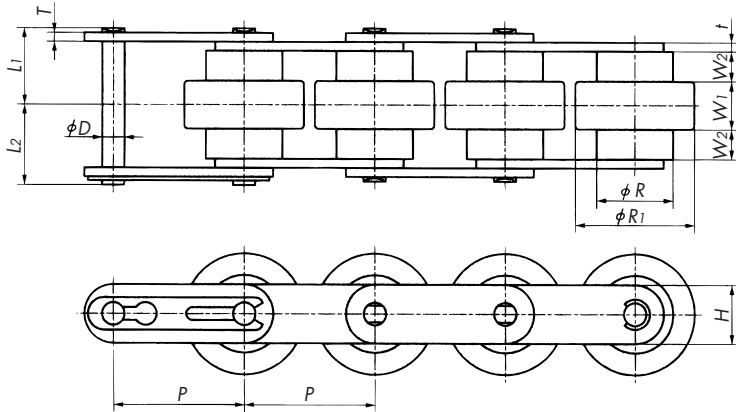
The speed of the chain and conveyed objects is the same ratio of 1:1.

### Stable Conveyance

Center Roller Chain allows stable conveyance, as its center of gravity is lower than that of Top Roller Chain and conveyed items are received on rollers on both sides.

The aluminum frame of Double Plus Chain can be used with Center Roller Chain.  
Steel type: Aluminum frame with steel rail.

### Base Chain



• RF2080CR connecting link is a cotter pin type.

Tsubaki Chain No.	Pitch P	Roller		Width		Plate			Pin			Approx. Mass kg/m	No. of Links per Unit
		R	R <sub>1</sub>	W <sub>1</sub>	W <sub>2</sub>	t	T	H	D	L <sub>1</sub>	L <sub>2</sub>		
RF2040CR	25.40	15.88	24.6	10.3	5.7	2.0	1.5	12.0	3.97	15.8	17.0	2.5	120
RF2050CR	31.75	19.05	30.6	13.0	7.1	2.4	2.0	15.0	5.09	19.55	21.25	3.7	96
RF2060CR	38.10	22.23	36.6	15.5	8.5	3.2	3.2	17.2	5.96	24.5	26.4	5.6	80
RF2080CR	50.80	28.58	48.0	20.0	15.0	4.0	4.0	23.0	7.94	35.8	38.0	8.6	60

## Chain Numbering

### RF2040CR

Chain size — Center roller  
Roller material: CR steel

• Center Roller Chain with snap cover is also available. • Use sprockets dedicated for Double Plus Chain.

# Accessories for Double Plus Chain

## Frames

### 1. Aluminum Frame

This is a frame for Double Plus Chain using engineering plastic for the rollers (including the type with snap covers).

### 2. Aluminum Frame with Steel Rail

Steel rails are laid on the small roller area on the conveying side of the aluminum frame. (See the dimensional drawing.)

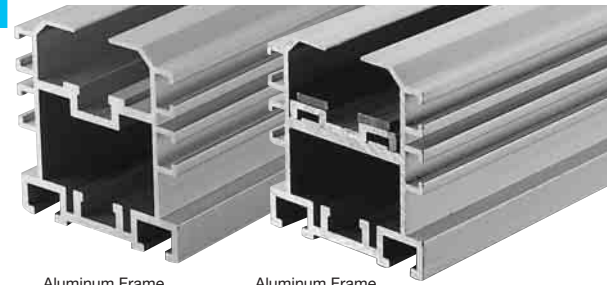
This aluminum frame can be used with all Double Plus Chains (including snap cover types) and Center Roller Chains.

### 3. Frame Dedicated for Drive and Driven Sections

The frame is provided with a notch on the end face for receiving the return-side section of the chain.

Standard length: 1 m (for all sizes)

Aluminum frames and aluminum frames with steel rails are available.



Aluminum Frame

Aluminum Frame with Steel Rail

Aluminum Frame for Drive and Driven Sections



## Pallet Guide Rails

- 1) This rail is installed on the side of the aluminum frame to guide the pallet.
- 2) The pallet guide rail is available for the middle section, and drive and driven sections.



## Plastic Rails

- 1) The plastic rail is installed on the pallet guide rail for smooth pallet sliding.
- 2) The plastic rail is available for the middle section, and drive and driven sections.



## Return Guides

The return guide guides the Double Plus Chain on the return side at both ends of the aluminum frame.



## Brackets

The bracket is a fitting for attaching the return guide.

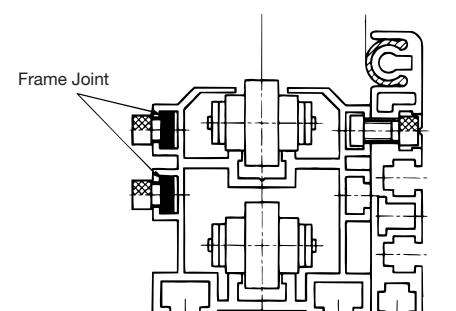
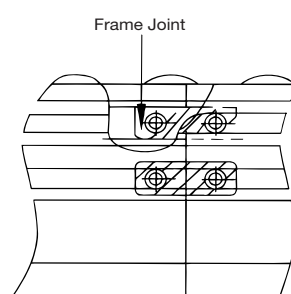
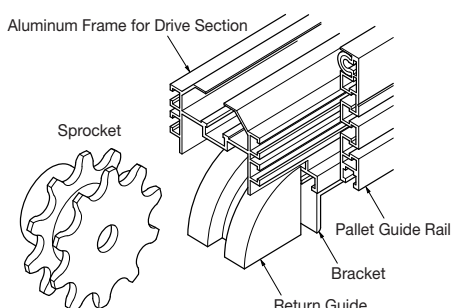


## Frame Joints

The frame joint is a nut-type part for connecting frames.



## Examples of Use



Double Plus Chain

Center Roller Chain

Accessories for  
Double Plus Chain

Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

# Accessories for Double Plus Chain

## ■ Frames for the Middle Section

### Aluminum Frame (for chains with engineering plastic rollers)

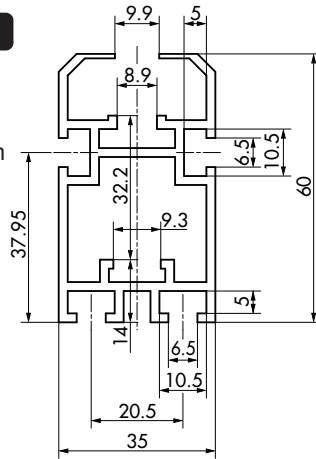
Material: Aluminum

#### Frame No.

#### RF2030VRP-R3

Standard length: 3 m

Approx. mass: 1.4 kg/m



### Aluminum Frame with Steel Rail

Material: Main body = Aluminum

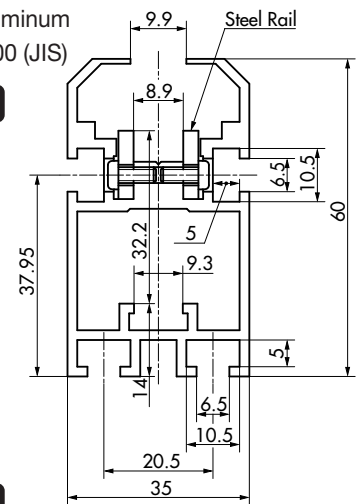
Steel rail = SS400 (JIS)

#### Frame No.

#### RF2030VRP-R3S

Standard length: 3 m

Approx. mass: 2.2 kg/m

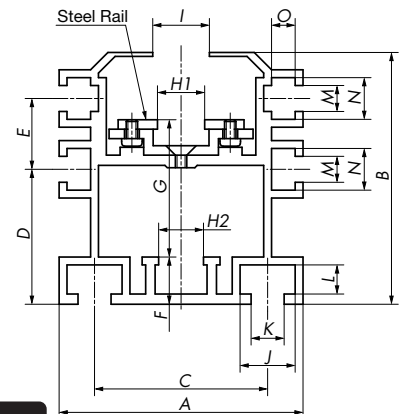


#### Frame No.

#### RF2040 · RF2050 · RF2060VRP-R4S

Standard length: 4 m

Dimensions and approx. mass: See table below

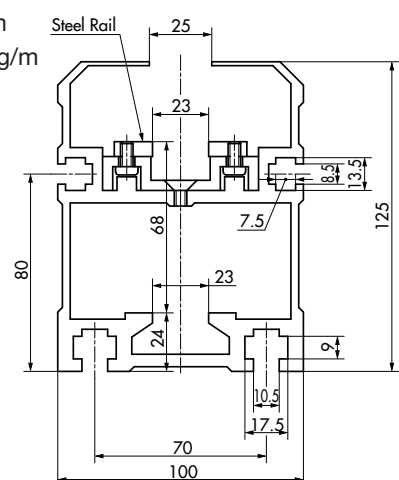


#### Frame No.

#### RF2080VRP-R3S

Standard length: 3 m

Approx. mass: 9.9 kg/m

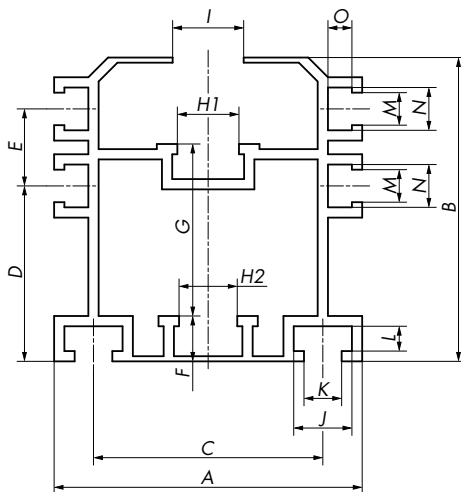


#### Frame No.

#### RF2040 · RF2050 · RF2060VRP-R4

Standard length: 4 m

Dimensions and approx. mass: See table below



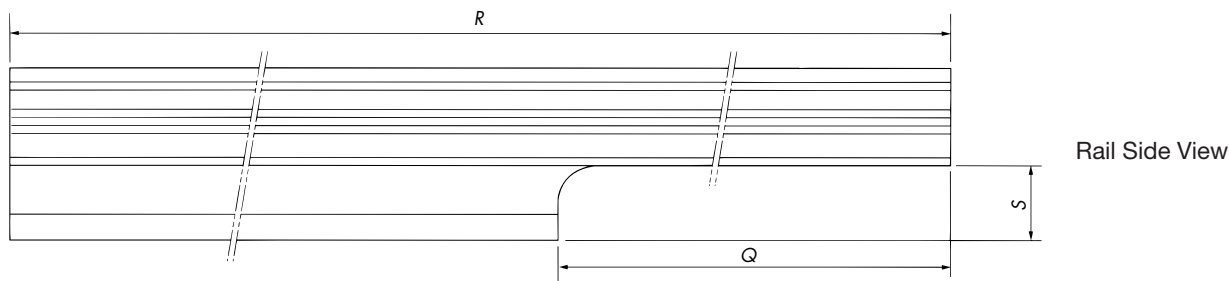
Note: Refer to page 150 for the attachment position of steel rails for aluminum frames with steel rails.

Aluminum Frame No.		A	B	C	D	E	F	G	H <sub>1</sub>	H <sub>2</sub>	I	J	K	L	M	N	O	Approx. Mass kg/m	
Aluminum Frame	With Steel Rail																	Aluminum Frame	With Steel Rail
RF2040VRP-R4	RF2040VRP-R4S	63	66	44.5	35.25	18.5	13	34.9	11.4	12	13.5	13.5	8.5	7.5	6.5	10.5	5	2.6	3.7
RF2050VRP-R4	RF2050VRP-R4S	78	80	55.5	41.75	23.0	15	43.0	14.3	15	16.5	17.5	10.5	9	8.5	13.5	7.5	3.6	5.0
RF2060VRP-R4	RF2060VRP-R4S	95	91	72.5	51.25	23.5	15	50.5	17.2	18	19.5	17.5	10.5	9	8.5	13.5	7.5	4.2	5.9

Delivery: Please contact a Tsubakimoto representative.

## ■ Frames for Drive and Driven Sections

- The cross-sectional shape, dimensions, and material of these frames are the same as those of frames for the middle section.
- The dimension Q is different in frames for drive and driven sections.
- Refer to page 150 for the attachment position of steel rails for aluminum frames with steel rails.



Drive and Driven Section Frame No.				Q		R (Standard Length)	S	Approx. Mass kg/m	
Aluminum Frame No.		Steel Rail Frame No.		For Drive Section	For Driven Section			Aluminum Frame	With Steel Rail
For Drive Section	For Driven Section	For Drive Section	For Driven Section						
RF2030VRP-R1K	RF2030VRP-R1J	RF2030VRP-R1SK	RF2030VRP-R1SJ	210	80	1m	25	1.3	2.1
RF2040VRP-R1K	RF2040VRP-R1J	RF2040VRP-R1SK	RF2040VRP-R1SJ	300	100	1m	25	2.4	3.5
RF2050VRP-R1K	RF2050VRP-R1J	RF2050VRP-R1SK	RF2050VRP-R1SJ	340	120	1m	30	3.4	4.8
RF2060VRP-R1K	RF2060VRP-R1J	RF2060VRP-R1SK	RF2060VRP-R1SJ	430	130	1m	40	4.0	5.7
—	—	RF2080VRP-R1SK	RF2080VRP-R1SJ	550	200	1m	60	—	9.5

Delivery: Please contact a Tsubakimoto representative.

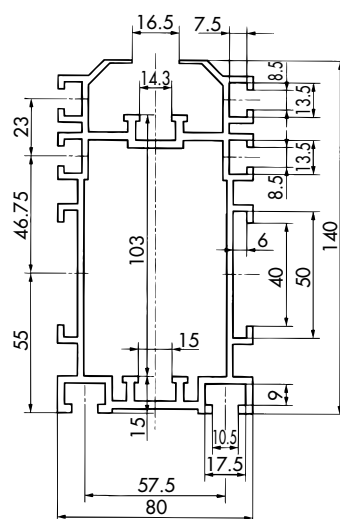
## ■ Other Aluminum Frames (for the Middle Section)

### Aluminum Frame

Frame No.

**RF2050VRP-R3H**

Material: Aluminum  
Standard length: 3 m  
Approx. mass: 5 kg/m

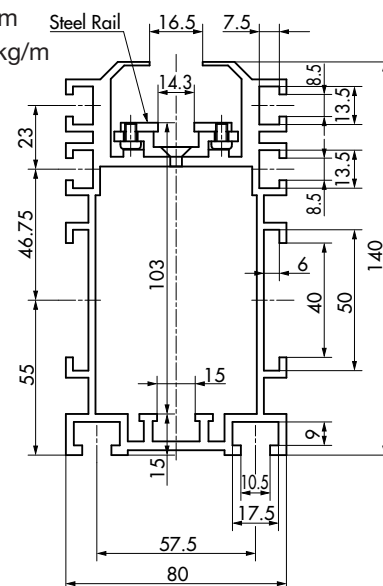


### Aluminum Frame with Steel Rail

Frame No.

**RF2050VRP-R3HS**

Material: Main body = Aluminum  
Steel rail = SS400 (JIS)  
Standard length: 3 m  
Approx. mass: 6.3 kg/m



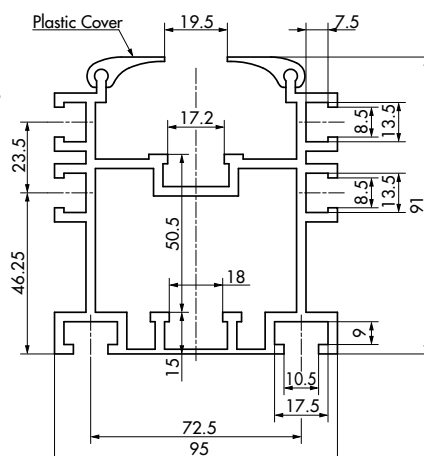
### Aluminum Frame with Plastic Cover

Frame No.

**RF2060VRP-R4C**  
**RF2060VRP-PCOVER**

Note: R4C does not include plastic cover. Place order for plastic cover separately.

Material: Main body = Aluminum  
Standard length: 4 m  
Approx. mass: 4 kg/m



Delivery: Please contact a Tsubakimoto representative.

# Accessories for Double Plus Chain



## ■ Pallet Guide Rails

## ■ Plastic Rails

Plastic Rail

Pallet Guide Rail

### Guide Rail No.

#### RF2040VRP-PGR

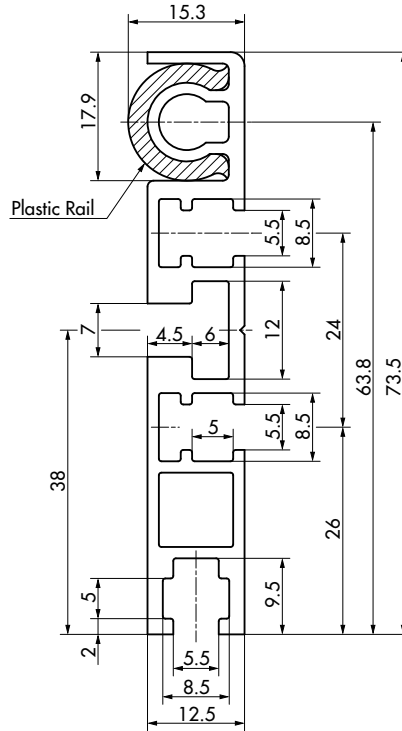
Applicable chain size

Pallet guide rail: PGR

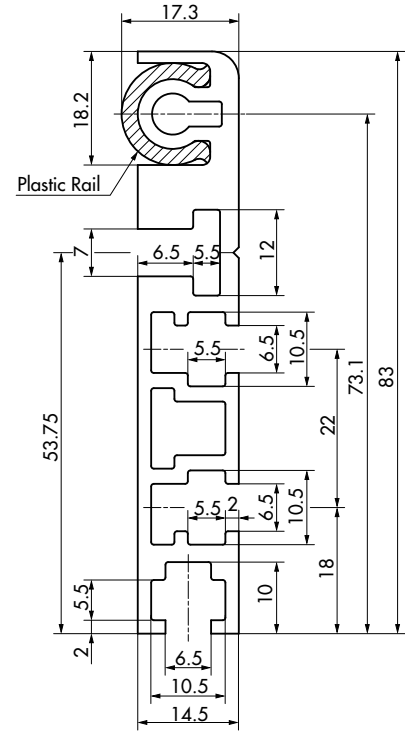
Plastic rail: PR

For middle section: 3 or 4 (Standard length: 3 m or 4 m)  
 RF2030VRP, RF2080VRP = 3  
 RF2040VRP – RF2060VRP = 4  
 For drive and driven sections: 1 (Standard length 1 m)

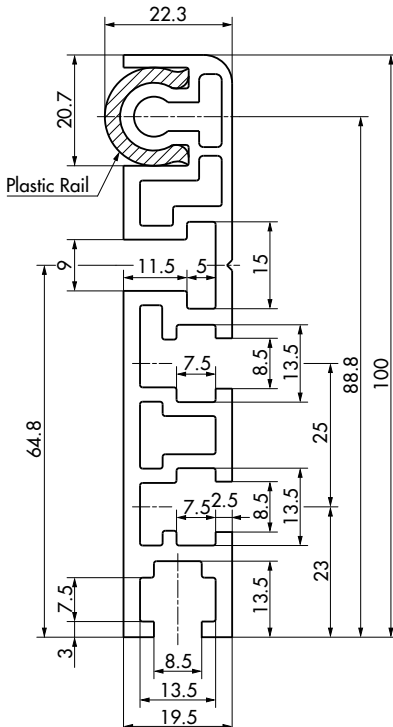
#### ● RF2030VRP



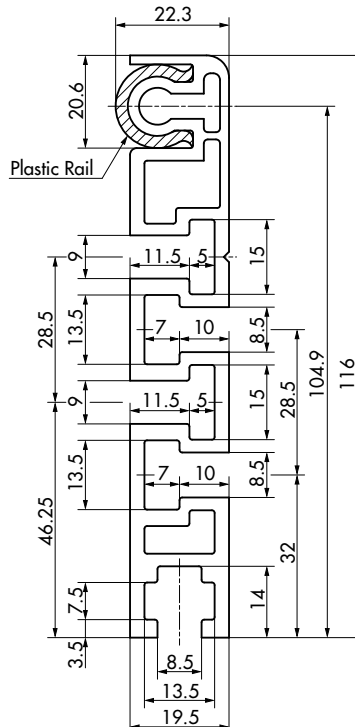
#### ● RF2040VRP



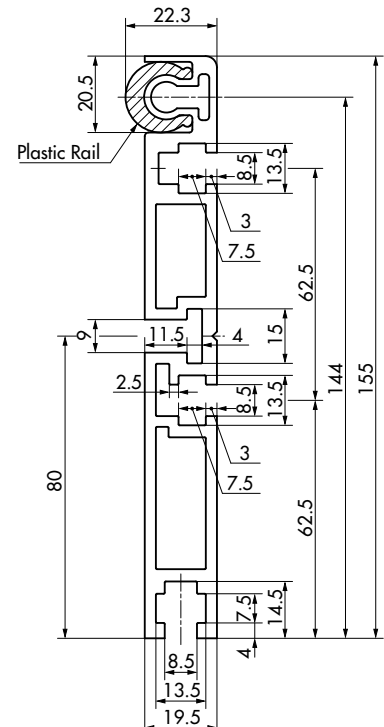
#### RF2050VRP\*



#### RF2060VRP\*



#### RF2080VRP\*



\* The plastic rail is commonly used for all models.





Double Plus Chain

Center Roller Chain

Accessories for  
Double Plus Chain

Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

Pallet Guide Rail No.		Standard Length		Approx. Mass kg/m	Material
Middle Section No.	Drive and Driven Section No.	For Middle Section	For Drive and Driven Sections		
RF2030VRP-PGR3	RF2030VRP-PGR1	3m	1m	0.9	Aluminum
RF2040VRP-PGR4	RF2040VRP-PGR1	4m	1m	1.5	
RF2050VRP-PGR4	RF2050VRP-PGR1	4m	1m	2.2	
RF2060VRP-PGR4	RF2060VRP-PGR1	4m	1m	2.5	
RF2080VRP-PGR3	RF2080VRP-PGR1	3m	1m	3.5	

Pallet Guide Rail No.		Standard Length		Material
Middle Section No.	Drive and Driven Section No.	For Middle Section	For Drive and Driven Sections	
RF2030VRP-PR3	RF2030VRP-PR1	3m	1m	Ultra-high molecular weight polyethylene
RF2040VRP-PR4	RF2040VRP-PR1	4m	1m	
RF2050VRP-PR4	RF2050VRP-PR1	4m	1m	
RF2060VRP-PR4	RF2060VRP-PR1	4m	1m	
RF2080VRP-PR3	RF2080VRP-PR1	3m	1m	

Delivery: Please contact a Tsubakimoto representative.

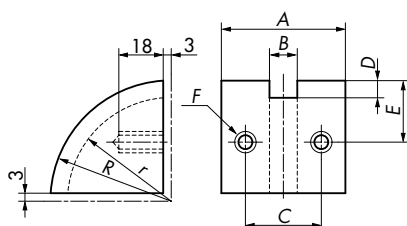
Note: Plastic rails are not supplied with a pallet guide rail. The rail for the middle section and the rail for the drive and driven sections are different only in their standard length.

## Return Guides

### For Double Plus Chain

(Return guides for RF2030 and RF2040 can also be used for Double Plus Chain with snap cover.)

Can also be used with Center Roller Chain.

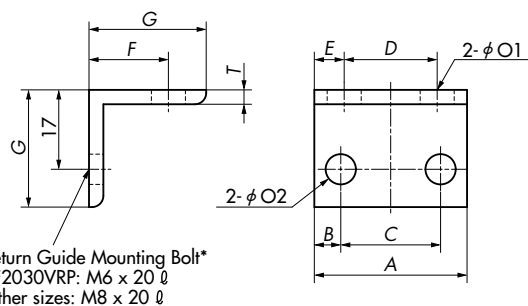


Return Guide No.	A	B	C	D	E	F	r	R	Applicable Chain
RF2030VRP-RG	34	9	22	6	31	M6	54	60	Double Plus Chain and Double Plus Chain with snap cover
RF2040VRP-RG	50	12	30	8	30	M8	52	60	
RF2050VRP-RG	56	15	35	10	32	M8	50	60	Double Plus Chain
RF2060VRP-RG	60	18	39	12.5	32	M8	47.5	60	
RF2080VRP-RG	70	23	45	15	41	M8	65	80	

Material: Ultra-high molecular weight polyethylene.

Delivery: Please contact a Tsubakimoto representative.

## Brackets

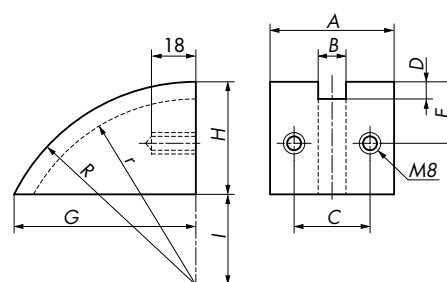


Return Guide No.	A	B	C	D	E	F	G	T	O1	O2
RF2030VRP-GB	34	6	22	20.5	6.7	18	25	3	6.5	6.5
RF2040VRP-GB	60	15	30	44.5	7.7	20	30	3	8.5	8.5
RF2050VRP-GB	76	20.5	35	55.5	10.2	24	35	4	10.5	8.5
RF2060VRP-GB	94	27.5	39	72.5	10.7	24	35	4	10.5	8.5
RF2080VRP-GB	100	27.5	45	70	15	24	35	4	10.5	8.5

\* The mounting bolt is not supplied with the bracket.

Material: Aluminum. Delivery: Please contact a Tsubakimoto representative.

### For Double Plus Chain with Snap Cover



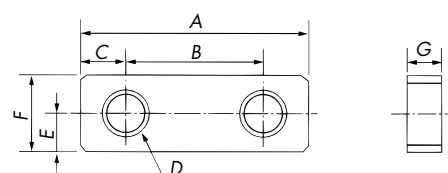
Return Guide No.	A	B	C	D	E	G	H	I	r	R
RF2050VRP-RG-SC	56	15	35	10	32	90.3	57	43	90	100
RF2060VRP-RG-SC	60	18	39	12.5	32	90.3	57	43	87.5	100
RF2080VRP-RG-SC	70	23	45	15	41	139.6	77	88	150	165

Note: The return guides for RF2030 and RF2040 can also be used as the return guides for Double Plus Chain.

Material: Ultra-high molecular weight polyethylene

Delivery: Please contact a Tsubakimoto representative.

## Frame Joints



Frame Joint No.	A	B	C	D	E	F	G
RF2030VRP-FJ	40	24	8	M6	5	10	5
RF2040VRP-FJ	40	24	8	M6	5	10	5
RF2050VRP-FJ	40	24	8	M8	6.5	13	6
RF2060VRP-FJ	40	24	8	M8	6.5	13	6
RF2080VRP-FJ	40	24	8	M8	6.5	13	6

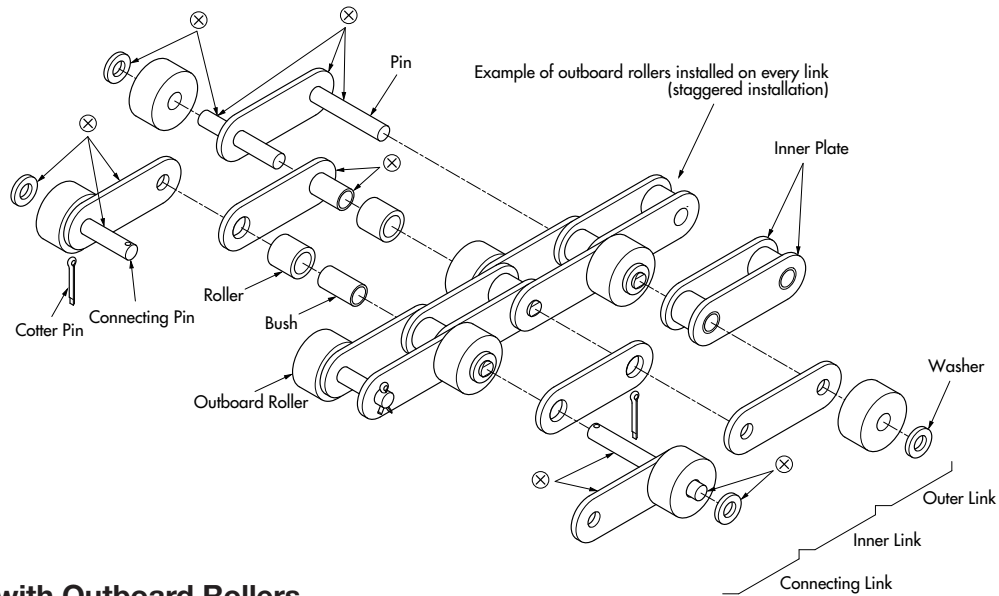
Material: Stainless steel. Delivery: Please contact a Tsubakimoto representative.

# Outboard Roller Chain

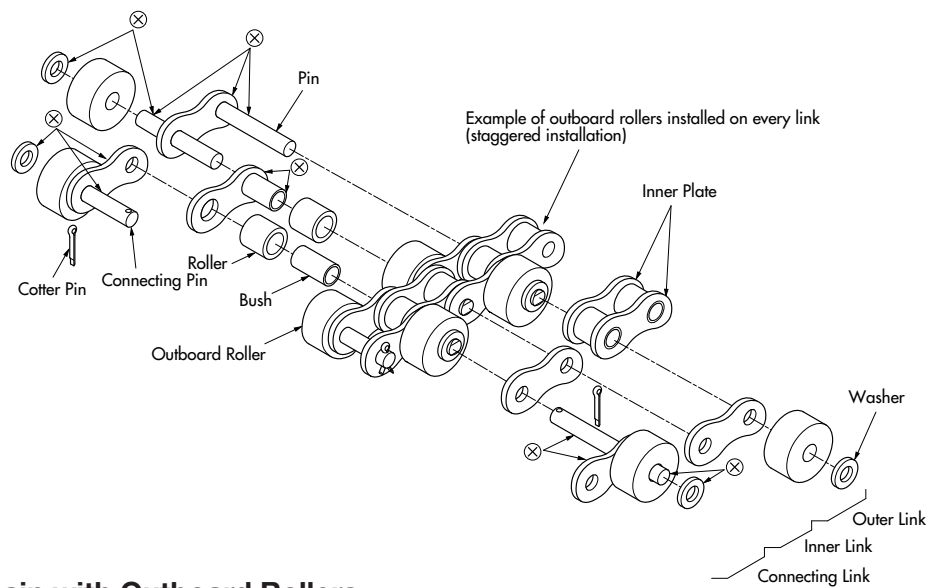
Outboard Roller Chain is a Free Flow Chain on which the pins of a Double Pitch or RS Chain are extended, and free-running outboard rollers are installed on the extended pins.

## Construction

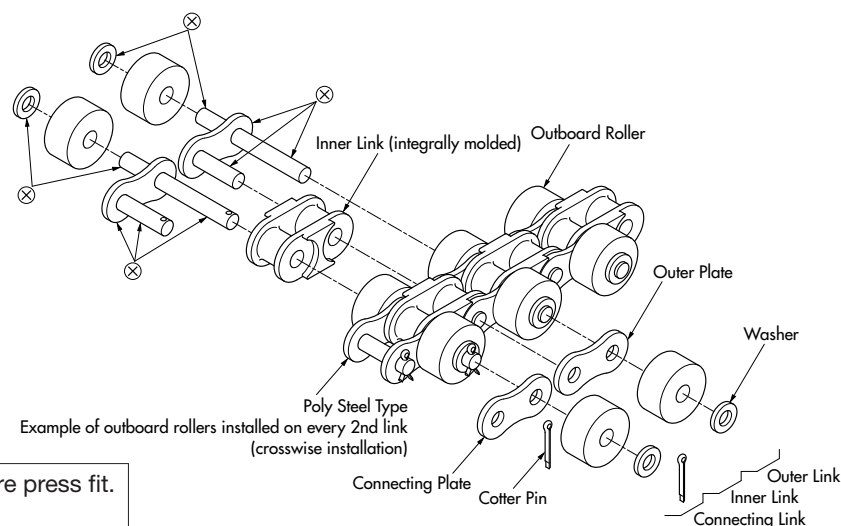
### Double Pitch Chain with Outboard Rollers



### RS Chain with Outboard Rollers



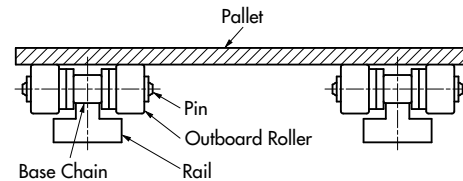
### Poly Steel Chain with Outboard Rollers



Parts marked with (X) are press fit.  
Other parts are slip fit.

## Features

- 1) Outboard rollers allow for a compact conveyor, while the ability to flex backwards allows easy layout on the return side.
- 2) Since numerous rollers can be installed, Outboard Roller Chain is suitable for conveyors on which small objects are placed directly.



## Product Types

Base Chain Type	Base Chain Roller	Type of Plastic Outboard Roller			Type of Plastic Outboard Roller with Brake		Type of Steel Outboard Roller		Max. Allowable Tension Unit: kN {kgf}
		Plastic Roller	Conductive Roller	KV Roller	Plastic Roller with Brake	Electro-Conductive Roller with Spring Brake	Steel Roller	Stainless Steel Roller	
Standard	Double Pitch	Steel	RF2040S-SRP	RF2040S-SRPE	—	RF2040S-SRPB	RF2040S-SRPBE	RF2040S-SR	2.65{270}
			RF2050S-SRP	RF2050S-SRPE	—	RF2050S-SRPB	RF2050S-SRPBE	RF2050S-SR	4.31{440}
			RF2060S-SRP	RF2060S-SRPE	—	RF2060S-SRPB	RF2060S-SRPBE	RF2060S-SR	6.28{640}
		Engineering Plastic	RF2080S-SRP	—	—	—	—	RF2080S-SR	10.7{1090}
			RF2100S-SRP	—	—	—	—	RF2100S-SR	17.1{1740}
			RF2040R-SRP	RF2040R-SRPE	—	RF2040R-SRPB	RF2040R-SRPBE	RF2040R-SR	2.65{270}
		RS	RF2050R-SRP	RF2050R-SRPE	—	RF2050R-SRPB	RF2050R-SRPBE	RF2050R-SR	4.31{440}
			RF2060R-SRP	RF2060R-SRPE	—	RF2060R-SRPB	RF2060R-SRPBE	RF2060R-SR	6.28{640}
			RF2040RP-SRP	RF2040RP-SRPE	—	RF2040RP-SRPB	RF2040RP-SRPBE	RF2040RP-SR	0.44{ 45}
			RF2050RP-SRP	RF2050RP-SRPE	—	RF2050RP-SRPB	RF2050RP-SRPBE	RF2050RP-SR	0.69{ 70}
			RF2060RP-SRP	RF2060RP-SRPE	—	RF2060RP-SRPB	RF2060RP-SRPBE	RF2060RP-SR	1.03{105}
			RF2080RP-SRP	RF2080RP-SRPE	—	RF2080RP-SRPB	RF2080RP-SRPBE	RF2080RP-SR	1.77{180}
			RF2100RP-SRP	RF2100RP-SRPE	—	RF2100RP-SRPB	RF2100RP-SRPBE	RF2100RP-SR	2.55{260}
	RS	Steel	RS40-SRP	RS40-SRPE	—	RS40-SRPB	RS40-SRPBE	RS40-SR	2.65{270}
			RS50-SRP	RS50-SRPE	—	RS50-SRPB	RS50-SRPBE	RS50-SR	4.31{440}
			RS60-SRP	RS60-SRPE	—	RS60-SRPB	RS60-SRPBE	RS60-SR	6.28{640}
		Engineering Plastic	RS80-SRP	—	—	—	—	RS80-SR	10.7{1090}
			RS100-SRP	—	—	—	—	RS100-SR	17.1{1740}
		Lambda*1	RF2040S-LMC-SRP	RF2040S-LMC-SRPE	—	RF2040S-LMC-SRPB	RF2040S-LMC-SRPBE	RF2040S-LMC-SR	2.65{270}
			RF2050S-LMC-SRP	RF2050S-LMC-SRPE	—	RF2050S-LMC-SRPB	RF2050S-LMC-SRPBE	RF2050S-LMC-SR	4.31{440}
			RF2060S-LMC-SRP	RF2060S-LMC-SRPE	—	RF2060S-LMC-SRPB	RF2060S-LMC-SRPBE	RF2060S-LMC-SR	6.28{640}
		Double Pitch	RF2040R-LMC-SRP	RF2040R-LMC-SRPE	—	RF2040R-LMC-SRPB	RF2040R-LMC-SRPBE	RF2040R-LMC-SR	2.65{270}
			RF2050R-LMC-SRP	RF2050R-LMC-SRPE	—	RF2050R-LMC-SRPB	RF2050R-LMC-SRPBE	RF2050R-LMC-SR	4.31{440}
			RF2060R-LMC-SRP	RF2060R-LMC-SRPE	—	RF2060R-LMC-SRPB	RF2060R-LMC-SRPBE	RF2060R-LMC-SR	6.28{640}
SS*2 (304 stainless steel)	Double Pitch	Steel	RF2040S-SS-SRP	RF2040S-SS-SRPE	RF2040S-SS-SRPKV	RF2040S-SS-SRPB	RF2040S-SS-SRPBE	RF2040S-SS-SR	0.44{ 45}
			RF2050S-SS-SRP	RF2050S-SS-SRPE	RF2050S-SS-SRPKV	RF2050S-SS-SRPB	RF2050S-SS-SRPBE	RF2050S-SS-SR	0.69{ 70}
			RF2060S-SS-SRP	RF2060S-SS-SRPE	RF2060S-SS-SRPKV	RF2060S-SS-SRPB	RF2060S-SS-SRPBE	RF2060S-SS-SR	1.03{105}
		Engineering Plastic	RF2080S-SS-SRP	—	—	—	—	RF2080S-SS-SR	1.77{180}
			RF2100S-SS-SRP	—	—	—	—	RF2100S-SS-SR	2.55{260}
			RF2040R-SS-SRP	RF2040R-SS-SRPE	—	RF2040R-SS-SRPB	RF2040R-SS-SRPBE	RF2040R-SS-SR	0.44{ 45}
		Stainless Steel	RF2050R-SS-SRP	RF2050R-SS-SRPE	—	RF2050R-SS-SRPB	RF2050R-SS-SRPBE	RF2050R-SS-SR	0.69{ 70}
			RF2060R-SS-SRP	RF2060R-SS-SRPE	—	RF2060R-SS-SRPB	RF2060R-SS-SRPBE	RF2060R-SS-SR	1.03{105}
			RF2040RP-SS-SRP	RF2040RP-SS-SRPE	—	RF2040RP-SS-SRPB	RF2040RP-SS-SRPBE	RF2040RP-SS-SR	0.44{ 45}
	RS	Engineering Plastic	RF2050RP-SS-SRP	RF2050RP-SS-SRPE	—	RF2050RP-SS-SRPB	RF2050RP-SS-SRPBE	RF2050RP-SS-SR	0.69{ 70}
			RF2060RP-SS-SRP	RF2060RP-SS-SRPE	—	RF2060RP-SS-SRPB	RF2060RP-SS-SRPBE	RF2060RP-SS-SR	1.03{105}
			RF2080RP-SS-SRP	RF2080RP-SS-SRPE	—	RF2080RP-SS-SRPB	RF2080RP-SS-SRPBE	RF2080RP-SS-SR	1.77{180}
		Double Pitch	RF2100RP-SS-SRP	RF2100RP-SS-SRPE	—	RF2100RP-SS-SRPB	RF2100RP-SS-SRPBE	RF2100RP-SS-SR	2.55{260}
			RS40-SS-SRP	RS40-SS-SRPE	RS40-SS-SRPKV	RS40-SS-SRPB	RS40-SS-SRPBE	RS40-SS-SR	0.44{ 45}
			RS50-SS-SRP	RS50-SS-SRPE	RS50-SS-SRPKV	RS50-SS-SRPB	RS50-SS-SRPBE	RS50-SS-SR	0.69{ 70}
		Stainless Steel	RS60-SS-SRP	RS60-SS-SRPE	RS60-SS-SRPKV	RS60-SS-SRPB	RS60-SS-SRPBE	RS60-SS-SR	1.03{105}
			RS80-SS-SRP	—	—	—	—	RS80-SS-SR	1.77{180}
			RS100-SS-SRP	—	—	—	—	RS100-SS-SR	2.55{260}
Poly Steel	Plastic	Double Pitch	RS40-PC-SRP	RS40-PC-SRPE	—	RS40-PC-SRPB	RS40-PC-SRPBE	—	0.44{ 45}
			RS50-PC-SRP	RS50-PC-SRPE	—	RS50-PC-SRPB	RS50-PC-SRPBE	—	0.69{ 70}
			RS60-PC-SRP	RS60-PC-SRPE	—	RS60-PC-SRPB	RS60-PC-SRPBE	—	0.88{ 90}

- Note: 1. "Base chain" refers to all parts of the chain, except the outboard rollers.  
 2. \*1: Even if the base chain is Lambda Chain, the steel outboard rollers need to be lubricated.  
 3. \*2: Pins are made of precipitation-hardened stainless steel.  
 4. Chains with conductive rollers and NP-type base chain use a spring brake.  
 5. When the outboard roller is a KV roller, the roller of the base chain should be an S roller.

# Outboard Roller Chain

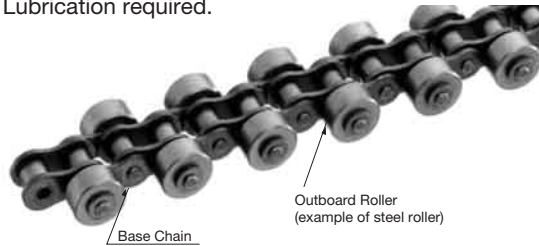
## Base Chain Specifications

### 1. Standard

Base chain is available with steel rollers (R, S) or engineering plastic R rollers.  
RS Chain is available with steel rollers. R roller for Double Pitch Chain is available in steel or plastic.

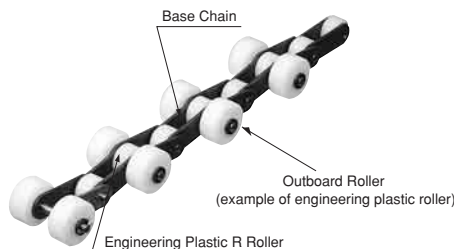
#### 1) Steel Roller Chain

- (1) All parts are made of heat-treated steel.
- (2) Operating temperature range: -10°C to 150°C
- (3) Lubrication required.



#### 2) Plastic R Roller Chain (available only for Double Pitch Chain)

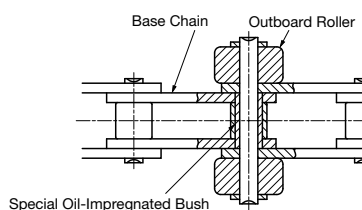
- (1) The R roller on the base chain is made of engineering plastic.
- (2) Features of engineering plastic R roller chain
  - <1> Lightweight (30% weight reduction compared with steel roller chain)
  - <2> Low noise (5 to 7 dB noise reduction compared with steel roller chain)
  - <3> Lower running resistance (30% less resistance compared with steel roller chain)
  - <4> Color of engineering plastic roller: White
  - <5> Operating temperature range: -10°C to 80°C
  - <6> Lubrication is required between the pins and the bushes.



### 2. Lambda (lube free)

- The bushes on the base chain are special oil-impregnated bushes and can be used with no lubrication. (Lubrication is required on steel outboard rollers.)
- The allowable tension of Lambda chain is the same as that of standard chain. The inner and outer plates are treated with a black oxide finish for identification.
- Operating temperature range: -10°C to 150°C
- Do not use the chain in environments where it will come into contact with chemicals or water, or in cleansing and degreasing environments.

Note: Lambda chain is available only in RF2060 or smaller.



### 3. SS (stainless steel)

SS chain is available with stainless steel rollers (R, S) or engineering plastic R rollers.

RS Chain is available with stainless steel rollers. S roller for Double Pitch Chain is available in stainless steel and R roller for Double Pitch Chain is available in plastic or stainless steel.

#### 1) Stainless Steel Roller Chain

- (1) All parts except pins (precipitation-hardened stainless steel) are made of 304 stainless steel.
- (2) Operating temperature range: -20°C to 400°C
- (3) Lubrication required.

#### 2) Plastic R Roller Chain (available only for Double Pitch Chain)

- (1) The R roller of the base chain is made of engineering plastic.  
Pins are made of precipitation-hardened stainless steel.
- (2) Features of plastic R roller chain
  - <1> Lightweight (30% weight reduction compared with steel roller chain)
  - <2> Low noise (5 to 7 dB noise reduction compared with steel roller chain)
  - <3> Lower running resistance (30% less resistance compared with steel roller chain)
  - <4> Color of engineering plastic roller: White
  - <5> Operating temperature range: -20°C to 80°C
  - <6> Lubrication is required between the pins and the bushes.

### 4. Poly Steel

- 1) Poly Steel Chain is composed of inner links made of engineering plastic and outer links made of 304 stainless steel. (The pins are made of precipitation-hardened stainless steel.)
- 2) No lubrication is needed, and is corrosion resistant.
- 3) Lightweight (50% weight reduction compared with steel roller chain)
- 4) Low noise (5 dB noise reduction compared with steel roller chain)
- 5) Color of engineering plastic roller: White
- 6) Operating temperature range: -20°C to 80°C
- 7) Offset links are not available for this type.

### 5. NP

NP chain is standard chain and Lambda chain treated with nickel plating.

#### Number of Links per Unit

Outboard Roller Chain is supplied by standard length (length of one chain) unless otherwise specified.

Tsubaki Chain No.	No. of Links per Unit	Tsubaki Chain No.	No. of Links per Unit
RF2040	120	RS40	240
RF2050	96	RS50	192
RF2060	80	RS60	160
RF2080	60	RS80	120
RF2100	48	RS100	96

#### ⚠ Safety Precautions for Nickel-Plated Chain

Do not use NP chain if it 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 chain or contact a Tsubakimoto representative about chain selection if using in environments where coating flakes or wear dust present problems.

Though nickel is not subject to the Japan Food Sanitation Law or the Industrial Safety and Health Law, plating on sliding parts can peel.

## Outboard Roller Specifications

### 1. Engineering Plastic Rollers

#### 1) Plastic Rollers

- (1) Material: Polyacetal (white)
- (2) Operating temperature range: -20°C to 80°C

#### 2) Plastic Brake Rollers

- (1) Material: Special engineering plastic (brown)
- (2) Operating temperature range: -20°C to 80°C
- (3) The use of special engineering plastic with a large coefficient of friction assures proper brake performance and enables rapid response.

#### 3) Electro-Conductive Rollers

- (1) Material: Special engineering plastic (black)
- (2) Operating temperature range: -20°C to 80°C
- (3) Volume resistivity  $10^6 \Omega \cdot \text{cm}$

Note: Electro-conductive rollers are available only for RF2060 or smaller.

#### 4) KV Rollers

- (1) Material: Super engineering plastic (black)
- (2) Operating temperature range: -20°C to 180°C
- (3) With excellent heat resistance, chemical resistance, and flame resistance, the KV roller meets the requirements of the Japan Food Sanitation Law.

Note: KV rollers are available only for RF2060 or smaller.

### 2. Steel Rollers

#### 1) Steel Rollers

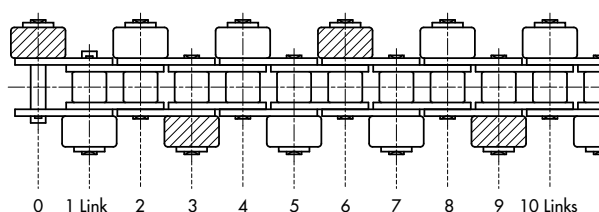
- (1) Material: Hardened steel
- (2) Operating temperature range: -10°C to 150°C
- (3) Lubrication: Required

#### 2) Stainless Steel Rollers

- (1) Material: 304 stainless steel
- (2) Operating temperature range: -20°C to 400°C
- (3) Lubrication: Required

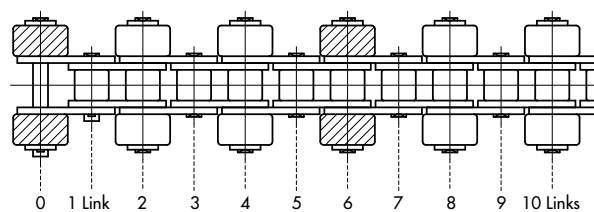
## Installation of Outboard Rollers

### 1. Staggered Installation (Type I)



- 1) The diagram above is an example of outboard rollers installed on every link in a staggered arrangement (Type I).
- 2) It is standard to install plastic brake rollers on every third link (the shaded part in the diagram above) when outboard rollers are installed on every link in a staggered arrangement.

### 2. Crosswise Installation (Type II)



- 1) The diagram above is an example of outboard rollers installed on every second link in a crosswise arrangement (Type II).  
When the base chain is RF chain, outboard rollers can be spaced every one or more links (two links or more in the case of RS Chain).
- 2) It is standard to install plastic brake rollers on every sixth link (the shaded part in the diagram above) when outboard rollers are installed on every second link in a crosswise arrangement.

## Sprockets

### Double Pitch Chain with Outboard Rollers

Double pitch sprockets can be used with all Double Pitch Chains with outboard rollers.  
RS Roller Chain sprockets can only be used if they have S rollers and 30 or more teeth.

### RS Chain with Outboard Rollers

RS Roller Chain sprockets having a small number of teeth (gray shaded areas in the table below) cannot be used with RS Chain with outboard rollers since the hub comes in contact with the outboard roller. To use a sprocket having a small number of teeth on RS Chain with outboard rollers, machine the hub diameter of the RS Roller Chain sprocket to adapt to the dimensions shown in the table below. When the number of sprocket teeth is other than listed below, the RS Roller Chain sprocket can be used as is.

Tsubaki Chain No.	No. of Teeth	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
RS40		20	24	28	32	36	40	44	48	52	56	60	64	68	72	76
RS50		26	31	36	41	46	51	56	61	66	71					
RS60		32	38	44	50	56										
RS80		44				76		92								
RS100			62	72	81											

Refer to page 144 for detailed information on dimensions of sprockets for RS Chain with outboard rollers.



# Outboard Roller Chain



Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

## How to Order

In placing an order for Outboard Roller Chain, please specify the chain length as well as the chain size and type.

### 1. Model Identification

In placing an order for a chain, connecting link, or offset link, please specify the product code and chain number to avoid any error. Refer to the chain number information for the product code and chain number.

### 2. Information When Placing a Chain Order

- 1) If the number of links on the overall chain is even, the link on one end of the chain will be a connecting link and the link on the other will be an inner link.
- 2) If the number of links on the overall chain is odd, please specify the link type on both ends of the chain as per below.

- (1) Inner links on both ends
- (2) Connecting links on both ends
- (3) Outer links on both ends
- (4) Connecting link on one end and offset link on the other

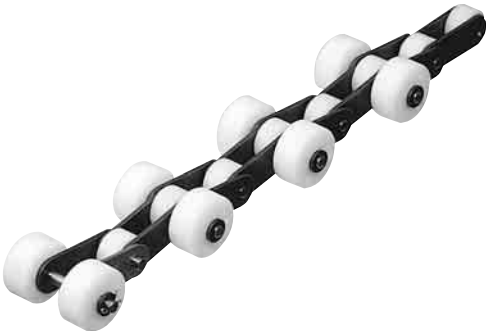
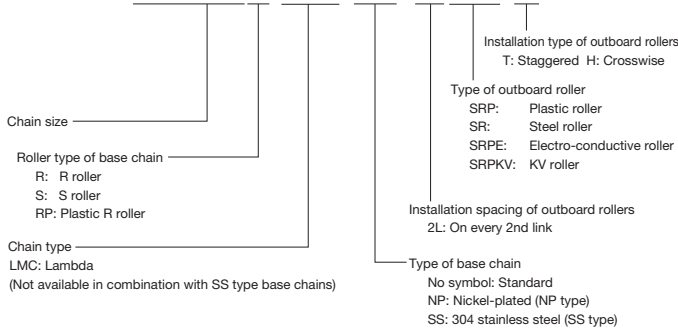
#### 3) Position and spacing for installing outboard rollers

Outboard rollers are installed in a staggered (Type I) or crosswise (Type II) arrangement. Refer to the information on the installation position of the outboard rollers. Information on installation spacing and chain number of the outboard roller is given above.

## Example of Outboard Roller Chain Numbering

### ■ Double Pitch Chain with Outboard Rollers

**RF2040R-LMC-NP-2LSRP-H**

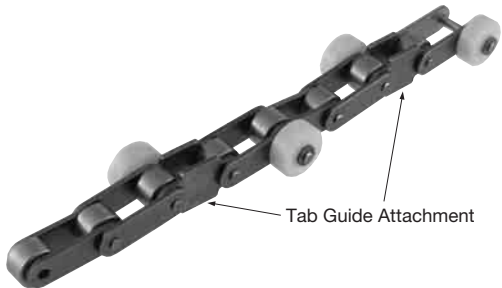
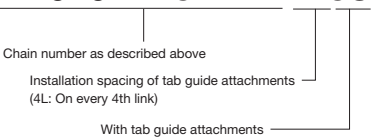


Note:

1. KV roller  
The KV roller can be used only with S roller and SS type base chains.
2. Please specify the installation spacing of brake rollers.

### ■ Chain with Tab Guide Attachments

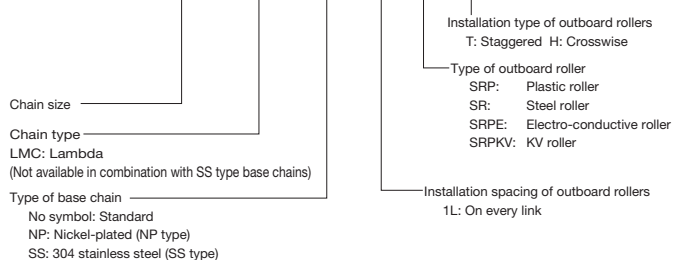
**RF2040R-2LSRPE-H-4LSG**





## ■ RS Chain with Outboard Rollers

### RS40-LMC-NP-1LSRP-T

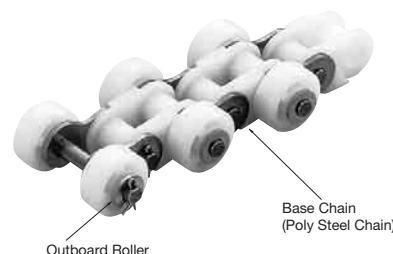
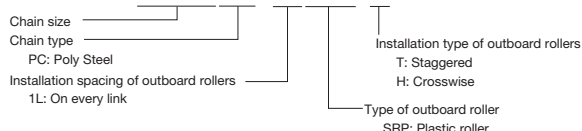


Note:

1. The type of base chain for KV rollers is SS.
2. Please specify the installation spacing of brake rollers.

## ■ Poly Steel Chain with Outboard Rollers

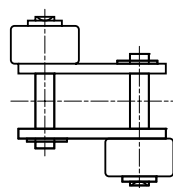
### RS40PC-1LSRP-T



## Example of Chain Numbering for Outboard Roller Chain Connecting Links

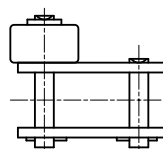
There are four types of connecting links. Please use caution when placing an order for connecting links to avoid any error. (Connecting link symbol: CL)

### 1) Staggered Installation on Every Link



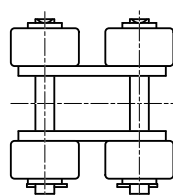
**RF2040R-1LSRP-T-CL**  
Base Chain

### 2) Staggered Installation on Every Second Link



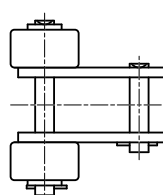
**RF2040R-2LSRP-T-CL**  
Base Chain

### 3) Crosswise Installation on Every Link



**RF2040R-1LSRP-H-CL**  
Base Chain

### 4) Crosswise Installation on Every Second Link



**RF2040R-2LSRP-H-CL**  
Base Chain

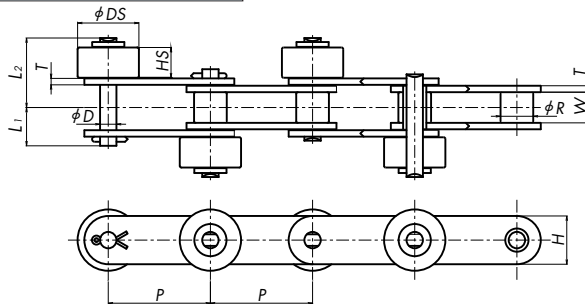
# Outboard Roller Chain

## Double Pitch Chain with Outboard Rollers (same for all types)

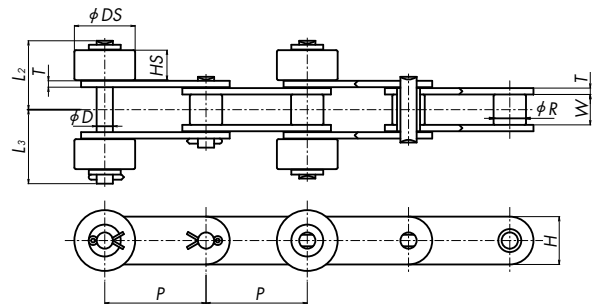
### • Chain without Brake

Base Chain S Roller

Staggered Installation (Type I)

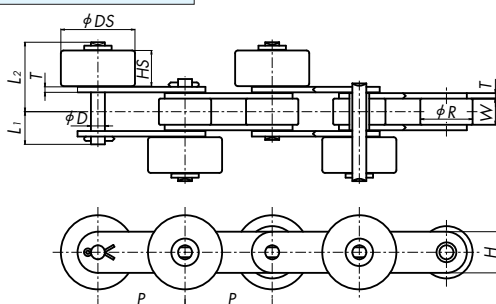


Crosswise Installation (Type II)

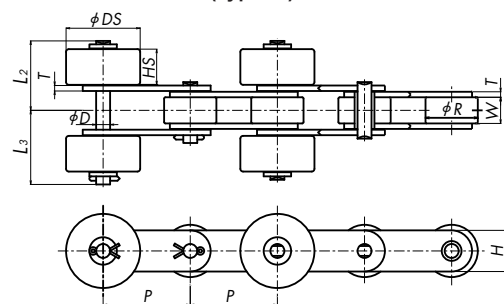


Base Chain R Roller

Staggered Installation (Type I)



Crosswise Installation (Type II)



• All connecting links are cotter pin type.

Tsubaki Chain No.			Roller Type	Pitch <i>P</i>	Roller Dia. <i>R</i>	Width Between Inner Link Plates <i>W</i>	Plate		Pin				Outboard Roller		Approx. Mass kg/m	
Plastic Outboard Roller							Thickness <i>T</i>	Width <i>H</i>	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i> <sub>3</sub>	<i>DS</i>	<i>HS</i>	Base Chain Steel Roller	Base Chain Plastic Roller
Standard	Lambda	SS														
RF2040S-SRP	RF2040S-LMC-SRP	RF2040S-SS-SRP	S	25.40	7.92	7.95	1.5	12.0	3.97	9.65	17.9	19.3	15.88	7.8	0.66	—
RF2050S-SRP	RF2050S-LMC-SRP	RF2050S-SS-SRP		31.75	10.16	9.53	2.0	15.0	5.09	11.9	21.6	23.3	19.05	9.4	1.03	—
RF2060S-SRP	RF2060S-LMC-SRP	RF2060S-SS-SRP		38.10	11.91	12.70	3.2	17.2	5.96	16.95	29.65	32.05	22.23	12.6	1.80	—
RF2080S-SRP	—	RF2080S-SS-SRP		50.80	15.88	15.88	4.0	23.0	7.94	20.95	36.65	39.65	28.58	15.8	3.12	—
RF2100S-SRP	—	RF2100S-SS-SRP		63.50	19.05	19.05	4.8 <5.0>	28.6	9.54	24.5 <24.9>	44.2 <45.1>	47.3 <47.8>	39.69	19	4.77 <4.89>	—
RF2040R-SRP	RF2040R-LMC-SRP	RF2040R-SS-SRP	R	25.40	15.88	7.95	1.5	12.0	3.97	9.65	23.1	24.5	23	13	1.24	0.89
RF2050R-SRP	RF2050R-LMC-SRP	RF2050R-SS-SRP		31.75	19.05	9.53	2.0	15.0	5.09	11.9	25.3	27.0	27	13	1.70	1.23
RF2060R-SRP	RF2060R-LMC-SRP	RF2060R-SS-SRP		38.10	22.23	12.70	3.2	17.2	5.96	16.95	29.65	32.05	30	12.6	2.64	1.93

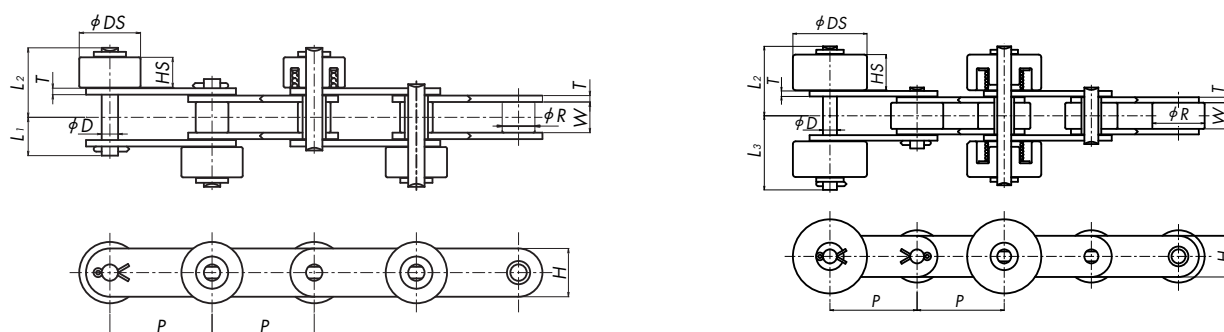
Tsubaki Chain No.			Roller Type	Pitch <i>P</i>	Roller Dia. <i>R</i>	Width Between Inner Link Plates <i>W</i>	Plate		Pin				Outboard Roller		Approx. Mass kg/m
Steel Outboard Roller							Thickness <i>T</i>	Width <i>H</i>	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i> <sub>3</sub>	<i>DS</i>	<i>HS</i>	
Standard	Lambda	SS													
RF2040S-SR	RF2040S-LMC-SR	RF2040S-SS-SR	S	25.40	7.92	7.95	1.5	12.0	3.97	9.65	17.9	19.3	15.88	7.8	1.02
RF2050S-SR	RF2050S-LMC-SR	RF2050S-SS-SR		31.75	10.16	9.53	2.0	15.0	5.09	11.9	21.6	23.3	19.05	9.4	1.53
RF2060S-SR	RF2060S-LMC-SR	RF2060S-SS-SR		38.10	11.91	12.70	3.2	17.2	5.96	16.95	29.65	32.05	22.23	12.6	2.56
RF2080S-SR	—	RF2080S-SS-SR		50.80	15.88	15.88	4.0	23.0	7.94	20.95	36.65	39.65	28.58	15.8	4.30
RF2100S-SR	—	RF2100S-SS-SR		63.50	19.05	19.05	4.8 <5.0>	28.6	9.54	24.5 <24.9>	44.2 <45.1>	47.3 <47.8>	39.69	19	7.00 <7.12>
RF2040R-SR	RF2040R-LMC-SR	RF2040R-SS-SR	R	25.40	15.88	7.95	1.5	12.0	3.97	9.65	23.1	24.5	23	13	—
RF2050R-SR	RF2050R-LMC-SR	RF2050R-SS-SR		31.75	19.05	9.53	2.0	15.0	5.09	11.9	25.3	27.0	27	13	—
RF2060R-SR	RF2060R-LMC-SR	RF2060R-SS-SR		38.10	22.23	12.70	3.2	17.2	5.96	16.95	29.65	32.05	30	12.6	—

Note: 1. The mass given in the above table assumes that outboard rollers are installed on every link in a staggered installation (as illustrated above in the diagram on the left) or on every second link in a crosswise installation (as illustrated above in the diagram on the right).

2. When the base chain plastic R roller is not specified for SS type, the rollers are made of 304 stainless steel.

3. Figures inside < > are for stainless steel chain.

## • Chain with Brake



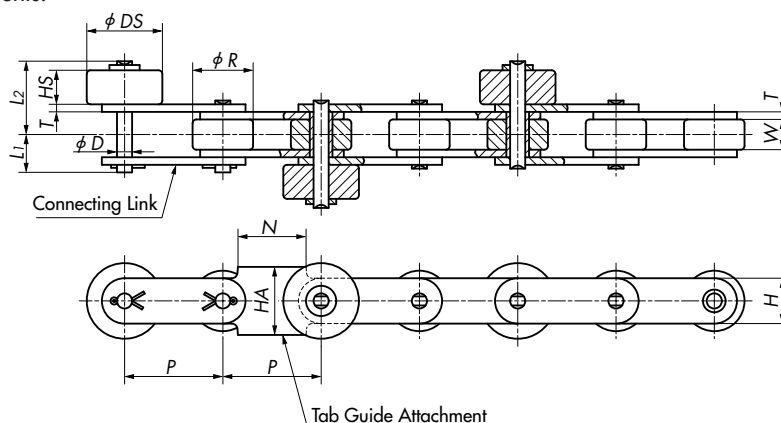
- All connecting links are cotter pin type.
- The dimensional drawing is of a conductive type (spring brake). Chains with plastic brakes have the same structure as those with no brakes.

Tsubaki Chain No.			Roller Type	Pitch <i>P</i>	Roller Dia. <i>R</i>	Width Between Inner Link Plates <i>W</i>	Plate		Pin				Outboard Roller		Approx. Mass kg/m
							Thickness <i>T</i>	Width <i>H</i>	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i> <sub>3</sub>	<i>DS</i>	<i>HS</i>	
Plastic Outboard Roller															
Standard	Lambda	SS													
RF2040S-SRPB	RF2040S-LMC-SRPB	RF2040S-SS-SRPB	S	25.40	7.92	7.95	1.5	12.0	3.97	9.65	17.9	19.3	15.88	7.8	1.02
RF2050S-SRPB	RF2050S-LMC-SRPB	RF2050S-SS-SRPB		31.75	10.16	9.53	2.0	15.0	5.09	11.90	21.6	23.2	19.05	9.4	1.53
RF2060S-SRPB	RF2060S-LMC-SRPB	RF2060S-SS-SRPB		38.10	11.91	12.70	3.2	17.2	5.96	16.95	29.65	32.05	22.23	12.6	2.56
RF2040R-SRPB	RF2040R-LMC-SRPB	RF2040R-SS-SRPB	R	25.40	15.88	7.95	1.5	12.0	3.97	9.65	23.1	24.5	23	13	—
RF2050R-SRPB	RF2050R-LMC-SRPB	RF2050R-SS-SRPB		31.75	19.05	9.53	2.0	15.0	5.09	11.90	25.3	27.0	27	13	—
RF2060R-SRPB	RF2060R-LMC-SRPB	RF2060R-SS-SRPB		38.10	22.23	12.70	3.2	17.2	5.96	16.95	29.65	32.05	30	12.6	—

Note: 1. The mass given in the above table assumes that outboard rollers are installed on every link in a staggered installation (as illustrated above in the diagram on the left) or on every second link in a crosswise installation (as illustrated above in the diagram on the right).  
2. If using a conductive roller, the brake is a spring brake with chain number SRPBE.

## • Chain with Tab Guide Attachments

Tab guide attachments are installed to prevent meandering on a longer conveyor. Please use caution so as to avoid contact between the tab guide attachments and the hub of the sprocket. Please specify the installation spacing of outboard rollers and tab guide attachments.



- All connecting links are cotter pin type.

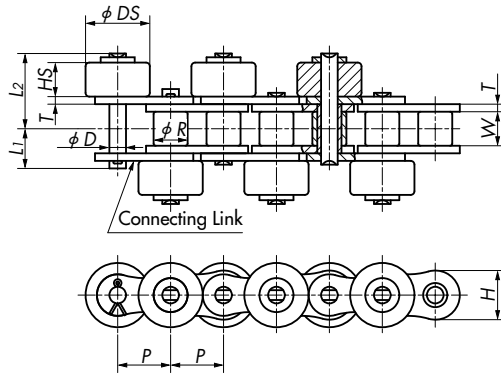
Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Inner Link Plates W	Plate		Pin			Outboard Roller		N	HA	Approx. Mass kg/m	
				Thickness H	Width T	Dia. D	L <sub>1</sub>	L <sub>2</sub>	DS	HS			Plastic Outboard Roller	Steel Outboard Roller
RF2050R-SG	31.75	19.05	9.53	15.0	2.0	5.09	11.9	25.3	27	13	20.0	24.0	1.50	2.22
RF2060R-SG	38.10	22.23	12.70	17.2	3.2	5.96	16.95	30.05	30	12.6	25.4	27.0	2.41	3.16

Note: The mass given in the above table assumes that outboard rollers are installed on every link in a staggered installation or on every second link in a crosswise installation.

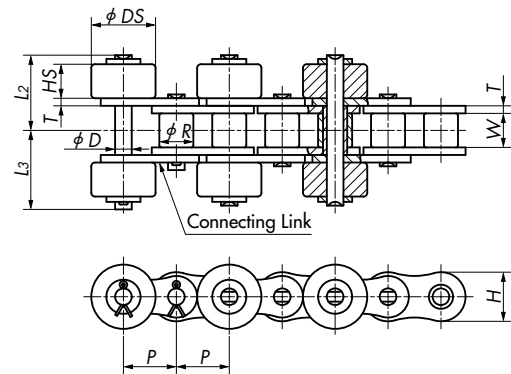
# Outboard Roller Chain

## ■ RS Chain with Outboard Rollers (same for all types)

Staggered Installation (Type I)



Crosswise Installation (Type II)



- All connecting links are cotter pin type.
- The construction of the spring brake is the same as for Double Pitch Chain.

## ■ Chain without Brake

Tsubaki Chain No.			Pitch <i>P</i>	Roller Dia. <i>R</i>	Width Between Inner Link Plates <i>W</i>	Plate		Pin				Outboard Roller		Approx. Mass kg/m
Plastic Outboard Roller						Thickness <i>T</i>	Width <i>H</i>	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i> <sub>3</sub>	<i>DS</i>	<i>HS</i>	
Standard	Lambda	SS												
RS40-SRP	RS40-LMC-SRP	RS40-SS-SRP	12.70	7.92	7.95	1.5	12.0	3.97	9.65	17.9	19.3	15.88	7.8	0.94
RS50-SRP	RS50-LMC-SRP	RS50-SS-SRP	15.875	10.16	9.53	2.0	15.0	5.09	11.9	21.6	23.2	19.05	9.4	1.42
RS60-SRP	RS60-LMC-SRP	RS60-SS-SRP	19.05	11.91	12.70	2.4	18.1	5.96	15.25	27.95	30.35	22.23	12.6	2.11
RS80-SRP	—	RS80-SS-SRP	25.40	15.88	15.88	3.2	24.1	7.94	19.25	35.05	37.95	28.58	15.8	3.57
RS100-SRP	—	RS100-SS-SRP	31.75	19.05	19.05	4.0	30.1	9.54	22.85	42.55	45.65	39.69	19.0	5.56

Tsubaki Chain No.			Pitch <i>P</i>	Roller Dia. <i>R</i>	Width Between Inner Link Plates <i>W</i>	Plate		Pin				Outboard Roller		Approx Mass kg/m
Steel Outboard Roller						Thickness <i>T</i>	Width <i>H</i>	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i> <sub>3</sub>	<i>DS</i>	<i>HS</i>	
Standard	Lambda	SS												
RS40-SR	RS40-LMC-SR	RS40-SS-SR	12.70	7.92	7.95	1.5	12.0	3.97	9.65	17.9	19.3	15.88	7.8	1.67
RS50-SR	RS50-LMC-SR	RS50-SS-SR	15.875	10.16	9.53	2.0	15.0	5.09	11.9	21.6	23.2	19.05	9.4	2.42
RS60-SR	RS60-LMC-SR	RS60-SS-SR	19.05	11.91	12.70	2.4	18.1	5.96	15.25	27.95	30.35	22.23	12.6	3.63
RS80-SR	—	RS80-SS-SR	25.40	15.88	15.88	3.2	24.1	7.94	19.25	35.05	37.95	28.58	15.8	5.92
RS100-SR	—	RS100-SS-SR	31.75	19.05	19.05	4.0	30.1	9.54	22.85	42.55	45.65	39.69	19.0	10.02

- Note: 1. The mass given in the above table assumes that outboard rollers are installed on every link in a staggered installation (as illustrated above in the diagram on the left) or on every second link in a crosswise installation (as illustrated above in the diagram on the right).
2. Even if the chain with steel outboard rollers is Lambda Chain, the outboard rollers need to be lubricated.
3. When the chain with steel outboard rollers is SS type, the material of the outboard roller is 304 stainless steel.

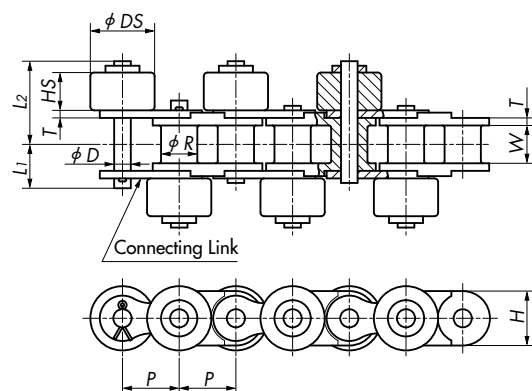
## ■ Chain with Brake

Tsubaki Chain No.			Pitch <i>P</i>	Roller Dia. <i>R</i>	Width Between Inner Link Plates <i>W</i>	Plate		Pin				Outboard Roller		Approx. Mass kg/m
Plastic Outboard Roller						Thickness <i>T</i>	Width <i>H</i>	Dia. <i>D</i>	<i>L</i> <sub>1</sub>	<i>L</i> <sub>2</sub>	<i>L</i> <sub>3</sub>	<i>DS</i>	<i>HS</i>	
Standard	Lambda	SS												
RS40-SRPB	RS40-LMC-SRPB	RS40-SS-SRPB	12.70	7.92	7.95	1.5	12.0	3.97	9.65	17.9	19.3	15.88	7.8	0.94
RS50-SRPB	RS50-LMC-SRPB	RS50-SS-SRPB	15.875	10.16	9.53	2.0	15.0	5.09	11.9	21.6	23.2	19.05	9.4	1.42
RS60-SRPB	RS60-LMC-SRPB	RS60-SS-SRPB	19.05	11.91	12.70	2.4	18.1	5.96	15.25	27.95	30.35	22.23	12.6	2.11

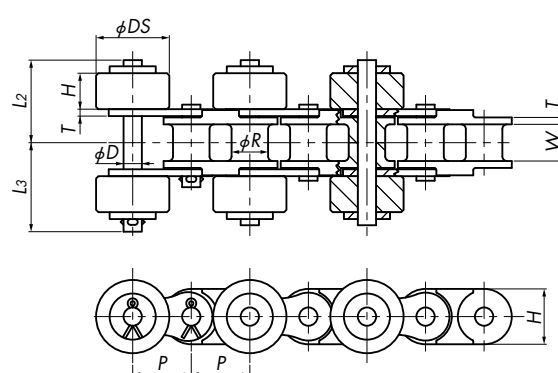
- Note: 1. The mass given in the above table assumes that outboard rollers are installed on every link in a staggered installation (as illustrated above in the diagram on the left) or on every second link in a crosswise installation (as illustrated above in the diagram on the right).
2. If using a conductive roller, the brake is a spring brake with chain number SRPBE.

## Poly Steel Chain with Plastic Outboard Rollers

Staggered Installation (Type I)



Crosswise Installation (Type II)



- All connecting links are cotter pin type.

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Inner Link Plates W	Plate		Pin				Outboard Roller		Approx. Mass kg/m
				Thickness T	Width H	Dia. D	L1	L2	L3	DS	HS	
RS40-PC-SRP	12.70	7.92	7.95	1.5	12.0	3.97	9.65	17.9	19.3	15.88	7.8	0.69
RS50-PC-SRP	15.875	10.16	9.53	2.0	15.0	5.09	11.9	21.6	23.2	19.05	9.4	0.96
RS60-PC-SRP	19.05	11.91	12.70	2.4	18.1	5.96	15.25	27.95	30.35	22.23	12.6	1.40

Note: 1. Since the offset link is not available, use a chain with an even number of links.

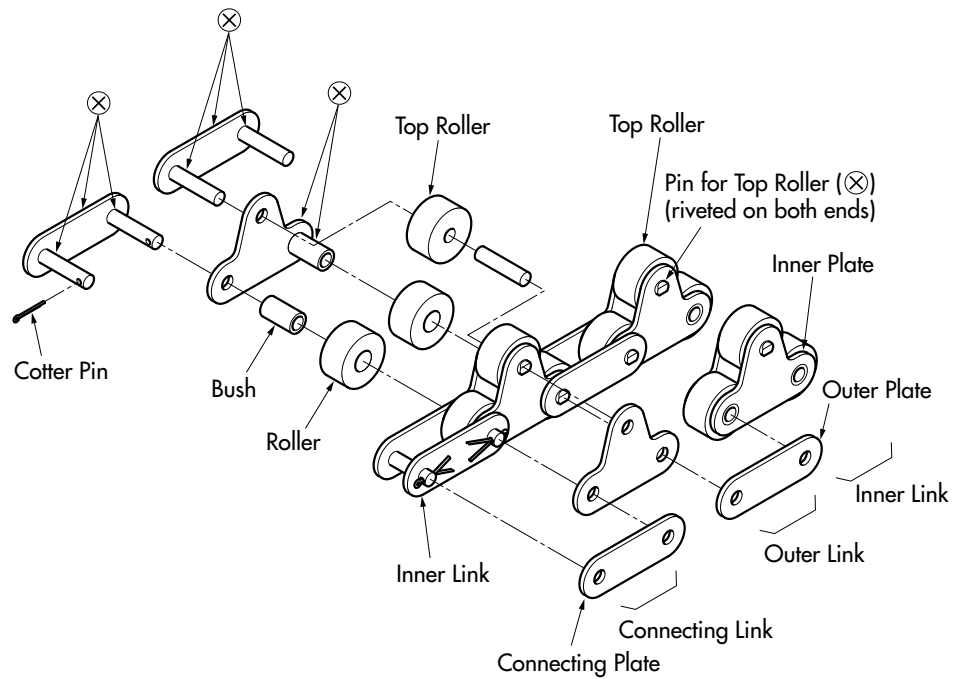
2. The approx. mass given in the above table assumes that outboard rollers are installed as illustrated above.

# Top Roller Chain

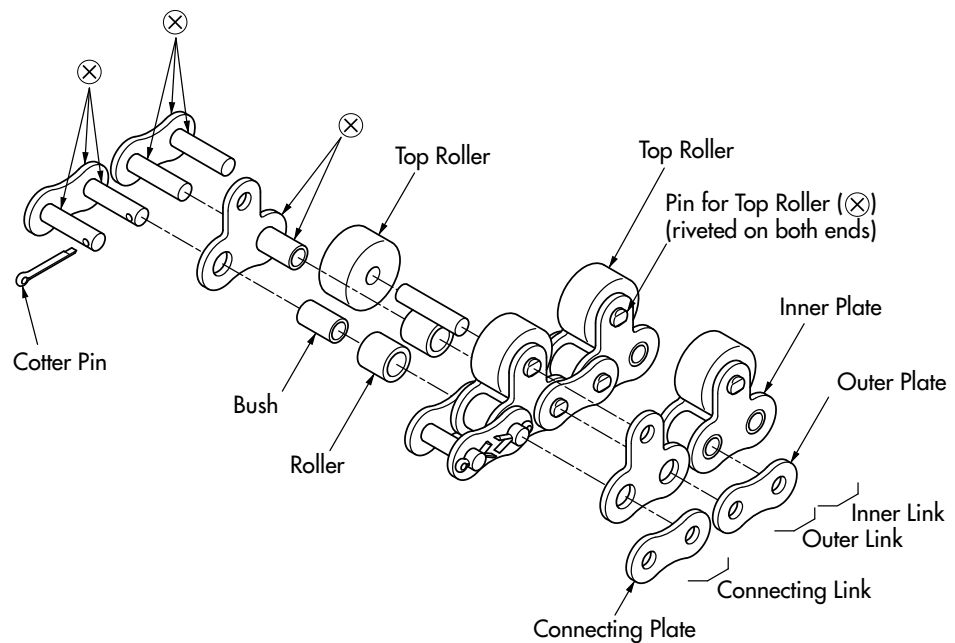
Top Roller Chain is a Free Flow Chain on which the plate of a Double Pitch or RS Roller Chain is extended upward and a free-running top roller is installed on the plate.

## Construction

### Double Pitch Chain with Top Rollers



### RS Chain with Top Rollers

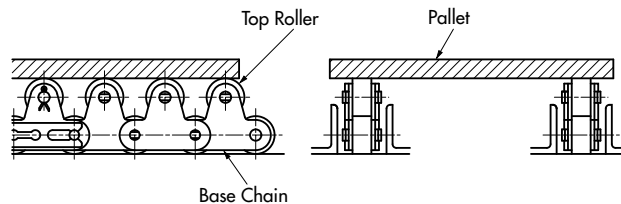


Parts marked with (X) are press fit. Other parts are slip fit.



## Features

- 1) The width of the chain is smaller than that of other types of Free Flow Chain.
- 2) With top rollers supported by plates on both sides, this chain is suitable for use with rugged free-flow conveyors.



## Product Types

Base Chain Type		Base Chain Roller	Type of Plastic Top Roller		Type of Steel Top Roller		Max. Allowable Tension			
			Plastic Roller	KV Roller	Steel Roller	Stainless Steel Roller		Unit: kN {kgf}		
Standard	Double Pitch	Steel	RF2040S-TRP	—	RF2040S-TR	—	2.65{270}			
			RF2050S-TRP	—	RF2050S-TR	—	4.31{440}			
			RF2060S-TRP	—	RF2060S-TR	—	6.28{640}			
			RF2080S-TRP	—	RF2080S-TR	—	10.7{1090}			
			RF2100S-TRP	—	RF2100S-TR	—	17.1{1740}			
			RF2040R-TRP	—	RF2040R-TR	—	2.65{270}			
			RF2050R-TRP	—	RF2050R-TR	—	4.31{440}			
		Engineering Plastic	RF2060R-TRP	—	RF2060R-TR	—	6.28{640}			
			RF2040RP-TRP	—	RF2040RP-TR	—	0.44{ 45}			
			RF2050RP-TRP	—	RF2050RP-TR	—	0.69{ 70}			
	RS	Steel	RF2060RP-TRP	—	RF2060RP-TR	—	1.03{105}			
			RF2080RP-TRP	—	RF2080RP-TR	—	1.77{180}			
			RF2100RP-TRP	—	RF2100RP-TR	—	2.55{260}			
			RS40-TRP	—	RS40-TR	—	2.65{270}			
			RS50-TRP	—	RS50-TR	—	4.31{440}			
		Steel	RS60-TRP	—	RS60-TR	—	6.28{640}			
			RS80-TRP	—	RS80-TR	—	10.7{1090}			
			RS100-TRP	—	RS100-TR	—	17.1{1740}			
			Lambda (LMC)*1	Double Pitch	Steel	RF2040S-LMC-TRP	—	RF2040S-LMC-TR	—	2.65{270}
						RF2050S-LMC-TRP	—	RF2050S-LMC-TR	—	4.31{440}
RF2060S-LMC-TRP	—	RF2060S-LMC-TR				—	6.28{640}			
RF2040R-LMC-TRP	—	RF2040R-LMC-TR				—	2.65{270}			
RF2050R-LMC-TRP	—	RF2050R-LMC-TR			—	4.31{440}				
RF2060R-LMC-TRP	—	RF2060R-LMC-TR			—	6.28{640}				
Engineering Plastic	RF2040RP-LMC-TRP	—			RF2040RP-LMC-TR	—	0.44{ 45}			
	RF2050RP-LMC-TRP	—		RF2050RP-LMC-TR	—	0.69{ 70}				
	RF2060RP-LMC-TRP	—		RF2060RP-LMC-TR	—	1.03{105}				
RS	Steel	RS40-LMC-TRP		—	RS40-LMC-TR	—	2.65{270}			
		RS50-LMC-TRP	—	RS50-LMC-TR	—	4.31{440}				
		RS60-LMC-TRP	—	RS60-LMC-TR	—	6.28{640}				
SS (Stainless Steel)	Double Pitch	Stainless Steel	RF2040S-SS-TRP	RF2040S-SS-TR-PKV	—	RF2040S-SS-TR	0.44{ 45}			
			RF2050S-SS-TRP	RF2050S-SS-TR-PKV	—	RF2050S-SS-TR	0.69{ 70}			
			RF2060S-SS-TRP	RF2060S-SS-TR-PKV	—	RF2060S-SS-TR	1.03{105}			
			RF2080S-SS-TRP	—	—	RF2080S-SS-TR	1.77{180}			
			RF2100S-SS-TRP	—	—	RF2100S-SS-TR	2.55{260}			
			RF2040R-SS-TRP	—	—	RF2040R-SS-TR	0.44{ 45}			
			RF2050R-SS-TRP	—	—	RF2050R-SS-TR	0.69{ 70}			
		Engineering Plastic	RF2060R-SS-TRP	—	—	RF2060R-SS-TR	1.03{105}			
			RF2040RP-SS-TRP	—	—	RF2040R-SS-TR	0.44{ 45}			
			RF2050RP-SS-TRP	—	—	RF2050R-SS-TR	0.69{ 70}			
			RF2060RP-SS-TRP	—	—	RF2060R-SS-TR	1.03{105}			
			RF2080RP-SS-TRP	—	—	RF2080R-SS-TR	1.77{180}			
	RS	Stainless Steel	RF2100RP-SS-TRP	—	—	RF2100R-SS-TR	2.55{260}			
			RS40-SS-TRP	RS40-SS-TR-PKV	—	RS40-SS-TR	0.44{ 45}			
			RS50-SS-TRP	RS50-SS-TR-PKV	—	RS50-SS-TR	0.69{ 70}			
			RS60-SS-TRP	RS60-SS-TR-PKV	—	RS60-SS-TR	1.03{105}			
			RS80-SS-TRP	—	—	RS80-SS-TR	1.77{180}			
		RS100-SS-TRP	—	—	RS100-SS-TR	2.55{260}				

Note: 1. "Base chain" refers to all parts of the chain, except the top rollers.

2. \*1: Even if the base chain is Lambda Chain, the steel top rollers need to be lubricated.

# Top Roller Chain



Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

## Base Chain Specifications

### 1. Standard

Base chain is available with steel rollers (R, S) or engineering plastic R rollers.

#### 1) Steel Roller Chain

- (1) All parts are made of heat-treated steel.
- (2) Operating temperature range: -10°C to 150°C
- (3) Lubrication required.

#### 2) Plastic R Roller Chain

- (1) The R roller on the base chain is made of engineering plastic.
- (2) Features of engineering plastic R roller chain
  - <1> Lightweight (40% weight reduction compared with steel roller chain)
  - <2> Low noise (5 to 7 dB noise reduction compared with steel roller chain)
  - <3> Lower running resistance (30% less resistance compared with steel roller chain)
  - <4> Color of engineering plastic roller: White
  - <5> Operating temperature range: -10°C to 80°C
  - <6> Lubrication is required between the pins and the bushes.

### 2. Lambda (lube free)

- (1) The bushes on the base chain are special oil-impregnated bushes and can be used with no lubrication. (Lubrication is required on steel top rollers.)
- (2) The allowable tension of Lambda chain is the same as that of standard chain. The inner and outer plates are treated with a black oxide finish for identification.
- (3) Operating temperature range: -10°C to 150°C
- (4) Do not use the chain in environments where it will come into contact with chemicals or water, or in cleansing and degreasing environments.

### 3. SS (stainless steel)

SS chain is available with stainless steel rollers (R, S) or engineering plastic R rollers.

#### 1) Stainless Steel Roller Chain

- (1) All parts are made of 304 stainless steel.
- (2) Operating temperature range: -20°C to 400°C
- (3) Lubrication required.

#### 2) Plastic R Roller Chain

- (1) The R roller of the base chain is made of engineering plastic.
- (2) Features of plastic R roller chain
  - <1> Lightweight (40% weight reduction compared with steel roller chain)
  - <2> Low noise (5 to 7 dB noise reduction compared with steel roller chain)
  - <3> Lower running resistance (30% less resistance compared with steel roller chain)
  - <4> Color of engineering plastic roller: White
  - <5> Operating temperature range: -20°C to 80°C
  - <6> Lubrication is required between the pins and the bushes.

### 4. NP

NP chain is standard chain and Lambda chain treated with nickel plating.

#### Number of Links per Unit

Top Roller Chain is supplied by standard length (length of one chain) unless otherwise specified.

Tsubaki Chain No.	No. of Links per Unit	Tsubaki Chain No.	No. of Links per Unit
RF2040	120	RS40	240
RF2050	96	RS50	192
RF2060	80	RS60	160
RF2080	60	RS80	120
RF2100	48	RS100	96

#### ⚠ Safety Precautions for Nickel-Plated Chain

Do not use NP chain if it 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 chain or contact a Tsubakimoto representative about chain selection if using in environments where coating flakes or wear dust present problems.

Though nickel is not subject to the Japan Food Sanitation Law or the Industrial Safety and Health Law, plating on sliding parts can peel.

## Top Roller Specifications

### 1. Engineering Plastic Rollers

#### 1) Plastic Rollers

- (1) Material: Polyacetal (white)
- (2) Operating temperature range: -20°C to 80°C

#### 2) KV Rollers

- (1) Material: Super engineering plastic (black)
- (2) Operating temperature range: -20°C to 180°C

### 2. Steel Rollers

#### 1) Steel Rollers

- (1) Material: Hardened steel
- (2) Operating temperature range: -10°C to 150°C
- (3) Lubrication: Required

#### 2) Stainless Steel Rollers

- (1) Material: 304 stainless steel
- (2) Operating temperature range: -20°C to 400°C
- (3) Lubrication: Required

## Sprockets

### Sprockets for Double Pitch Chain with Top Rollers

If the base chain roller is an R roller, a standard sprocket for Double Pitch Chain (R roller) cannot be used since the tooth end of the sprocket comes in contact with the top roller.

In this case, use the sprocket for Top Roller Chain shown on page 143.

If the base chain roller is an S roller, a standard sprocket for RF Double Pitch Chain (S roller) can be used as is. RS Roller Chain sprockets can only be used if they are the S roller type and when the number of the engaging teeth is 15 or more (number of sprocket teeth: 30).

## How to Order

When placing an order for Top Roller Chain, please specify the chain length as well as the chain size and type.

### 1. Model Identification

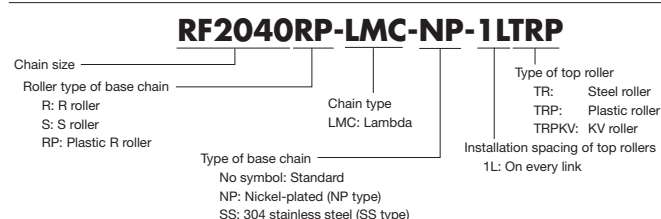
In placing an order for a chain, connecting link, or offset link, please specify the product code and chain number to avoid any error. Refer to the chain number information for the product code and chain number.

### 2. Information When Placing a Chain Order

- 1) If the number of links on the overall chain is even, the link on one end of the chain will be a connecting link and the link on the other will be an inner link.
- 2) If the number of links on the overall chain is odd, please specify the link type on both ends of the chain as per below.
  - (1) Inner links on both ends
  - (2) Connecting links on both ends
  - (3) Outer links on both ends
  - (4) Connecting link on one end and offset link on the other
- 3) Installation of top rollers
  - (1) Single-strand installation  
When a top roller is installed on each even-numbered link, the top roller is installed on the inner link unless otherwise specified.
  - (2) Double-strand installation  
When a top roller is installed on each even-numbered link, the top roller is installed on the outer link unless otherwise specified.

## Example of Top Roller Chain Numbering

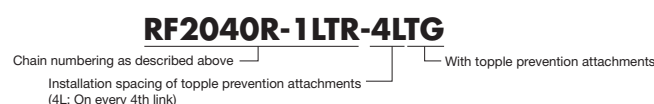
### Double Pitch Chain with Top Rollers



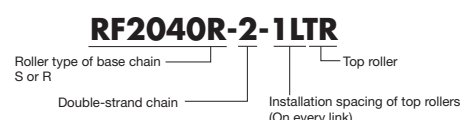
- Note: 1. The type of base chain for KV rollers is SS.  
2. The SS and LMC types cannot be used in combination.



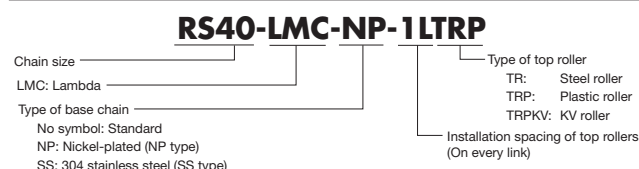
### Chain with Toppole Prevention Attachments



### Chain with Double-Strand Top Rollers



### RS Chain with Top Rollers



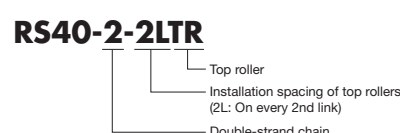
- Note: 1. The type of base chain for KV rollers is SS.  
2. The SS and LMC types cannot be used in combination.



### Chain with Toppole Prevention Attachments



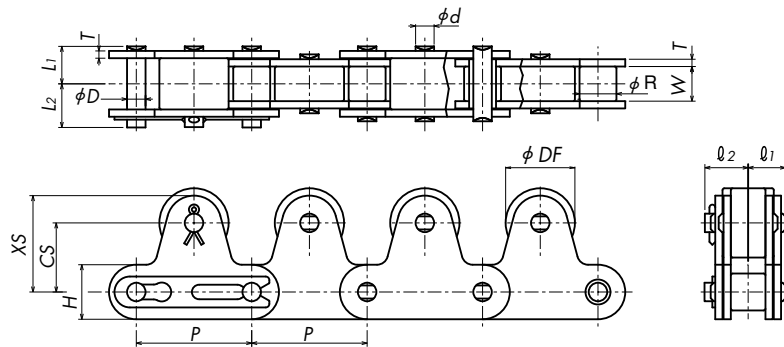
### Chain with Double-Strand Top Rollers



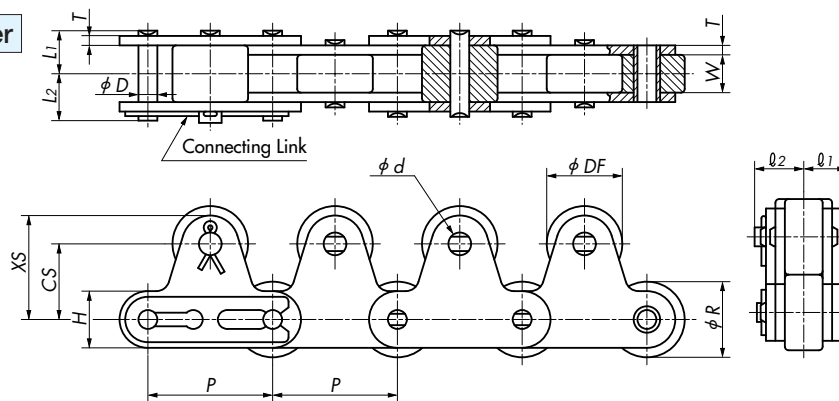
# Top Roller Chain

## Double Pitch Chain with Top Rollers (same for all types)

Base Chain S Roller



Base Chain R Roller



- RF2040 to RF2060 connecting links are spring clip type, and those of other models are cotter pin type.

Tsubaki Chain No.			Pitch P	Width Between Inner Link Plates W	Roller Dia. R		Pin			Plate		Top Roller						Approx. Mass kg/m		
Plastic Top Roller					S Roller	R Roller	Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T							S Roller	R Roller	Plastic R Roller
Standard	Lambda	SS			S Roller	R Roller	Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T	DF	CS	XS	φ 1	φ 2	d	S Roller	R Roller	R Roller
RF2040S-TRP	RF2040S-LMC-TRP	RF2040S-SS-TRP	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	15.88	15.0	21.0	8.25	9.65	3.97	0.91	—	—
RF2050S-TRP	RF2050S-LMC-TRP	RF2050S-SS-TRP	31.75	9.53	10.16	19.05	5.09	10.3	12.0	15.0	2.0	19.05	19.0	26.5	10.3	11.9	5.09	1.44	—	—
RF2060S-TRP	RF2060S-LMC-TRP	RF2060S-SS-TRP	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	22.23	23.0	31.6	14.55	16.95	5.96	2.77	—	—
RF2080S-TRP	—	RF2080S-SS-TRP	50.80	15.88	15.88	28.58	7.94	18.3	20.9	23.0	4.0	28.58	29.0	40.5	18.5	21.3	11.32	4.29	—	—
RF2100S-TRP	—	RF2100S-SS-TRP	63.50	19.05	19.05	39.69	9.54	$\frac{21.8}{22.3}$	$\frac{24.5}{24.9}$	28.6	$\frac{4.8}{5.0}$	39.69	35.4	49.7	22.1	27.2	14.52	$\frac{6.51}{6.63}$	—	—
RF2040R-TRP	RF2040R-LMC-TRP	RF2040R-SS-TRP	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	15.88	15.0	21.0	8.25	9.65	3.97	—	1.27	0.92
RF2050R-TRP	RF2050R-LMC-TRP	RF2050R-SS-TRP	31.75	9.53	10.16	19.05	5.09	10.3	12.0	15.0	2.0	19.05	19.0	26.5	10.3	11.9	5.09	—	1.90	1.43
RF2060R-TRP	RF2060R-LMC-TRP	RF2060R-SS-TRP	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	22.23	23.0	31.6	14.55	16.95	5.96	—	3.46	2.75
RF2080R-TRP	—	RF2080R-SS-TRP	50.80	15.88	15.88	28.58	7.94	18.3	20.9	23.0	4.0	28.58	29.0	40.5	18.5	21.3	11.32	—	5.40	4.52
RF2100R-TRP	—	RF2100R-SS-TRP	63.50	19.05	19.05	39.69	9.54	$\frac{21.8}{22.3}$	$\frac{24.5}{24.9}$	28.6	$\frac{4.8}{5.0}$	39.69	35.4	49.7	22.1	27.2	14.52	—	$\frac{8.77}{8.89}$	$\frac{6.60}{6.72}$

Tsubaki Chain No.			Pitch P	Width Between Inner Link Plates W	Roller Dia. R		Pin			Plate		Top Roller						Approx. Mass kg/m	
Steel Top Roller					S Roller	R Roller	Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T							S Roller	R Roller
Standard	Lambda	SS			S Roller	R Roller	Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T	DF	CS	XS	φ <sub>1</sub>	φ <sub>2</sub>	d	S Roller	R Roller
RF2040S-TR	RF2040S-LMC-TR	RF2040S-SS-TR	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	15.88	15.0	21.0	8.25	9.65	3.97	1.33	—
RF2050S-TR	RF2050S-LMC-TR	RF2050S-SS-TR	31.75	9.53	10.16	19.05	5.09	10.3	12.0	15.0	2.0	19.05	19.0	26.5	10.3	11.9	5.09	2.04	—
RF2060S-TR	RF2060S-LMC-TR	RF2060S-SS-TR	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	22.23	23.0	31.6	14.55	16.95	5.96	3.68	—
RF2080S-TR	—	RF2080S-SS-TR	50.80	15.88	15.88	28.58	7.94	18.3	20.9	23.0	4.0	28.58	29.0	40.5	18.5	21.3	11.32	5.65	—
RF2100S-TR	—	RF2100S-SS-TR	63.50	19.05	19.05	39.69	9.54	21.8 (22.3)	24.5 (24.9)	28.6	4.8 (5.0)	39.69	35.4	49.7	22.1	27.2	14.52	9.11 (9.23)	—
RF2040R-TR	RF2040R-LMC-TR	RF2040R-SS-TR	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	15.88	15.0	21.0	8.25	9.65	3.97	—	1.69
RF2050R-TR	RF2050R-LMC-TR	RF2050R-SS-TR	31.75	9.53	10.16	19.05	5.09	10.3	12.0	15.0	2.0	19.05	19.0	26.5	10.3	11.9	5.09	—	2.50
RF2060R-TR	RF2060R-LMC-TR	RF2060R-SS-TR	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	22.23	23.0	31.6	14.55	16.95	5.96	—	4.36
RF2080R-TR	—	RF2080R-SS-TR	50.80	15.88	15.88	28.58	7.94	18.3	20.9	23.0	4.0	28.58	29.0	40.5	18.5	21.3	11.32	—	6.76
RF2100R-TR	—	RF2100R-SS-TR	63.50	19.05	19.05	39.69	9.54	21.8 (22.3)	24.5 (24.9)	28.6	4.8 (5.0)	39.69	35.4	49.7	22.1	27.2	14.52	—	11.37 (11.49)

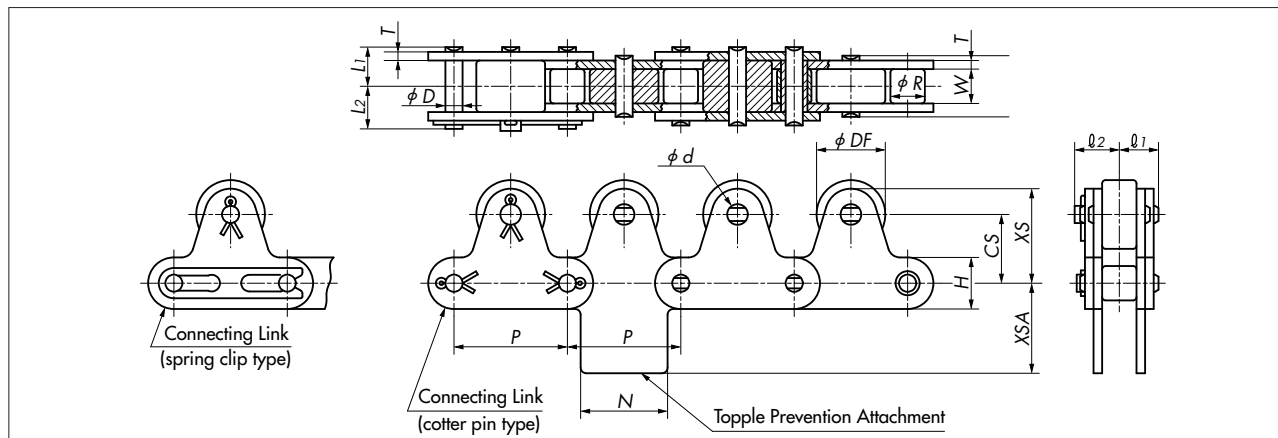
Note: 1. Figures inside < > are for stainless steel chain.

2. When a top roller is installed on each even-numbered link, the top roller is installed on the inner link unless otherwise specified.

3. When the base chain plastic R roller is not specified for SS type, the rollers are made of 304 stainless steel.

## • Double Pitch Chain with Topple Prevention Attachments

Special attachments are installed on a long conveyor so as to prevent toppling and meandering of the conveyor. Please use caution so as to avoid contact between these attachments and the hub of the sprocket. Please specify the installation spacing of the top rollers and attachments (four links or more).

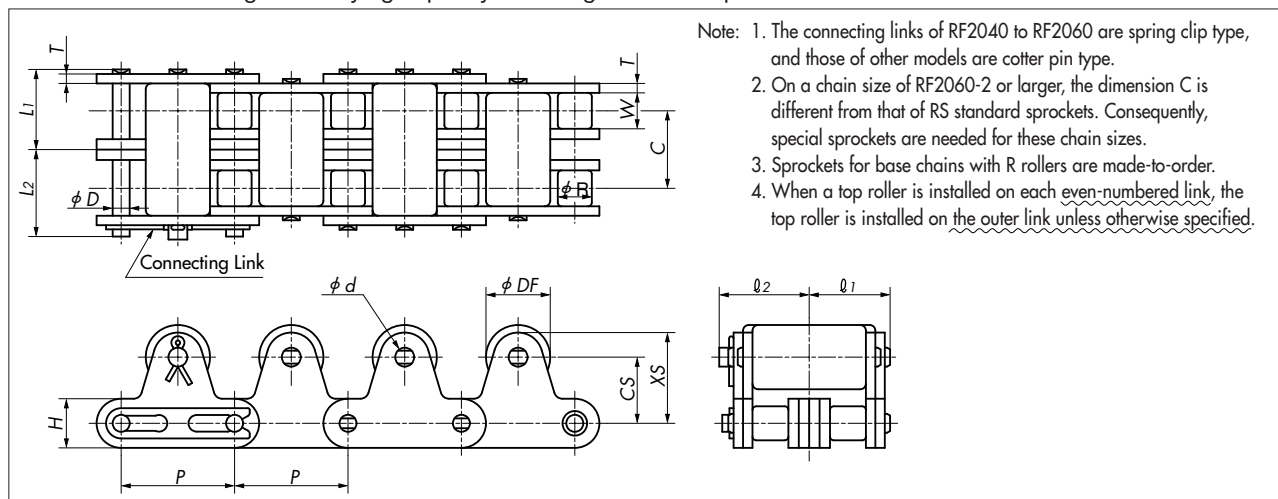


Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R		Pin			Plate		Top Roller & Attachment							
			S Roller	R Roller	Dia. D	L1	L2	Width H	Thickness T	DF	CS	XS	ℓ1	ℓ2	d	N	XSA
RF2040-TG	25.40	7.95	7.92	15.88	3.97	8.25	9.95	12.0	1.5	15.88	15.0	21.0	8.45	9.65	3.97	19.1	12.7
RF2050-TG	31.75	9.53	10.16	19.05	5.09	10.3	12.0	15.0	2.0	19.05	19.0	26.5	10.5	11.9	5.09	23.8	15.9
RF2060-TG	38.10	12.70	11.91	22.23	5.96	14.55	16.55	17.2	3.2	22.23	23.0	31.6	14.75	16.95	5.96	28.6	19.1
RF2080-TG	50.80	15.88	15.88	28.58	7.94	18.3	20.9	23.0	4.0	28.58	29.0	40.5	18.5	21.3	11.32	38.1	25.4
RF2100-TG	63.50	19.05	19.05	39.69	9.54	21.8	24.5	28.6	4.8	39.69	35.4	49.7	22.1	27.2	14.52	47.6	31.8

Note: Sprockets for base chains with R rollers are made-to-order.

## • Double Pitch Chain with Double-Strand Top Rollers

This chain allows a larger conveying capacity than single-strand Top Roller Chain.

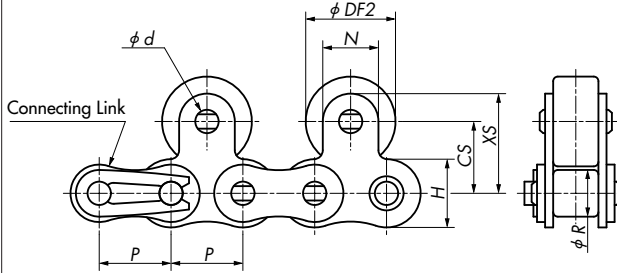
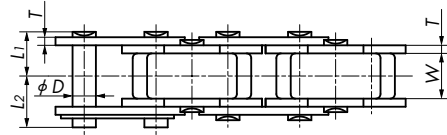


Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Transverse Pitch C	Roller Dia. R		Pin			Plate		Top Roller					
				S Roller	R Roller	Dia. D	L1	L2	Width H	Thickness T	DF	CS	XS	ℓ1	ℓ2	d
RF2040-2-TR	25.40	7.95	14.4	7.92	15.88	3.97	15.45	17.15	12.0	1.5	15.88	15.0	21.0	15.65	17.25	3.97
RF2050-2-TR	31.75	9.53	18.1	10.16	19.05	5.09	19.35	21.15	15.0	2.0	19.05	19.0	26.5	19.55	21.95	5.09
RF2060-2-TR	38.10	12.70	26.2	11.91	22.23	5.96	27.7	29.6	17.2	3.2	22.23	23.0	31.6	27.85	30.85	5.96
RF2080-2-TR	50.80	15.88	32.6	15.88	28.58	7.94	34.6	37.2	23.0	4.0	28.58	29.0	40.5	34.8	37.5	11.32
RF2100-2-TR	63.50	19.05	39.1	19.05	39.69	9.54	41.4	44.1	28.6	4.8	39.69	35.4	49.7	41.65	46.75	14.52

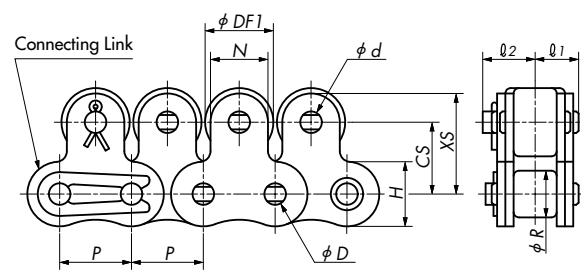
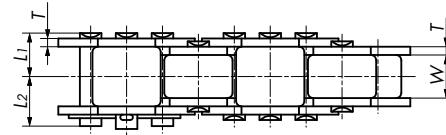
# Top Roller Chain

## ■ RS Chain with Top Rollers (same for all types)

Top Rollers Installed on Every Second Link



Top Rollers Installed on Every Link



- The connecting link uses a spring clip on RS40 to RS60, and cotter pin on RS80 to RS100.

Tsubaki Chain No.			Pitch P	Width Between Inner Link Plates W	Base Chain Roller Dia. R	Pin			Plate		Top Roller									Approx. Mass kg/m	
Plastic Top Roller						Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T										On Every Link	On Every 2nd Link
Standard	Lambda	SS																			
RS40-TRP	RS40-LMC-TRP	RS40SS-TRP	12.70	7.95	7.92	3.97	8.25	9.95	12.0	1.5	11.0	15.88	12.7	9.5	17.45	8.25	9.65	3.97	0.92	0.85	
RS50-TRP	RS50-LMC-TRP	RS50SS-TRP	15.875	9.53	10.16	5.09	10.3	12.0	15.0	2.0	15.0	19.05	15.9	12.7	22.25	10.3	11.9	5.09	1.56	1.38	
RS60-TRP	RS60-LMC-TRP	RS60SS-TRP	19.05	12.70	11.91	5.96	12.85	14.75	18.1	2.4	18.0	22.23	18.3	15.9	26.25	12.85	15.25	5.96	2.30	2.03	
RS80-TRP	—	RS80SS-TRP	25.40	15.88	15.88	7.94	16.25	19.25	24.1	3.2	24.0	28.58	24.6	19.1	34.15	16.25	19.25	7.94	3.90	3.44	
RS100-TRP	—	RS100SS-TRP	31.75	19.05	19.05	9.54	19.75	22.85	30.1	4.0	30.0	39.69	31.8	25.4	44.5	19.75	22.85	9.54	6.06	5.41	

Tsubaki Chain No.			Pitch P	Width Between Inner Link Plates W	Base Chain Roller Dia. R	Pin			Plate		Top Roller									Approx. Mass kg/m	
Steel Top Roller						Dia. D	L <sub>1</sub>	L <sub>2</sub>	Width H	Thickness T										On Every Link	On Every 2nd Link
Standard	Lambda	SS																			
RS40-TR	RS40-LMC-TR	RS40SS-TR	12.70	7.95	7.92	3.97	8.25	9.95	12.0	1.5	11.0	15.88	12.7	9.5	17.45	8.25	9.65	3.97	1.83	1.41	
RS50-TR	RS50-LMC-TR	RS50SS-TR	15.875	9.53	10.16	5.09	10.3	12.0	15.0	2.0	15.0	19.05	15.9	12.7	22.25	10.3	11.9	5.09	2.39	2.18	
RS60-TR	RS60-LMC-TR	RS60SS-TR	19.05	12.70	11.91	5.96	12.85	14.75	18.1	2.4	18.0	22.23	18.3	15.9	26.25	12.85	15.25	5.96	3.60	3.18	
RS80-TR	—	RS80SS-TR	25.40	15.88	15.88	7.94	16.25	19.25	24.1	3.2	24.0	28.58	24.6	19.1	34.15	16.25	19.25	7.94	6.09	5.27	
RS100-TR	—	RS100SS-TR	31.75	19.05	19.05	9.54	19.75	22.85	30.1	4.0	30.0	39.69	31.8	25.4	44.5	19.75	22.85	9.54	9.30	8.85	

Note: 1. "On Every Link" and "On Every 2nd Link" described in the column of the "Approx. Mass" refer to the spacing for the installation of the top rollers.

2. When a top roller is installed on each even-numbered link, the top roller is installed on the inner link unless otherwise specified.

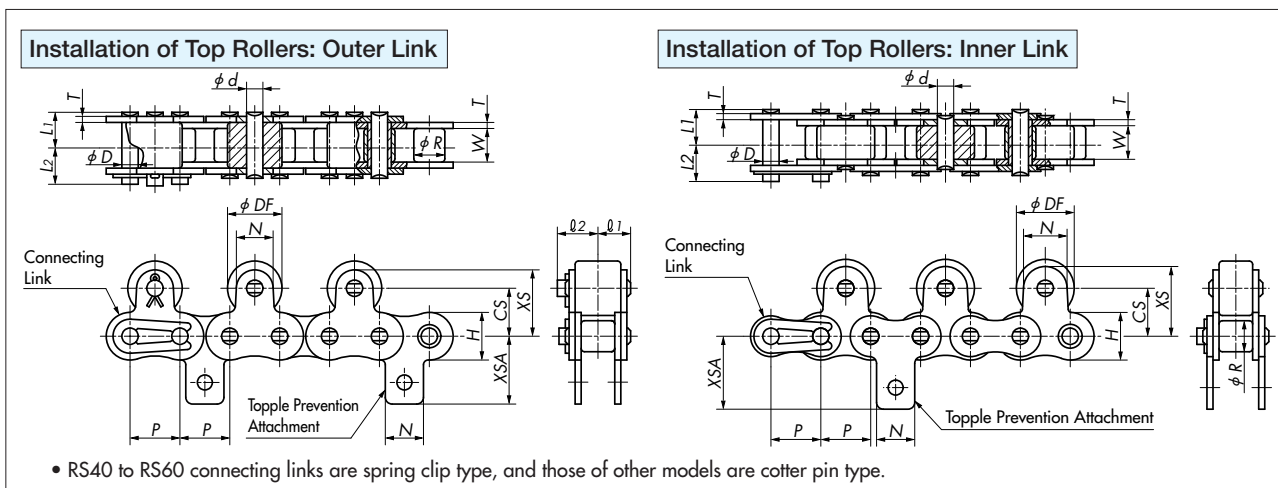
3. Even if the chain with steel top rollers is Lambda Chain, the top rollers need to be lubricated.

4. When the chain with steel top rollers is SS type, the material of the top roller is 304 stainless steel.



## • RS Chain with Topple Prevention Attachments

Special attachments are installed on a long conveyor so as to prevent toppling and meandering of the conveyor. Please use caution so as to avoid contact between these attachments and the hub of the sprocket. Please specify the installation spacing of the top rollers and attachments (four links or more).

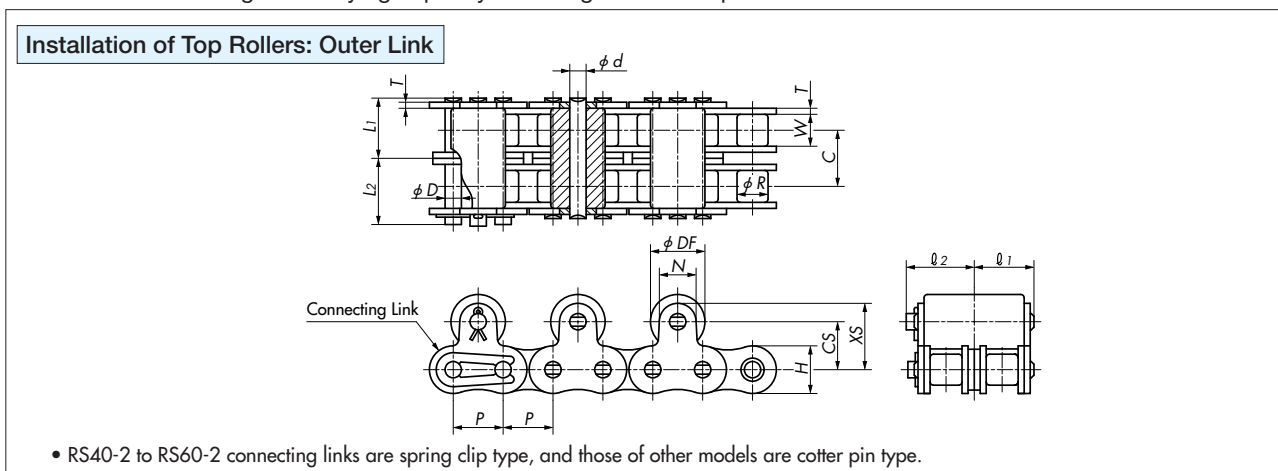


Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R	Pin			Plate		Top Roller & Attachment							
				Dia. D	L1	L2	Width H	Thickness T	DF	CS	N	XS	ℓ1	ℓ2	d	XSA
RS40-TG	12.70	7.95	7.92	3.97	8.25	9.95	12.0	1.5	15.88	12.7	9.5	17.45	8.25	9.65	3.97	17.4
RS50-TG	15.875	9.53	10.16	5.09	10.3	12.0	15.0	2.0	19.05	15.9	12.7	22.25	10.3	11.9	5.09	23.05
RS60-TG	19.05	12.70	11.91	5.96	12.85	14.75	18.1	2.4	22.23	18.3	15.9	26.25	12.85	15.25	5.96	26.85
RS80-TG	25.40	15.88	15.88	7.94	16.25	19.25	24.1	3.2	28.58	24.6	19.1	34.15	16.25	19.25	7.94	35.45
RS100-TG	31.75	19.05	19.05	9.54	19.75	22.85	30.1	4.0	39.69	31.8	25.4	44.5	19.75	22.85	9.73	44.0

Note: Please specify whether to install the top rollers on the inner or outer link.

## • RS Chain with Double-Strand Top Rollers

This chain allows a larger conveying capacity than single-strand Top Roller Chain.



Tsubaki Chain No.	Pitch P	Width Between Inner Link Plates W	Roller Dia. R	Transverse Pitch C	Pin			Plate		Top Roller						
					Dia. D	L1	L2	Width H	Thickness T	DF	CS	XS	N	ℓ1	ℓ2	d
RS40-2-TR	12.70	7.95	7.92	14.4	3.97	15.45	17.15	12.0	1.5	15.88	12.7	17.45	9.5	15.45	16.95	3.97
RS50-2-TR	15.875	9.53	10.16	18.1	5.09	19.35	21.15	15.0	2.0	19.05	15.9	22.25	12.7	19.35	21.15	5.09
RS60-2-TR	19.05	12.70	11.91	22.8	5.96	24.25	26.25	18.1	2.4	22.23	18.3	26.25	15.9	24.25	26.75	5.96
RS80-2-TR	25.40	15.88	15.88	29.3	7.94	30.9	33.9	24.1	3.2	28.58	24.6	34.15	19.1	30.9	33.9	7.94
RS100-2-TR	31.75	19.05	19.05	35.8	9.54	37.7	40.8	30.1	4.0	39.69	31.8	44.5	25.4	37.7	40.8	9.54

Note: 1. Dimension DF changes when top rollers are installed on every link.  
2. RS standard sprockets (double-strand) can be used.  
3. When a top roller is installed on each even-numbered link, the top roller is installed on the outer link unless otherwise specified.

Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

Outboard Roller Chain

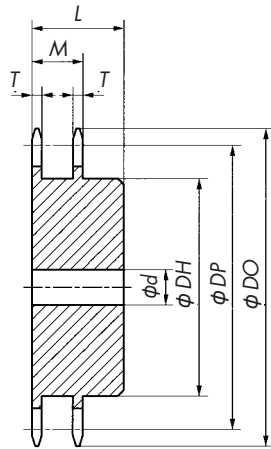
Top Roller Chain

Special Sprockets

Engineering Manual

# Special Sprockets

## Sprockets for Double Plus Chain: Same as for Double Plus Chain without snap cover (steel type)



### Sprocket Numbering

**RF2030VRP-10T-SC**

Applicable chain size

Chain with snap cover

No. of teeth: 10

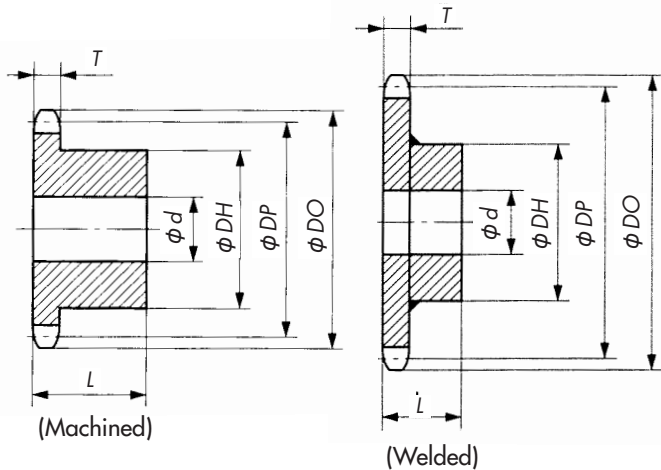
Tsubaki Sprocket No.	No. of Sprocket Teeth	Pitch Dia. $D_p$	Outer Dia. $D_o$	Facewidth $T$	Total Facewidth $M$	Bore Dia. $d$		Hub Dia. $D_H$	Total Width $L$	Approx. Mass kg	Material (Specification)
						Pilot Hole	Max.				
RF2030VRP-10T-SC	10	61.65	63	3.0	15.3	12.7	20	37	25	0.2	Carbon steel (machined)
RF2040VRP-10T-SC	10	82.20	85	4.0	20.4	15.9	32	52	40	0.8	
RF2050VRP-10T-SC	10	102.75	107	5.0	25.5	15.9	45	66	45	1.5	
RF2060VRP-10T-SC	10	123.30	128	6.0	30.5	19	55	81	50	2.5	
RF2080VRP-10T-SC	10	164.39	172	12.0	47.5	23	72	110	67	7.0	

Note: 1. The tooth tip is not hardened on any model.

2. Delivery: Please contact a Tsubakimoto representative.

3. 304 stainless steel type is also manufactured in the same dimensions as the steel type.

## Sprockets for Double Pitch Chain with Top Rollers (steel type)



### Sprocket Numbering

**RF2040R 1200T-TR**

Applicable chain size

Top roller

No. of engaging teeth (1200 T: 12)

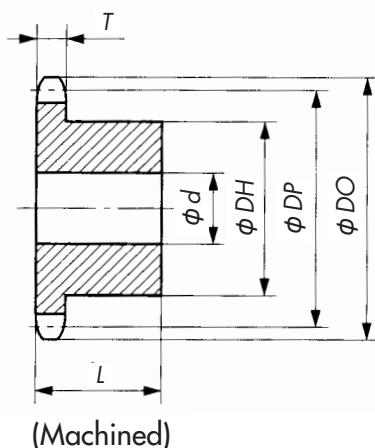
Tsubaki Sprocket No.	Roller Type	No. of Engaging Teeth	Pitch Dia. $D_p$	Outer Dia. $D_o$	Facewidth $T$	Bore Dia. $d$		Hub Dia. $D_H$	Total Width $L$	Approx. Mass kg	Material (Specification)
						Pilot Hole	Max.				
RF2040R 1100T-TR	R roller	11	90.16	97	7.3	12.7	42	63	25	0.8	Carbon steel (machined)
RF2040R 1200T-TR		12	98.14	105						0.9	
RF2040R 1300T-TR		13	106.14	114						0.9	
RF2050R 1100T-TR		11	112.70	124	8.9	15.9	48	73	28	1.3	
RF2050R 1200T-TR		12	122.67	134						1.3	
RF2050R 1300T-TR		13	132.67	144						1.5	
RF2060R 1100T-TR		11	135.24	150	11.9	18	55	83	45	2.6	
RF2060R 1200T-TR		12	147.21	162						2.8	
RF2060R 1300T-TR		13	159.20	175						3.1	
RF2080R 1100T-TR		11	180.31	109	15	28	75	107	45	4.8	
RF2080R 1200T-TR		12	196.28	216						5.3	
RF2080R 1300T-TR		13	212.27	232						5.9	
RF2100R 1100T-TR		11	225.39	244	18	33	80	117	56	7.9	Rolled steel (welded)

Note: 1. The tooth tip is not hardened on any model.

2. Delivery: Please contact a Tsubakimoto representative.

3. RS standard sprockets can be used with RF Double Pitch Chain (S roller) or when the number of engaging teeth of the sprocket is 15 or more (sprocket teeth: 30).

## Sprockets for RS Chain with Outboard Rollers (steel type)



### Sprocket Numbering

**RS401B 9T-SR**

Applicable chain size

Outboard roller

No. of teeth: 9

Tsubaki Sprocket No.	No. of Teeth	Pitch Dia. $D_p$	Outer Dia. $D_o$	Facewidth $T$	Bore Dia. $d$		Hub Dia. $D_H$	Total Width $L$	Approx. Mass kg	Material (Specification)
					Pilot Hole	Max.				
RS401B 09T-SR	9	37.13	42	7.3	9.5	10	20	22	0.08	Carbon steel (machined)
RS401B 10T-SR	10	41.10	46			11	24		0.10	
RS401B 11T-SR	11	45.08	51			14	28		0.14	
RS401B 12T-SR	12	49.07	53			16	32		0.17	
RS401B 13T-SR	13	53.07	58		12.7	20	36		0.22	
RS401B 14T-SR	14	57.07	63			22	40		0.27	
RS401B 15T-SR	15	61.08	67			26	44		0.32	
RS401B 16T-SR	16	65.10	71			28	48		0.38	
RS401B 17T-SR	17	69.12	75			32	52		0.44	
RS401B 18T-SR	18	73.14	78			35	56		0.50	
RS401B 19T-SR	19	77.16	83			38	60	25	0.57	
RS401B 20T-SR	20	81.18	88			42	64		0.72	
RS401B 21T-SR	21	85.21	92			44	68		0.80	
RS401B 22T-SR	22	89.24	96			46	72		0.90	
RS401B 23T-SR	23	93.27	98			50	76		0.98	
RS501B 09T-SR	9	46.42	53	8.9	9.5	12	26	25	0.15	
RS501B 10T-SR	10	51.37	58			16	31		0.21	
RS501B 11T-SR	11	56.35	63			20	36		0.25	
RS501B 12T-SR	12	61.34	68			23	41		0.32	
RS501B 13T-SR	13	66.34	73		12.7	27	46		0.41	
RS501B 14T-SR	14	71.34	78			31	51		0.51	
RS501B 15T-SR	15	76.35	83			35	56		0.61	
RS501B 16T-SR	16	81.37	88			38	61		0.71	
RS501B 17T-SR	17	86.39	93			43	66		0.82	
RS501B 18T-SR	18	91.42	98			46	71	28	0.98	
RS601B 09T-SR	9	55.70	63	11.9	9.5	16	32	32	0.30	
RS601B 10T-SR	10	61.65	68		12.7	20	$\phi 37$		0.37	
RS601B 11T-SR	11	67.62	76			26	44		0.52	
RS601B 12T-SR	12	73.60	82			30	50		0.68	
RS601B 13T-SR	13	79.60	88		15.9	35	56		0.80	
RS801B 09T-SR	9	74.26	85	15	15.9	26	44	40	0.65	
RS801B 13T-SR	13	106.14	118		19	50	76		1.88	
RS801B 15T-SR	15	122.17	135			62	92		2.57	
RS1001B 10T-SR	10	102.75	117	18	18	40	62	50	1.82	
RS1001B 11T-SR	11	112.70	127		23	46	72		2.21	
RS1001B 12T-SR	12	122.67	138			52	81		2.73	

- Note: 1. The tooth tip is hardened on all models.  
2. Delivery: Please contact a Tsubakimoto representative.  
3. Models other than those listed above can be used with RS standard sprockets.

## Sprockets for RF Outboard Roller Chain

RF Double Pitch sprockets can be used with all RF outboard roller chains.

## Chain Selection

An appropriate chain size and type can be selected based upon the type and capacity of the conveyor. In some cases, it may be difficult to determine the most appropriate chain size and type, since there are a variety of operating conditions for the conveyor. The general procedure for chain selection is as follows:

### Step 1: Check Conveyance Conditions

- (1) Type, mass, dimensions, and quantity of the conveyed objects (including pallet)
- (2) Conveying speed
- (3) Conveyor length (length of accumulating and conveying sections)
- (4) Environment and lubrication requirements

### Step 2: Select Chain Type

Select the base chain and roller type according to the operating conditions and environment.

### Step 3: Tentatively Determine Chain Type

Perform tentative checking of chain tension.

SI units:  $F = 9.80665 \times W_T \times f \times K_v / 1000$

Gravimetric units:  $F = W_T \times f \times K_v$

Note: In this catalog, values are indicated in both SI and gravimetric units. The weight (kgf) used to calculate the max. tension  $F$  in the gravimetric units is the same value as the mass (kg).

$F$ : Max. tension applied to chain kN {kgf}

$W_T$ : Total mass of conveyed objects excluding chain kg

$f$ : Coefficient of friction  $f_2$  (Table 2)+  $f_3$  (Table 3)

$K_v$ : Speed coefficient (Table 7)

When two chains arranged in parallel are used, their working tensions are unequal. Allowing for the imbalance of working tension, determine the model and size of a chain tentatively to ensure the max. allowable tension (Tables 8 and 9) of the chain is  $F \times 0.6$  or more.

**Table 1:  $f_1$ : Coefficient of Friction Between Chain and Rail During Conveyance**

Chain Type	Type of Base Chain Roller		Dry	Lubricated
Double Plus Chain	Plastic roller	A · B C · D UA · UB	0.08	—
	Steel roller		—	0.05
Center Roller Chain	Steel roller		—	0.08
Outboard Roller Chain	Steel roller	S roller	(0.21)	0.14
		R roller	(0.12)	0.08
Top Roller Chain	Plastic roller	S roller	—	—
		R roller	0.08	—
Poly Steel Chain	(Plastic inner link)		0.25	—

Figures inside ( ) are given for reference purposes.

**Table 2:  $f_2$ : Coefficient of Friction Between Chain and Conveyed Objects During Accumulation**

Chain Type	Type of Transfer Roller	Dry	Lubricated
Double Plus Chain	A · C · UA	0.10	—
	B · D · UB	0.15	—
	Steel roller	—	0.10
Center Roller Chain	Steel roller	—	0.06
Outboard Roller Chain	Plastic outboard roller	0.06	—
	Outboard roller with plastic brake	0.20*	—
	Steel outboard roller	(0.09)	0.06
Top Roller Chain	Plastic top roller	0.06	—
	Steel top roller	(0.09)	0.06

Figures inside ( ) are given for reference purposes.

\* Coefficient of friction for each outboard roller with plastic brake.

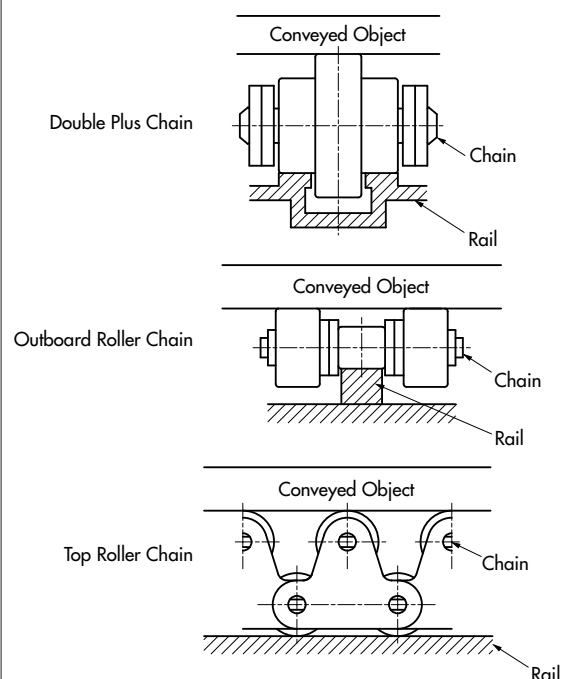
When the number of brake outboard rollers accounts for about one third of the total number of outboard rollers, the coefficient of friction is 0.1. (Refer to "Installation of Outboard Rollers" on page 128.)

**Table 3:  $f_3$ : Coefficient of Friction Between Chain and Rail During Accumulation**

Chain Type	Type of Transfer Roller		Dry	Lubricated
Double Plus Chain	A • C • UA		0.20	—
	B • D • UB		0.25	—
	Steel roller		—	0.10
Center Roller Chain	Steel roller		—	0.10
Outboard Roller Chain	Steel roller	S roller	(0.21)	0.14
		R roller	(0.12)	0.08
	Plastic roller	S roller	—	—
		R roller	0.08	—
Poly Steel Chain	(Plastic inner link)		0.25	—

Figures inside ( ) are given for reference purposes.

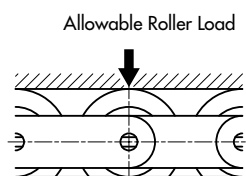
**Coefficient of Friction: Reference Diagram of  $f_1$ ,  $f_2$ , and  $f_3$**



## Step 4: Check Allowable Roller Load

The load applied on the roller should not exceed the values given below. The values for steel rollers assume lubricated conditions.

### 1. Double Plus Chain and Center Roller Chain



#### RF2030 to RF2080

The values given below are the allowable conveying load per two strands of chain (allowable load per one meter of pallet).

**Table 4: Allowable Roller Load**

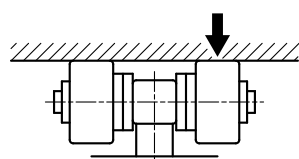
Unit: kN {kgf}/m

Tsubaki Chain No.	Plastic Roller		Steel Roller
	Aluminum Frame	Aluminum Frame with Steel Rail	
RF2030 (urethane roller)	0.39{ 40}	0.78{ 80}	1.57{160}
RF2040	0.20{ 20}	0.20{ 20}	—
RF2050	0.59{ 60}	1.18{120}	2.35{240}
RF2060	0.78{ 80}	1.57{160}	3.14{320}
RF2080	0.98{100}	1.96{200}	3.92{400}
	—	2.94{300}	5.88{600}

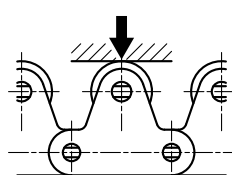
### 2. Outboard Roller Chain and Top Roller Chain

#### 1) Allowable Load of Outboard Roller and Top Roller

Allowable Load of Outboard Roller



Allowable Load of Top Roller

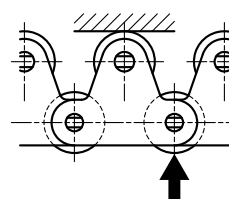


**Table 5: Allowable Roller Load**

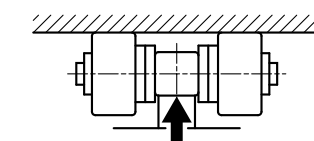
Unit: kN {kgf}/roller

Tsubaki Chain No.	Outboard Roller and Single-Strand Top Roller		Double-Strand Top Roller
	Plastic Roller	Steel Roller	
RF2040 · RS 40	0.05{ 5}	0.15{15}	0.29{ 30}
RF2050 · RS 50	0.07{ 7}	0.20{20}	0.39{ 40}
RF2060 · RS 60	0.10{10}	0.29{30}	0.59{ 60}
RF2080 · RS 80	0.18{18}	0.54{55}	1.08{110}
RF2100 · RS100	0.29{30}	0.78{80}	1.57{160}

#### 2) Allowable Load of Base Chain Roller



Allowable Load of Base Chain Roller



Allowable Load of Base Chain Roller

**Table 6: Allowable Load of Base Chain Roller** Unit: kN {kgf}/roller

Tsubaki Chain No.	Steel Roller		Plastic Roller	Poly Steel
	R Roller	S Roller	R Roller	
RF2040 · RS 40	0.64{ 65}	0.15{15}	0.20{ 20}	0.02{2}
RF2050 · RS 50	0.98{100}	0.20{20}	0.29{ 30}	0.04{4}
RF2060 · RS 60	1.57{160}	0.29{30}	0.49{ 50}	0.06{6}
RF2080 · RS 80	2.65{270}	0.54{55}	0.88{ 90}	—
RF2100 · RS100	3.92{400}	0.78{80}	1.27{130}	—

Note:

1. The above values for Poly Steel Chain represent the allowable load for each plastic inner link.
2. The allowable load of Lambda Chain is the same as that of steel roller chain.
3. Please use S45C (JIS), 1045 (AISI) or higher high-tensile material for the base chain steel roller guide rail.
4. The plastic roller includes heat-resistant type rollers (KV type).

Double Plus Chain

Center Roller Chain

Accessories for Double Plus Chain

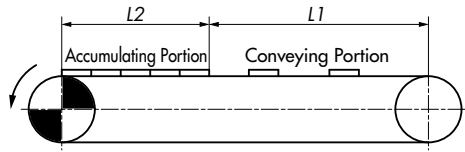
Outboard Roller Chain

Top Roller Chain

Special Sprockets

Engineering Manual

## Step 5: Calculate Chain Tension (T)



### SI Units

$$F = \frac{G}{1000} \cdot \{ (W1 + M) L1 \cdot f1 + W2 \cdot L2 \cdot f2 + (W2 + M) \times L2 \cdot f3 + 1.1M (L1 + L2) f1 \}$$

$$kW = \frac{F \cdot V}{60} \times 1.1 \times \frac{1}{\eta}$$

### Gravimetric Units

$$F = (W1 + M) L1 \cdot f1 + W2 \cdot L2 \cdot f2 + (W2 + M) L2 \cdot f3 + 1.1M (L1 + L2) f1$$

$$kW = \frac{F \cdot V}{6120} \times 1.1 \times \frac{1}{\eta}$$

F : Maximum tension applied to chain : kN {kgf}

L1 : Length of conveying portion : m

W1 : Mass of conveyed objects in conveying portion : kg/m

L2 : Length of accumulating portion : m

W2 : Mass of conveyed objects in accumulating portion : kg/m

f1 : Coefficient of friction between chain and rail during conveyance

f2 : Coefficient of friction between chain and conveyed objects during accumulation

f3 : Coefficient of friction between chain and rail during accumulation

M : Mass of chain, slats, etc. : kg/m

kW : Power required : kW

V : Chain speed : m/min

$\eta$  : Transmission efficiency of drive unit

G : Acceleration of gravity: 9.80665 m/s<sup>2</sup>

Since the free flow conveyor uses two strands of chain generally laid in parallel, the chain mass is assumed to be that of two strands of chain. Consequently, "F" in the above formula represents the maximum chain tension applied to two strands of chain. Allowing for the imbalance of the working tension, it is assumed that a tension of 0.6 F is applied to a single strand.

## Step 6: Determine Chain Size

Multiply the maximum tension (0.6 F) applied to a single strand of chain by the speed coefficient (Kv) given in Table 7 for a chain that satisfies the following formula:

$$0.6 F \times Kv \leq \text{Maximum allowable chain tension}$$

Table 7: Speed Coefficient (Kv)

Chain Speed (m/min)	Speed Coefficient (Kv)
15 or less	1.0
15 to 30	1.2
30 to 50	1.4
50 to 70	1.6
70 to 90	2.2
90 to 110	2.8
110 to 120	3.2

The recommended speed of the following chains is as follows:

Double Plus Chain : 5 to 15 m/min or less

Plastic R roller chain : 70 m/min or less

Poly Steel Chain : 70 m/min or less

Table 9: Max. Allowable Chain Tension (2)

Unit: kN {kgf}

Chain Type	Type of Base Chain Roller	RS40 RF2040	RS50 RF2050	RS60 RF2060	RS80 RF2080	RS100 RF2100
Outboard Roller Chain	Steel roller	2.65 {270}	4.31 {440}	6.28 {640}	10.7 {1090}	17.1 {1740}
	Plastic R roller	0.44 {45}	0.69 {70}	1.03 {105}	1.77 {180}	2.55 {260}
	Poly Steel roller	0.44 {45}	0.69 {70}	0.88 {90}	—	—
Top Roller Chain (Single-Strand)	Steel roller	2.65 {270}	4.31 {440}	6.28 {640}	10.7 {1090}	17.1 {1740}
	Plastic R roller	0.44 {45}	0.69 {70}	1.03 {105}	1.77 {180}	2.55 {260}

Note: 1. The max. allowable tension of Lambda chain is the same as that of steel roller chain.

2. The max. allowable tension of double-strand top roller chain is 1.7 times that of single-strand top roller chain (1.4 times for Lambda chain).

Table 8: Max. Allowable Chain Tension (1)

Unit: kN {kgf}

Tsubaki Chain No. \ Roller Type \ Base Chain Type		A · C UA	B · D UB
RF2030VRP	Standard	0.55{56}	0.27{28}
	HCP		
	Lambda		
	SS	0.27{28}	
RF2040VRP	Standard	0.88{90}	0.44{45}
	HCP		
	Lambda		
	SS	0.44{45}	
RF2050VRP	Standard	1.37{140}	0.69{70}
	HCP		
	Lambda		
	SS	0.69{70}	
RF2060VRP	Standard	2.06{210}	1.03{105}
	HCP		
	Lambda		
	SS	1.03{105}	
RF2080VRP	Standard	5.30{540}	2.65{270}
	HCP		
	Lambda		
	SS	2.65{270}	

Tsubaki Chain No.	Roller Type Base Chain Type	Steel (Double Plus Chain)	Center Roller (Equal Speed)
RF2030VR	Standard	0.98{100}	—
RF2040VR · CR	Standard	1.57{160}	1.57{160}
RF2050VR · CR	Standard	2.45{250}	2.45{250}
RF2060VR · CR	Standard	3.73{380}	3.73{380}



## Design Information on Double Plus Chain Conveyors

Please use the dimensional information given below for reference in configuring and installing your conveyor.

### 1. Conveyor Ends and Sprocket Position

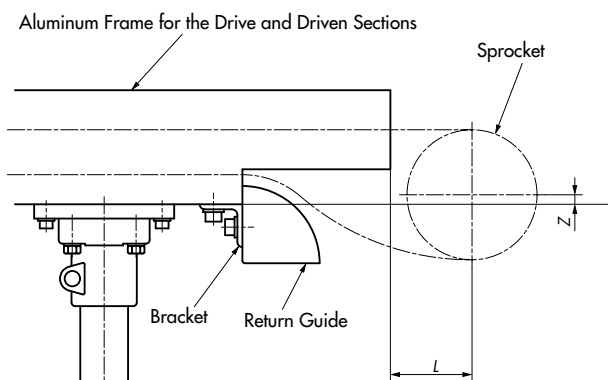


Table 1

Tsubaki Chain No.	RF2030VRP	RF2040VRP	RF2050VRP
Rail No.	RF2030VRP-R3 RF2030VRP-R3S	RF2040VRP-R4 RF2040VRP-R4S	RF2050VRP-R4 RF2050VRP-R4S
Z	21.3	14.7	16.1
L	40	50	60

Tsubaki Chain No.	RF2050VRP	RF2060VRP	RF2080VRP
Rail No.	RF2050VRP-R3H RF2050VRP-R3HS	RF2060VRP-R4C RF2060VRP-R4 RF2060VRP-R4S	RF2080VRP-R3S
Z	76.2	14.9	24
L	60	70	100

### 2. Dimensions for Machining Aluminum Frame

The rails listed on the right do not have an aluminum frame for the drive and driven sections. Add a frame for the middle section, referring to the dimensions in Table 2.

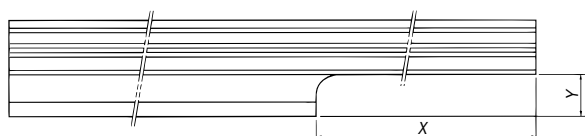


Table 2

Tsubaki Chain No.	RF2050VRP	RF2060VRP
Rail No.	RF2050VRP-R3H RF2050VRP-R3HS	RF2060VRP-R4C
X (drive side)	340	430
X (driven side)	120	130
Y	30	40

### 3. Mounting Bolt and Conveyor Height

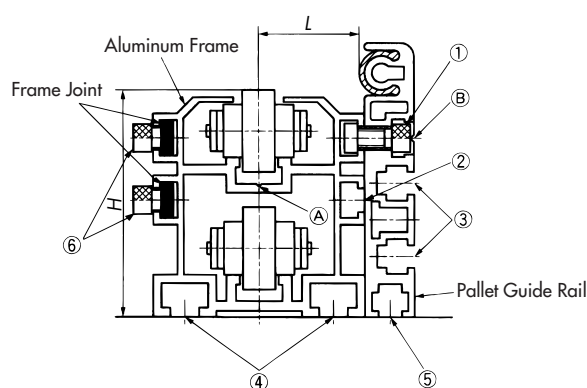


Table 3

Item	①	②	③	④	⑤	⑥	H	L
Frame								
RF2030VRP-R3	M6×10 ①	M6	M5	M6	M5	M6×8 ①	61.5	14.5
RF2030VRP-R3S								
RF2040VRP-R4	M6×12 ①	M6	M6	M8	M6	M6×8 ①	68	28.5
RF2040VRP-R4S								
RF2050VRP-R4	M8×20 ①	M8	M8	M10	M8	M8×10 ①	82.5	36
RF2050VRP-R4S								
※ RF2050VRP-R3H	M8×20 ①	M8	M8	M10	M8	M8×10 ①	142.5	37
※ RF2050VRP-R3HS								
RF2060VRP-R4C	M8×20 ①	M8	M8	M10	M8	M8×10 ①	95	44.5
RF2060VRP-R4								
RF2060VRP-R4S								
RF2080VRP-R3S	M8×25 ①	M8	M8	M10	M8	M8×12 ①	130	47

#### 1) Positioning Between the Aluminum Frames

Position the frames using the V groove (marked with ① in the above diagram) as a guide and secure them with bolts ④ on the base.

#### 2) Connecting the Aluminum Frames

After positioning is complete, connecting the frames via the frame joint is recommended so as to reinforce the connection. The frame joint is not intended for positioning between aluminum frames.

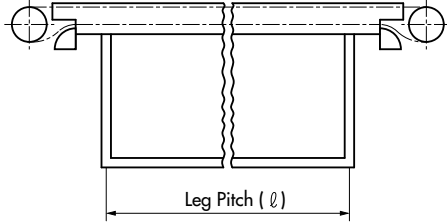
#### 3) Installing the Pallet Guide Rail

Make a hole of an appropriate size at the V groove position marked ② in the above diagram and secure the rail using the hexagonal bolt ① listed in Table 3.

#### 4) On models marked with ※ in Table 3, there is a difference of 60 mm in height between the aluminum frame and pallet guide rail. To offset the height difference, fit a collar for height adjustment under the pallet guide rail.

## 4. Conveyor Leg Pitch

Determine the conveyor leg pitch based on the mass of the conveyed objects and the geometrical moment of inertia given in Table 4.



### ■ Calculation of Leg Pitch (ℓ)

$$\ell = \left\{ \frac{384EI}{5 \times (0.6W)} \times \delta \times 10 \right\}^{\frac{1}{4}} (\text{mm})$$

$I$  = Geometrical moment of inertia ( $\text{cm}^4$ ) (See Table 4)

$W$  = Total conveyed mass ( $\text{kg/m}$ )     $\delta$  = Slack (2 mm)

$E = 7.0 \times 10^3 (\text{kg/mm}^2)$

Note: The total conveyed mass ( $W$ ) is not always distributed evenly between the two conveyor strands. This is taken into account with the factor (0.6).

Table 4

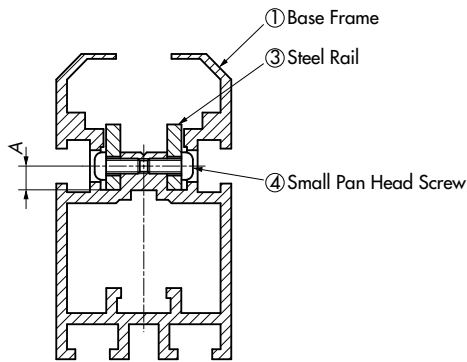
Type	Frame No.	Geometrical Moment of Inertia ( $I$ ) ( $\text{cm}^4$ )
Aluminum Frame	RF2030VRP-R3	17.127
	RF2040VRP-R4	40.185
	RF2050VRP-R4	84.039
	RF2050VRP-R3H	408.283
	RF2060VRP-R4	135.137
	RF2060VRP-R4C	108.508
Aluminum Frame with Steel Rail	RF2030VRP-R3S	17.821
	RF2040VRP-R4S	44.312
	RF2050VRP-R4S	95.623
	RF2050VRP-R3HS	442.093
	RF2060VRP-R4S	171.761
	RF2080VRP-R3S	360.726

The geometrical moment of inertia ( $I$ ) of the frame for the drive and driven sections is the same as given in the table above.

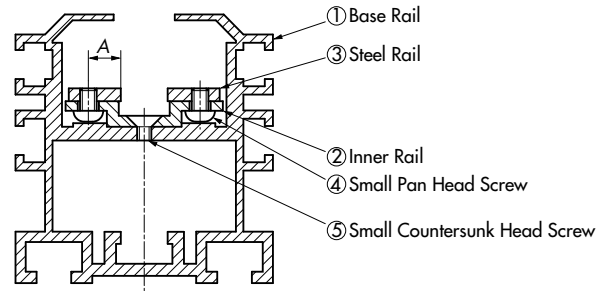
## 5. Aluminum Frame with Steel Rail

### 1) Cross Section

#### RF2030VRP

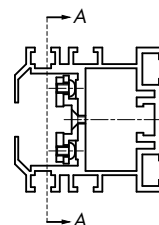
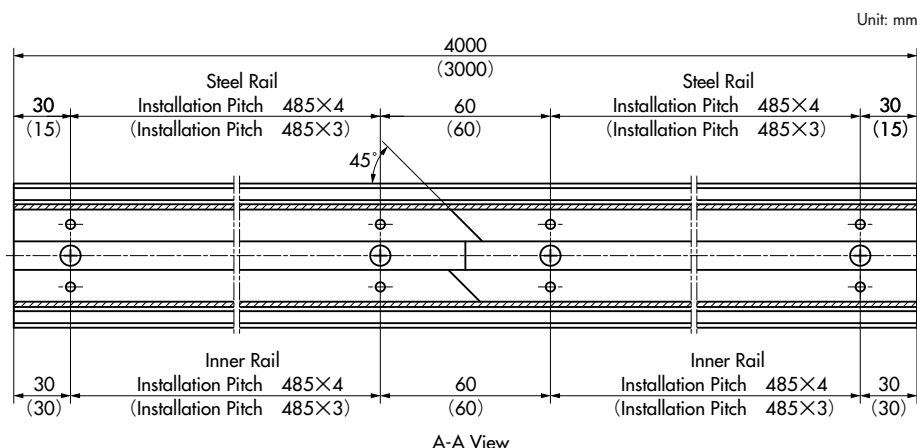


#### RF2040VRP to RF2080VRP



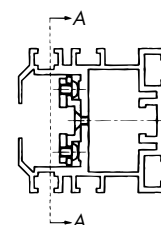
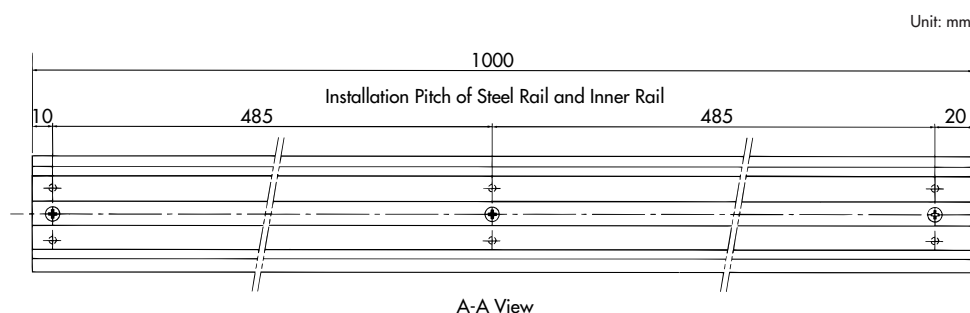
Frame No.		Steel Rail (No. 3)		Steel Rail Mounting Screw (No. 4)	Inner Rail Mounting Screw (No. 5)
For Middle Section	For Drive and Driven Sections	Dimensions (Plate Thickness × Width)	Dimension A	Cross-Recessed Pan Head Screw	Cross-Recessed Countersunk Head Screw
RF2030VRP-R3S	RF2030VRP-R1SK, -R1SJ	3 × 13	4.75	M3 × 7 ℓ	—
RF2040VRP-R4S	RF2040VRP-R1SK, -R1SJ	3 × 13	8.4	M4 × 5 ℓ	M4 × 6 ℓ
RF2050VRP-R4S	RF2050VRP-R1SK, -R1SJ	3 × 13	8.4	M4 × 6 ℓ	M4 × 6 ℓ
RF2050VRP-R3HS	—	3 × 13	8.4	M4 × 6 ℓ	M4 × 6 ℓ
RF2060VRP-R4S	RF2060VRP-R1SK, -R1SJ	3 × 13	8.4	M4 × 6 ℓ	M4 × 6 ℓ
RF2080VRP-R3S	RF2080VRP-R1SK, -R1SJ	6 × 16	10.5	M5 × 8 ℓ	M6 × 10 ℓ

## 2) Construction Diagram of Middle-Section Frame



- RF2040VRP-R4S, RF2050VRP-R4S, RF2060VRP-R4S --- Overall length 4,000 mm
- RF2030VRP-R3S, RF2050VRP-R3HS, RF2080VRP-R3S --- The dimensions in ( ) are those for the frame of the overall length of 3,000 mm.
- The steel rail is cut at an angle of 45° at the center of the base chain rail.

## 3) Construction Diagram of Frame for the Drive and Driven Sections



- RF2050VRP-R3HS has no frame for the drive and driven sections.
- A notch is provided on the right-end bottom in the diagram above (See page 122).

## 4) Note for Handling Aluminum Frame with Steel Rail

### (1) When Cutting the Aluminum Frame with Steel Rail for Use

- <1> Do not cut the center area or the screw section on the frame.
- <2> Remove burrs and chips from the cut surface.
- <3> Connect and secure the steel rail with the inner rail, and the inner rail with the frame of the base chain by screws 15 to 30 mm away from the cut area.
- <4> Machine all parts individually. Completely remove burrs and chips produced by machining cleanly before starting reassembly. Fit the 45° cut area correctly to prevent misalignment.

### (2) Connecting the Frame

If there is a difference in level on the abutting surface of the steel rail after connecting the frame (in vertical and horizontal directions), chamfer the corners slightly to avoid chain rollers being caught.

Double Plus Chain

Center Roller Chain

Accessories for  
Double Plus Chain

Outboard Roller Chain

Top Roller Chain

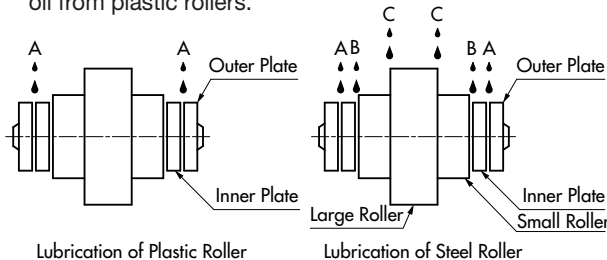
Special Sprockets

Engineering Manual

## Guidelines for Use

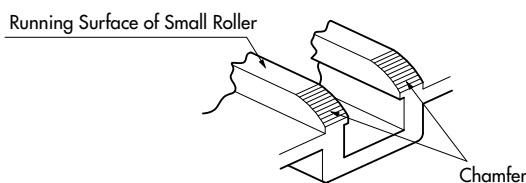
### 1. Double Plus Chain (Common with Double Plus Chain with Snap Cover)

- 1) Recommended conveyor length is 15 m or less.
- 2) Avoid using a chain with engineering plastic rollers in an environment where it will be exposed to oil or water. (Use in such an environment may cause the double-speed capability to deteriorate.)
- 3) Use caution not to drop a pallet or conveyed objects on the chain and avoid any operation that may expose the chain to impact and pressure by pressing it down.
- 4) When unusual noises are heard from a curved section around a sprocket after use for an extended period, apply a small amount of lubrication (SAE10 to 20) onto the pin through the gap between the outer plate and inner plate ("A" in the diagram below). Wipe off excess oil from plastic rollers.



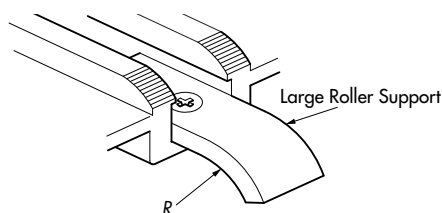
Since noise is unlikely to occur between pins and bushes on Lambda chain, Lambda chain is suitable for use where lubrication is best avoided.

- 5) Lubrication is required on steel rollers. Apply a small amount of lubrication (SAE10 to 20) in areas "A," "B" and "C." A lubricator with a sharp pointed tip like a syringe is convenient to use for lubrication. Wipe off excess oil from the periphery of large and small rollers.
- 6) **Finishing the Ends on the Conveying Side**  
Put a chamfer on the ends of the upper rail that the chain's small rollers travel on.



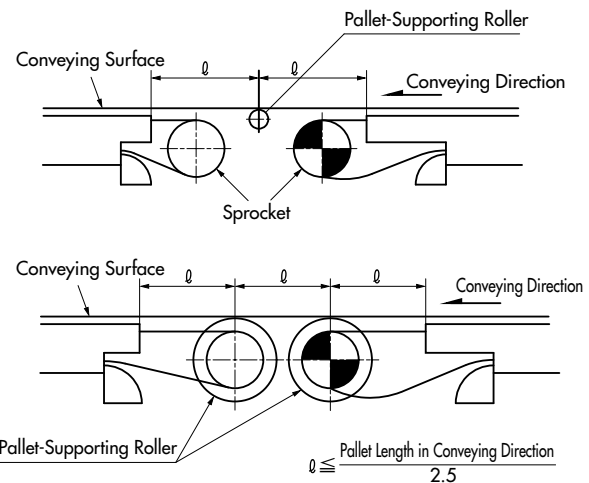
#### 7) Large Roller Support

It is possible to prevent the chain's large roller from dipping at the chamfered portion by installing a support for the large roller on the ends of the rail on the driven side.

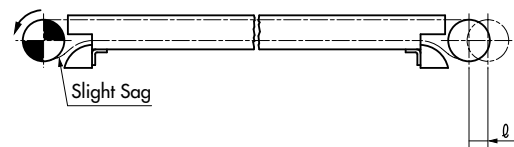


#### 8) Transferring Objects Between Conveyors (straight line transfer)

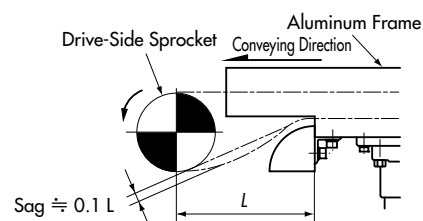
To convey pallets in a stable condition at the transfer portion of the conveyor, install a roller between the two conveyors or the shafts of sprockets. Be sure that the distance ( $\ell$ ) from the ends of the rail to the roller that supports the pallets is less than 1/2.5 times the pallet's length in the conveying direction.



#### 9) Take-Up (1)



Take-up amount  $L$  = Chain pitch  $\times$  2 + Allowance length  
Allow for a little sag up to 10% of span on the chain under the drive-side sprocket during operation. When the amount of sagging increases, adjust the take-up or cut the chain.



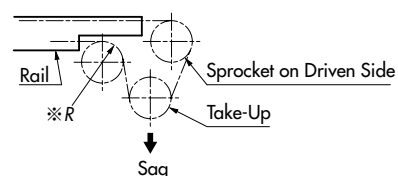
**Chain Sag** Unit: mm

Chain Size	Normal Sag	Max. Sag
RF2030	25	75
RF2040	35	105
RF2050	40	120
RF2060	50	150
RF2080	65	190

The sag in the table above is given on the basis of the conveyor design information on page 148.

#### 10) Take-Up (2)

Where take-up configuration shown above is not allowed because of the presence of conveyors, design the take-up configuration referring to the diagram below. With Double Plus Chain with snap cover, make the dimension  $\approx R$  larger than the dimension  $R$  of the return guide (see the dimensional diagram).



## 11) Sprocket and Shaft

Drive sprocket --- Should be keyed, with both left and right sprockets aligned.

Take-up sprocket --- Should be keyless (free), with separate shafts on the left and right sprockets.

Other sprockets --- Keyless (free)

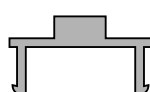


If a conveyed object is placed directly on the chain, the large roller may leave a mark on the conveyed object.

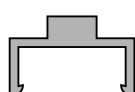
RF2030VRPUA and RF2030VRPUB (urethane-lined rollers) are designed so that the large roller is less likely to leave a mark on conveyed objects.

## 2. Double Plus Chain with Snap Cover

- 1) Handle the chain with care, as the snap cover is made of engineering plastic.
- 2) There are two types of snap covers; one for the outer link and another for the inner link. Use caution to avoid installing the wrong type of snap cover. (See the diagram below.) (The snap cover is fitted on the chain at time of shipment.)

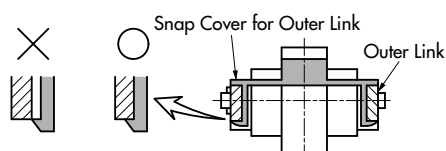
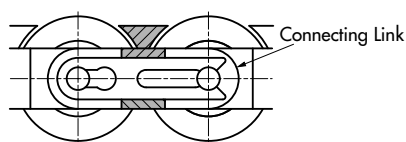


For Outer Link



For Inner Link

- 3) When connecting chains, connect them via a special connecting link and then fit the snap cover for the outer link correctly at the notch of the plate. (See the diagram below.)

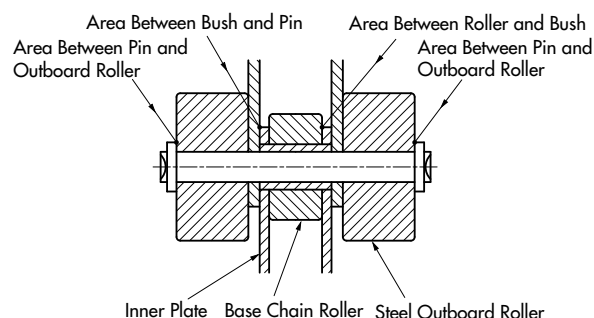


- 4) If a snap cover is damaged in handling, replace it with a new snap cover.

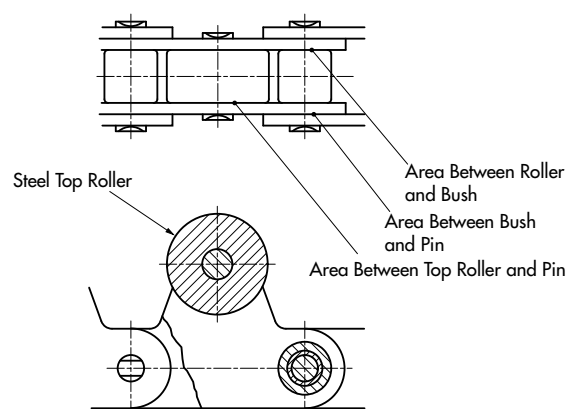
## 3. Outboard Roller Chain and Top Roller Chain

- 1) If parts making up the chain are made of steel, lubrication is generally required. (See the diagram below.) There is no need for lubrication on the base chain and engineering plastic rollers of Lambda chain.

### • Lubrication Positions on Outboard Roller Chain



### • Lubrication Positions on Top Roller Chain



- 2) Lubricate these parts regularly (about once a week) to avoid running out of lubrication. Perform drip lubrication (using lube listed below) or apply lube with a brush.

### Lubrication (SAE No.)

Lubrication Method	Drip or Brush			
Ambient Temperature	-10°C to 0°C	0°C to 40°C	40°C to 50°C	50°C to 60°C
Tsubaki Chain No.				
RS50 or smaller pitch	SAE10W	SAE20	SAE30	SAE40
RS60 · 80 · 100	SAE20	SAE30	SAE40	SAE50
RS120 or larger pitch	SAE30	SAE40	SAE50	

ISOVG: Please refer to page 101.

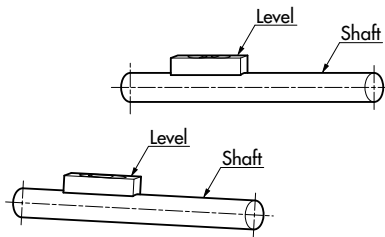
## 4. Installation

### 1) Sprocket Installation

Proper installation of the sprockets is critical to smooth operation of a conveyor, and it also affects chain life. The installation should be properly carried out in accordance with the procedure described below.

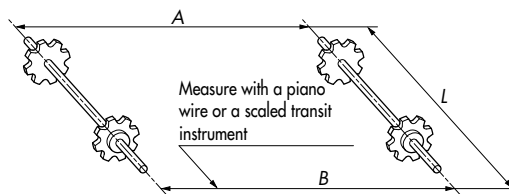
- 1) Check the horizontal positioning of the shafts with a level.

Adjust the level to within the tolerance of  $\pm \frac{1}{300}$ .



- 2) Check the parallelism of the shafts with a scale.

Adjust the shafts so that the parallelism as calculated with a formula  $\frac{A-B}{L}$  is to within  $\pm \frac{1}{100}$ .



- 3) Align the sprocket axis to match.

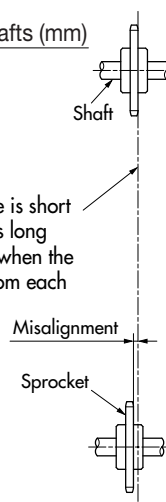
Tolerance relative to center distance:

Up to 1 m: within  $\pm 1$  mm

1 to 10 m: within  $\pm \frac{\text{Distance between shafts (mm)}}{1000}$

10 m or longer: within  $\pm 10$  mm

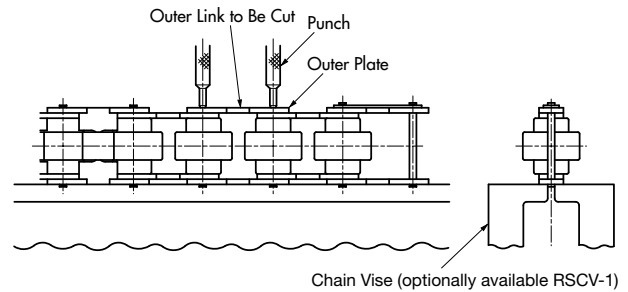
- Measure misalignment with:
- A straight edge when the distance is short
  - A piano wire when the distance is long
  - A leveling string or a piano wire when the sprocket positions are different from each other in terms of height



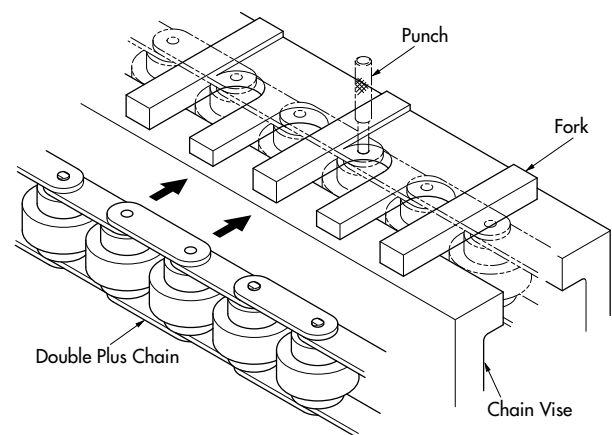
- 4) After processes 1) to 3) have been completed, lock each of the sprockets to the shaft(s) by means of keys or Tsubaki POWER-LOCKS. Lock the sprockets that are installed and used on the same shaft so that the teeth of both sprockets align in terms of phase.

## 5. Cutting and Connecting Double Plus Chain

### 1) Cutting Double Plus Chain



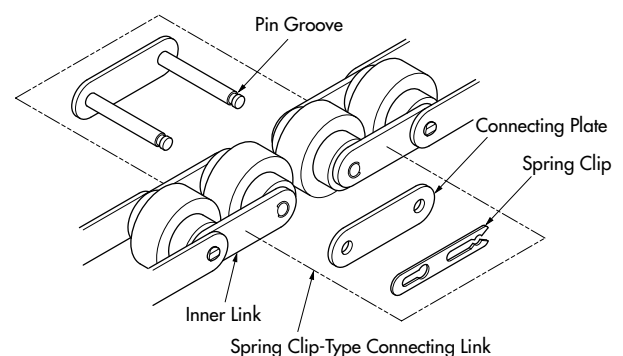
- (1) Shear off the rivet on the pin end of the outer link to be cut using a hand grinder.
- (2) Set the Double Plus Chain (for chain with snap cover, remove the snap covers from about three links of the area to be cut) on a chain vise (or its equivalent) and drive in the pin using a punch or other means until the outer plate on the upper side is removed.
- (3) The chain can be cut by using a chain vise and a fork-shaped tool.



### 2) Connecting Double Plus Chain (using a connecting link)

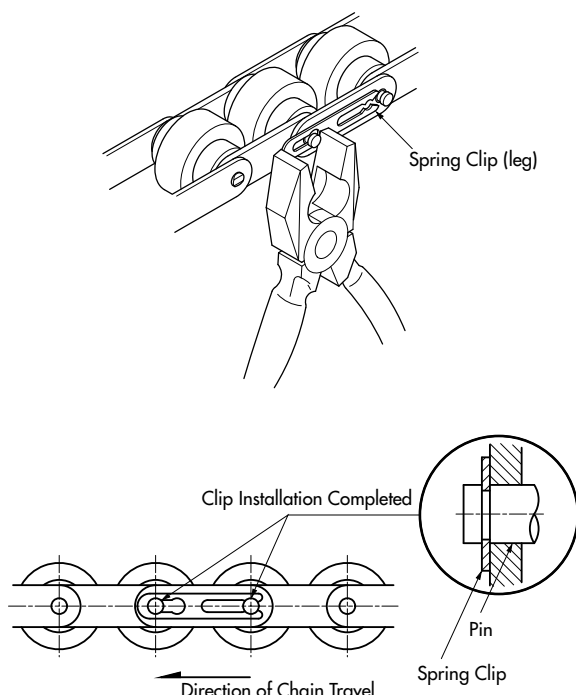
#### (1) Connecting Using a Spring Clip (RF2060 or smaller)

- <1> Pass the two pins of the connecting link through the bushes of the inner link and then through the holes of the connecting plate.



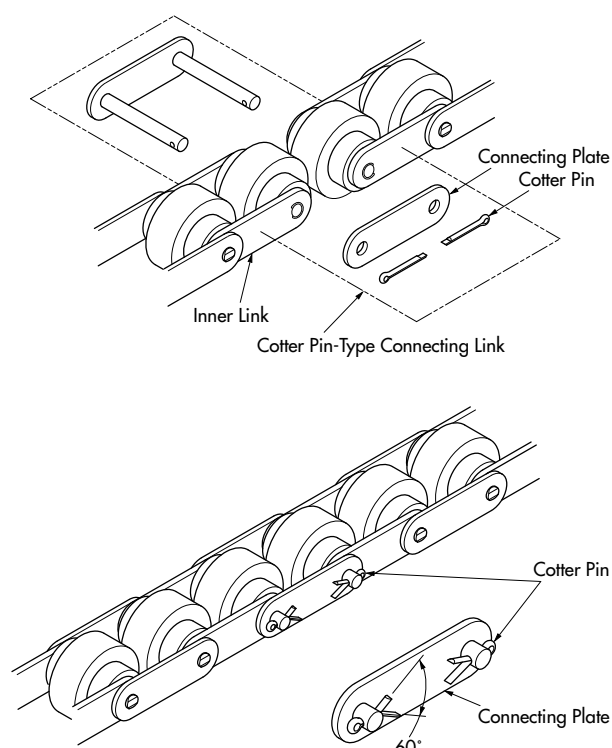


<2> Fit the spring clip securely into the pin groove.



## (2) Connecting Using a Cotter Pin (for RF2080)

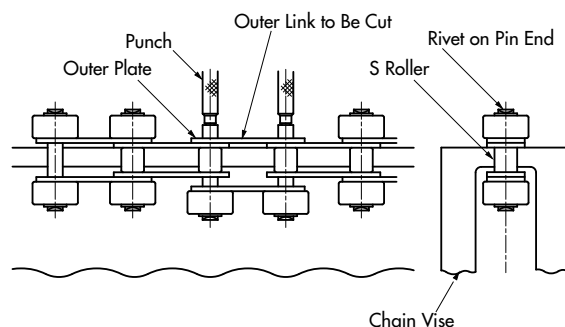
- <1> Pass the two pins of the connecting link through the bushes of the inner link and then through the holes of the connecting plate.
- <2> Pass the cotter pin through the hole of the pin and open the legs of the cotter pin to an angle of about 60°.



## 6. Cutting and Connecting Outboard Roller Chain

### 1) Cutting Chain When the Base Chain Roller Is an S Roller

For cutting Poly Steel Chain with outboard rollers, refer to 6. 3).



- (1) Determine the outer link to be cut and mark the link for identification.
- (2) Set the chain on a chain vise (sold separately) as shown above and shear off the rivets on the pin ends (two rivets on one side) using a hand grinder.
- (3) Remove the two pins using a pin with a diameter slightly smaller than the pin diameter of the chain (using a Tsubaki Punch or its equivalent). When the pins are pulled out a little, the two outboard rollers on the upper side can be removed.  
(The diagram above shows the outboard rollers being removed.)
- (4) Directly tap the pin with a small hammer until the end of the pin reaches the upper face of the outer plate to remove. Tap the two pins alternately to ensure they come off evenly.  
Use caution not to damage the outboard rollers on the right and left.
- (5) Tap and pull out the two pins using a punch until the outer plate on the upper side can be removed.

### Chain Vise (Optionally Available)

Chain Vise No.	Applicable OR Chain Size (Base Chain Roller: S Type)
RS-CV1	RS40, RF2040
RS-CV2	RS40 to 80, RF2040 to 2080
RS-CV3	RS80 to 100, RF2080 to 2100

OR: Outboard Roller

Double Plus Chain

Center Roller Chain

Accessories for  
Double Plus Chain

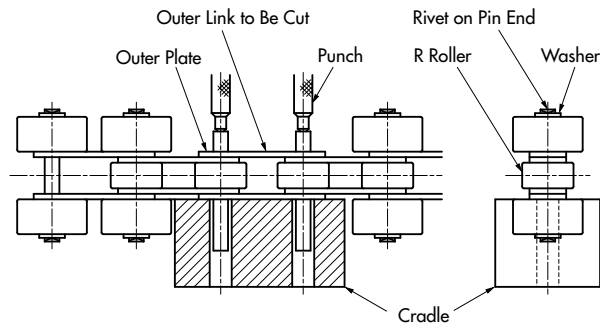
Outboard Roller Chain

Top Roller Chain

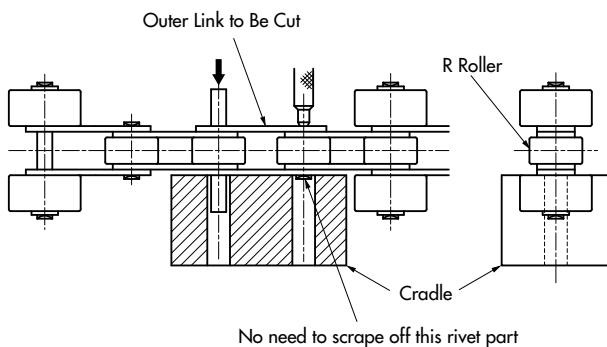
Special Sprockets

Engineering Manual

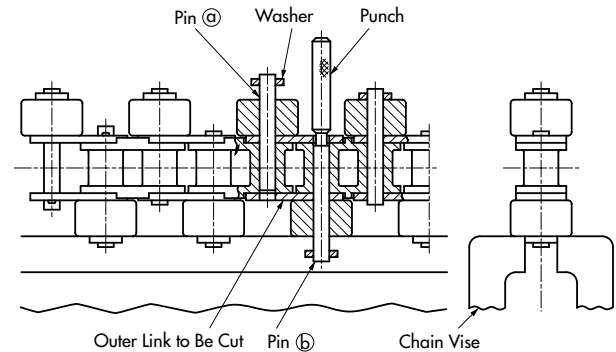
## 2) Cutting Chain When the Base Chain Roller Is an R Roller



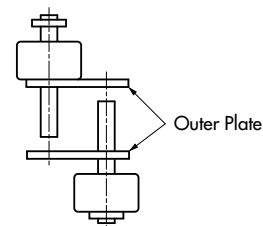
- (1) Determine the outer link to be cut and mark the link for identification.
- (2) Shear off the rivets on the pin ends (four rivets) using a hand grinder so as to remove the four outboard rollers. In doing so, shear down to the washers with the grinder to remove the washers.
- (3) Remove the four outboard rollers. (Receive the outboard roller on the cradle, apply the punch on the pin end face, and tap the pin out until the washer is removed. Follow the same procedure to remove the washers on the other side.)
- (4) Set the chain on the cradle as shown above and remove the two pins by tapping the punch with a hammer. Prepare a cradle yourself as appropriate.
- (5) Follow steps (4) and (5) of 6. 1).
- (6) If outboard rollers are spaced every two or more links, the rivet parts to be sheared off will differ from those shown in the above diagram. (See the diagram below.)



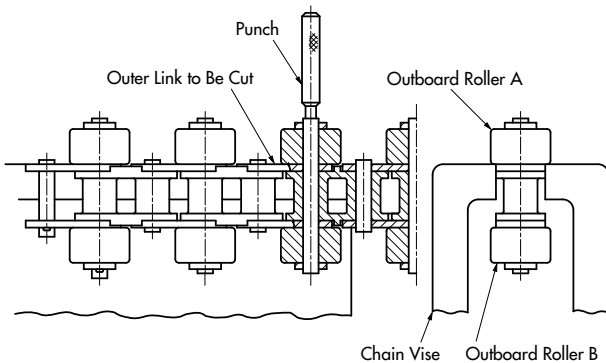
## 3) Cutting Poly Steel Chain with Outboard Rollers (1) When the Outboard Rollers Are Arranged in a Staggered Installation



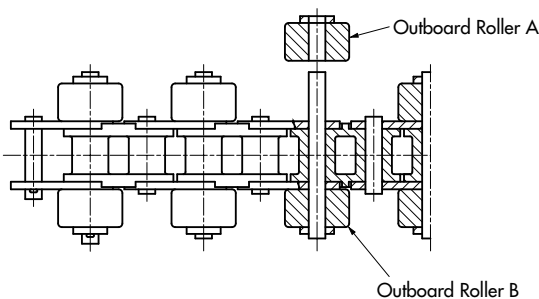
- <1> Determine the outer link to be cut and mark the link for identification.
- <2> Although the chain can be set in a chain vise in the same manner as shown in 6. 1) (with S type), this setting damages the chain because the inner link is made of engineering plastic. For this reason this cutting method cannot be used.
- <3> Lightly tighten the washer on the pin end with a chain vise. Since no rivet is provided on the pin end on this chain, proceed to cutting the chain.
- <4> Use a pin with a diameter slightly smaller than the pin diameter of the chain (using a Tsubaki Punch or its equivalent), tap the punch lightly with a hammer, and pull out the pin of the chain gradually (see the above diagram). When the pin is removed from the upper outer plate as shown above, stop tapping the pin.
- <5> When pins (A) and (B) are pulled out in the same procedure, the chain can be cut. The diagram above shows the state whereby pin (A) has been pulled out to the specified position and pin (B) has already been pulled out.
- <6> Discard the cut outer links (shown below).



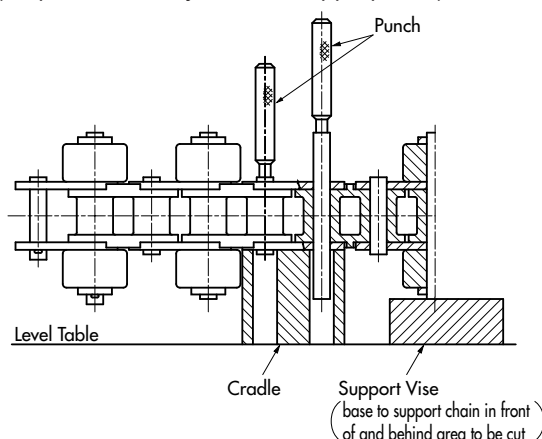
## (2) When the Outboard Rollers Are Arranged in a Crosswise Installation



- <1> Determine the outer link to be cut and mark the link for identification.
- <2> Although the chain can be set in a chain vise in the same manner as shown in 6. 1) (with S type), this setting damages the chain because the inner link is made of engineering plastic. For this reason this cutting method cannot be used.
- <3> Support outboard roller "A" on the upper side with a chain vise as shown above and lightly tighten the chain vise. Bring the outer link to be cut to the end of the chain vise, as shown above.
- <4> Apply the punch to the pin end of outboard roller "A" and lightly tap the punch with a light hammer. Outboard roller "A" will be removed as shown below.



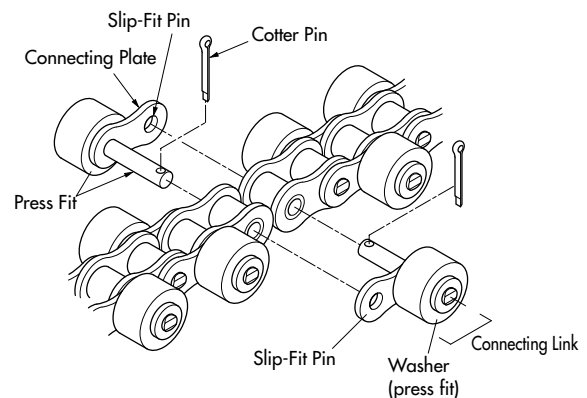
- <5> Turn the chain upside down and remove outboard roller "B" by following the same procedure for removing outboard roller "A."
- <6> Set the chain after removing outboard rollers "A" and "B" on the cradle as shown below, tap the punch lightly with a hammer, and remove the two pins. Pull out the pins up to a position where the upper outer link is removed. (Prepare a cradle yourself as appropriate.)



## 4) Connecting Chain with Outboard Rollers

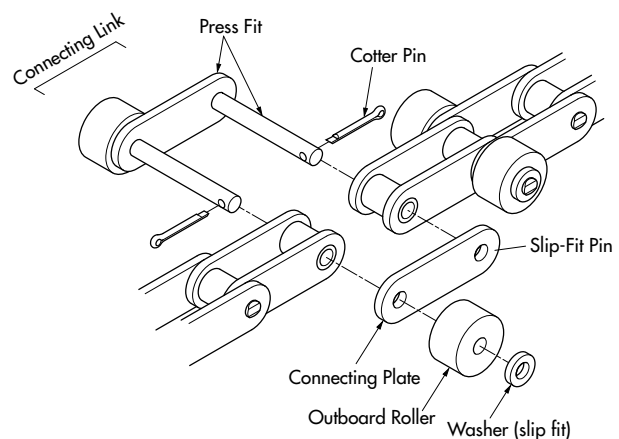
Chains are connected using connecting links.

### (1) When the Outboard Rollers Are Arranged in a Staggered Installation



- <1> Pass the two pins of the connecting link through the holes of the inner link and then through the slip-fit connecting plate.
- <2> Insert a cotter pin through each pin and open the legs of the cotter pin to an angle of about 60°.

### (2) When the Outboard Rollers Are Arranged in a Crosswise Installation

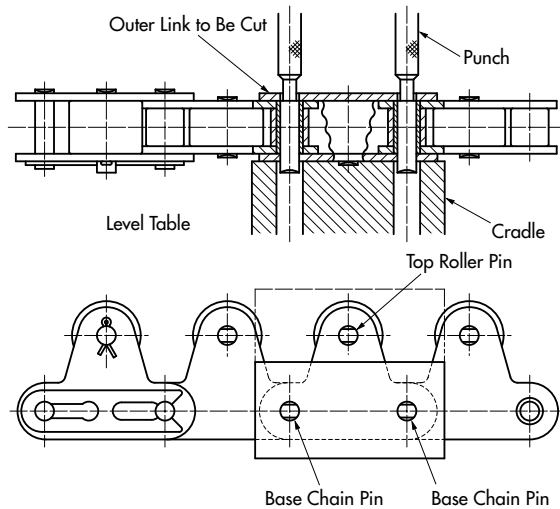


- <1> Pass the two pins of the connecting link through the holes of the inner link and then through the slip-fit connecting plate.
- <2> When installing outboard rollers on both sides of a pin as shown above, pass the pin through the outboard rollers and washer, and attach cotter pins in two places. Open the legs of the cotter pins to an angle of about 60°.

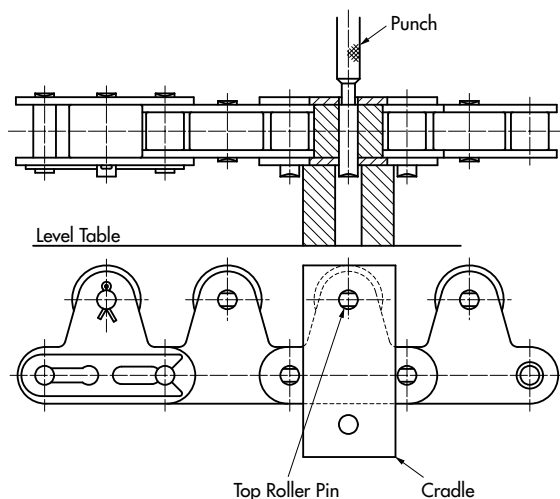
## 7. Cutting and Connecting Top Roller Chain

### 1) Cutting Chain When the Base Chain Roller Is an S Roller

<1> Mark the outer link to be cut for identification.



- <2> Shear off the rivets on the base chain pin ends and top roller pin ends using a hand grinder or other means (three rivets on one side of the chain).
- <3> Turn the chain side ground by the grinder upward and set the chain on a cradle, as shown above. Prepare a cradle yourself as appropriate. To remove the three pins including the top roller pin at the same time, prepare a cradle integrating the part shown by the phantom line.
- <4> Tap the punch (or its equivalent) with a hammer until the two (three) pins are removed from the outer plate (up to the position shown in the diagram).
- <5> Change the setting of the cradle as shown below to remove the top roller pin. (When top rollers are not attached to the outer link, this procedure is not necessary.)
- <6> Remove the top roller pin by repeating Step <4>.

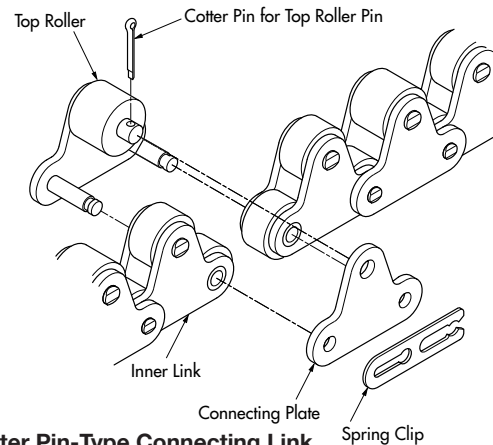


### 2) Connecting Top Roller Chain

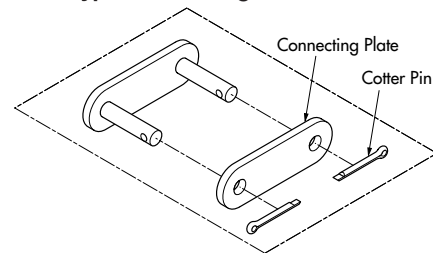
<1> Chains are connected using connecting links.

<2> Pass the two pins of the connecting link through the bushes of the inner link and then through the holes of the connecting plate (the connecting plate is slip fit).

#### Spring Clip-Type Connecting Link



#### Cotter Pin-Type Connecting Link



- <3> Fit a cotter pin or spring clip securely on the pin. Open the legs of the cotter pin to an angle of about 60°. Refer to the description of Double Plus Chain for detailed information on fitting the spring clip.

### Top Roller Chain Connecting Links

- There are two types of connecting links. Use caution when placing an order for connecting links to ensure correct order placement.
- The outer diameter of the top roller differs in chain with top rollers installed on every link and in chain with top rollers installed on every second link. Refer to the dimensional drawing for the dimensions of these top roller chains. (The diameter of double pitch rollers is the same in both these installation types.)
- When an attachment other than top rollers is attached to the connecting link, please diagram it. (Symbol of connecting link: CL)

■ For chain with top rollers installed on every link

**Chain Numbering**

**RS40-1LTRP-CL**

Base Chain

■ For chain with top rollers installed every second link

**Chain Numbering**

**RS40-2LTRP-CL**

Base Chain

## For Your Safety When Using the Chain



### **Warning** To avoid danger, observe the following rules.

- Do not use chain or chain accessories for any purpose other than their originally intended use.
- Never perform additional work on chain.
  - Do not anneal any chain parts.
  - Do not clean chain with acids or alkalis. These may cause cracking.
  - Never attempt to electroplate chain or chain parts. This may cause hydrogen embrittlement.
  - Do not weld chain. Heating effects will cause weakening and cracking.
  - When a torch is used to heat or cut chain, remove the links on each side and do not reuse them.
- When replacing a worn or damaged part, do not replace just the worn or damaged part. Replace all parts with new parts.
- If a material that causes hydrogen embrittlement (acid, strong alkali, battery fluid, etc.) comes in contact with the chain, immediately stop using the chain and replace it with new chain.
- When using chain in a lifting device, set up a safety barrier and do not allow anyone to go under the equipment.
- Always install safety equipment (safety covers, etc.) on chain and sprockets.
- Strictly observe the general guidelines listed in Section 1, Chapter 1, 2nd Edition of the Japanese Occupational Safety and Health Regulations as well as rules and regulations concerning occupational safety and health in your region/country.
- When installing, removing, inspecting, maintaining and oiling chain,
  - Perform the work as instructed in the manual, catalog or other documentation that was provided with the product.
  - Before starting work, turn off the power switch and take measures to prevent it from being turned on accidentally.
  - Secure the chain and parts to prevent them from moving freely.
  - Use a press tool or other special tools to separate or connect chain, and follow the correct procedures.
  - Remove and insert pins and rivets in the correct direction.
  - Wear clothing and protective gear (safety glasses, gloves, safety shoes, etc.) that are appropriate for the work.
  - Only experienced personnel should perform chain replacement.



### **Caution** To prevent accidents, observe the following rules.

- Understand the structure and specifications of the chain that you are handling.
- Before installing chain, inspect it to make sure no damage occurred during delivery.
- Inspect and maintain chain and sprockets at regular intervals.
- Chain strength varies by manufacturer. Only Tsubaki products should be used when chain is selected using Tsubaki catalogs.
- 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.

Configuration of conveyor, method for loading and unloading of objects to be conveyed, rail configuration, method of receiving on return side, and other remarks.

Company Name	Division/Title
Name	Tel:
Date	Fax:







# Custom Attachment Chain Worksheet

Use this sheet to identify the Attachments and Chain you need, then fax the form to your authorized distributor or your nearest Tsubakimoto representative. If you have any questions, please call your Tsubakimoto representative.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Telephone/Fax: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

NOTES: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Base Chain Size (ANSI/BS): \_\_\_\_\_

Quantity/Number of Chains: \_\_\_\_\_

Length: \_\_\_\_\_ Number of Pitches: \_\_\_\_\_ or Inches: \_\_\_\_\_

If uneven number of pitches, specify: \_\_\_\_\_

Roller link on each end: \_\_\_\_\_

Connecting link on each end: \_\_\_\_\_

Offset/Connecting link: \_\_\_\_\_

Type of offset: Riv. \_\_\_\_\_ Cot. \_\_\_\_\_

Construction: Riveted \_\_\_\_\_ Cottered \_\_\_\_\_

Material: ☐ Standard Carbon ☐ Nickel-Plated

☐ Stainless ☐ SS ☐ NS ☐ AS ☐ LSC

☐ Lambda® ☐ NEP

Attachment: Standard ☐ YES ☐ NO

Wide contour \_\_\_\_\_

Special \_\_\_\_\_ (Drawing required)

Spacing: Pitches \_\_\_\_\_ Inches \_\_\_\_\_

Extended Pin: ☐ YES ☐ NO

Projection: \_\_\_\_\_

## Special Dimensions

Pitch: \_\_\_\_\_

Single: \_\_\_\_\_

Double: \_\_\_\_\_

Special (Specify): \_\_\_\_\_

Side Plate (Thickness): \_\_\_\_\_

Rollers: \_\_\_\_\_

Width: \_\_\_\_\_

Diameter: \_\_\_\_\_

Solid: \_\_\_\_\_

Split: \_\_\_\_\_

Other Special Requirements:

\_\_\_\_\_

\_\_\_\_\_

Sketch the attachment and spacing below. Note if you want the attachment on the pin or roller links, if you want straight or bent attachments, or if you require extended pins.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_









## 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 & Power Transmission Operations

#### Chain Products Department

1-3 Kannabidai 1-chome  
Kyotanabe, Kyoto 610-0380, Japan  
Phone : +81-774-64-5100  
Facsimile : +81-774-64-5212



Kyotanabe Plant

### Global Associated Partners:

#### NORTH and SOUTH AMERICA

##### U.S. TSUBAKI

##### POWER TRANSMISSION, LLC

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

##### EQUIPAMENTOS INDUSTRIAIS LTDA.

Rua Pamplona, 1018 - C.J. 73/74  
Jardim Paulista, CEP 01405-001  
São Paulo - S.P. Brazil  
Phone : +55-11-3253-5656  
Facsimile : +55-11-3253-3384

#### EUROPE

##### TSUBAKIMOTO EUROPE B.V.

Aventurin 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

##### TSUBAKI DEUTSCHLAND GmbH

ASTO Park Oberpfaffenhofen  
Friedrichshafener Straße 1  
D-82205 Gilching, Germany  
Phone : +49-8105-7307100  
Facsimile : +49-8105-7307101

#### ASIA and OCEANIA

##### TSUBAKIMOTO SINGAPORE PTE. LTD.

25 Gul Lane  
Jurong  
Singapore 629419  
Phone : +65-6861-0422/3/4  
Facsimile : +65-6861-7035

##### TSUBAKIMOTO (THAILAND) CO., LTD.

388 Exchange Tower, 19th Floor Unit  
1902, Sukhumvit Road, Klongtoey  
Bangkok 10110 Thailand  
Phone : +66-2-262-0667/8/9 (3 lines)  
Facsimile : +66-2-262-0670

##### TSUBAKI INDIA

##### POWER TRANSMISSION PTE. LTD.

Chandrika Chambers No.4, 3rd Floor  
Anthony Street, Royapettah  
Chennai-600014, Tamil Nadu, India  
Phone : +91-44-4231-5251  
Facsimile : +91-44-4231-5253

##### TSUBAKIMOTO SINGAPORE PTE. LTD.

##### VIETNAM REPRESENTATIVE OFFICE

8F H&H Building, 209 Hoang Van Thu  
Phu Nhuan District, Ho Chi Minh City  
Vietnam  
Phone : +84-8-3999-0131 or 0132  
Facsimile : +84-8-3999-0130

##### TSUBAKIMOTO SINGAPORE PTE. LTD.

##### INDONESIA REPRESENTATIVE OFFICE

Wisma Kyoei Prince, 11th Floor, Suite 1106  
Jl. Jend. Sudirman, Kav. 3, Jakarta 10220  
Indonesia  
Phone : +62-21-5724-275  
Facsimile : +62-21-5724-275

##### TSUBAKI AUSTRALIA PTY. LTD.

Unit E, 95-101 Silverwater Road  
Silverwater, N.S.W. 2128  
Australia  
Phone : +61-2-9704-2500  
Facsimile : +61-2-9704-2550

##### 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 601, Urban City Centre  
45 Nanchang Rd., Huangpu District  
Shanghai 200020, China  
Phone : +86-21-5396-6651/6652  
Facsimile : +86-21-5396-6628

Distributed by: