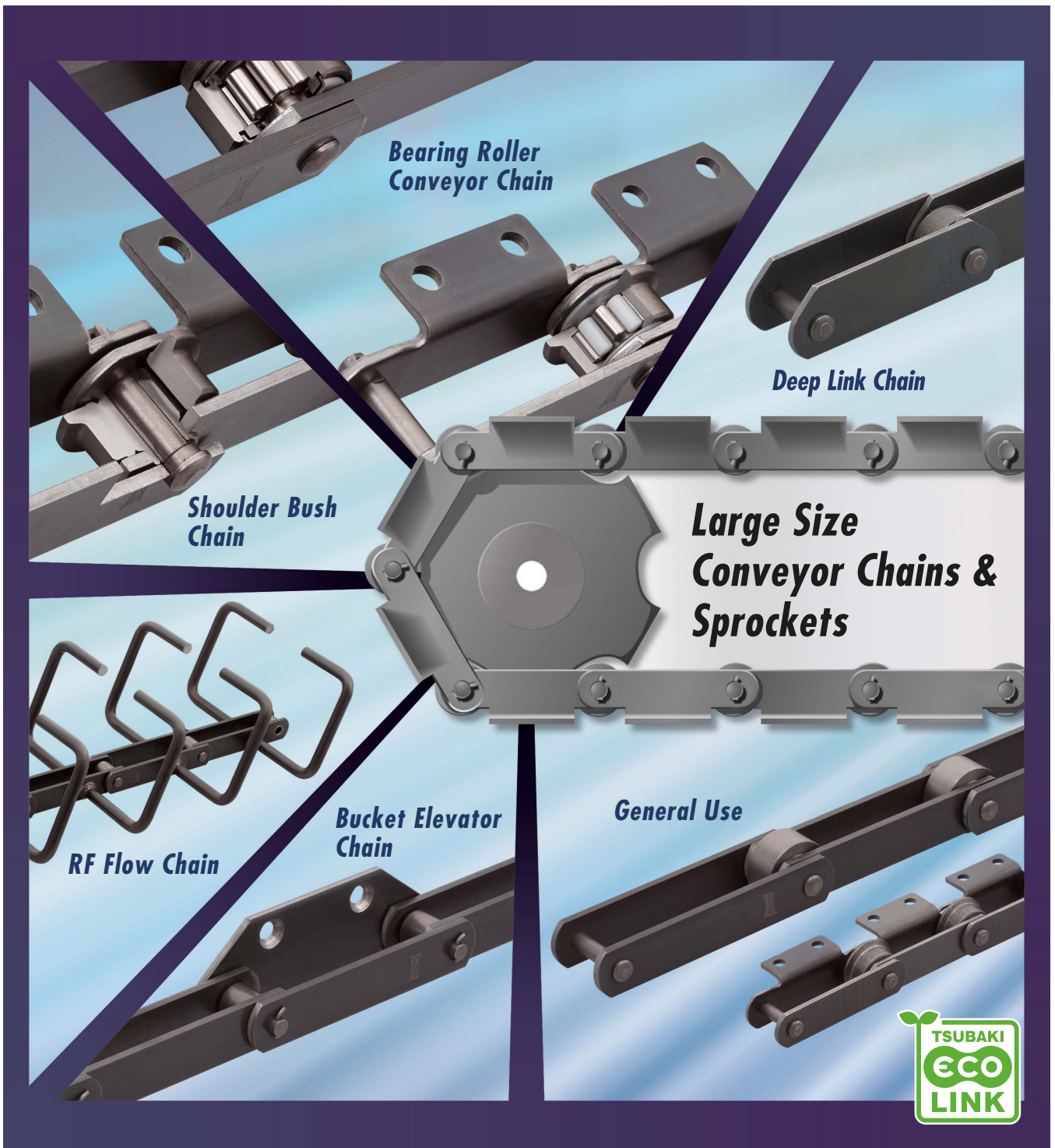


# TSUBAKI LARGE SIZE CONVEYOR CHAINS & SPROCKETS





## Tsubaki Group Basic Environmental Policy

### Philosophy

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

### Policy

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



# Power to the World!



## Ecology and Economy (ECO & ECO) – Driving the Future

Tsubaki Large Size Conveyor Chains combine Made In Japan quality with proven conveying power to support your ECO & ECO needs.

### Kyotanabe Plant Concepts

Kind consideration towards the global environment

Harmony and coexistence with the global environment

Pursuit of high efficiency and high quality

Courage to look to the future

Tsubakimoto Chain's Kyotanabe Plant is a state-of-the-art facility outfitted with the latest environmental systems to produce 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. The Chain Division acquired ISO9001 accreditation in 1995 and ISO14001 accreditation in 2003.



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The Tsubaki Group cares about the environment. That is why we have established standards for evaluating the environmental friendliness of our products. Only products that meet our exacting guidelines are recognized as eco-products and certified with the Tsubaki Eco Link logo.

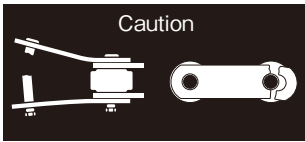


# Precautions Before Use

Always read this catalog and make the proper selection before using your Large Conveyor Chain. Ensure that all maintenance personnel are familiar with the related sections. Values given in this catalog are both in SI International Units and {Gravimetric Units}.



## Read the Following Before Use



The Large Conveyor Chain is a convenient part of machinery for compact conveyance, but this does not mean it has unlimited life.

1. The conveyor chain is an expendable item requiring periodic checks and replacement.



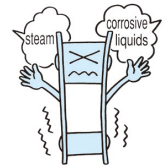
2. The conveyor chain may ride up on the sprocket or break from wear elongation. Lubrication will help extend the wear life of your chain.



3. Wear between the bushings and the rollers may 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 cause chain failure. Avoid this problem with proper lubrication or by using bearing rollers.

4. Excessive tension may cause chain failure. Including inertial forces and other forces when making the proper selection can help avoid this problem.

5. Corrosion and other environmental factors can cause chain failure. Selecting material in light of usage conditions can help avoid this problem.



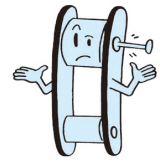
6. Poor centering and other layout problems can shorten the life of your chain, leading to chain failure. Installing equipment properly can help avoid this problem.

7. In situations where chain failure may pose a danger to human life or major damage to machinery, install the proper safety equipment to ensure against chain failure and potentially dangerous situations.

8. Select a chain based on any existing regulations based on rules or guidelines for chain selection and the safety factor. The chain selected should have an ample amount of both.



9. Widening plate holes, reducing the pin diameter, or heating the chain to make pin insertion and removal easier will remarkably decrease the performance of your chain and lead to accidents.



## Principles for Rationalizing Conveyance

1. Minimize conveyance distance.
2. Maximize conveyor operating rate.
3. Select the appropriate chain. Selecting the optimal conveyor type is can tie directly into rationalizing conveyance. Read this catalog carefully to select the appropriate type of chain conveyor and rationalize your conveyance situation.



## Features and Points for Chain Conveyors

### Features

1. Can generally convey items of any shape or size.
2. Can increase applicable range of conveyor length, direction of conveyance, and usage conditions.
3. Conveys accurately with no slippage.
4. Can maintain a high endurance and efficiency.

### Points

1. While no slippage is a benefit, it is necessary to select chain in light of shock impact resistance.
2. Fluctuations in speed will result from the mechanical nature of chain and sprocket engagement.



Refer to Tsubaki's Installation and Maintenance catalog or contact a Tsubaki representative for more information.



## The Three Basic Chain Dimensions

The three basic dimensions of conveyor chain are pitch, roller diameter, and inner link inner width. When these dimensions are the same, the chain and sprocket are compatible. (1 pitch = 1 link)

### 1. Pin (CP)

The most important role of the pin is connecting the inner link to the outer link. Along with the plate, it receives chain tension along the direction of travel while receiving vertical reactive forces from the conveyed items. The outer diameter of the pin suffers wear from sliding against the bush inner diameter when the chain articulates. The pin is an essential strength bearing part and requires high wear resistance.

### 2. Bush (B)

The bush is a strength-bearing part, receiving tension from the chain during sprocket engagement, but its major role is as a bearing part. The outer diameter of the bush suffers wear from sliding against the roller inner diameter during roller rotation, while the bush inner diameter suffers wear from sliding against the outer diameter of the pin when the chain articulates. Bush inner diameter wear is directly expressible as pitch elongation.

### 3. Roller (R-R, F-R, S-R, M-R, N-R)

Forms a slip fit with the bush. Rotates when engaging with the sprocket, while alleviating the shock and wear from the teeth. Rotation also lowers running resistance.

Note: ( ) denotes codes for part names as found on drawings.

### 4. Plate (PLP-A, PLP-B, BLP)

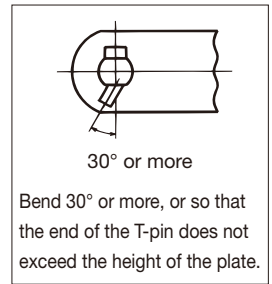
The plate mainly receives the tensile load along the chain's direction of travel while receiving vertical reactive forces while supporting the conveyed item. The outer plate and inner plate slide against each other during chain articulation, as well as against the sides of the sprocket teeth during sprocket engagement. Plate holes are either round or flat.

### 5. Attachments

For attaching items to the chain.

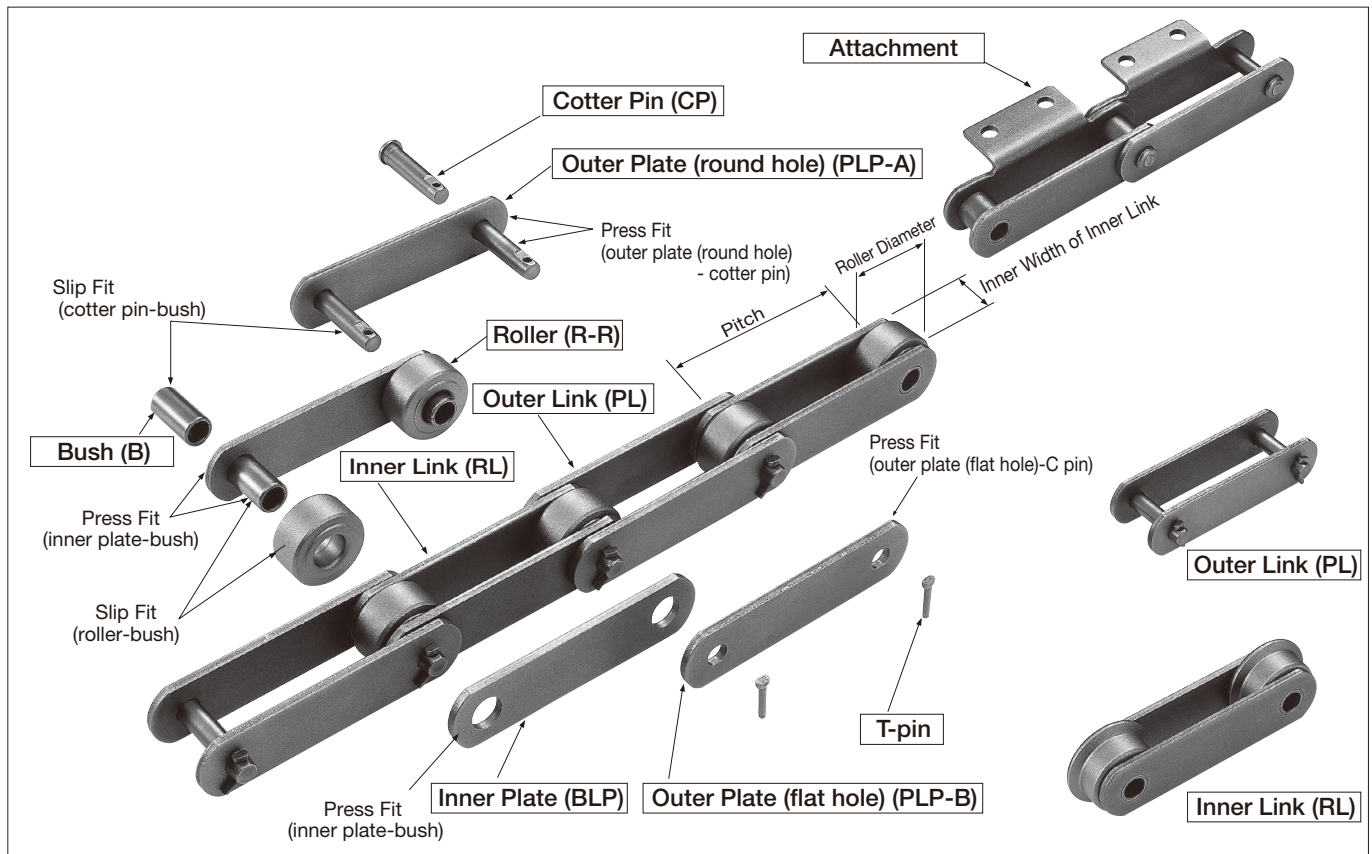
### 6. T-pin

After the outer plate is press-fitted to the pin, a T-pin is inserted and bent to prevent the pin from falling out.



### ⚠ For Safety

Never weld additional parts onto an assembled chain. Doing so may cause chain kinking or twisting due to plate deformation, further reducing part hardness and leading to embrittlement fracture from the welding heat.



#### Slip Fit

There is a continuous loose fit between the shafts and holes when fitted together.

#### Press Fit

There is a continuous interferential fit between the shafts and holes when fitted together.

Note: Total large size conveyor chain length tolerance is  $\pm 0.25\%$ .

# Roller Types

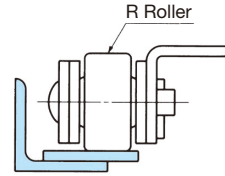
Tsubaki Conveyor Chains use three basic roller types.

## 1. R Rollers



The outer diameter of the roller is larger than the height of the link plate.

Tsubaki's most basic, versatile roller type. It has a large allowable load and low frictional resistance.

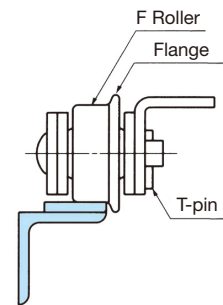


## 2. F Rollers



There is a flange on the roller, attached on the T-pin side, that acts as a guide.

Flange rollers are a simple way to prevent side oscillation. They are perfect for rough usage conditions and regular slat conveyance. Be careful when using K attachments, as the attachment area may contact the roller flange.



## 3. S, M, and N Rollers

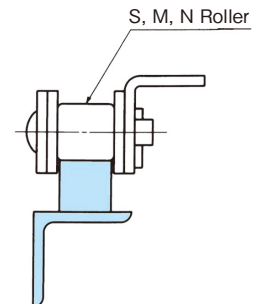


These rollers are effective in alleviating the shock and wear the chain would normally suffer during sprocket engagement.

S Rollers : The outer diameter of the roller is smaller than the height of the link plate.

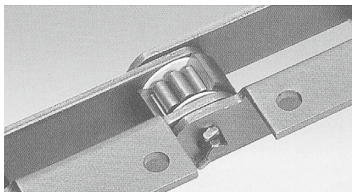
M Rollers : The outer diameter of the M Roller is slightly larger than that of the S Roller.

N Rollers : The roller diameter of the M and N rollers are the same, but the pin diameter is larger, increasing its strength. (RF26200N and above)



## Other roller types

### Bearing Rollers



Tsubaki Bearing Roller Conveyor Chain, with its unique cylindrical bearings in the rollers, is able to provide longer wear life and suppression of stick-slip phenomenon, and reduce required power. R, F, and S roller types available. See pg. 51 for more information.



# Conveyor Chain Guides

The following are examples of different guide methods by roller type used on the travel side/return side to provide for smooth running.

	R Roller (S Roller) Chains	F Roller Chains	Outboard Roller Chains
Travel Side			
Return Side			

# Attachment Types

Attachments can be attached at any link spacing. Refer to Pg. 16 Attachment Spacing for more information.

## 1. Standard Attachments (A1, A2, K1, K2, GA2, GA4)

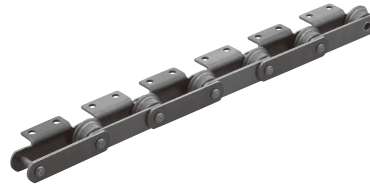
Standard attachments are both economical and versatile.

### A Attachments

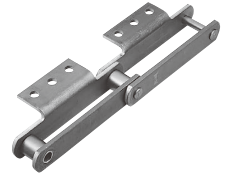
A attachments have a bent link plate on one side. They are referred to as A1, A2, or A3 attachments, depending on the number of bolt holes.



A1 Attachment



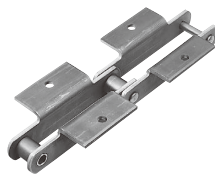
A2 Attachment



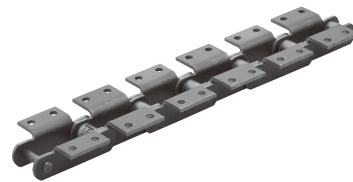
A3 Attachment

### K Attachments

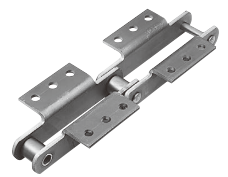
K attachments have a bent link plate on both ends. They are referred to as K1 or K2 attachments, depending on the number of bolt holes.



K1 Attachment



K2 Attachment



K3 Attachment

### GA Attachments

GA attachments have holes in the link plate itself. They are referred to as GA2 or GA4 attachments, depending on the number of bolt holes.



GA2 Attachment



GA4 Attachment

**⚠ Never weld additional parts onto a chain.**

- 1) Chain kinking or twisting due to plate distortion.
- 2) Brittle fracture and/or strength loss from heat.





**■ Attachment Positioning**

Attachments will be positioned as follows unless specified otherwise.

- 1) Attachments will be attached on the outer link when attached on even numbered links.
- 2) A and GA2 attachments will be attached on the T-pin side. (See pg. 23.)
- 3) GA4 attachments will be attached on the T-pin of opposing sides. (See pg. 25.)
- 4) Flanges for F rollers will be attached on the T-pin side. (See pg. 23.)

## 2. Specialty Attachments

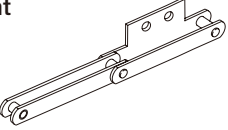
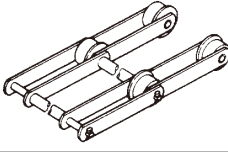
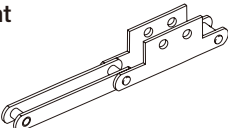
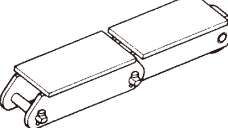
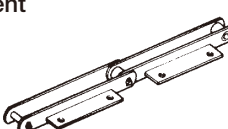
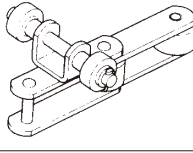
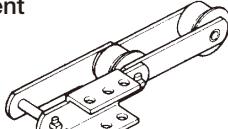
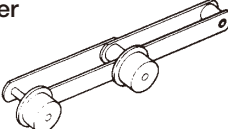
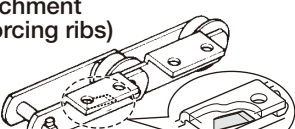
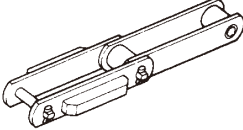
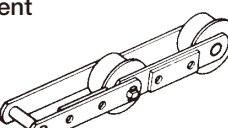
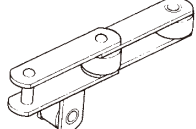
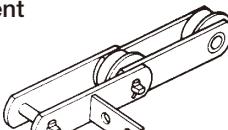
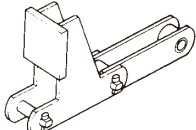
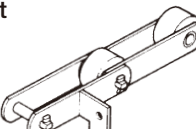
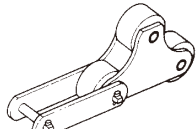
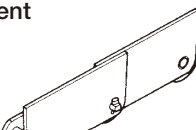
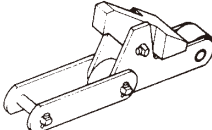
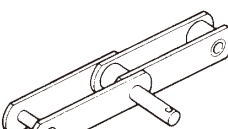
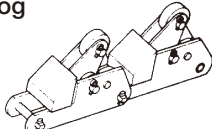
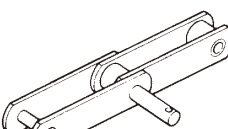
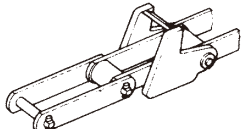
See other sections of this catalog for more information.

<p>Deep Link Conveyor Chain</p>  <p>Pg. 67</p>	<p>Top Roller Conveyor Chain</p>  <p>Pg. 63</p>	<p>Outboard Roller Conveyor Chain</p>  <p>Pg. 64</p>	<p>Flow Conveyor Chain</p>  <p>Pg. 70</p>
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### 3. Special Attachments (Plus Alpha Conveyor Chain)

See the appropriate page for more information.

<p><b>SA Attachment</b></p>  <p>Note: See Attachment section</p>	<p>Straight attachment on one side</p>	<p><b>Stay Pin (Type: TN)</b></p>  <p>Pg. 89</p> <p>Attachment can be laid directly on stay pin, or mesh can be attached</p>
<p><b>SK Attachment</b></p>  <p>Note: See Attachment section</p>	<p>Straight attachment on both sides</p>	<p><b>Top Plate (Type: TP)</b></p>  <p>Pg. 90</p> <p>Prevents damage to conveyed items</p>
<p><b>CA2 Attachment</b></p>  <p>Pg. 87</p>	<p>Used to attach a mesh or slat with no spacing</p>	<p><b>Trolley Roller (Type: TRO)</b></p>  <p>Pg. 90</p> <p>Used in long distance, horizontal applications</p>
<p><b>AA3 Attachment</b></p>  <p>Pg. 87</p>	<p>Stronger model - object attachment fits in between</p>	<p><b>Outboard Roller (Type: OR)</b></p>  <p>Pg. 90</p> <p>Provides support for heavy loads</p>
<p><b>A2R Attachment (w/reinforcing ribs)</b></p>  <p>Pg. 87</p>	<p>Increased flexural rigidity over A attachment</p>	<p><b>Guide Shoe (Type: GS)</b></p>  <p>Pg. 91</p> <p>Prevents lateral movement</p>
<p><b>MG2 Attachment</b></p>  <p>Pg. 88</p>	<p>Allows for one mounted jig to be used</p>	<p><b>Guide Roller (Type: GR)</b></p>  <p>Pg. 91</p> <p>Used in horizontal applications</p>
<p><b>AS2 Attachment</b></p>  <p>Pg. 88</p>	<p>Uses scraper or flight attachment</p>	<p><b>Fixed Dog (Type: KD)</b></p>  <p>Pg. 92</p> <p>Conveys by pushing</p>
<p><b>AF2 Attachment</b></p>  <p>Pg. 88</p>	<p>Uses deep scraper or flight attachment</p>	<p><b>Dog Roller (Type: RD)</b></p>  <p>Pg. 92</p> <p>Conveys round items by pushing</p>
<p><b>WSA0 Attachment</b></p>  <p>Pg. 89</p>	<p>Prevents conveyed items from overspilling</p>	<p><b>Tilting Dog (Type: CD)</b></p>  <p>Pg. 93</p> <p>Can accumulate items on top of the conveyor</p>
<p><b>Extended Pin (Type: EP)</b></p>  <p>Pg. 89</p>	<p>Objects attach easily to pin end</p>	<p><b>Roller Tilting Dog (Type: RCD)</b></p>  <p>Pg. 93</p> <p>Can accumulate round items</p>
<p><b>Extended Pin (Type: EP)</b></p>  <p>Pg. 89</p>	<p>Objects attach easily to pin end</p>	<p><b>Ducking Dog (Type: DD)</b></p>  <p>Pg. 93</p> <p>Conveyed item will remain in fixed position</p>

# Large Size Conveyor Chain Line-up

Series	Product Name	Features/Application	Special Features	Ambient Temperature Range
General Use	DT Series	Economical general-use series	Heat treated pin and bush	-20°C to 200°C
Wear Resistant/Heavy Duty	GT Series	Increased wear life between roller-bush	Higher roller load capacity than DT Series	-20°C to 200°C
	AT Series	Increased tensile strength, compact design	Approx. two times the tensile strength of the DT Series with a higher roller load capacity	-60°C to 400°C
	CT Series	Increased wear life between pin and bush	Special heat treatment on pin and bush	-20°C to 200°C
	BT Series	Optimal for conveying loose materials	Approx. two times the tensile strength of the CT Series	-20°C to 200°C
Wear Resistant/Heavy Duty Conveyor Chain Bearing Roller Conveyor Chain	Standard Series (standard specs)	Perfect for direct conveyance of heavy items. Reduces necessary chain size, provides energy and space savings. Used for item conveyance.	Cylindrical bearings inside the roller lowers the coefficient of friction and increases roller load capacity	-20°C to 80°C
	Standard Series (anti-dust specs)	Used in environments with dust or airborne particulates		-20°C to 80°C
	Lube Free Series (standard specs)	Lube-free version of standard series. Perfect for direct conveyance of heavy items. Reduces necessary chain size, provides energy and space savings. Used for item conveyance.		-20°C to 50°C
	Lube Free Series (water-resistant specs)	Perfect for environments where chain is exposed to water		0°C to 50°C
Corrosion Resistant Series	DS Series (stainless steel)	Corrosion resistant, heat resistant, cold resistant	All components use SUS400	-70°C to 400°C
	GS Series (stainless steel)		1.6 times the tensile strength of DS Series	-70°C to 400°C
	SS Series (stainless steel)		All components use SUS300	-100°C to 400°C
	MT Series	Slightly water resistant	Pin and bush are SUS400	-20°C to 200°C
	VT Series		Twice the tensile strength of MT Series	-20°C to 400°C
	RT Series		Pin, bush, and roller are SUS400	-20°C to 200°C
	YT Series		Perfect for fly ash conveyance	Approx. two times the tensile strength of RT Series
Specialty Conveyor Chains	Double Plus Conveyor Chain	Can convey as a free flow conveyor chain, as well as accumulate	The combination of large and small diameter rollers allows items to be conveyed 2.3 times the chain speed	-20°C to 200°C
	Top Roller Conveyor Chain		Direct conveyance of items on top rollers	*1-20°C to 200°C
	Outboard Roller Conveyor Chain		Sprocket engages the chain in the center of the S roller	*1-20°C to 200°C
	Bearing Bush Conveyor Chain	Used for high-precision positioning in indexing operations and item conveyance	Uses bearings between pin and bush, will not elongate	-10°C to 60°C
	Deep Link Conveyor Chain	Items to be conveyed can be placed directly on the tall plates	Equipped with an R roller with little frictional resistance	*1-20°C to 200°C
	Coil Transfer Conveyor Chain	Extremely high stiffness for conveying heavy loads	Uses Tsubaki's unique cylindrical bearings in the rollers	-20°C to 200°C
	Lambda Plastic Roller Conveyor Chain	Perfect for use in clean environments	Uses a specially lubricated bush (lube-free)	0°C to 50°C
	Flow Conveyor Chain	Perfect for conveyance in hermetically sealed cases	Great wear resistance, wide variety of attachment types available	*1-20°C to 200°C
	FA Series Fly Ash Flow Conveyor Chain	Perfect for fly ash conveyance	Features a special surface treatment for increased wear resistance	*1-20°C to 200°C
	Bucket Elevator Conveyor Chain	Specialty chain focusing on wear resistance and fatigue strength	Uses an ideal combination of materials for wear inducing environments	-20°C to 200°C*2
	FB Series Bucket Elevator Conveyor Chain	Increased pin-bush wear resistance	Solid lubricant between pin-bush, O-ring between links	-15°C to 200°C
	Shoulder Bush Conveyor Chain	Can convey heavier items than RF Conveyor Chain	Large bush outer diameter, increased roller load capacity	*1-20°C to 200°C
	Waste Treatment Conveyor Chain	Perfect for conveying material from waste treatment processes	Increased wear/corrosion resistance thanks to the right combination of component materials	*1-20°C to 200°C
	Block Chain		Superior structural stiffness and high tensile strength	Uses two outer plates and one or two inner plates and pins
		Block Chain for flow conveyors	Used for conveyance in extreme wear environments	-60°C to 400°C

\*1: Usage temperature will change depending on chain specification. The temperature shown is for the DT Series.

\*2: Y Series is 400°C.

Note: For RF03075 and RF03100 chains, their bushes and S rollers use 600 Series stainless steel.





# Ordering Large Size Conveyor Chains

You will need to provide information on chain size and series, as well as chain length (number of links), attachment positioning, and formation when ordering. The following lists the common ordering method and points to note.

## 1. Sample Order

Use the Tsubaki product code and chain number when ordering to ensure there are no mistakes regarding chain size or attachment type. See the relevant dimension pages for product code and chain number.

### 1) If Product Code Is Provided

< General Use, Wear Resistant/Heavy Duty, Corrosion Resistant >

Chain Number	Qty.	Unit	Legend
<b>RF03075R-DT-1L A2</b>	400	L	L : Links H : Strands K : Pieces

### 2) If Product Code Is Not Provided

< Bearing Roller Conveyor Chain >

Chain Number	Qty.	Unit
<b>RF03075BR-DT-1L A2</b>	400	L

# Ordering Large Size Conveyor Chains

## 2. Specific Ordering Examples for Large Size Conveyor Chain

Unlike drive chains and light duty conveyor chains, large size conveyor chains are ordered in links instead of units.

### 2.1 Chain assembly when ordering with total number of links

- 1) In general, your large size conveyor chain will be delivered in standard lengths (~3m) + extra parts based on the total number of links in your order. Your chain may not be provided in standard lengths (~3m) depending on its size, pitch, or attachment spacing. Please notify us with any specific packing requests.

Ex. 1) When ordering RF03100R-DT-1LA2 500L

(Packing) 30L x 16H + 20L x 1H (total 500L)

Ex. 2) When ordering RF03100R-DT-1LA2 500L (250Lx2H)

(Packing) 30L x 16H + 10L x 2H (total 500L)

Ex. 3) When ordering RF03100R-DT-4LA2 280L (standard length is not 3m)

(Packing) 28L x 10H (total 280L)

**Caution**

Standard length will vary depending on chain size, pitch, and attachment spacing. We will try to deliver in ~3m standard lengths.

Ex. 4) When ordering RF03100R-DT-6LA2 38L (when quantity is indivisible due to attachment spacing)

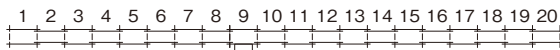
(Packing) 30L x 1H + 8L x 1H (w/2 att.) (total 38L)



**Caution**

Attachments can be attached to extra parts as well. Please indicate if attachments are not needed. Try to ensure that attachment spacing allows for an evenly divisible quantity.

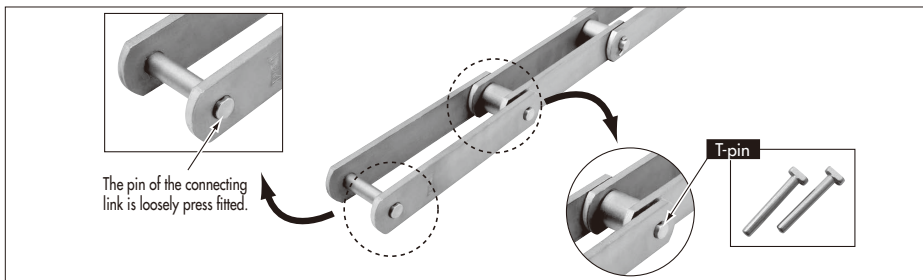
Ex. 5) When ordering RF03100R-DT-A2 20L (special assembly: A2 att. every 9th link)



**Caution**

Count links from the left hand side, starting at "one." Instructions to start counting from the right may lead to incorrect attachment positioning.

- 2) One end of a standard length (~3m) will be the outer link, while the other end will be the inner link. Add additional chain lengths onto this standard length to create a longer chain. The connecting link is delivered with a loose press fit. (See photo below.)



Note: Delivery of the chain may differ depending on chain shape.

### 2.2 Special assembly

A chain assembled to your specified chain length, end formation, attachment spacing, etc. is considered a special assembly.

#### 2.2.1 When total length has an even number of links

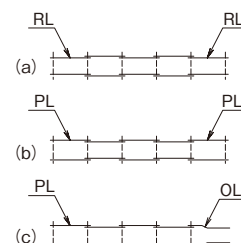
- 1) One end of the chain will be the outer link, while the other end will be the inner link.
- 2) Refer to section P16. 3 Attachment Spacing for specifying the position and spacing of attachments.

#### 2.2.2 When total length has an odd number of links

- a) Both ends inner links (RL - RL)
- b) Both ends outer links (PL - PL)
- c) One end outer link, other end offset link (PL - OL)

**Caution**

When using an odd number of links, be sure to specify the end formation as per a) - c) above. C) requires a separate fee for an offset link.



# Ordering Large Size Conveyor Chains

## 2.2.3 When using chain in parallel

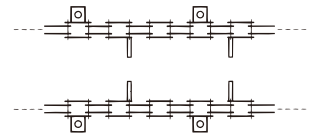
### 1) Half assembled in mirror image

Attachments on a set of chains to be used in parallel are manufactured to be symmetrical. Thus, when chains need to be in mirror image, please specify half assembled in mirror image when ordering.

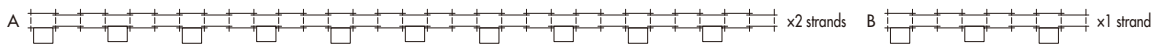
Ordering strands in parallel does not mean that they will be in mirror image.

The following examples show when half assembled in mirror image is appropriate and when it is not.

Ex. RF03100R-6LA2-5LEP1

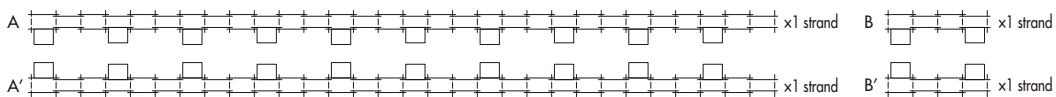


Ex. 1) When ordering RF03100R-DT-3LA2 68L (when not indicating half assembled in mirror image)  
Shipped as A: 30 L x 2H, B: 2L x 1H (w/3 att.)



**Caution**  
When ordering chain, we will assume that the chains will be used in single strands (and not in parallel). Please indicate when two or more strands will be used, or when half assembled in mirror image is required.

Ex. 2) RF03100R-DT-3LA2 68L (when ordering half assembled in mirror image)  
Shipped as A: 30L x 1 strand, B: 4L x 1 strand (w/2 att.) as per the diagram  
A: 30L x 1 strand, B: 4L x 1H (w/2 att.) mirror image of diagram



**Caution**  
We will only manufacture chains as per Ex. 2 when instructed to half assemble in mirror image.

Ex. 3) RF03100R-DT-3LA2 68L (34L x 2H) (when not indicating half assembled in mirror image)  
Shipped as A: 30L x 2H, B: 4L x 2H (w/2 att.)



**Caution**  
We will arrange the number of links so that there are two strands, but it will not be manufactured as half assembled in mirror image. There are applications where not manufacturing half assembled in mirror image will result in problems.

### 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 in parallel, the chain is matched and tagged in pairs. Indicate one of the following two methods when ordering. Contact a Tsubaki representative for details.

**Note: Total large size conveyor chain length tolerance is ±0.25%. Chains half assembled in mirror image cannot be matched and tagged in pairs. Only when stands are not interchangeable.**

#### 1) When ordering minimal matched tolerance differences

The overall length of several sets of standard length (~3m) is measured, and without performing the match and tag process we will assemble the chain randomly based on the results of statistical and technical data. If the results are not appropriate, we will measure the total length of all strands and assemble.

#### 2) When ordering matched and tagged within XX mm

Total length of each standard length (~3m) is measured and assembled within the relative difference specified.

〈Delivery〉

Different colored tags are attached to the left and right sides at fixed intervals (~3m). Connecting order for the chain is written on the tag.

Note: There is an extra charge for chains matched and tagged in pairs. Contact a Tsubaki representative for details.

## 2.2.4 Long chain lengths

Long chain lengths refer to chains with total lengths over a standard length (~3m). There are limits on long chain lengths depending on chain size due to transportation and handling problems. Contact a Tsubaki representative for details.

## 2.2.5 Rust prevention

Large Size Conveyor Chains are not coated with a rust preventative oil during shipping. Please indicate whether rust preventative measures are required when ordering.

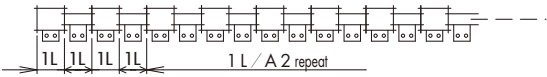
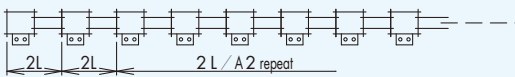
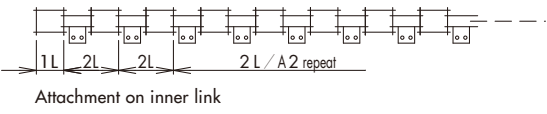
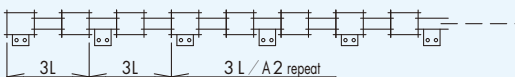
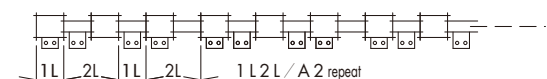
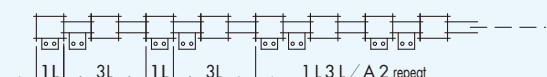
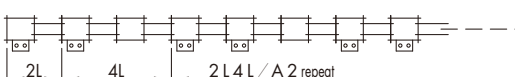
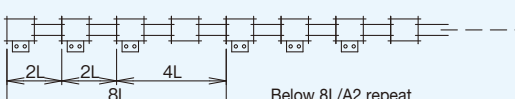
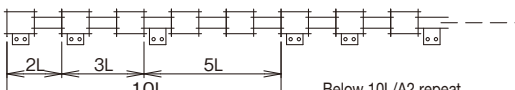
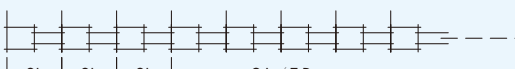
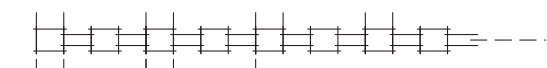
Note: A separate treatment fee will apply.



# Ordering Large Size Conveyor Chains

## 3. Attachment Spacing

Overview

Numbering Example	Basic Attachment Coding	Connecting Link Att. Type	Diagram
RF12200R-1LA2 ○ =1	○ LA2	A2	
RF12200R-2LA2 ○ =2	○ LA2	A2	
RF12200R-2LA2RL ○ =2	○ LA2RL	No attachment	 Attachment on inner link
RF12200R-3LA2 ○ =3	○ LA2	A2	
RF12200R-1L2LA2 ○ =1, △ =2	○ L △ LA2	A2	
RF12200R-1L3LA2 ○ =1, △ =3	○ L △ LA2	A2	
RF12200R-2L4LA2 ○ =2, △ =4	○ L △ LA2	A2	
RF12200R-2L2L4LA2 ○ =2, △ =2, □ =4	○ L △ L □ LA2	A2	 Below 8L/A2 repeat
RF12200R-2L3L5LA2 ○ =2, △ =3, □ =5	○ L △ L □ LA2	A2	 Below 10L/A2 repeat
RF12200R-2LEP ○ =2 EP:Extended pin (see pg. 89)	○ LEP	EP single side	
RF12200R-1L3LEP ○ =1, △ =3 EP:Extended pin (see pg. 89)	○ L △ LEP	EP both sides	

# Large Size Conveyor Chain Strength Tables

## Average Tensile Strength

Unit: kN{kgf}

Chain Size	Series	Wear Resistant/Heavy Duty Conveyor Chain					Corrosion Resistant Conveyor Chain							
	General Use Conveyor Chain	DT	AT	GT	CT	BT	DS	GS	SS	MT	VT	RT	YT	
Meter Lengths	RF03075 RF03100	29.4{3000}	69.6{7100}	29.4{3000}	29.4{3000}	51.0{5200}	29.4{3000}	53.9{5500}	33.3{3400}	29.4{3000}	69.6{7100}	29.4{3000}	69.6{7100}	
	RF05075 RF05100 RF05125 RF05150	68.6{7000}	142{14500}	68.6{7000}	68.6{7000}	98.1{10000}	68.6{7000}	108{11000}	68.6{7000}	68.6{7000}	142{14500}	68.6{7000}	142{14500}	
	RF08125 RF08150	78.5{8000}	142{14500}	78.5{8000}	78.5{8000}	98.1{10000}	78.5{8000}	123{12500}	68.6{7000}	78.5{8000}	142{14500}	78.5{8000}	142{14500}	
	RF10100 RF10125 RF10150	113{11500}	226{23000}	123{12500}	123{12500}	226{23000}	113{11500}	177{18000}	108{11000}	123{12500}	226{23000}	123{12500}	226{23000}	
	RF12200 RF12250	186{19000}	279{28500}	186{19000}	186{19000}	279{28500}	167{17000}	265{27000}	132{13500}	186{19000}	279{28500}	186{19000}	279{28500}	
	RF17200 RF17250 RF17300	245{25000}	387{39500}	245{25000}	245{25000}	387{39500}	221{22500}	358{36500}	186{19000}	245{25000}	387{39500}	245{25000}	387{39500}	
	RF26200 RF26250 RF26300 RF26450	314{32000}	520{53000}	314{32000}	314{32000}	520{53000}	294{30000}	461{47000}	250{25500}	314{32000}	520{53000}	314{32000}	520{53000}	
	RF36250 RF36300 RF36450 RF36600	476{48500}	682{69500}	476{48500}	476{48500}	682{69500}	—	—	—	476{48500}	682{69500}	476{48500}	682{69500}	
	RF52300 RF52450 RF52600	500{51000}	1030{105000}	500{51000}	500{51000}	1030{105000}	—	—	—	500{51000}	1030{105000}	500{51000}	1030{105000}	
	RF60300 RF60350 RF60400	500{51000}	1040{106000}	500{51000}	500{51000}	1040{106000}	—	—	—	500{51000}	1040{106000}	500{51000}	1040{106000}	
	RF90350 RF90400 RF90500	789{80500}	1630{166000}	789{80500}	789{80500}	1630{166000}	—	—	—	789{80500}	1630{166000}	789{80500}	1630{166000}	
	RF120400 RF120600	1110{113000}	2210{225000}	1110{11300}	1110{11300}	2210{225000}	—	—	—	1110{113000}	2210{225000}	1110{113000}	2210{225000}	
	RF280400 RF280600	—	3040{310000}	—	—	—	—	—	—	—	—	—	—	
	RF360400 RF360600	—	3630{370000}	—	—	—	—	—	—	—	—	—	—	
	RF440400 RF440600	—	4460{455000}	—	—	—	—	—	—	—	—	—	—	
	Inch Lengths	RF430	53.9{5500}	98.1{10000}	53.9{5500}	53.9{5500}	69.6{7100}	52.0{5300}	83.4{8500}	48.1{4900}	53.9{5500}	98.1{10000}	53.9{5500}	98.1{10000}
		RF204	78.5{8000}	142{14500}	78.5{8000}	78.5{8000}	98.1{10000}	78.5{8000}	123{12500}	68.6{7000}	78.5{8000}	142{14500}	78.5{8000}	142{14500}
		RF450	78.5{8000}	142{14500}	78.5{8000}	78.5{8000}	98.1{10000}	78.5{8000}	123{12500}	68.6{7000}	78.5{8000}	142{14500}	78.5{8000}	142{14500}
		RF650	78.5{8000}	142{14500}	113{11500}	113{11500}	98.1{10000}	78.5{8000}	142{14500}	68.6{7000}	113{11500}	142{14500}	113{11500}	142{14500}
		RF214	127{13000}	240{24500}	127{13000}	127{13000}	240{24500}	118{12000}	186{19000}	123{12500}	127{13000}	240{24500}	127{13000}	240{24500}
RF205		127{13000}	240{24500}	127{13000}	127{13000}	240{24500}	118{12000}	186{19000}	123{12500}	127{13000}	240{24500}	127{13000}	240{24500}	
RF6205		186{19000}	279{28500}	186{19000}	186{19000}	279{28500}	167{17000}	265{27000}	132{13500}	186{19000}	279{28500}	186{19000}	279{28500}	
RF212		245{25000}	387{39500}	245{25000}	245{25000}	387{39500}	221{22500}	358{36500}	186{19000}	245{25000}	387{39500}	245{25000}	387{39500}	

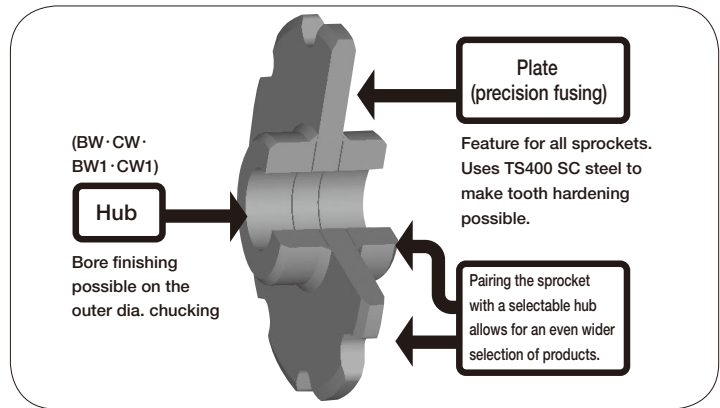
Note: 1. Average tensile strength values are based on Tsubaki design standards, and represent calculated strength. Especially, as long as there are no constraints, average tensile strength is used in Large Size Conveyor Chain selection. Values differ by maker and do not represent guaranteed values  
 2. Minimum tensile strength is 85% of the average tensile strength.

# Large Size Conveyor Chain Sprocket Configuration

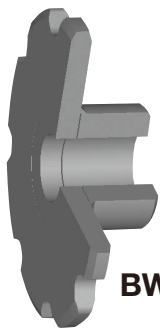
Overview

## Features of RF Conveyor Chain Sprockets

The unique material used for the plate has allowed us to give our sprockets the optimal induction hardening treatment. This has increased the wear resistance and transmission capacity of the sprocket while lowering its cost.

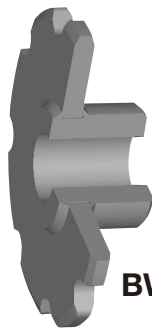


## 1. Types



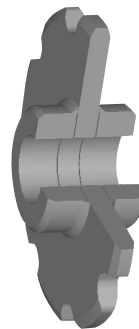
**BW** type

A hub is welded onto a single side of the sprocket plate. Suitable for RF10150 chain and below (meter pitch).



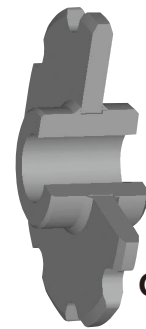
**BW1** type

A hub is passed through the sprocket plate. While only protruding from one side, both sides are welded. Suitable for RF12200 chain and above (meter pitch).



**CW** type

Hubs are welded to both sides of the sprocket plate. Suitable for RF205 chain and below (inch pitch).



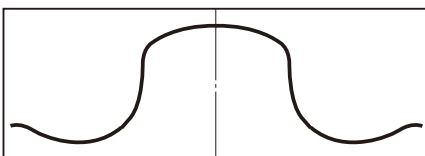
**CW1** type

A hub is passed through the sprocket plate. Both sides of the hub protrude and are welded. Suitable for RF6205 chain and above (inch pitch).

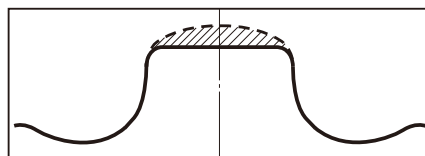
## 2. Teeth Profiles

### 2-1 Profile

**S1: Teeth are rounded**



**S2: Teeth are flat** (cross-hatching represents shape if S1 were cut)



Chains with K attachments should use S2 teeth profiles if there is a possibility of interference with the sprocket outer diameter.

### 2-2 Specifications

● **Normal series (Code: N)**

These non-heat treated specifications are suitable for low load, low wear applications.

● **Strong series (Code: Q)**

The teeth have been induction hardened. Suitable for when wear resistance is required, or under heavy load conditions.

The follow chart shows the usage classification for both normal and strong specifications.

### Usage Classification for Normal and Strong Series

Chain Series	Roller Type	Drive Side		Driven Side	
		Normal Conditions	Wear-Inducing Conditions	Normal Conditions	Wear-Inducing Conditions
DT Series	S	Q	Q	N	Q
	R	N	Q	N	N
	F	N	Q	N	N

Chain Series	Roller Type	Drive Side		Driven Side	
		Normal Conditions	Wear-Inducing Conditions	Normal Conditions	Wear-Inducing Conditions
AT Series	S	Q	Q	N	Q
	R	Q	Q	N	Q
	F	Q	Q	N	Q

The above classifications are based on standard usage conditions. Contact a Tsubaki representative regarding use in extremely wear-inducing, heavy load environments.



# Large Size Conveyor Chain Sprocket Construction and Ordering Examples

## 3. Series

### 3-1 Finished Bore Series

The bore dimensions are processed under the following specifications so that time-consuming shaft processing can be finished quickly for delivery. Does not come with a set screw. See pg. 47 for more details.

#### Standard Bore Processing Specifications

Bore Tolerance	Keyway Width Tolerance (aligned with tooth)	Tap Processing
H8	JISB1301-1996 Standard type Js9	Two taps processed at 120° intervals, with one of them located on the keyway.
	Old JISB1301-1959 Type 2 E9	

Inform your Tsubaki representative of the following if processing specifications other than the above are required.

- Bore shape, diameter, and tolerance
- Keyway type, size, and tolerance
- Tap size and position

### 3-2 Selectable Hubs

Selectable hubs are a stock item designed as specialty hubs for conveyor sprockets. Users can freely select dimensions not listed in the catalog for specialty items. See page 46 for more details.

### 3-3 Keyway

The keyway is processed so that the tooth center of the sprocket coincides with the keyway center. Chains can be used in parallel without modifying the keyway. If further precision is required, contact your Tsubaki representative.

## 4. Large Size Conveyor Chain Sprocket Precision

### 4-1 Tooth Width

The dimensional tolerance of the tooth width of each sprocket is shown in each size table.

### 4-2 Overall Sprocket Length

The following table shows the tolerance of the overall length of each sprocket.

Unit: mm

Overall Length	Model	BW	BW1
		CW	CW1
Up to 80		0, -1.0	±0.3
More than 80, up to 150		0, -1.2	±0.5
More than 150, up to 200		0, -1.4	
More than 200, up to 300		0, -1.8	

### 4-3 Run-out

The eccentricity and face run-out based on the outer diameter of the hub are shown in the following table.

Unit: mm

Outer Dia.	Eccentricity	Face Run-Out
Up to 200	Max. 1.0	Max. 1.0
More than 200, up to 630	Max. 1.5	Max. 1.5
More than 630, up to 1250	Max. 2.5	Max. 2.5

### 4-4 Keyway Center and Tooth Center

The off-center of the keyway center and tooth center based on the circumference are shown in the following table.

Unit: mm

Outer Dia.	Off-Center
Up to 400	Max. 3.0
More than 400, up to 800	Max. 4.0
More than 800	Max. 6.0

## Sprocket Ordering

Please include both the product code and model number when ordering to eliminate any confusion. You will find both product codes and model numbers for each product in the dimensional tables.

### 1) If a product code is provided

Model number  
**RF03075 R 6T-BW N**

### 2) If no product code is provided

Product with Standard Finished Bore

Model number  
**RF05150 R 8T CW Q H 50 J**

Special Sprockets

Model number  
**RF36200 R 13T CW1**

For special sprockets, refer to the above example and specify the materials, dimensions, shapes, and processing instructions through drawings and specification sheets. Indicate areas with dimensions that differ from the catalog dimensions.

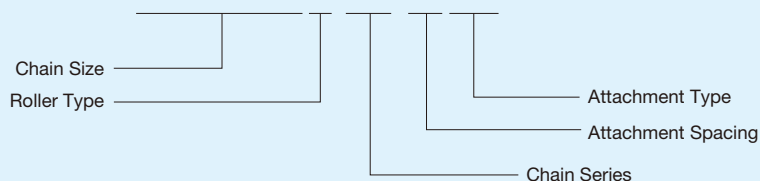
# General Use, Wear Resistant/Heavy Duty, and Corrosion Resistant Large Size Conveyor Chain

- DT Series (General Use Large Size Conveyor Chain)
- GT, CT, AT, BT Series (Heavy Duty Large Size Conveyor Chain)
- MT, RT, DS, VT,  
YT, GS, SS, NEP Series (Corrosion Resistant Large Size Conveyor Chain)

## Ordering General Use, Wear Resistant/Heavy Duty, and Corrosion Resistant Conveyor Chain

### ● Chain Numbering Example

**RF03075R-AT-1LA2**



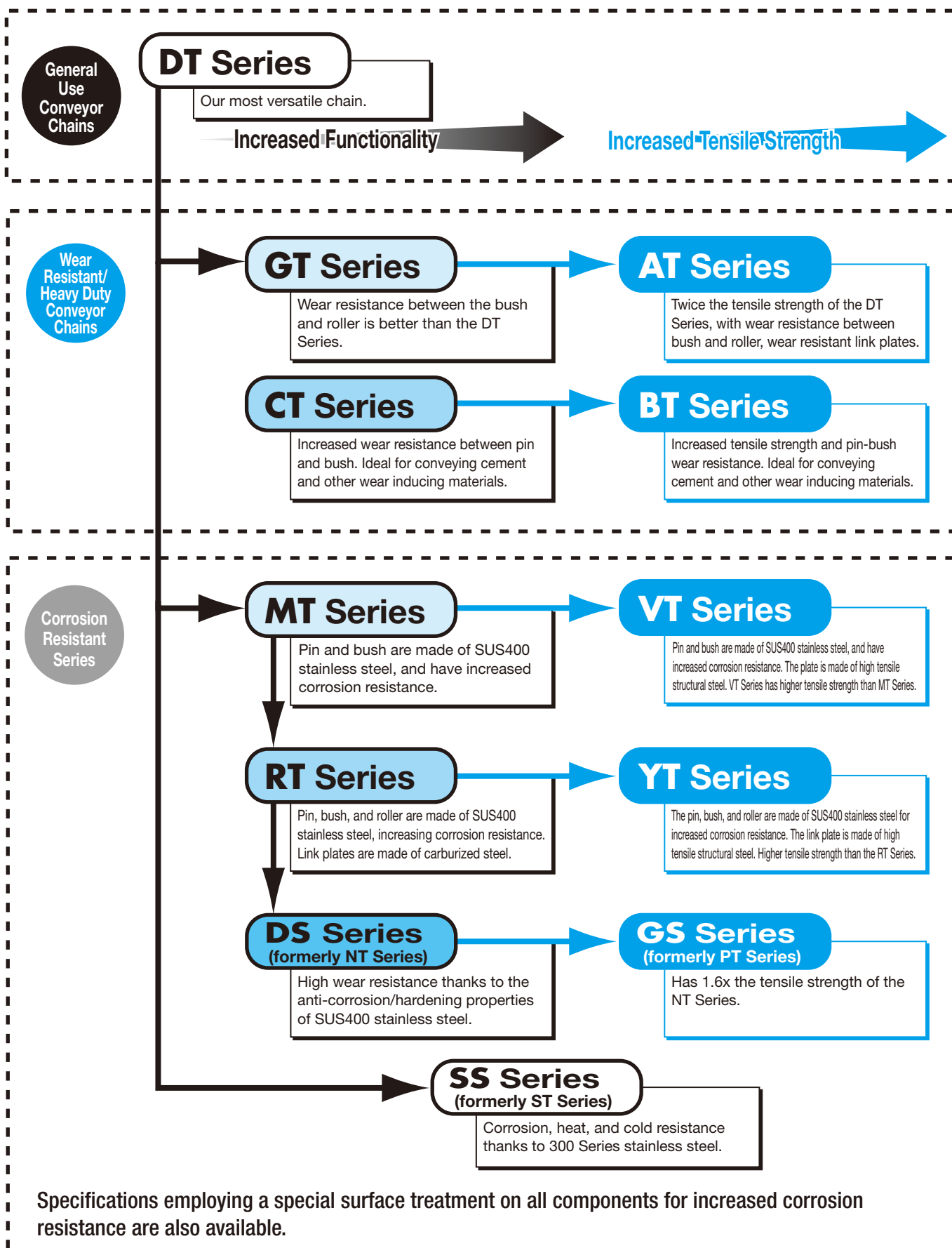
### ● Ordering Example

Chain Size= RF03, Pitch= 75mm, Roller Type= R  
 Material Specification= AT Series  
 Attachment Spacing/Type= A2 every link  
 Quantity= 400 links

Chain Number	Quantity	Unit
<b>RF03075R-AT-1LA2</b>	400	L

# Tsubaki's Wide Selection of Large Size Conveyor Chains

Tsubaki Conveyor Chain is made from carbon steel, high tensile structural steel, or stainless steel (300/400 Series) components to satisfy any application.



Note: For RF03075 and RF03100 chains using 400 Series stainless steel, their bushes and S rollers use 600 Series stainless steel.



# Tsubaki's Wide Selection of Large Size Conveyor Chains

We offer a line-up of chains that offer various functions and features besides just material and heat-treatment combinations to solve your needs, as well as chains for special applications.

## Specification Details

Applications	Product Name	Features	Operating Environment Temperature	Page	
Chain Wear Elongation Resistance	FB Series Conveyor Chain	Solid lubricant between pin-bush, O-ring between links	-15°C to 200°C	79	
	Lambda Plastic Roller Conveyor Chain	Uses a specially lubricated bush (lube-free)	0°C to 50°C	69	
Bush-Roller Wear Resistance	Shoulder Bush Conveyor Chain	Large bush outer diameter, increased roller load capacity	-20°C to 200°C	80	
	FA Series Conveyor Chain	Features a special surface treatment for increased wear resistance	-20°C to 200°C	74	
Bush-Roller Wear Resistance, Heavy Load Conveyance, Energy Savings, Smaller Chain Design	Bearing Roller Conveyor Chain	Standard Series (standard specs)	Cylindrical bearings inside the rollers lower the coefficient of friction and increase roller load capacity	-20°C to 80°C	53
		Standard Series (anti-dust specs)	Used in environments with dust or airborne particulates	-20°C to 80°C	53
		Lube-Free Series (standard specs)	Special cylindrical bearings with self-lubricating function between the bush and roller Can be used without lubricating the rollers	-20°C to 50°C	55
		Lube-Free Series (completely lube-free specs)	Special cylindrical bearings with self-lubricating function between the bush and roller, and pin and bush Can be used without additional lubrication	-20°C to 50°C	57
		Lube-Free Series (water-resistant specs)	Perfect for environments where the chain is exposed to water	0°C to 50°C	55

General Use/Heavy Duty/  
Corrosion Resistant

## Specialty Conveyor Chain Line-up

Applications	Product Name	Features	Operating Environment Temperature	Page
Free Flow Conveyance	Double Plus Conveyor Chain	Conveyance speed is 2.3 times chain speed thanks to the size difference between its large and small diameter rollers.	-20°C to 200°C	62
	Top Roller Conveyor Chain	A top roller is added in between chain pitches to any conveyor chain specification, allowing for direct conveyance on the top roller.	-20°C to 200°C*1	63
	Outboard Roller Conveyor Chain	An outboard roller is attached to the S roller of any conveyor chain specification.	-20°C to 200°C*1	64
Indexing Conveyance	Bearing Bush Conveyor Chain	Features needle bearings between the pin and bush. Reduces wear elongation to the absolute minimum possible. Suitable for index positioning and tact conveyance.	-10°C to 60°C	65
Direct Conveyance	Deep Link Conveyor Chain	A small R roller with little frictional resistance is added to a wide link plate on any conveyor chain specification to allow for direct conveyance of heavy objects.	-20°C to 200°C*1	67
Low Friction/Very Heavy Object Conveyance	Coil Transfer Conveyor Chain	This reinforced chain has extremely high rigidity for conveying extremely heavy objects, such as containers, steel structures, and cold/hot coils used in steelworks.	-20°C to 200°C*1	68
Fly Ash Conveyance	Flow Conveyor Chain	By conveying fly ash in a sealed case, there is no scattering of ash, making this loose material conveyor chain ideal for preventing damage.	-20°C to 200°C*1	70
Bucket Elevator Conveyance	Bucket Elevator Conveyor Chain	This specialty chain features high wear resistance and fatigue strength.	-20°C to 200°C*2	77
Waste Treatment	Waste Treatment Conveyor Chain	Tsubaki has recognized the kinds of wear found in each waste treatment facility process and has created this chain especially for this industry.	-20°C to 200°C	81
Special Applications	Block Chain	This strong chain features a simple construction with superior rigidity. It has high tensile strength for its mass.	-60°C to 400°C	84

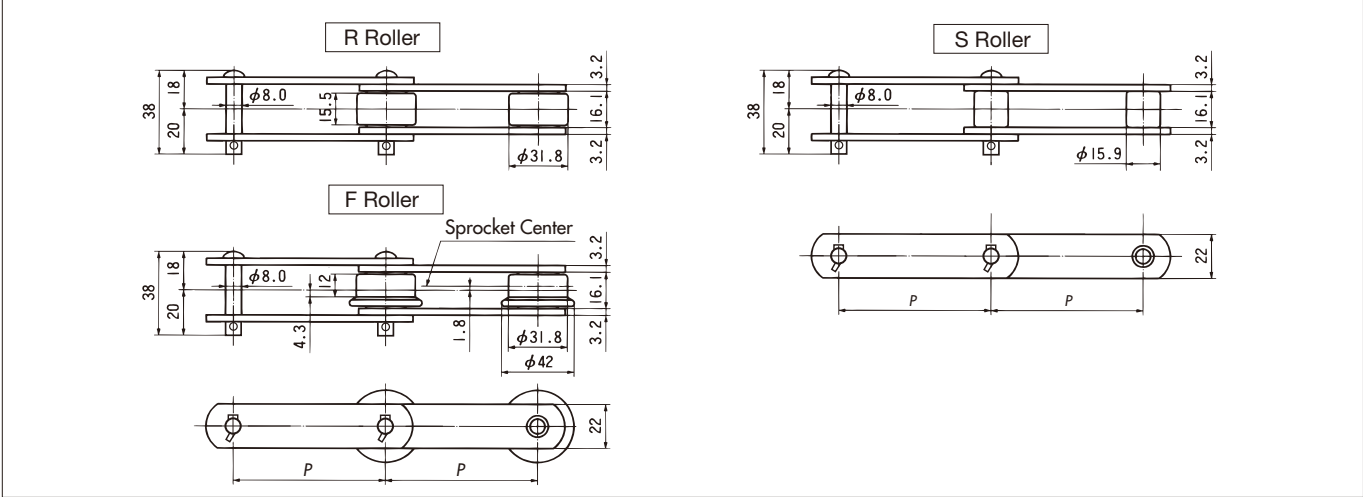
\*1: The operating temperature varies with the chain series. The temperatures given here are the operating temperatures for the DT Series.

\*2: The operating temperature for the Y Series is 400°C.

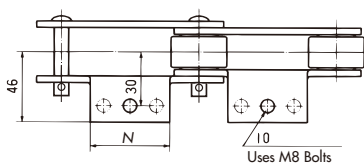
# RF03

## Meter Pitch (Dimensions)

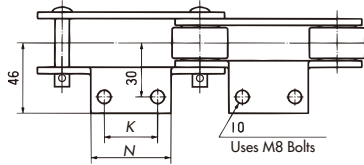
RF03075 • RF03100



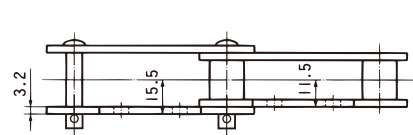
**A1(A3) Attachment**



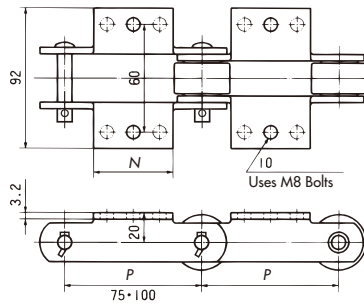
**A2 Attachment**



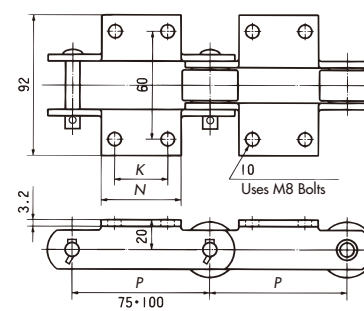
**SA2 Attachment**



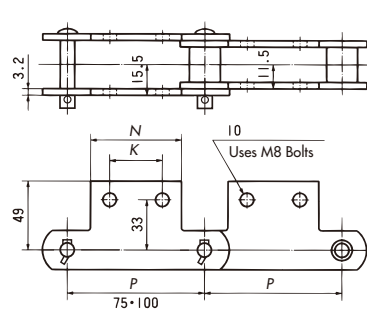
**K1(K3) Attachment**



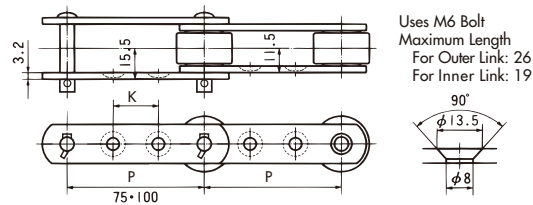
**K2 Attachment**



**SK2 Attachment**



**GA2 Attachment**



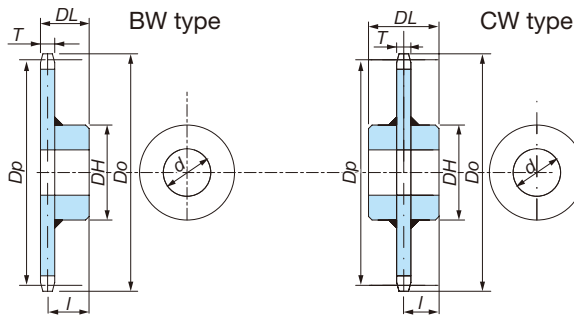
TSUBAKI Chain Number	DT Series Average Tensile Strength		Pitch P	Attachment			Attachment & Roller Combinations				Approximate Mass kg/m			A Attachment Mass kg/each
	kN	{kgf}		A · K · SA · SK		GA2	A1(A3) K1(K3)	A2 K2	SA2 SK2	GA2	R Roller	F Roller	S Roller	
				N	K	K								
<b>RF03075</b>	29.4	{3000}	75	55	30	30	R/F/S	R/F/S	R/S	R/S	2.8	2.9	1.8	0.06
<b>RF03100</b>			100	65	40	50	R/F/S	R/F/S	R/S	R/S	2.4	2.5	1.6	0.07

- Note 1. The mass of A attachments in the chart are the additional mass (kg) per attachment. For K attachments, multiply this number by two.  
 2. Contact a Tsubaki representative if using a guide on A or K attachment sides.  
 3. Attachments written in    are standard attachments.

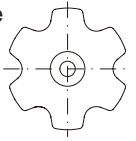
# Sprockets for RF03 Chain (BW/CW)

## RF03075 R 6T - BW N

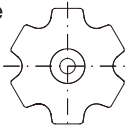
Chain size	No. of teeth	Hub type
Roller type	BW-CW	
Tooth hardening		
Hardened : Q		
Normal : N		



S1 Tooth Profile  
(Teeth are rounded)



S2 Tooth Profile  
(Teeth are flat)



General Use/Heavy Duty  
Corrosion Resistant

R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Standard Series					BW Type		CW Type	
		Pitch Circle Dia. Dp	Outer Dia. Do	Tooth Width T	Tooth Profile	Bore Dia. d		Hub Dia. DH	Total Length DL	Approx. Weight kg	Hub No.	Center Distance l	Hub No.	Center Distance l
						Pilot Bore	Max.							
<b>RF03075R</b> (75)	6	150.0	158	11.9 <sup>0</sup> <sub>-0.8</sub>	S1	18	50	73	57	3.0	SB1	51.0	SC1	28.5
	8	196.0	209		S1	18	55	83	62	4.8	SB2	56.0	SC2	31.0
	10	242.7	259		S1	18	60	93	67	7.1	SB3	61.0	SC3	33.5
	12	289.8	308		S1	18	60	93	67	9.0	SB3	61.0	SC3	33.5
<b>RF03100R</b> (100)	6	200.0	206	11.9 <sup>0</sup> <sub>-0.8</sub>	S2	18	55	83	62	4.9	SB2	56.0	SC2	31.0
	8	261.3	272		S2	18	60	93	67	7.8	SB3	61.0	SC3	33.5
	10	323.6	336		S1	18	65	98	72	11.1	SB4	66.0	SC4	36.0
	12	386.4	401		S1	18	65	98	72	14.4	SB4	66.0	SC4	36.0

F Roller

<b>RF03075F</b> (75)	6	150.0	158	8.9 <sup>0</sup> <sub>-0.7</sub>	S1	18	50	73	54	2.6	SB1	49.5	SC1	27.0
	8	196.0	209		S1	18	55	83	59	4.1	SB2	54.5	SC2	29.5
	10	242.7	259		S1	18	60	93	64	6.0	SB3	59.5	SC3	32.0
	12	289.8	308		S1	18	60	93	64	7.4	SB3	59.5	SC3	32.0
<b>RF03100F</b> (100)	6	200.0	206	8.9 <sup>0</sup> <sub>-0.7</sub>	S2	18	55	83	59	4.2	SB2	54.5	SC2	29.5
	8	261.3	272		S2	18	60	93	64	6.5	SB3	59.5	SC3	32.0
	10	323.6	336		S1	18	65	98	69	9.2	SB4	64.5	SC4	34.5
	12	386.4	401		S1	18	65	98	69	11.6	SB4	64.5	SC4	34.5

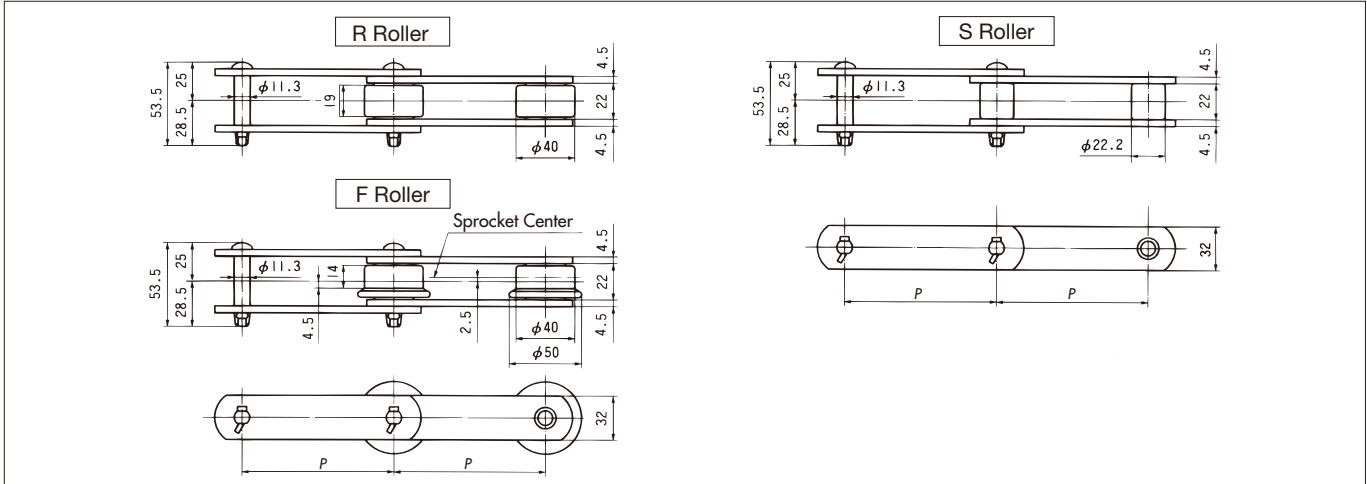
S Roller

<b>RF03075S</b> (75)	6	150.0	158	11.9 <sup>0</sup> <sub>-0.8</sub>	S1	18	50	73	57	3.0	SB1	51.0	SC1	28.5
	8	196.0	206		S1	18	55	83	62	4.8	SB2	56.0	SC2	31.0
	10	242.7	252		S1	18	60	93	67	7.1	SB3	61.0	SC3	33.5
	12	289.8	299		S1	18	60	93	67	9.0	SB3	61.0	SC3	33.5
<b>RF03100S</b> (100)	6	200.0	210	11.9 <sup>0</sup> <sub>-0.8</sub>	S2	18	55	83	62	4.9	SB2	56.0	SC2	31.0
	8	261.3	269		S1	18	60	93	67	7.8	SB3	61.0	SC3	33.5
	10	323.6	333		S1	18	65	98	72	11.1	SB4	66.0	SC4	36.0
	12	386.4	396		S1	18	65	98	72	14.4	SB4	66.0	SC4	36.0

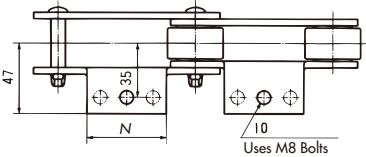
# RF05

## Meter Pitch (Dimensions)

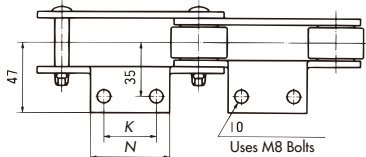
RF05075 • RF05100  
RF05125 • RF05150



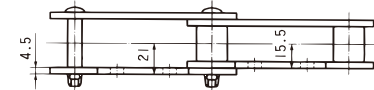
A1(A3) Attachment



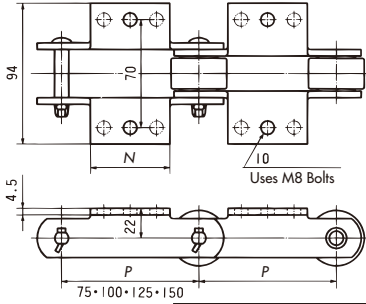
A2 Attachment



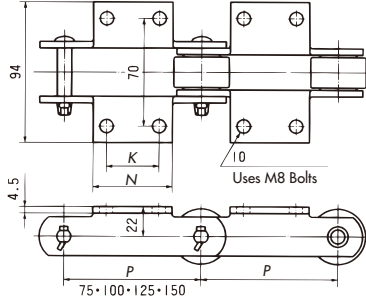
SA2 Attachment



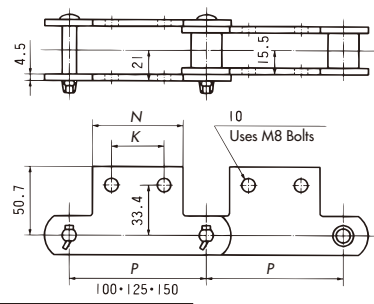
K1(K3) Attachment



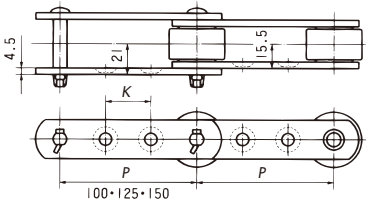
K2 Attachment



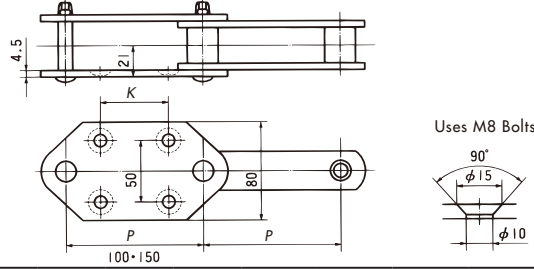
SK2 Attachment



GA2 Attachment



GA4 Attachment



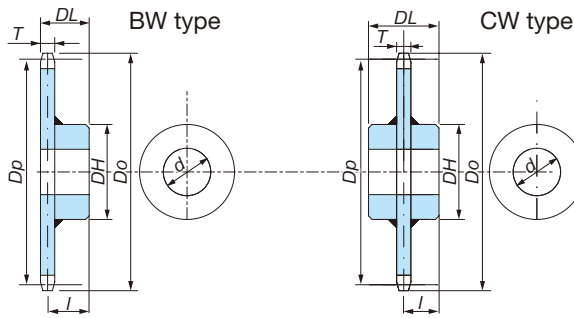
TSUBAKI Chain Number	DT Series		Pitch P	Attachment				Attachment & Roller Combinations					Approximate Mass kg/m			A Attachment Mass kg/each	GA4 Attachment Mass kg/m
	Average Tensile Strength kN	{kgf}		A • K • SA • SK		GA2	GA4	A1 (A3) K1(K3)	A2 K2	SA2 SK2	GA2	GA4	R Roller	F Roller	S Roller		
				N	K	K	K										
<b>RF05075</b>	68.6	{7000}	75	55	30	-	-	S	S	-	-	-	-	-	4.3	0.06	-
<b>RF05100</b>			100	65	40	40	50	R/F/S	R/F/S	R/S	R/S	S	5.2	5.4	3.8	0.07	4.6
<b>RF05125</b>			125	75	50	50	-	R/F/S	R/F/S	R/S	R/F/S	-	4.5	4.6	3.4	0.08	-
<b>RF05150</b>			150	85	60	60	70	R/F/S	R/F/S	R/S	R/F/S	S	4.2	4.4	3.3	0.10	4.1

- Note 1. The mass of A attachments in the chart are the additional mass (kg) per attachment. For K attachments, multiply this number by two.  
 2. The mass of GA4 attachments is for one attachment ever two links.  
 3. Contact a Tsubaki representative if using a guide on A or K attachment sides.  
 4. Attachments written in   are standard attachments.

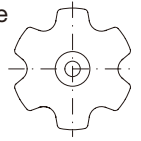
# Sprockets for RF05 Chain (BW/CW)

## RF05100 R 6T - BW N

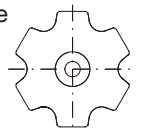
Chain size	No. of teeth	Hub type
Roller type	BW-CW	
Tooth hardening		
Hardened : Q		
Normal : N		



S1 Tooth Profile  
(Teeth are rounded)



S2 Tooth Profile  
(Teeth are flat)



### R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Standard Series					BW Type		CW Type	
		Pitch Circle Dia. Dp	Outer Dia. Do	Tooth Width T	Tooth Profile	Bore Dia. d		Hub Dia. DH	Total Length DL	Approx. Weight kg	Hub No.	Center Distance l	Hub No.	Center Distance l
						Pilot Bore	Max.							
RF05100R (100)	6	200.0	205	18 <sup>0</sup> <sub>-0.8</sub>	S1	28	75	107	86	8.8	SB5	77.0	SC5	43.0
	8	261.3	273		S1	28	75	107	86	12.0	SB5	77.0	SC5	43.0
	10	323.6	340		S1	33	80	117	94	17.4	SB6	85.0	SC6	47.0
	12	386.4	405		S1	33	85	127	104	24.4	SB7	95.0	SC7	52.0
RF05125R (125)	6	250.0	256	18 <sup>0</sup> <sub>-0.8</sub>	S2	28	75	107	86	11.3	SB5	77.0	SC5	43.0
	8	326.6	338		S2	33	80	117	94	17.6	SB6	85.0	SC6	47.0
	10	404.5	420		S2	33	85	127	104	26.0	SB7	95.0	SC7	52.0
	12	483.0	499		S1	33	95	137	116	36.4	SB8	107.0	SC8	58.0
RF05150R (150)	6	300.0	304	18 <sup>0</sup> <sub>-0.8</sub>	S2	33	80	117	94	15.8	SB6	85.0	SC6	47.0
	8	392.0	402		S2	33	85	127	104	24.9	SB7	95.0	SC7	52.0
	10	485.4	500		S2	33	95	137	116	36.7	SB8	107.0	SC8	58.0
	12	579.6	596		S2	33	95	137	116	47.8	SB8	107.0	SC8	58.0

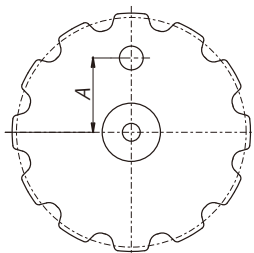
### F Roller

RF05100F (100)	6	200.0	205	11.9 <sup>0</sup> <sub>-0.8</sub>	S1	28	75	107	80	7.3	SB5	74.0	SC5	40.0
	8	261.3	273		S1	28	75	107	80	9.4	SB5	74.0	SC5	40.0
	10	323.6	340		S1	33	80	117	88	13.5	SB6	82.0	SC6	44.0
	12	386.4	405		S1	33	85	127	98	18.8	SB7	92.0	SC7	49.0
RF05125F (125)	6	250.0	256	11.9 <sup>0</sup> <sub>-0.8</sub>	S2	28	75	107	80	9.0	SB5	74.0	SC5	40.0
	8	326.6	338		S2	33	80	117	88	13.6	SB6	82.0	SC6	44.0
	10	404.5	420		S2	33	85	127	98	19.9	SB7	92.0	SC7	49.0
	12	483.0	499		S1	33	95	137	110	27.7	SB8	104.0	SC8	55.0
RF05150F (150)	6	300.0	304	11.9 <sup>0</sup> <sub>-0.8</sub>	S2	33	80	117	88	12.4	SB6	82.0	SC6	44.0
	8	392.0	402		S2	33	85	127	98	19.2	SB7	92.0	SC7	49.0
	10	485.4	500		S2	33	95	137	110	27.9	SB8	104.0	SC8	55.0
	12	579.6	596		S2	33	95	137	110	35.2	SB8	104.0	SC8	55.0

### S Roller

RF05075S (75)	8	196.0	209	18 <sup>0</sup> <sub>-0.8</sub>	S1	28	75	107	86	8.6	SB5	77.0	SC5	43.0
	10	242.7	256		S1	28	75	107	86	10.9	SB5	77.0	SC5	43.0
	12	289.8	303		S1	33	80	117	94	15.1	SB6	85.0	SC6	47.0
RF05100S (100)	6	200.0	212	18 <sup>0</sup> <sub>-0.8</sub>	S2	28	75	107	86	8.8	SB5	77.0	SC5	43.0
	8	261.3	273		S1	28	75	107	86	12.0	SB5	77.0	SC5	43.0
	10	323.6	337		S1	33	80	117	94	17.4	SB6	85.0	SC6	47.0
	12	386.4	400		S1	33	85	127	104	24.4	SB7	95.0	SC7	52.0
RF05125S (125)	6	250.0	262	18 <sup>0</sup> <sub>-0.8</sub>	S2	28	75	107	86	11.3	SB5	77.0	SC5	43.0
	8	326.6	340		S2	33	80	117	94	17.6	SB6	85.0	SC6	47.0
	10	404.5	417		S1	33	85	127	104	26.0	SB7	95.0	SC7	52.0
	12	483.0	496		S1	33	95	137	116	36.4	SB8	107.0	SC8	58.0
RF05150S (150)	6	300.0	310	18 <sup>0</sup> <sub>-0.8</sub>	S2	33	80	117	94	15.8	SB6	85.0	SC6	47.0
	8	392.0	405		S2	33	85	127	104	24.9	SB7	95.0	SC7	52.0
	10	485.4	499		S2	33	95	137	116	36.7	SB8	107.0	SC8	58.0
	12	579.6	592		S1	33	95	137	116	47.8	SB8	107.0	SC8	58.0

Table of Hole Dimensions for Hanging Applications



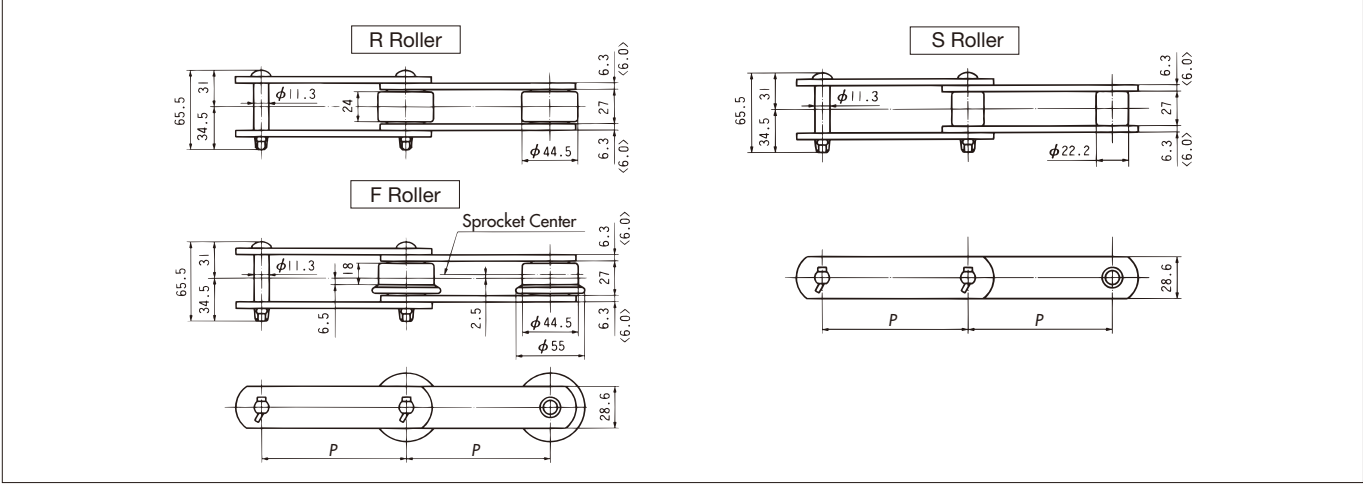
TSUBAKI Chain Number	No. of Teeth	Hanging Hole Dim.	
		A	No. of Hanging Holes
RF05125	12	155	1
	10	160	1
RF05150	12	190	1

Caution: Hanging holes are not available on sprockets with numbers of teeth or for chain numbers not listed.

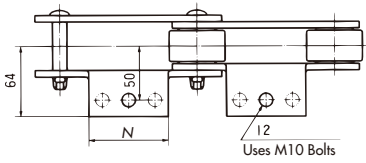


# RF08

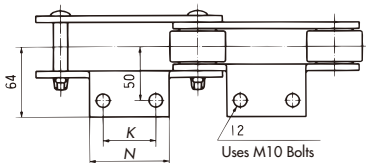
## Meter Pitch (Dimensions) RF08125 • RF08150



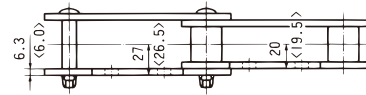
A1(A3) Attachment



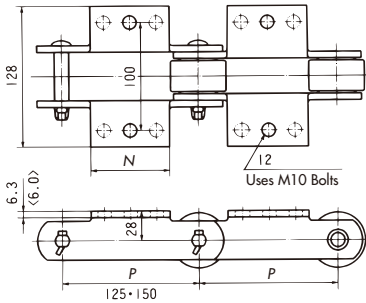
A2 Attachment



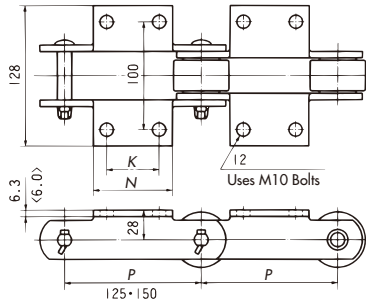
SA2 Attachment



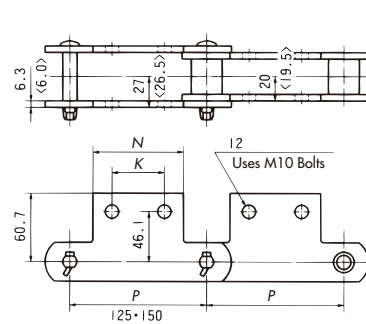
K1(K3) Attachment



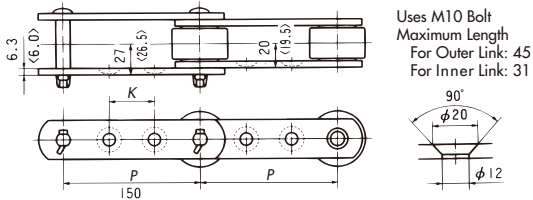
K2 Attachment



SK2 Attachment



GA2 Attachment



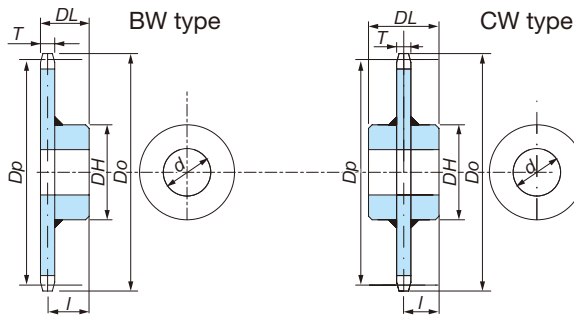
TSUBAKI Chain Number	DT Series Average Tensile Strength		Pitch P	Attachment			Attachment & Roller Combinations				Approximate Mass kg/m			A Attachment Mass kg/each
	kN	{kgf}		A · K · SA · SK		GA2	A1(A3) K1(K3)	A2 K2	SA2 SK2	GA2	R Roller	F Roller	S Roller	
				N	K	K								
<b>RF08125</b>	78.5	{8000}	125	80	50	—	R/F/S	R/F/S	R/S	—	5.9	6.2	4.2	0.19
<b>RF08150</b>			150	90	60	60	R/F/S	R/F/S	R/S	R/F/S	5.6	5.8	4.0	0.23

- Note 1. The mass of A attachments in the chart are the additional mass (kg) per attachment. For K attachments, multiply this number by two.  
 2. Numbers in < > are when SUS300 stainless steel is used.  
 3. Contact a Tsubaki representative if using a guide on A or K attachment sides.  
 4. Attachments written in   are standard attachments.

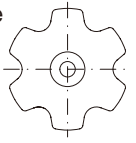
# Sprockets for RF08 Chain (BW/CW)

## RF08125 R 6T - BW N

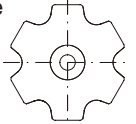
Chain size	No. of teeth	Hub type
Roller type	BW-CW	
Tooth hardening		
Hardened : Q		
Normal : N		



S1 Tooth Profile  
(Teeth are rounded)



S2 Tooth Profile  
(Teeth are flat)



### R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Standard Series						BW Type		CW Type	
		Pitch Circle Dia. Dp	Outer Dia. Do	Tooth Width T	Tooth Profile	Bore Dia. d		Hub Dia. DH	Total Length DL	Approx. Weight kg	Hub No.	Center Distance l	Hub No.	Center Distance l	
						Pilot Bore	Max.								
<b>RF08125R</b> (125)	6	250.0	263	22 <sup>0</sup> <sub>-1.0</sub>	S2	28	75	107	90	12.8	SB5	79.0	SC5	45.0	
	8	326.6	346		S2	33	80	117	98	20.2	SB6	87.0	SC6	49.0	
	10	404.5	426		S1	33	85	127	108	30.0	SB7	97.0	SC7	54.0	
	12	483.0	508		S1	33	95	137	120	42.2	SB8	109.0	SC8	60.0	
<b>RF08150R</b> (150)	6	300.0	311	22 <sup>0</sup> <sub>-1.0</sub>	S2	33	80	117	98	18.0	SB6	87.0	SC6	49.0	
	8	392.0	410		S2	33	85	127	108	28.7	SB7	97.0	SC7	54.0	
	10	485.4	507		S2	33	95	137	120	42.5	SB8	109.0	SC8	60.0	
	12	579.6	604		S2	33	95	137	120	56.1	SB8	109.0	SC8	60.0	

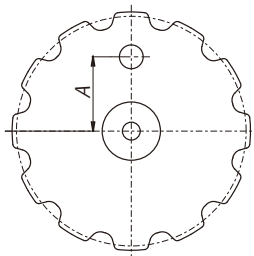
### F Roller

<b>RF08125F</b> (125)	6	250.0	263	15 <sup>0</sup> <sub>-0.8</sub>	S2	28	75	107	83	10.2	SB5	75.5	SC5	41.5
	8	326.6	346		S2	33	80	117	91	15.7	SB6	83.5	SC6	45.5
	10	404.5	426		S1	33	85	127	101	23.0	SB7	93.5	SC7	50.5
	12	483.0	508		S1	33	95	137	113	32.1	SB8	105.5	SC8	56.5
<b>RF08150F</b> (150)	6	300.0	311	15 <sup>0</sup> <sub>-0.8</sub>	S2	33	80	117	91	14.1	SB6	83.5	SC6	45.5
	8	392.0	410		S2	33	85	127	101	22.1	SB7	93.5	SC7	50.5
	10	485.4	507		S2	33	95	137	113	32.4	SB8	105.5	SC8	56.5
	12	579.6	604		S2	33	95	137	113	41.6	SB8	105.5	SC8	56.5

### S Roller

<b>RF08125S</b> (125)	6	250.0	263	22 <sup>0</sup> <sub>-1.0</sub>	S2	28	75	107	90	12.8	SB5	79.0	SC5	45.0
	8	326.6	340		S1	33	80	117	98	20.2	SB6	87.0	SC6	49.0
	10	404.5	418		S1	33	85	127	108	30.0	SB7	97.0	SC7	54.0
	12	483.0	496		S1	33	95	137	120	42.2	SB8	109.0	SC8	60.0
<b>RF08150S</b> (150)	6	300.0	313	22 <sup>0</sup> <sub>-1.0</sub>	S2	33	80	117	98	18.0	SB6	87.0	SC6	49.0
	8	392.0	403		S1	33	85	127	108	28.7	SB7	97.0	SC7	54.0
	10	485.4	499		S1	33	95	137	120	42.5	SB8	109.0	SC8	60.0
	12	579.6	593		S1	33	95	137	120	56.1	SB8	109.0	SC8	60.0

Table of Hole Dimensions for Hanging Applications



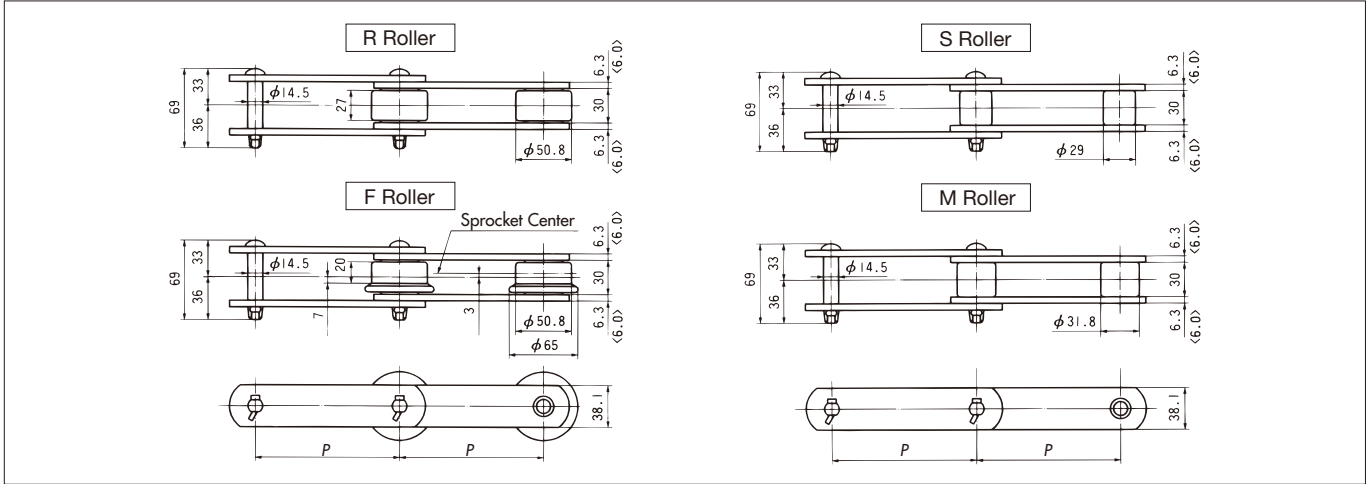
TSUBAKI Chain Number	No. of Teeth	Hanging Hole Dim.	
		A	No. of Hanging Holes
<b>RF08125</b>	12	155	1
	10	155	1
<b>RF08150</b>	12	190	1

Caution: Hanging holes are not available on sprockets with numbers of teeth or for chain numbers not listed.

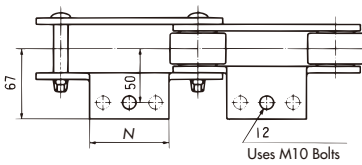
# RF10

## Meter Pitch (Dimensions)

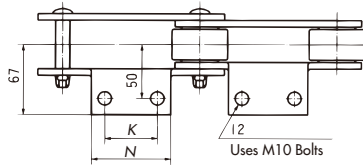
RF10100 • RF10125  
RF10150



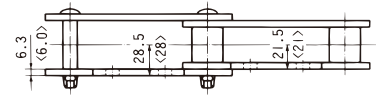
A1(A3) Attachment



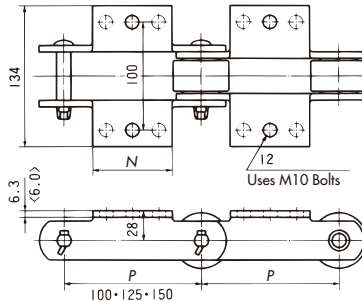
A2 Attachment



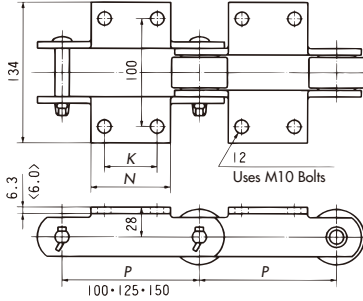
SA2 Attachment



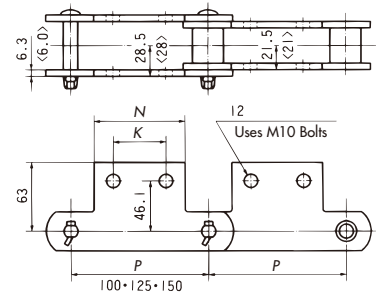
K1(K3) Attachment



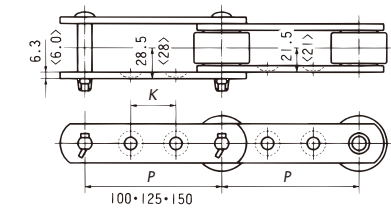
K2 Attachment



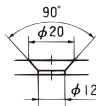
SK2 Attachment



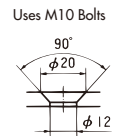
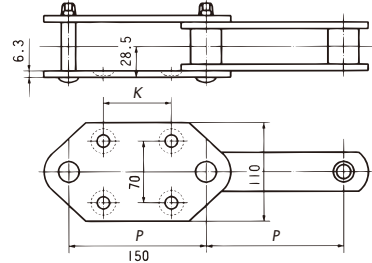
GA2 Attachment



Uses M10 Bolt  
Maximum Length  
For Outer Link: 49  
For Inner Link: 35



GA4 Attachment



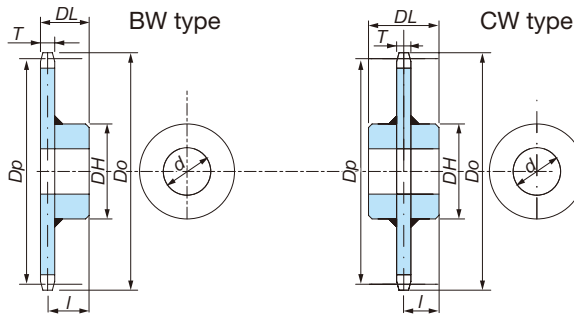
TSUBAKI Chain Number	DT Series Average Tensile Strength kN {kgf}	Pitch P	Attachment				Attachment & Roller Combinations					Approximate Mass kg/m				A Attachment Mass kg/each	GA4 Attachment Mass kg/m
			A·K·SA·SK		GA2	GA4	A1(A3) K1(K3)	A2 K2	SA2 SK2	GA2	GA4	R Roller	F Roller	S Roller	M Roller		
			N	K													
RF10100	113 {11500}	100	70	40	30	-	R/S/M	R/S/M	R/S/M	S/M	-	10	-	7	7.3	0.16	-
RF10125		125	80	50	40	-	R/F/S/M	R/F/S/M	R/S/M	R/S/M	-	8.7	9.0	6.3	6.5	0.18	-
RF10150		150	90	60	60	75	R/F/S/M	R/F/S/M	R/S/M	R/F/S/M	S/M	8	8.3	5.9	6.1	0.20	7.7(7.9)

- Note 1. The mass of A attachments in the chart are the additional mass (kg) per attachment. For K attachments, multiply this number by two.  
 2. The mass of GA4 attachments is for one attachment ever two links (kg/m). ( ) indicates an M roller.  
 3. Numbers in < > are when SUS300 stainless steel is used.  
 4. Contact a Tsubaki representative if using a guide on A or K attachment sides.  
 5. Attachments written in   are standard attachments.

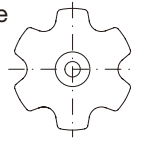
# Sprockets for RF10 Chain (BW/CW)

## RF10100 R 6T - BW N

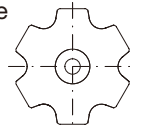
Chain size	No. of teeth	Hub type
Roller type	BW-CW	
Tooth hardening		
Hardened : Q		
Normal : N		



S1 Tooth Profile  
(Teeth are rounded)



S2 Tooth Profile  
(Teeth are flat)



### R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Standard Series					BW Type		CW Type	
		Pitch Circle Dia. Dp	Outer Dia. Do	Tooth Width T	Tooth Profile	Bore Dia. d		Hub Dia. DH	Total Length DL	Approx. Weight kg	Hub No.	Center Distance l	Hub No.	Center Distance l
						Pilot Bore	Max.							
<b>RF10100R</b> (100)	6	200.0	214	22 <sup>0</sup> <sub>-1.0</sub>	S1	28	75	107	90	9.8	SB5	79.0	SC5	45.0
	8	261.3	282		S1	33	85	127	108	17.1	SB7	97.0	SC7	54.0
	10	323.6	349		S1	33	95	137	120	24.7	SB8	109.0	SC8	60.0
	12	386.4	414		S1	38	100	147	123	32.6	SB9	112.0	SC9	61.5
<b>RF10125R</b> (125)	6	250.0	262	22 <sup>0</sup> <sub>-1.0</sub>	S2	33	85	127	108	16.3	SB7	97.0	SC7	54.0
	8	326.6	343		S1	33	95	137	120	25.0	SB8	109.0	SC8	60.0
	10	404.5	426		S1	38	100	147	123	34.5	SB9	112.0	SC9	61.5
	12	483.0	508		S1	38	110	157	133	47.3	SB10	122.0	SC10	66.5
<b>RF10150R</b> (150)	6	300.0	309	22 <sup>0</sup> <sub>-1.0</sub>	S2	33	95	137	120	22.7	SB8	109.0	SC8	60.0
	8	392.0	408		S2	38	100	147	123	33.2	SB9	112.0	SC9	61.5
	10	485.4	506		S2	38	110	157	133	47.6	SB10	122.0	SC10	66.5
	12	579.6	601		S1	38	115	167	144	65.2	SB11	133.0	SC11	72.0
					S1	38	115	167	144	65.2	SB11	133.0	SC11	72.0

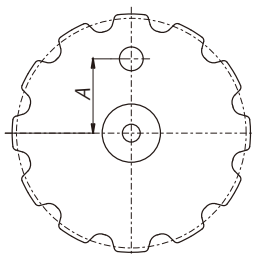
### F Roller

<b>RF10125F</b> (125)	6	250.0	262	15 <sup>0</sup> <sub>-0.8</sub>	S2	33	85	127	101	13.6	SB7	93.5	SC7	50.5
	8	326.6	343		S1	33	95	137	113	20.4	SB8	105.5	SC8	56.5
	10	404.5	426		S1	38	100	147	116	27.5	SB9	108.5	SC9	58.0
	12	483.0	508		S1	38	110	157	126	37.3	SB10	118.5	SC10	63.0
<b>RF10150F</b> (150)	6	300.0	309	15 <sup>0</sup> <sub>-0.8</sub>	S2	33	95	137	113	18.9	SB8	105.5	SC8	56.5
	8	392.0	408		S2	38	100	147	116	26.6	SB9	108.5	SC9	58.0
	10	485.4	506		S2	38	110	157	126	37.5	SB10	118.5	SC10	63.0
	12	579.6	601		S1	38	115	167	137	50.8	SB11	129.5	SC11	68.5

### S Roller

<b>RF10100S</b> (100)	6	200.0	217	22 <sup>0</sup> <sub>-1.0</sub>	S2	28	75	107	90	9.8	SB5	79.0	SC5	45.0
	8	261.3	279		S1	33	85	127	108	17.1	SB7	97.0	SC7	54.0
	10	323.6	341		S1	33	95	137	120	24.7	SB8	109.0	SC8	60.0
	12	386.4	404		S1	38	100	147	123	32.6	SB9	112.0	SC9	61.5
<b>RF10125S</b> (125)	6	250.0	267	22 <sup>0</sup> <sub>-1.0</sub>	S2	33	85	127	108	16.3	SB7	97.0	SC7	54.0
	8	326.6	343		S1	33	95	137	120	25.0	SB8	109.0	SC8	60.0
	10	404.5	422		S1	38	100	147	123	34.5	SB9	112.0	SC9	61.5
	12	483.0	500		S1	38	110	157	133	47.3	SB10	122.0	SC10	66.5
<b>RF10150S</b> (150)	6	300.0	316	22 <sup>0</sup> <sub>-1.0</sub>	S2	33	95	137	120	22.7	SB8	109.0	SC8	60.0
	8	392.0	409		S2	38	100	147	123	33.2	SB9	112.0	SC9	61.5
	10	485.4	503		S1	38	110	157	133	47.6	SB10	122.0	SC10	66.5
	12	579.6	597		S1	38	115	167	144	65.2	SB11	133.0	SC11	72.0

## Table of Hole Dimensions for Hanging Applications



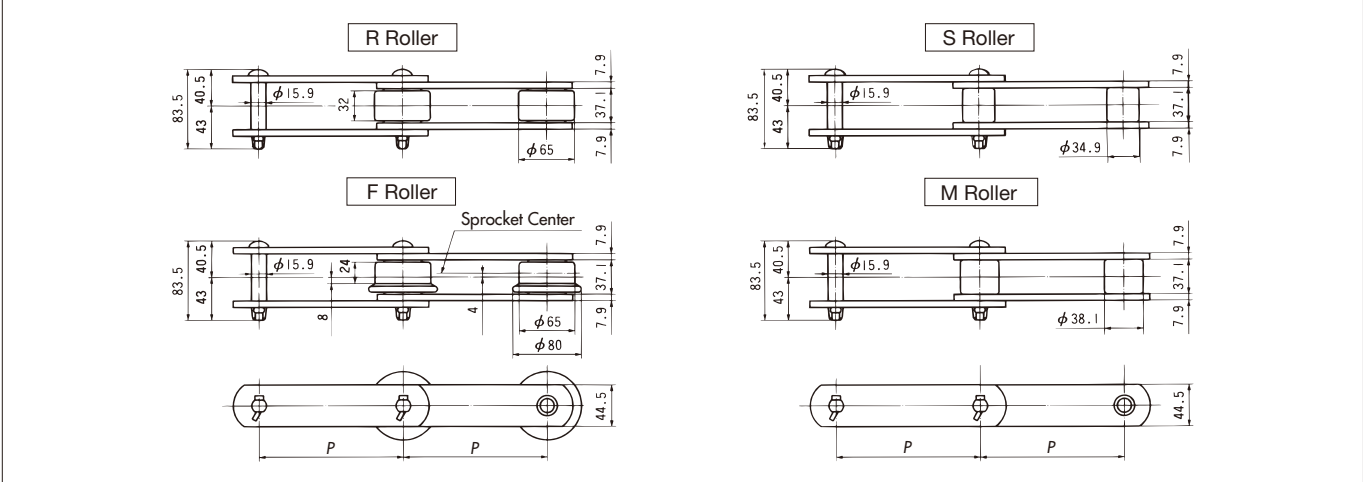
TSUBAKI Chain Number	No. of Teeth	Hanging Hole Dim. A	No. of Hanging Holes
<b>RF10125</b>	12	155	1
<b>RF10150</b>	10	155	1
	12	185	1

Caution: Hanging holes are not available on sprockets with numbers of teeth or for chain numbers not listed.

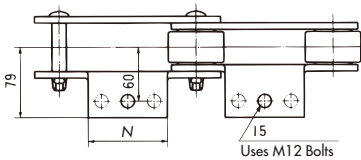
# RF12

## Meter Pitch (Dimensions)

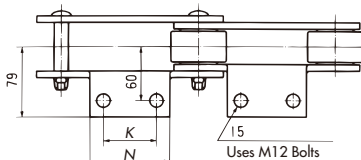
### RF12200 • RF12250



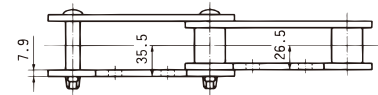
**A1(A3) Attachment**



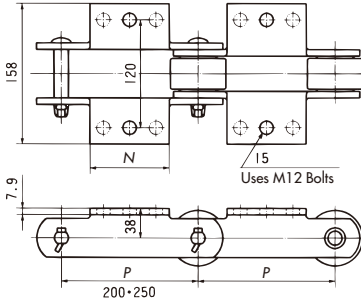
**A2 Attachment**



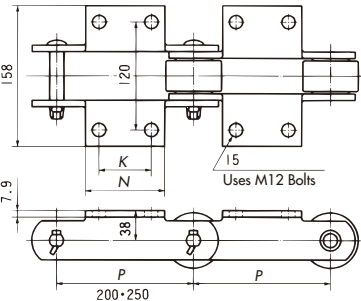
**SA2 Attachment**



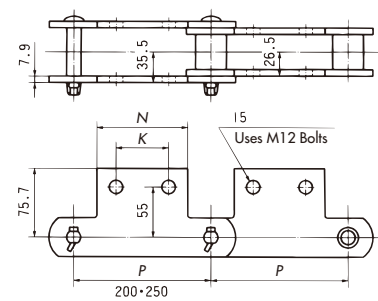
**K1(K3) Attachment**



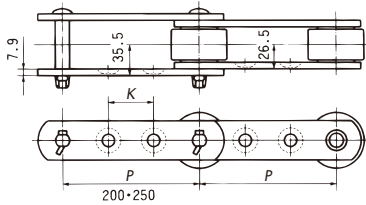
**K2 Attachment**



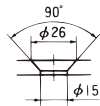
**SK2 Attachment**



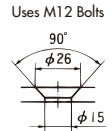
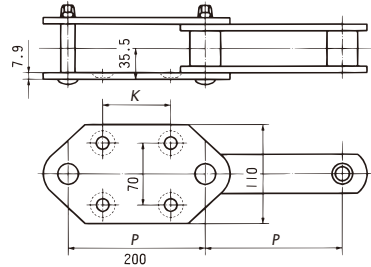
**GA2 Attachment**



Uses M12 Bolt  
Maximum Length  
For Outer Link: 63  
For Inner Link: 45



**GA4 Attachment**



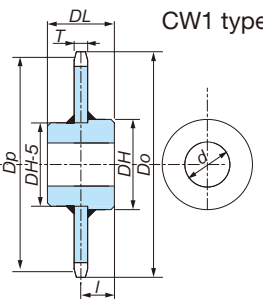
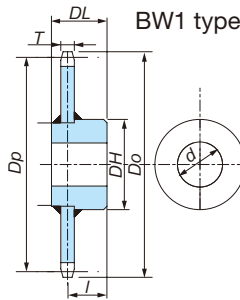
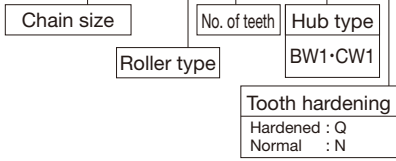
TSUBAKI Chain Number	DT Series Average Tensile Strength kN {kgf}	Pitch P	Attachment				Attachment & Roller Combinations					Approximate Mass kg/m				A Attachment Mass kg/each	GA4 Attachment Mass kg/m	
			A·K·SA·SK		GA2	GA4	A1(A3) K1(K3)	A2 K2	SA2 SK2	GA2	GA4	R Roller	F Roller	S Roller	M Roller			
			N	K	K	K												
<b>RF12200</b>	186	{19000}	200	120	80	80	100	R/F/S/M	R/F/S/M	R/S/M	R/F/S/M	S/M	11.6	12.1	8.3	8.6	0.44	10.3(10.7)
<b>RF12250</b>			250	170	125	125	-	R/F/S/M	R/F/S/M	R/S/M	R/F/S/M	-	10.4	10.8	7.8	8.0	0.61	-

- Note 1. The mass of A attachments in the chart are the additional mass (kg) per attachment. For K attachments, multiply this number by two.  
 2. The mass of GA4 attachments is for one attachment ever two links (kg/m). ( ) indicates an M roller.  
 3. Contact a Tsubaki representative if using a guide on A or K attachment sides.  
 4. Attachments written in   are standard attachments.

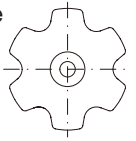


# Sprockets for RF12 Chain (BW1/CW1)

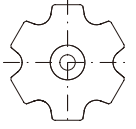
## RF12200 R 6T - BW1 N



S1 Tooth Profile  
(Teeth are rounded)



S2 Tooth Profile  
(Teeth are flat)



General Use/Heavy Duty  
Corrosion Resistant

R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Standard Series					BW1 Type		CW1 Type	
		Pitch Circle Dia. Dp	Outer Dia. Do	Tooth Width T	Tooth Profile	Bore Dia. d		Hub Dia. DH	Total Length DL	Approx. Weight kg	Hub No.	Center Distance l	Hub No.	Center Distance l
						Pilot Bore	Max.							
<b>RF12200R</b> (200)	6	400.0	418	28 <sup>0</sup> <sub>-1.0</sub>	S2	55	110	157	135	41.3	TB2	110.0	TC2	67.5
	8	522.6	551		S2	60	120	177	150	67.4	TB3	125.0	TC3	75.0
	10	647.2	682		S2	65	130	187	160	96.6	TB4	135.0	TC4	80.0
	12	772.7	810		S2	75	145	207	180	136.9	TB5	155.0	TC5	90.0
<b>RF12250R</b> (250)	6	500.0	515	28 <sup>0</sup> <sub>-1.0</sub>	S2	60	120	177	150	63.4	TB3	125.0	TC3	75.0
	8	653.3	680		S2	65	130	187	160	97.9	TB4	135.0	TC4	80.0
	10	809.0	841		S2	75	145	207	180	146.8	TB5	155.0	TC5	90.0
	12	965.9	1002		S2	80	160	227	200	207.7	TB6	175.0	TC6	100.0

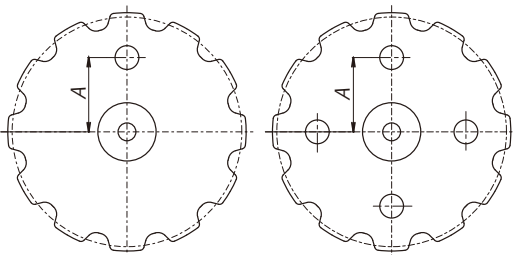
F Roller

<b>RF12200F</b> (200)	6	400.0	418	18 <sup>0</sup> <sub>-0.8</sub>	S2	55	110	157	135	33.0	TB2	115.0	TC2	67.5
	8	522.6	551		S2	60	120	177	150	52.5	TB3	130.0	TC3	75.0
	10	647.2	682		S2	65	130	187	160	72.9	TB4	140.0	TC4	80.0
	12	772.7	810		S2	75	145	207	180	102.8	TB5	160.0	TC5	90.0
<b>RF12250F</b> (250)	6	500.0	515	18 <sup>0</sup> <sub>-0.8</sub>	S2	60	120	177	150	49.9	TB3	130.0	TC3	75.0
	8	653.3	680		S2	65	130	187	160	73.8	TB4	140.0	TC4	80.0
	10	809.0	841		S2	75	145	207	180	109.1	TB5	160.0	TC5	90.0
	12	965.9	1002		S2	80	160	227	200	153.4	TB6	180.0	TC6	100.0

S Roller

<b>RF12200S</b> (200)	6	400.0	421	28 <sup>0</sup> <sub>-1.0</sub>	S2	55	110	157	135	41.3	TB2	110.0	TC2	67.5
	8	522.6	544		S1	60	120	177	150	67.4	TB3	125.0	TC3	75.0
	10	647.2	668		S1	65	130	187	160	96.6	TB4	135.0	TC4	80.0
	12	772.7	794		S1	75	145	207	180	136.9	TB5	155.0	TC5	90.0
<b>RF12250S</b> (250)	6	500.0	521	28 <sup>0</sup> <sub>-1.0</sub>	S2	60	120	177	150	63.4	TB3	125.0	TC3	75.0
	8	653.3	674		S2	65	130	187	160	97.9	TB4	135.0	TC4	80.0
	10	809.0	830		S1	75	145	207	180	146.8	TB5	155.0	TC5	90.0
	12	965.9	987		S1	80	160	227	200	207.7	TB6	175.0	TC6	100.0

Table of Hole Dimensions for Hanging Applications



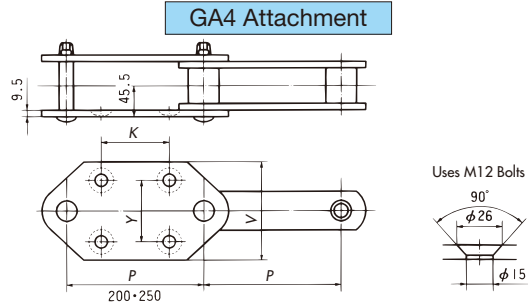
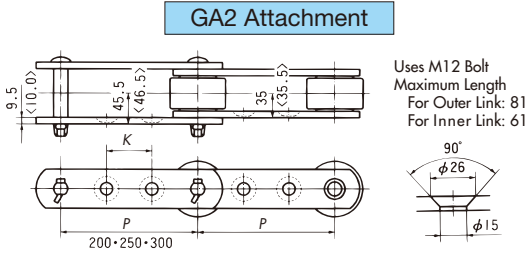
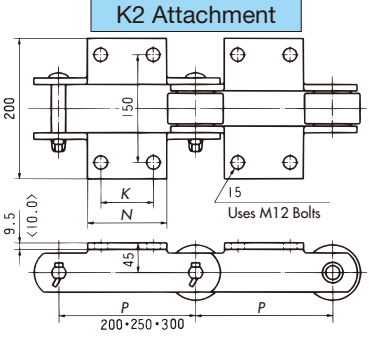
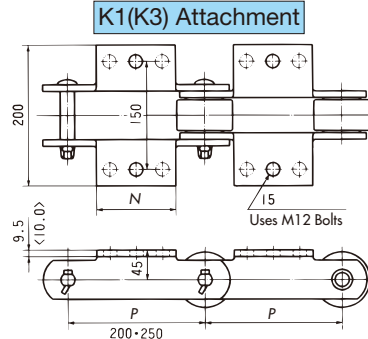
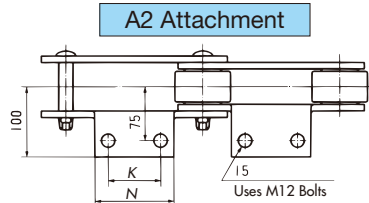
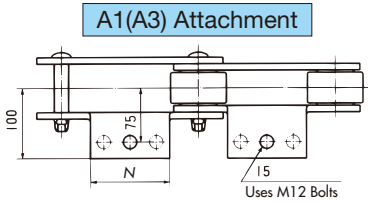
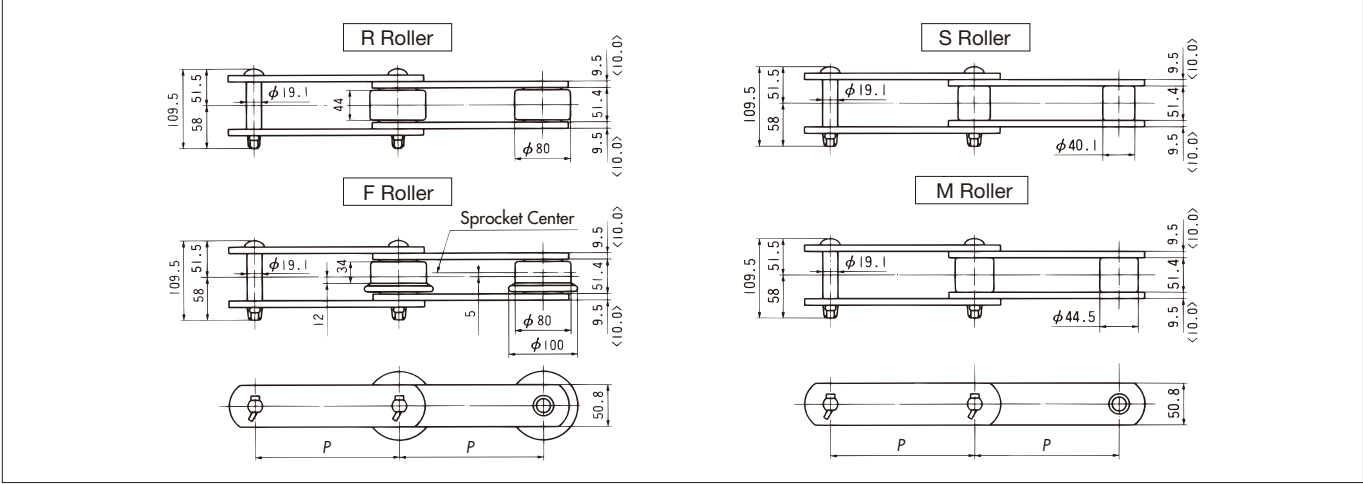
TSUBAKI Chain Number	No. of Teeth	Hanging Hole Dim.	No. of Hanging Holes
		A	
<b>RF12200</b>	8	160	1
	10	205	1
	12	250	4
<b>RF12250</b>	6	155	1
	8	210	1
	10	260	4
	12	315	4

Caution: Hanging holes are not available on sprockets with numbers of teeth or for chain numbers not listed.

# RF17

## Meter Pitch (Dimensions)

RF17200 • RF17250  
RF17300



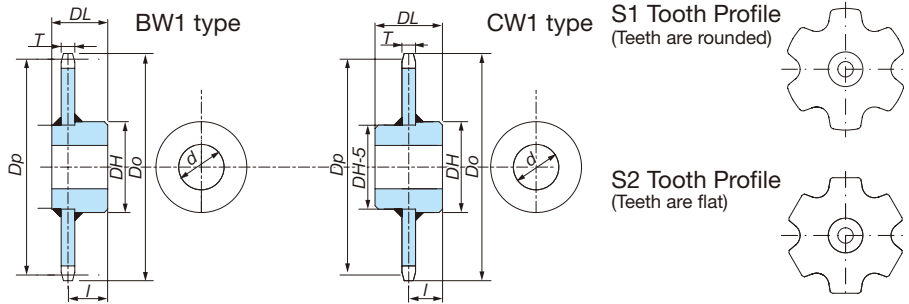
TSUBAKI Chain Number	DT Series		Attachment					Attachment & Roller Combinations					Approximate Mass kg/m				A Attachment Mass kg/each	GA4 Attachment Mass kg/m		
	Average Tensile Strength kN	{kgf}	Pitch P	A-K-SA-SK		GA2			Roller Combinations					R Roller	F Roller	S Roller			M Roller	
				N	K	K	K	V	Y	A1(A3) K1(K3)	A2 K2	YA2 (Welded)	GA2							GA4
<b>RF17200</b>			200	120	80	70	100	120	80	R/F/S/M	R/F/S/M	-	R/F/S/M	S/M	20	21	12	13	0.64	14(15)
<b>RF17250</b>	245	{25000}	250	170	125	110	140	150	100	R/F/S/M	R/F/S/M	-	R/F/S/M	S/M	17	18	11	12	0.88	15(16)
<b>RF17300</b>			300	220	180	150	-	-	-	-	R/F/S/M	-	R/F/S/M	-	16	16	11	11	1.26	-

- Note 1. The mass of A attachments in the chart are the additional mass (kg) per attachment. For K attachments, multiply this number by two.  
 2. The mass of GA4 attachments is for one attachment over two links (kg/m). ( ) indicates an M roller.  
 3. Numbers in < > are for when SUS300 stainless steel is used.  
 4. Contact a Tsubaki representative if using a guide on A or K attachment sides.  
 5. Attachments written in   are standard attachments.

# Sprockets for RF17 Chain (BW1/CW1)

## RF17200 R 6T - BW1 N

Chain size	No. of teeth	Hub type
Roller type	BW1·CW1	
Tooth hardening		
Hardened : Q		
Normal : N		



General Use/Heavy Duty  
Corrosion Resistant

### R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Standard Series					BW1 Type		CW1 Type	
		Pitch Circle Dia. Dp	Outer Dia. Do	Tooth Width T	Tooth Profile	Bore Dia. d		Hub Dia. DH	Total Length DL	Approx. Weight kg	Hub No.	Center Distance l	Hub No.	Center Distance l
						Pilot Bore	Max.							
<b>RF17200R</b> (200)	6	400.0	426	40 <sup>0</sup> <sub>-1.2</sub>	S2	60	120	177	150	57.3	TB3	118.0	TC3	75.0
	8	522.6	562		S2	75	145	207	180	98.1	TB5	148.0	TC5	90.0
	10	647.2	691		S1	75	145	207	180	134.0	TB5	148.0	TC5	90.0
	12	772.7	821		S1	80	160	227	200	190.1	TB6	168.0	TC6	100.0
<b>RF17250R</b> (250)	6	500.0	522	40 <sup>0</sup> <sub>-1.2</sub>	S2	65	130	187	160	83.3	TB4	128.0	TC4	80.0
	8	653.3	689		S2	75	145	207	180	135.9	TB5	148.0	TC5	90.0
	10	809.0	850		S2	80	160	227	200	204.2	TB6	168.0	TC6	100.0
	12	965.9	1012		S2	80	160	227	220	278.5	TB7	188.0	TC7	110.0
<b>RF17300R</b> (300)	6	600.0	619	40 <sup>0</sup> <sub>-1.2</sub>	S2	75	145	207	180	119.5	TB5	148.0	TC5	90.0
	8	783.9	816		S2	80	160	227	200	194.4	TB6	168.0	TC6	100.0
	10	970.8	1010		S2	80	160	227	220	280.8	TB7	188.0	TC7	110.0
	12	1159.1	1204		S2	85	175	247	240	395.7	TB9	208.0	TC9	120.0

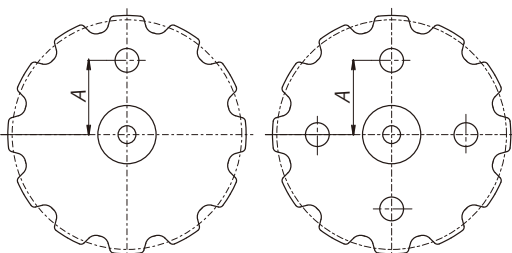
### F Roller

<b>RF17200F</b> (200)	6	400.0	426	28 <sup>0</sup> <sub>-1.0</sub>	S2	60	120	177	150	47.8	TB3	125.0	TC3	75.0
	8	522.6	562		S2	75	145	207	180	81.0	TB5	155.0	TC5	90.0
	10	647.2	691		S1	75	145	207	180	106.2	TB5	155.0	TC5	90.0
	12	772.7	821		S1	80	160	227	200	149.8	TB6	175.0	TC6	100.0
<b>RF17250F</b> (250)	6	500.0	522	28 <sup>0</sup> <sub>-1.0</sub>	S2	65	130	187	160	67.4	TB4	135.0	TC4	80.0
	8	653.3	689		S2	75	145	207	180	107.5	TB5	155.0	TC5	90.0
	10	809.0	850		S2	80	160	227	200	159.7	TB6	175.0	TC6	100.0
	12	965.9	1012		S2	80	160	227	220	213.3	TB7	195.0	TC7	110.0
<b>RF17300F</b> (300)	6	600.0	619	28 <sup>0</sup> <sub>-1.0</sub>	S2	75	145	207	180	96.0	TB5	155.0	TC5	90.0
	8	783.9	816		S2	80	160	227	200	152.8	TB6	175.0	TC6	100.0
	10	970.8	1010		S2	80	160	227	220	214.9	TB7	195.0	TC7	110.0
	12	1159.1	1204		S2	85	175	247	240	300.8	TB9	215.0	TC9	120.0

### S Roller

<b>RF17200S</b> (200)	6	400.0	424	40 <sup>0</sup> <sub>-1.2</sub>	S2	60	120	177	150	57.3	TB3	118.0	TC3	75.0
	8	522.6	547		S1	75	145	207	180	98.1	TB5	148.0	TC5	90.0
	10	647.2	671		S1	75	145	207	180	134.0	TB5	148.0	TC5	90.0
	12	772.7	797		S1	80	160	227	200	190.1	TB6	168.0	TC6	100.0
<b>RF17250S</b> (250)	6	500.0	524	40 <sup>0</sup> <sub>-1.2</sub>	S2	65	130	187	160	83.3	TB4	128.0	TC4	80.0
	8	653.3	677		S1	75	145	207	180	135.9	TB5	148.0	TC5	90.0
	10	809.0	833		S1	80	160	227	200	204.2	TB6	168.0	TC6	100.0
	12	965.9	990		S1	80	160	227	220	278.5	TB7	188.0	TC7	110.0
<b>RF17300S</b> (300)	6	600.0	624	40 <sup>0</sup> <sub>-1.2</sub>	S2	75	145	207	180	119.5	TB5	148.0	TC5	90.0
	8	783.9	808		S2	80	160	227	200	194.4	TB6	168.0	TC6	100.0
	10	970.8	995		S1	80	160	227	220	280.8	TB7	188.0	TC7	110.0
	12	1159.1	1183		S1	85	175	247	240	395.7	TB9	208.0	TC9	120.0

Table of Hole Dimensions for Hanging Applications



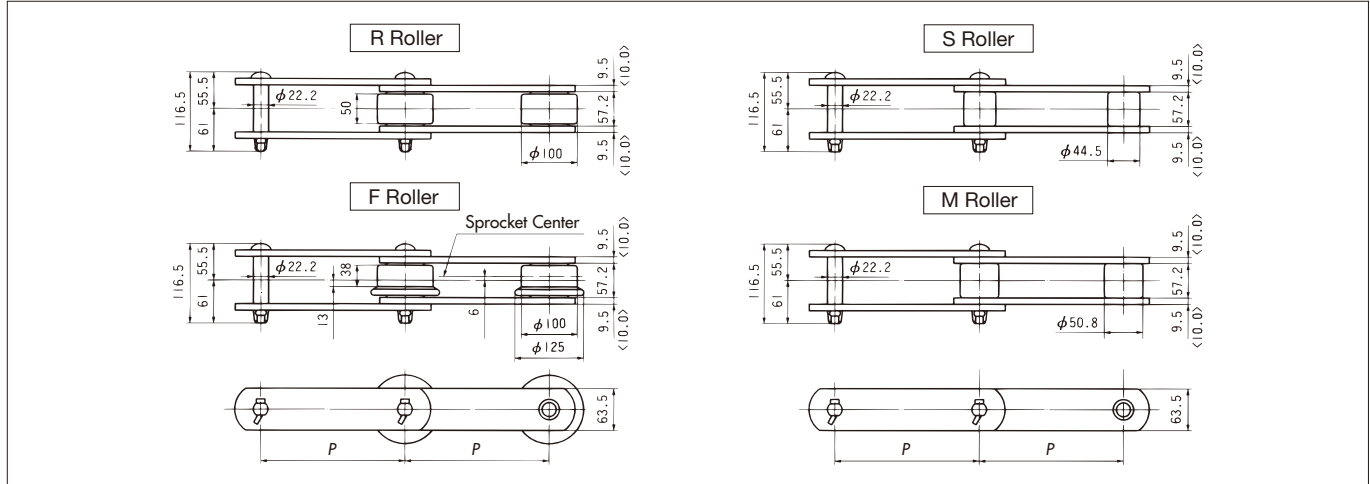
TSUBAKI Chain Number	No. of Teeth	Hanging Hole Dim.	
		A	No. of Hanging Holes
<b>RF17200</b>	10	200	1
	12	245	4

Caution: Hanging holes are not available on sprockets with numbers of teeth or for chain numbers not listed.

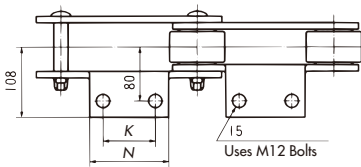
# RF26

## Meter Pitch (Dimensions)

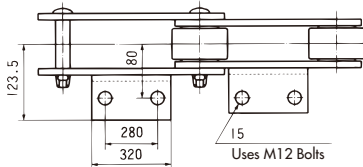
RF26200 • RF26250  
RF26300 • RF26450



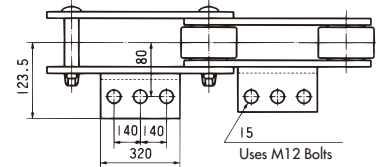
### A2 Attachment



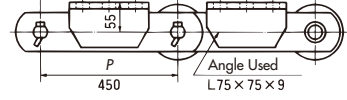
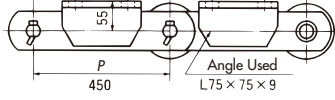
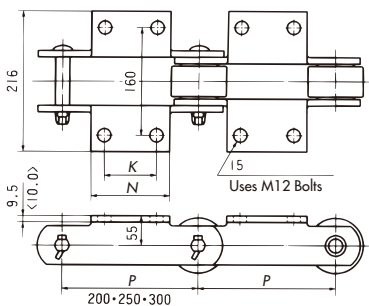
### YA2 Attachment (Welded)



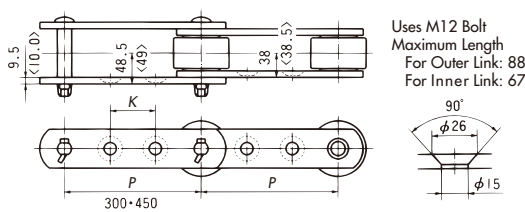
### YA3 Attachment (Welded)



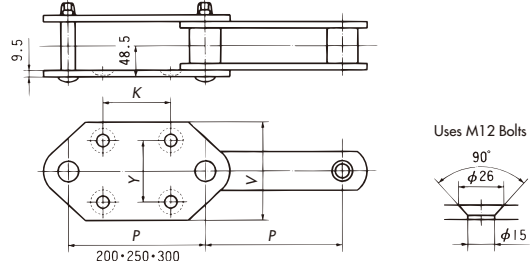
### K2 Attachment



### GA2 Attachment



### GA4 Attachment



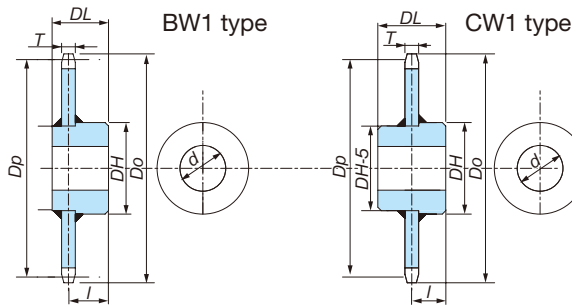
TSUBAKI Chain Number	DT Series Average Tensile Strength		Pitch P	Attachment					Attachment & Roller Combinations					Approximate Mass kg/m				A Attachment Mass kg/each	GA4 Attachment Mass kg/m		
	kN	{kgf}		A·K·SA·SK		GA2			GA4		A2 K2	YA2 (Welded)	YA3 (Welded)	GA2	GA4	R Roller	F Roller			S Roller	M Roller
				N	K	K	K	V	Y												
<b>RF26200</b>	314	{32000}	200	120	80	-	100	120	80	S/M	-	-	-	S/M	-	-	16	17	0.74	19(20)	
<b>RF26250</b>			250	170	125	-	140	150	100	R/F/S/M	-	-	-	S/M	26	27	15	16	1.01	18(19)	
<b>RF26300</b>			300	220	180	140	180	150	100	R/F/S/M	-	-	R/F/S/M	S/M	23	24	14	15	1.34	17(18)	
<b>RF26450</b>			450	See dwg	See dwg	220	-	-	-	-	R/F/S/M	R/F/S/M	R/F/S/M	-	-	19	19	13	13	3.19	-

- Note 1. The mass of A attachments in the chart are the additional mass (kg) per attachment. For K attachments, multiply this number by two.
- Note 2. The mass of GA4 attachments is for one attachment ever two links (kg/m). ( ) indicates an M roller.
- Note 3. Numbers in < > are for when SUS300 stainless steel is used.
- Note 4. Contact a Tsubaki representative if using a guide on A or K attachment sides.
- Note 5. Attachments written in   are standard attachments.

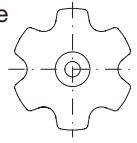
# Sprockets for RF26 Chain (BW1/CW1)

## RF26200 R 6T - BW1 N

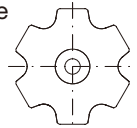
Chain size	No. of teeth	Hub type
Roller type	BW1-CW1	
Tooth hardening		
Hardened : Q		
Normal : N		



S1 Tooth Profile  
(Teeth are rounded)



S2 Tooth Profile  
(Teeth are flat)



General Use/Heavy Duty  
Corrosion Resistant

R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Standard Series					BW1 Type		CW1 Type	
		Pitch Circle Dia. Dp	Outer Dia. Do	Tooth Width T	Tooth Profile	Bore Dia. d		Hub Dia. DH	Total Length DL	Approx. Weight kg	Hub No.	Center Distance l	Hub No.	Center Distance l
						Pilot Bore	Max.							
RF26250R (250)	6	500.0	535	45 ±1.3	S2	75	145	207	180	98.7	TB5	144.0	TC5	90.0
	8	653.3	703		S2	80	160	227	200	159.7	TB6	164.0	TC6	100.0
	10	809.0	864		S1	85	175	247	240	244.1	TB9	204.0	TC9	120.0
	12	965.9	1026		S1	85	175	247	240	321.4	TB9	204.0	TC9	120.0
RF26300R (300)	6	600.0	631	45 ±1.3	S2	80	160	227	220	146.7	TB7	184.0	TC7	110.0
	8	783.9	829		S2	85	175	247	240	233.0	TB9	204.0	TC9	120.0
	10	970.8	1025		S1	85	175	247	240	324.0	TB9	204.0	TC9	120.0
	12	1159.1	1219		S1	95	190	267	270	456.4	TB11	234.0	TC11	135.0

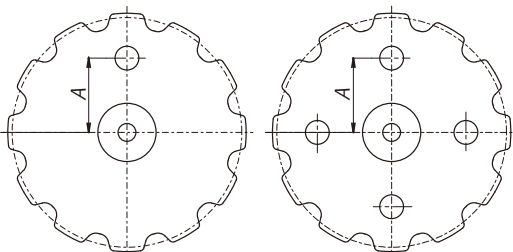
F Roller

RF26250F (250)	6	500.0	535	30 <sup>0</sup> <sub>-1.0</sub>	S2	75	145	207	180	79.6	TB5	150.0	TC5	90.0
	8	653.3	703		S2	80	160	227	200	125.0	TB6	170.0	TC6	100.0
	10	809.0	864		S1	85	175	247	240	189.3	TB9	210.0	TC9	120.0
	12	965.9	1026		S1	85	175	247	240	240.7	TB9	210.0	TC9	120.0
RF26300F (300)	6	600.0	631	30 <sup>0</sup> <sub>-1.0</sub>	S2	80	160	227	220	118.2	TB7	190.0	TC7	110.0
	8	783.9	829		S2	85	175	247	240	181.9	TB9	210.0	TC9	120.0
	10	970.8	1025		S1	85	175	247	240	242.5	TB9	210.0	TC9	120.0
	12	1159.1	1219		S1	95	190	267	270	338.8	TB11	240.0	TC11	135.0

S Roller

RF26200S (200)	6	400.0	427	45 ±1.3	S1	75	145	207	180	73.8	TB5	144.0	TC5	90.0
	8	522.6	547		S1	75	145	207	180	105.1	TB5	144.0	TC5	90.0
	10	647.2	674		S1	80	160	227	200	157.5	TB6	164.0	TC6	100.0
	12	772.7	800		S1	85	175	247	240	228.2	TB9	204.0	TC9	120.0
RF26250S (250)	6	500.0	527	45 ±1.3	S1	75	145	207	180	98.7	TB5	144.0	TC5	90.0
	8	653.3	680		S1	80	160	227	200	159.7	TB6	164.0	TC6	100.0
	10	809.0	836		S1	85	175	247	240	244.1	TB9	204.0	TC9	120.0
	12	965.9	993		S1	85	175	247	240	321.4	TB9	204.0	TC9	120.0
RF26300S (300)	6	600.0	627	45 ±1.3	S2	80	160	227	220	146.7	TB7	184.0	TC7	110.0
	8	783.9	811		S1	85	175	247	240	233.0	TB9	204.0	TC9	120.0
	10	970.8	998		S1	85	175	247	240	324.0	TB9	204.0	TC9	120.0
	12	1159.1	1186		S1	95	190	267	270	456.4	TB11	234.0	TC11	135.0

### Table of Hole Dimensions for Hanging Applications



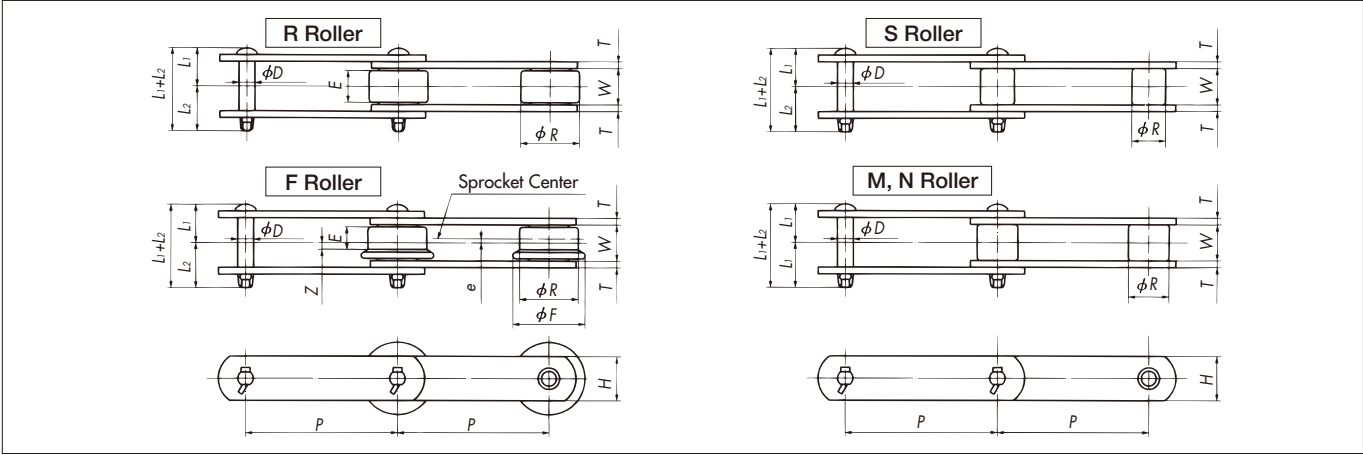
TSUBAKI Chain Number	No. of Teeth	Hanging Hole Dim.	
		A	No. of Hanging Holes
RF26200	10	195	1
	12	235	4

Caution: Hanging holes are not available on sprockets with numbers of teeth or for chain numbers not listed.



# RF36 – RF440

## Meter Pitch (Attachment Dimensions) RF36250 – RF120600



TSUBAKI Chain Number		DT Series Average Tensile Strength		Pitch P	Roller								Width between Inner Link Plates W	
Chain Size	Roller Type	kN	{kgf}		R Roller		F Roller				S Roller Dia. R	M Roller Dia. R		
				Dia. R	Contact Width E	Dia. R	Flange Dia. F	Contact Width E	Off-Center e	Z				
RF36250	S/M	476	{48500}	250	-	-	-	-	-	-	-	50.8	57.2	66.7
RF36300	R/F/S/M			300	125	56	125	150	42	7	14			
RF36450	R/F/S/M			450	125	56	125	150	42	7	14			
RF36600	R/F/S/M			600	125	56	125	150	42	7	14			
RF52300	R/F/S	500	{51000}	300	140	65	140	170	49	8	16.5	57.2	-	77
RF52450	R/F/S			450	140	65	140	170	49	8	16.5			
RF52600	R/F/S			600	140	65	140	170	49	8	16.5			
RF60300	R/F/N	500	{51000}	300	140	65	140	170	49	8	16.5	-	70	77
RF60350	R/F/N			350	140	65	140	170	49	8	16.5			
RF60400	R/F/N			400	140	65	140	170	49	8	16.5			
RF90350	N	789	{80500}	350	-	-	-	-	-	-	-	-	85	88
RF90400	R/F/N			400	170	76	170	205	56	10	18			
RF90500	R/F/N			500	170	76	170	205	56	10	18			
RF120400	R/N	1110	{113000}	400	200	87	-	-	-	-	-	-	100	100
RF120600	R/F/N			600	200	87	200	240	64	11.5	20.5			
RF280400	N	3040	{310000}	400	-	-	-	-	-	-	-	-	120	120
RF280600	R/N			600	220	105	-	-	-	-	-			
RF360400	N	3630	{370000}	400	-	-	-	-	-	-	-	-	130	130
RF360600	R/N			600	230	115	-	-	-	-	-			
RF440400	N	4460	{455000}	400	-	-	-	-	-	-	-	-	145	145
RF440600	R/N			600	250	130	-	-	-	-	-			

※Denotes Wear Resistant/Heavy Duty Conveyor Chain items.

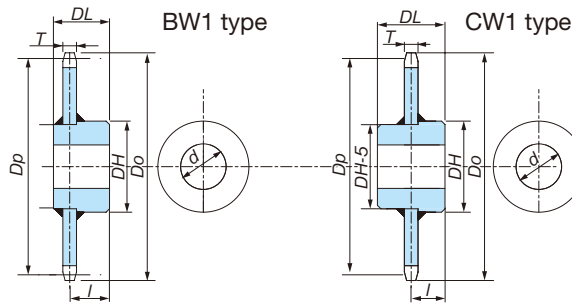
Chain Size	Plate		Pin				Approximate Mass kg/m				Standard Attachment & Roller Combinations			
	Height H	Thickness T	Dia. D	$L_1+L_2$	$L_1$	$L_2$	R Roller	F Roller	S Roller	M Roller	A2 (Welded)	A3 (Welded)	GA2	GA4
RF36250	76.2	12.7	25.4	146	68	78	-	-	25	26	-	-	-	S/M
RF36300							40	42	23	24	R/F/S/M	-	-	S/M
RF36450							32	33	21	21	R/F/S/M	R/F/S/M	R/F/S/M	R/F/S/M
RF36600							28	29	19	20	R/F/S/M	R/F/S/M	R/F/S/M	R/F/S/M
RF52300	76.2	16	31.8	172	82	90	55	58	30	-	R/F/S	-	-	-
RF52450							43	45	26	-	R/F/S	R/F	R/F/S	
RF52600							37	38	25	-	R/F/S	R/F	R/F/S	
RF60300	90	12.7	35.0	160.5	77	83.5	54	57	-	32	R/F/N	-	-	-
RF60350							49	51	-	30	R/F/N	R/F/N	R/F/N	
RF60400							45	47	-	28	R/F/N	R/F/N	R/F/N	
RF90350	110	16	42.0	185	89.5	95.5	-	-	-	49	N	-	-	-
RF90400							74	78	-	46	R/F/N	-	-	
RF90500							65	68	-	42	R/F/N	R/F/N	R/F/N	
RF120400	130	19	50.0	211.5	103.5	108	113	-	-	69	R/N	-	-	-
RF120600							88	92	-	59	R/F/N	R/F/N	R/F/N	
RF280400	160 (135)	19	56.0	242	118.5	123.5	-	-	-	90	-	-	-	-
RF280600							112	-	-	75	-	-	-	
RF360400	170 (160)	22	61.0	258	126.5	131.5	-	-	-	112	-	-	-	-
RF360600							135	-	-	92	-	-	-	
RF440400	185 (170)	25	68.0	285	140	145	-	-	-	145	-	-	-	-
RF440600							175	-	-	120	-	-	-	

Note 1. R, F, S, M, and N denote roller types for standard attachments.  
 2. Inner link and outer link dimensions are different for H. Sizes in ( ) represent outer link dimensions.

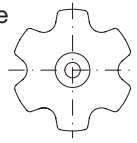
# Sprockets for RF36 – RF440 Chain (BW1/CW1)

## RF36300 R 6T - BW1 N

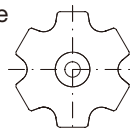
Chain size	No. of teeth	Hub type
Roller type	BW1·CW1	
Tooth hardening		
Hardened : Q		
Normal : N		



S1 Tooth Profile  
(Teeth are rounded)



S2 Tooth Profile  
(Teeth are flat)



General Use/Heavy Duty  
Corrosion Resistant

R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Standard Series					BW1 Type		CW1 Type	
		Pitch Circle Dia. Dp	Outer Dia. Do	Tooth Width T	Tooth Profile	Bore Dia. d		Hub Dia. DH	Total Length DL	Approx. Weight kg	Hub No.	Center Distance l	Hub No.	Center Distance l
						Pilot Bore	Max.							
RF36300R (300)	6	600.0	653	55 ±1.3	S2	85	175	247	220	174.2	TB8	178.0	TC8	110.0
	8	783.9	853		S2	95	190	267	240	276.2	TB10	198.0	TC10	120.0
	10	970.8	1046		S1	95	190	267	270	398.9	TB11	228.0	TC11	135.0
	12	1159.1	1234		S1	100	210	297	260	550.8	TB12	218.0	TC12	130.0

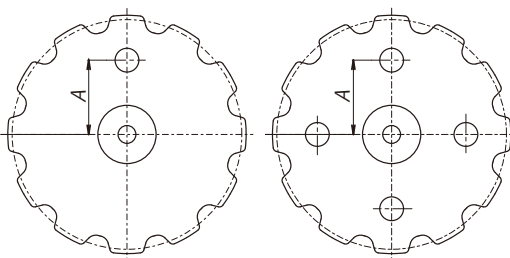
F Roller

RF36300F (300)	6	600.0	653	33.7 <sup>0</sup> <sub>-1.2</sub>	S2	85	175	247	220	135.0	TB8	188.0	TC8	110.0
	8	783.9	853		S2	95	190	267	240	204.9	TB10	208.0	TC10	120.0
	10	970.8	1046		S1	95	190	267	270	284.5	TB11	238.0	TC11	135.0
	12	1159.1	1234		S1	100	210	297	260	386.0	TB12	228.0	TC12	130.0

S Roller

RF36250S (250)	6	500.0	530	55 ±1.3	S2	80	160	227	200	122.9	TB6	158.0	TC6	100.0
	8	653.3	684		S1	85	175	247	240	203.5	TB9	198.0	TC9	120.0
	10	809.0	839		S1	95	190	267	240	289.8	TB10	198.0	TC10	120.0
	12	965.9	996		S1	95	190	267	270	395.7	TB11	228.0	TC11	135.0
RF36300S (300)	6	600.0	631	55 ±1.3	S1	85	175	247	220	174.2	TB8	178.0	TC8	110.0
	8	783.9	814		S1	95	190	267	240	276.2	TB10	198.0	TC10	120.0
	10	970.8	1001		S1	95	190	267	270	398.9	TB11	228.0	TC11	135.0
	12	1159.1	1190		S1	100	210	297	260	550.8	TB12	218.0	TC12	130.0

## Table of Hole Dimensions for Hanging Applications



TSUBAKI Chain Number	No. of Teeth	Hanging Hole Dim.	No. of Hanging Holes
		A	
RF36250	8	185	1
	10	240	4
	12	295	4

Caution: Hanging holes are not available on sprockets with numbers of teeth or for chain numbers not listed.

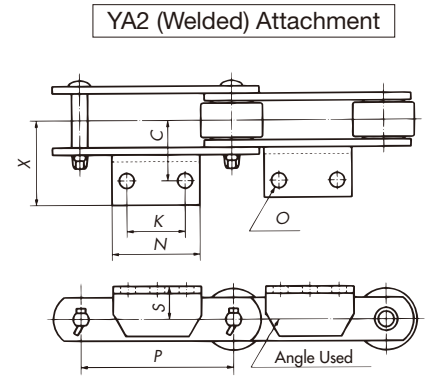
# RF36 – RF440

**Meter Pitch  
(Attachment Dimensions)  
RF36250 – RF120600**

### YA2 (Welded) Attachment

TSUBAKI Chain Number		P	S	C	X	K	N	O	Angle Used	Bolt Used	Additional Mass/Each kg
Chain Size	Roller Type										
<b>RF36300</b>	R/F/S/M	300	70	100	160	100	160	19	L100×100×10	M16	2.4
<b>RF36450</b>	R/F/S/M	450				280	330				4.9
<b>RF36600</b>	R/F/S/M	600				360	410				6.1
<b>RF52300</b>	R/F/S	300	80	120	172	100	160	24	L100×100×13	M20	3.1
<b>RF52450</b>	R/F/S	450				280	330				6.3
<b>RF52600</b>	R/F/S	600				360	410				7.8
<b>RF60300</b>	R/F/N	300	90	115	165	110	170	24	L100×100×13	M20	3.2
<b>RF60350</b>	R/F/N	350				160	220				4.2
<b>RF60400</b>	R/F/N	400				200	260				5.0
<b>RF90350</b>	N	350	100	140	210	100	180	28	L130×130×15	M24	5.2
<b>RF90400</b>	R/F/N	400				150	230				6.6
<b>RF90500</b>	R/F/N	500				260	340				9.8
<b>RF120400</b>	R/N	400	120	150	220	120	200	28	L130×130×15	M24	5.8
<b>RF120600</b>	R/F/N	600				320	400				11.5

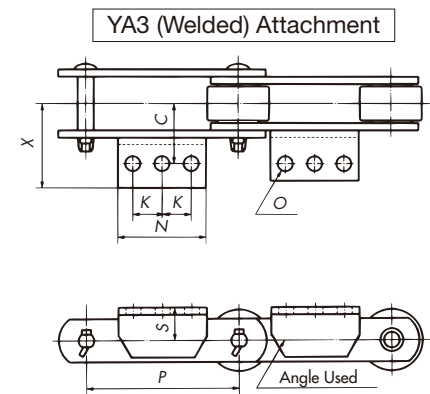
Note 1. Angle dimensions are different for stainless steel series. Contact a Tsubaki representative for more information.  
 2. Contact a Tsubaki representative if using a guide on the attachment side.



### YA3 (Welded) Attachment

TSUBAKI Chain Number		P	S	C	X	K	N	O	Angle Used	Bolt Used	Additional Mass/Each kg
Chain Size	Roller Type										
<b>RF36450</b>	R/F/S/M	450	70	100	160	140	330	19	L100×100×10	M16	4.9
<b>RF36600</b>	R/F/S/M	600				180	410				6.1
<b>RF52450</b>	R/F	450	80	120	172	140	330	24	L100×100×13	M20	6.3
<b>RF52600</b>	R/F	600				180	410				7.8
<b>RF60350</b>	R/F/N	350	90	115	165	80	220	24	L100×100×13	M20	4.2
<b>RF60400</b>	R/F/N	400				100	260				5.0
<b>RF90500</b>	R/F/N	500	100	140	210	130	340	28	L130×130×15	M24	9.8
<b>RF120600</b>	R/F/N	600	220	150	220	160	400	28	L130×130×15	M24	11.5

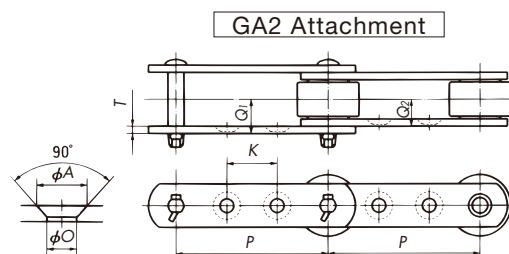
Note 1. Angle dimensions are different for stainless steel series. Contact a Tsubaki representative for more information.  
 2. Contact a Tsubaki representative if using a guide on the attachment side.



# RF36 – RF440

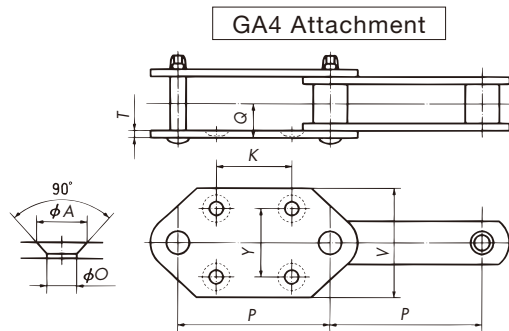
## GA2 Attachment

TSUBAKI Chain Number		P	K	T	Q <sub>1</sub>	Q <sub>2</sub>	A	O	Max. Length of Attachment Bolt		Bolt Used
Chain Size	Roller Type								Outer Link	Inner Link	
<b>RF36450</b>	R/F/S/M	450	220								M16
<b>RF36600</b>	R/F/S/M	600	300	12.7	60	46	32	19	105	75	
<b>RF52450</b>	R/F/S	450	200								M20
<b>RF52600</b>	R/F/S	600	300	16	72	54.5	38	24	125	90	



## GA4 Attachment

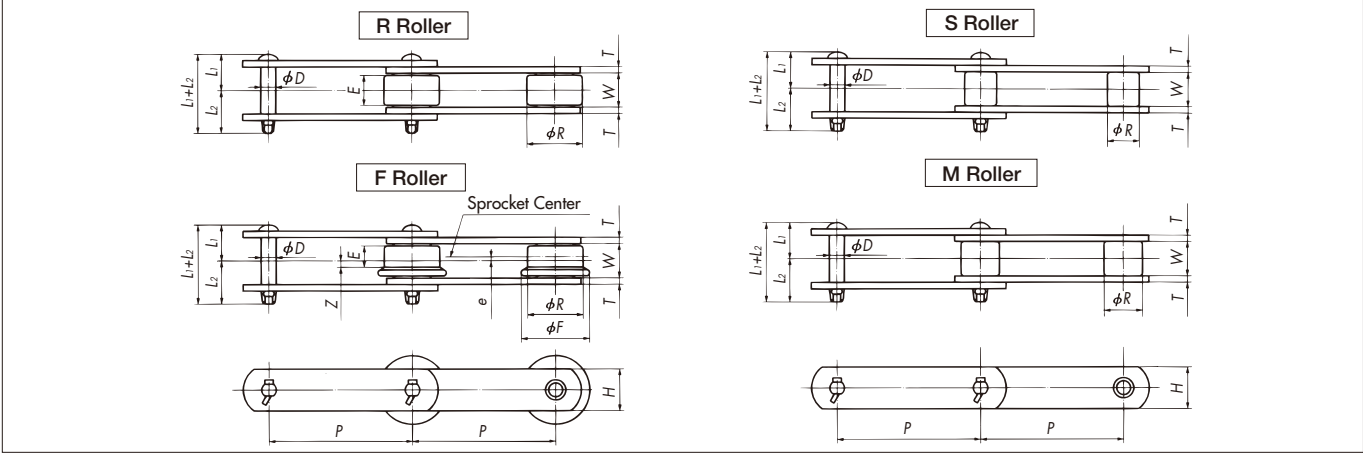
TSUBAKI Chain Number		P	V	K	Y	T	Q	A	O	Bolt Used	Mass for Attachment/2R kg/m	
Chain Size	Roller Type										S Roller	M Roller
<b>RF36250</b>	S/M	250	150	140	100	12.7	60	32	19	M16	29	30
<b>RF36300</b>	S/M	300		180							27	28



General Use/Heavy Duty/Corrosion Resistant

# Inch Sizes

## Inch Pitch (Chain Dimensions)

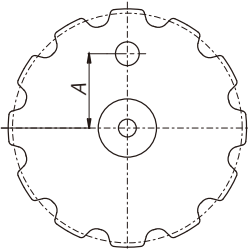


TSUBAKI Chain Number		DT Series Average Tensile Strength		Pitch $P$	Roller										Width between Inner Link Plates $W$
Chain Size	Roller Type	kN	{kgf}		R Roller		F Roller				S Roller Dia. $R$	M Roller Dia. $R$			
				Dia. $R$	Contact Width $E$	Dia. $R$	Flange Dia. $F$	Contact Width $E$	Off-Center $e$	$Z$					
<b>RF 430</b>	R/S	53.9	{5500}	101.6	38.1	19	-	-	-	-	-	20.1	-	22.6	
<b>RF 204</b>	S	78.5	{8000}	66.27	-	-	-	-	-	-	-	22.2	-	27	
<b>RF 450</b>	R/F/S	78.5	{8000}	101.6	44.5	24	44.5	55	18	2.5	6.5	22.2	-	27	
<b>RF 650</b>	R/F/S/M	78.5	{8000}	152.4	50.8	26	50.8	65	20	3	7	25.8	31.8	30.2	
<b>RF 214</b>	R/S/M	127	{13000}	101.6	44.5	27	-	-	-	-	-	31.8	34.9	31.6	
<b>RF 205</b>	S	127	{13000}	78.11	-	-	-	-	-	-	-	31.8	-	37.1	
<b>RF 6205</b>	R/F/S/M	186	{19000}	152.4	57.2	32	57.2	70	25	3.5	9	34.9	38.1	37.1	
<b>RF 212</b>	R/S/M	245	{25000}	152.4	69.9	32.5	-	-	-	-	-	40.1	44.5	37.1	

TSUBAKI Chain Number	Plate		Pin				Approximate Mass kg/m				Attachment & Roller Combinations				
	Height $H$	Thickness $T$	Dia. $D$	$L_1+L_2$	$L_1$	$L_2$	R Roller	F Roller	S Roller	M Roller	A1(A3) K1(K3)	A2 K2	SA2 SK2	GA2	GA4
<b>RF 430</b>	25.4	4.8(5.0)	9.7	55(56)	25.5(26.0)	29.5(30.0)	4.4	-	3.0	-	R/S	R/S	R/S		
<b>RF 204</b>	28.6	6.3(6.0)	11.3	65.5	31	34.5	-	-	5.5	-	S	S			
<b>RF 450</b>	28.6	6.3(6.0)	11.3	65.5	31	34.5	6.9	7.2	4.6	4.8	R/F/S	R/F/S	R/S		
<b>RF 650</b>	38.1	6.3(6.0)	11.3	69	32.5	36.5	7.9	8.2	5.7	6.1	R/F/S/M	R/F/S/M	R/S/M	R/F/S/M	S/M
<b>RF 214</b>	38.1	7.9	15.9	77.5	37.5	40	10.5	-	8.7	9.1	R/S/M	R/S/M	R/S/M		
<b>RF 205</b>	38.1	7.9	15.9	83.5	40.5	43	-	-	10.3	-	S	S			
<b>RF 6205</b>	44.5	7.9	15.9	83.5	40.5	43	12.2	12.6	9.2	9.5	R/F/S/M	R/F/S/M	R/S/M	R/F/S/M	S/M
<b>RF 212</b>	50.8	9.5(10.0)	19.1	95.5	44.5	51	18	-	13	13	R/S/M	R/S/M	R/S/M		

Note: Numbers in < > denote SUS300 Series stainless steel, while other numbers are the same for all series.

### Table of Hole Dimensions for Hanging Applications



TSUBAKI Chain Number	No. of Teeth	Hanging Hole Dim.	No. of Hanging Holes
		$A$	
<b>RF650</b>	8	230	1
	10	155	1
	12	190	1
<b>RF6205</b>	10	155	1
	12	190	1
<b>RF212</b>	12	185	1

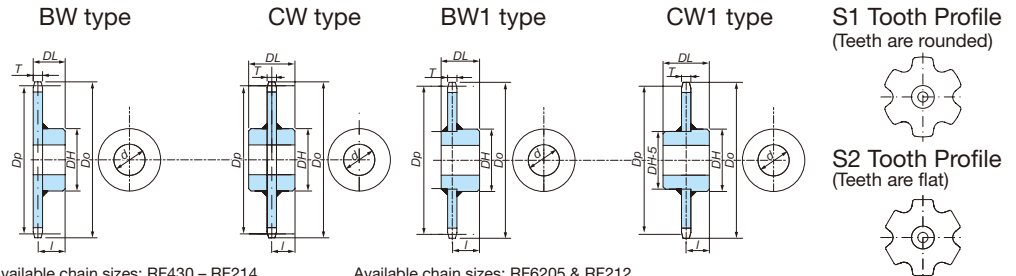
Caution: Hanging holes are not available on sprockets with numbers of teeth or for chain numbers not listed.



# Sprockets for Inch Sizes (BW/CW/BW1/CW)

## RF430 R 6T - BW N

Chain size	No. of teeth	Hub type
Roller type		BW-CW
Tooth hardening		
Hardened : Q		
Normal : N		



### R Roller

TSUBAKI Chain Number (Chain Pitch)	No. of Teeth N	Basic Sprocket Dim. and Shape				Tooth Profile	Standard Series				BW1 Type		CW1 Type	
		Pitch Circle Dia. $D_p$	Outer Dia. $D_o$	Tooth Width $T$	Bore Dia. $d$		Hub Dia. $D_H$	Total Length $D_L$	Approx. Weight kg	Hub No.	Center Distance $l$	Hub No.	Center Distance $l$	
RF430R (101.6)	6	203.2	211	18 <sup>0</sup> <sub>-0.8</sub>	S1	18	60	93	73	7.4	SB3	64.0	SC3	36.5
	8	265.5	277		S1	18	65	98	78	11.2	SB4	69.0	SC4	39.0
	10	328.8	345		S1	28	75	107	86	16.4	SB5	77.0	SC5	43.0
	12	392.6	411		S1	28	75	107	86	21.5	SB5	77.0	SC5	43.0
RF450R (101.6)	6	203.2	217	22 <sup>0</sup> <sub>-1.0</sub>	S1	28	75	107	90	10.0	SB5	79.0	SC5	45.0
	8	265.5	286		S1	28	75	107	90	13.9	SB5	79.0	SC5	45.0
	10	328.8	354		S1	33	80	117	98	20.4	SB6	87.0	SC6	49.0
	12	392.6	419		S1	33	85	127	108	28.7	SB7	97.0	SC7	54.0
RF650R (152.4)	6	304.8	321	22 <sup>0</sup> <sub>-1.0</sub>	S1	33	80	117	98	18.3	SB6	87.0	SC6	49.0
	8	398.2	422		S1	33	85	127	108	29.3	SB7	97.0	SC7	54.0
	10	493.2	521		S1	33	95	137	120	43.5	SB8	109.0	SC8	60.0
	12	588.8	618		S1	33	95	137	120	57.5	SB8	109.0	SC8	60.0
RF214R (101.6)	6	203.2	230	24 <sup>0</sup> <sub>-1.0</sub>	S1	28	75	107	92	10.5	SB5	80.0	SC5	46.0
	8	265.5	292		S1	33	95	137	122	20.9	SB8	110.0	SC8	61.0
	10	328.8	356		S1	33	95	137	122	26.5	SB8	110.0	SC8	61.0
	12	392.6	419		S1	38	100	147	125	35.1	SB9	113.0	SC9	62.5
RF6205R (152.4)	6	304.8	330	28 <sup>0</sup> <sub>-1.0</sub>	S2	50	100	147	125	27.0	TB1	100.0	TC1	62.5
	8	398.2	432		S1	55	110	157	135	41.1	TB2	110.0	TC2	67.5
	10	493.2	528		S1	60	120	177	150	62.2	TB3	125.0	TC3	75.0
	12	588.8	623		S1	60	120	177	150	80.0	TB3	125.0	TC3	75.0
RF212R (152.4)	6	304.8	339	28 <sup>0</sup> <sub>-1.0</sub>	S1	55	110	157	135	29.8	TB2	110.0	TC2	67.5
	8	398.2	440		S1	60	120	177	150	47.6	TB3	125.0	TC3	75.0
	10	493.2	535		S1	65	130	187	160	66.2	TB4	135.0	TC4	80.0
	12	588.8	631		S1	75	145	207	180	93.7	TB5	155.0	TC5	90.0

### F Roller

RF450F (101.6)	6	203.2	217	15 <sup>0</sup> <sub>-0.8</sub>	S1	28	75	107	83	8.2	SB5	75.5	SC5	41.5
	8	265.5	286		S1	28	75	107	83	10.4	SB5	75.5	SC5	41.5
	10	328.8	354		S1	33	80	117	91	15.7	SB6	83.5	SC6	45.5
	12	392.6	419		S1	33	85	127	101	22.0	SB7	93.5	SC7	50.5
RF650F (152.4)	6	304.8	321	18 <sup>0</sup> <sub>-0.8</sub>	S2	33	80	117	94	16.1	SB6	85.0	SC6	47.0
	8	398.2	422		S2	33	85	127	104	25.4	SB7	95.0	SC7	52.0
	10	493.2	521		S2	33	95	137	116	37.5	SB8	107.0	SC8	58.0
	12	588.8	618		S1	33	95	137	116	49.0	SB8	107.0	SC8	58.0
RF6205F (152.4)	6	304.8	330	18 <sup>0</sup> <sub>-0.8</sub>	S2	50	100	147	125	22.6	TB1	105.0	TC1	62.5
	8	398.2	432		S2	55	110	157	135	32.8	TB2	115.0	TC2	67.5
	10	493.2	528		S1	60	120	177	150	49.1	TB3	130.0	TC3	75.0
	12	588.8	623		S1	60	120	177	150	60.6	TB3	130.0	TC3	75.0

### S Roller

RF430S (101.6)	6	203.2	215	18 <sup>0</sup> <sub>-0.8</sub>	S1	18	60	93	73	7.4	SB3	64.0	SC3	36.5
	8	265.5	277		S1	18	65	98	78	11.2	SB4	69.0	SC4	39.0
	10	328.8	341		S1	28	75	107	86	16.4	SB5	77.0	SC5	43.0
	12	392.6	405		S1	28	75	107	86	21.5	SB5	77.0	SC5	43.0
RF204S (66.27)	8	173.2	187	22 <sup>0</sup> <sub>-1.0</sub>	S1	18	65	98	82	7.5	SB4	71.0	SC4	41.0
	10	214.5	228		S1	28	75	107	90	10.6	SB5	79.0	SC5	45.0
	12	256.0	269		S1	28	75	107	90	13.3	SB5	79.0	SC5	45.0
	6	203.2	217		S1	28	75	107	90	10.0	SB5	79.0	SC5	45.0
RF450S (101.6)	8	265.5	279	22 <sup>0</sup> <sub>-1.0</sub>	S1	28	75	107	90	13.9	SB5	79.0	SC5	45.0
	10	328.8	342		S1	33	80	117	98	20.4	SB6	87.0	SC6	49.0
	12	392.6	406		S1	33	85	127	108	28.7	SB7	97.0	SC7	54.0
	6	304.8	320		S1	33	80	117	98	18.3	SB6	87.0	SC6	49.0
RF650S (152.4)	8	398.2	414	22 <sup>0</sup> <sub>-1.0</sub>	S1	33	85	127	108	29.3	SB7	97.0	SC7	51.5
	10	493.2	509		S1	33	95	137	120	43.5	SB8	109.0	SC8	59.5
	12	588.8	604		S1	33	95	137	120	57.5	SB8	109.0	SC8	59.5
	6	203.2	222		S1	28	75	107	92	10.5	SB5	80.0	SC5	46.0
RF214S (101.6)	8	265.5	285	24 <sup>0</sup> <sub>-1.0</sub>	S1	33	95	137	122	20.9	SB8	110.0	SC8	61.0
	10	328.8	348		S1	33	95	137	122	26.5	SB8	110.0	SC8	61.0
	12	392.6	412		S1	38	100	147	125	35.1	SB9	113.0	SC9	62.5
	8	204.1	223		S1	33	80	117	104	12.9	SB6	90.0	SC6	52.0
RF205S (78.11)	10	252.8	272	28 <sup>0</sup> <sub>-1.0</sub>	S1	33	85	127	114	18.8	SB7	100.0	SC7	54.5
	12	301.8	321		S1	33	95	137	126	26.2	SB8	112.0	SC8	62.5
	6	304.8	330		S2	50	100	147	125	27.0	TB1	100.0	TC1	62.5
	8	398.2	432		S1	55	110	157	135	41.1	TB2	110.0	TC2	67.5
RF6205S (152.4)	10	493.2	528	28 <sup>0</sup> <sub>-1.0</sub>	S1	60	120	177	150	62.2	TB3	125.0	TC3	75.0
	12	588.8	623		S1	60	120	177	150	80.0	TB3	125.0	TC3	75.0
	6	304.8	339		S1	55	110	157	135	29.8	TB2	110.0	TC2	67.5
	8	398.2	440		S1	60	120	177	150	47.6	TB3	125.0	TC3	75.0
RF212S (152.4)	10	493.2	535	28 <sup>0</sup> <sub>-1.0</sub>	S1	65	130	187	160	66.2	TB4	135.0	TC4	80.0
	12	588.8	631		S1	75	145	207	180	93.7	TB5	155.0	TC5	90.0

# Inch Sizes

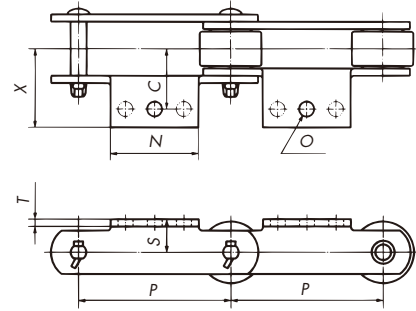
## Inch Pitch (Attachment Dimensions)

### A1 (A3) Attachment

TSUBAKI Chain Number		P	S	C	X	N	T	O	Bolt Used	Additional Mass/Each kg
Chain Size	Roller Type									
<b>RF430</b>	R/S	101.6	22	40	54	70	4.8(5.0)	12	M10	0.11
<b>RF204</b>	S	66.27	24	45	60	35	6.3(6.0)	12	M10	0.07
<b>RF450</b>	R/F/S	101.6	28	50	64	70	6.3(6.0)	12	M10	0.18
<b>RF650</b>	R/F/S/M	152.4	32	50	64	90	6.3(6.0)	12	M10	0.23
<b>RF214</b>	R/S/M	101.6	35	55	73	80	7.9	15	M12	0.28
<b>RF205</b>	S	78.11	30	55	73	45	7.9	12	M10	0.13
<b>RF6205</b>	R/F/S/M	152.4	38	60	79	100	7.9	15	M12	0.37
<b>RF212</b>	R/S/M	152.4	45	65	83	100	9.5(10.0)	15	M12	0.47

Note: A3 attachment not available for RF204 & RF205.

A1 (A3) Attachment

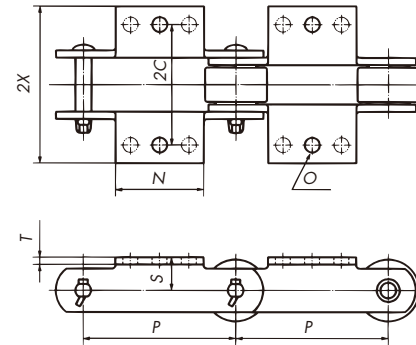


### K1 (K3) Attachment

TSUBAKI Chain Number		P	S	2C	2X	N	T	O	Bolt Used	Additional Mass/Each kg
Chain Size	Roller Type									
<b>RF430</b>	R/S	101.6	22	80	108	70	4.8(5.0)	12	M10	0.22
<b>RF204</b>	S	66.27	24	90	120	35	6.3(6.0)	12	M10	0.14
<b>RF450</b>	R/F/S	101.6	28	100	128	70	6.3(6.0)	12	M10	0.36
<b>RF650</b>	R/F/S/M	152.4	32	100	128	90	6.3(6.0)	12	M10	0.44
<b>RF214</b>	R/S/M	101.6	35	110	146	80	7.9	15	M12	0.56
<b>RF205</b>	S	78.11	30	110	146	45	7.9	12	M10	0.26
<b>RF6205</b>	R/F/S/M	152.4	38	120	158	100	7.9	15	M12	0.74
<b>RF212</b>	R/S/M	152.4	45	130	166	100	9.5(10.0)	15	M12	0.94

Note: K3 attachment not available for RF204 & RF205.

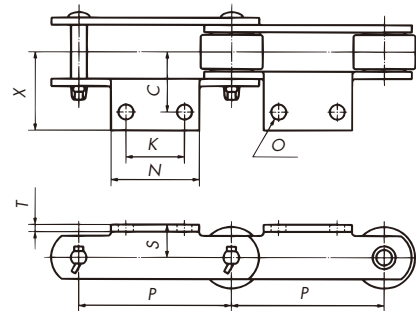
K1 (K3) Attachment



### A2 Attachment

TSUBAKI Chain Number		P	S	C	X	K	N	T	O	Bolt Used	Additional Mass/Each kg
Chain Size	Roller Type										
<b>RF430</b>	R/S	101.6	22	40	54	40	70	4.8(5.0)	12	M10	0.11
<b>RF204</b>	S	66.27	24	45	60	35	55	6.3(6.0)	12	M10	0.11
<b>RF450</b>	R/F/S	101.6	28	50	64	40	70	6.3(6.0)	12	M10	0.18
<b>RF650</b>	R/F/S/M	152.4	32	50	64	60	90	6.3(6.0)	12	M10	0.22
<b>RF214</b>	R/S/M	101.6	35	55	73	40	80	7.9	15	M12	0.28
<b>RF205</b>	S	78.11	35	60	75	30	65	7.9	12	M10	0.22
<b>RF6205</b>	R/F/S/M	152.4	38	60	79	60	100	7.9	15	M12	0.37
<b>RF212</b>	R/S/M	152.4	45	65	83	60	100	9.5(10.0)	15	M12	0.47

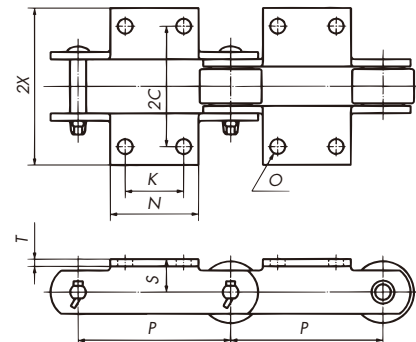
A2 Attachment



### K2 Attachment

TSUBAKI Chain Number		P	S	2C	2X	K	N	T	O	Bolt Used	Additional Mass/Each kg
Chain Size	Roller Type										
<b>RF430</b>	R/S	101.6	22	80	108	40	70	4.8(5.0)	12	M10	0.22
<b>RF204</b>	S	66.27	24	90	120	35	55	6.3(6.0)	12	M10	0.22
<b>RF450</b>	R/F/S	101.6	28	100	128	40	70	6.3(6.0)	12	M10	0.36
<b>RF650</b>	R/F/S/M	152.4	32	100	128	60	90	6.3(6.0)	12	M10	0.44
<b>RF214</b>	R/S/M	101.6	35	110	146	40	80	7.9	15	M12	0.56
<b>RF205</b>	S	78.11	35	120	150	30	65	7.9	12	M10	0.44
<b>RF6205</b>	R/F/S/M	152.4	38	120	158	60	100	7.9	15	M12	0.74
<b>RF212</b>	R/S/M	152.4	45	130	166	60	100	9.5(10.0)	15	M12	0.94

K2 Attachment



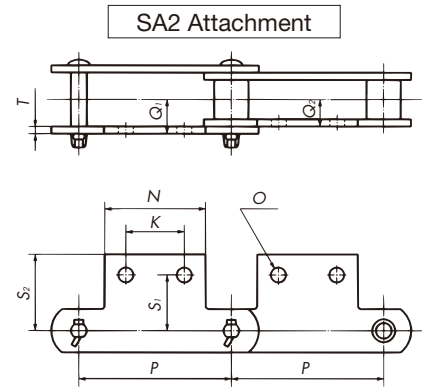
Note 1. Numbers in < > denote SUS300 Series stainless steel, while other numbers are the same for all series.

2. X and 2X values for A and K attachments are approximate values. Contact a Tsubaki representative if using a guide on the A or K attachment sides.

3. Attachments written in blue are standard attachments.

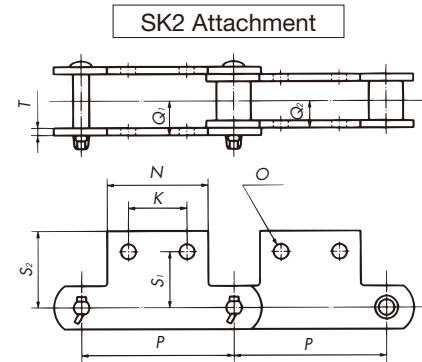
## SA2 Attachment

TSUBAKI Chain Number		P	S <sub>1</sub>	S <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	K	N	T	Ø	Bolt Used	Additional Mass/Each kg
Chain Size	Roller Type											
<b>RF430</b>	R/S	101.6	37.6	51.6	22(22.5)	16(16.5)	40	70	4.8(5.0)	12	M10	0.10
<b>RF450</b>	R/S	101.6	47.6	60.7	27(26.5)	20(19.5)	40	70	6.3(6.0)	12	M10	0.16
<b>RF650</b>	R/S/M	152.4	50	63	28.5(28)	21.5(21)	60	90	6.3(6.0)	12	M10	0.20
<b>RF214</b>	R/S/M	101.6	50	70	32.5	23.5	40	80	7.9	15	M12	0.25
<b>RF6205</b>	R/S/M	152.4	55	75.7	35.5	26.5	60	100	7.9	15	M12	0.33
<b>RF212</b>	R/S/M	152.4	60	83.6	38.5(39.5)	28(28.5)	60	100	9.5(10.0)	15	M12	0.43



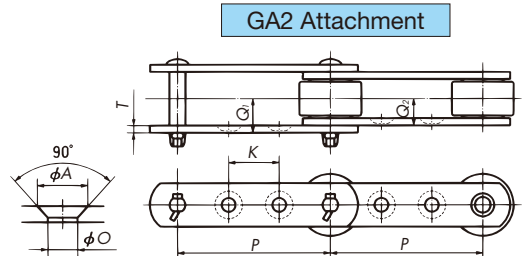
## SK2 Attachment

TSUBAKI Chain Number		P	S <sub>1</sub>	S <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	K	N	T	Ø	Bolt Used	Additional Mass/Each kg
Chain Size	Roller Type											
<b>RF430</b>	R/S	101.6	37.6	51.6	22(22.5)	16(16.5)	40	70	4.8(5.0)	12	M10	0.20
<b>RF450</b>	R/S	101.6	47.6	60.7	27(26.5)	20(19.5)	40	70	6.3(6.0)	12	M10	0.32
<b>RF650</b>	R/S/M	152.4	50	63	28.5(28)	21.5(21)	60	90	6.3(6.0)	12	M10	0.40
<b>RF214</b>	R/S/M	101.6	50	70	32.5	23.5	40	80	7.9	15	M12	0.50
<b>RF6205</b>	R/S/M	152.4	55	75.7	35.5	26.5	60	100	7.9	15	M12	0.66
<b>RF212</b>	R/S/M	152.4	60	83.6	38.5(39.5)	28(28.5)	60	100	9.5(10.0)	15	M12	0.86



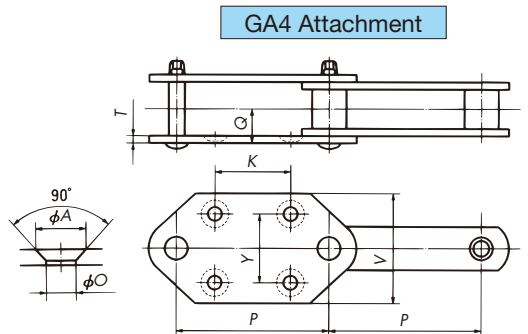
## GA2 Attachment

TSUBAKI Chain Number		P	K	T	Q <sub>1</sub>	Q <sub>2</sub>	A	Ø	Max. Length of Attachment Bolt		Bolt Used
Chain Size	Roller Type								Outer Link	Inner Link	
<b>RF650</b>	R/S/M	152.4	60	6.3(6)	28.5(28)	21.5(21)	20	12	49	35	M10
<b>RF6205</b>	R/S/M	152.4	50	7.9	35.5	26.5	16	15	63	45	M12



## GA4 Attachment

TSUBAKI Chain Number		P	V	K	Y	T	Q	A	Ø	Bolt Used	Mass for Attachment/2ℓ kg/m	
Chain Size	Roller Type										S Roller	M Roller
<b>RF650</b>	S/M	152.4	110	75	70	6.3	28.5	20	12	M10	7.5	7.9
<b>RF6205</b>	S/M	152.4	110	75	70	7.9	35.5	26	15	M12	11.2	11.5



Note 1. Numbers in < > denote SUS300 Series stainless steel, while other numbers are the same for all series.  
 2. Attachments written in   are standard attachments.



# Selecting Hub Specifications & Dimensions

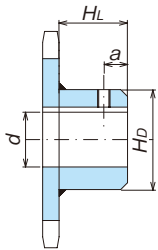
Dedicated selectable hubs are in stock and designed for conveyor sprockets. The following section provides information on the standard bore diameters, key specifications, and tap specifications for these hubs. Hubs in dimensions other than the standard dimensions specified in the catalog can be chosen freely.

## 1. Hub Selection

The standard bore diameter for each selectable hub is listed below. Select the desired standard bore diameter from the corresponding hub number.

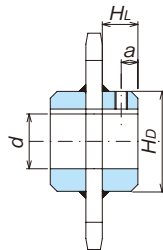
### BW selectable hub

Hub no.: SB1 – SB11



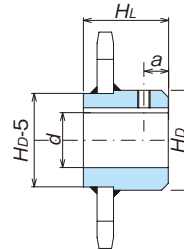
### CW selectable hub

Hub no.: SC1 – SC12



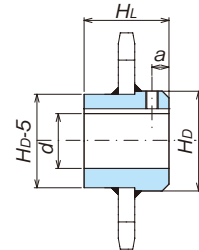
### BW1 selectable hub

Hub no.: TB1 – TB12



### CW1 selectable hub

Hub no.: TC1 – TC12



### Bore Processing Range

\*Bore processing

\*Keyway processing

\*Set screw tap (two points at 120° intervals)

Note: No set screws are provided.

### BW Selectable Hub

Hub No.	Max. Bore Dia. $d_{max}$	Pilot Bore Dia. $d$	Hub Dia. $H_b$	Hub Length $H_L$	Tap Position $a$	Weight (kg)	Standard Bore Dia.																		
							Finished Bore Dia. $d$ Tolerance H8																		
							25	28	30	35	38	40	45	50	55	60	65	70	75	80	85	90	95	100	110
SB1	50	18	73	45	12	1.4																			
SB2	55	18	83	50	15	2.0																			
SB3	60	18	93	55	15	2.8																			
SB4	65	18	98	60	15	3.4																			
SB5	75	28	107	68	18	4.5																			
SB6	80	33	117	76	18	5.9																			
SB7	85	33	127	86	18	8.0																			
SB8	95	33	137	98	24	10.7																			
SB9	100	38	147	101	24	12.6																			
SB10	110	38	157	111	24	15.9																			
SB11	115	38	167	122	30	19.9																			

### CW Selectable Hub

Hub No.	Max. Bore Dia. $d_{max}$	Pilot Bore Dia. $d$	Hub Dia. $H_b$	Hub Length $H_L$	Tap Position $a$	Weight (kg)	Standard Bore Dia.																		
							Finished Bore Dia. $d$ Tolerance H8																		
							25	28	30	35	38	40	45	50	55	60	65	70	75	80	85	90	95	100	110
SC1	50	18	73	22.5	8	0.7																			
SC2	55	18	83	25.0	10	1.0																			
SC3	60	18	93	27.5	10	1.4																			
SC4	65	18	98	30.0	10	1.7																			
SC5	75	28	107	34.0	12	2.2																			
SC6	80	33	117	38.0	12	3.0																			
SC7	85	33	127	43.0	12	4.0																			
SC8	95	33	137	49.0	16	5.3																			
SC9	100	38	147	50.5	16	6.3																			
SC10	110	38	157	55.5	16	7.9																			
SC11	115	38	167	61.0	20	9.9																			
SC12	130	38	187	70.5	20	14.6																			

Note: Two hubs are used for each sprocket

### BW1 Selectable Hub

Hub No.	Max. Bore Dia. $d_{max}$	Pilot Bore Dia. $d$	Hub Dia. $H_b$	Hub Length $H_L$	Tap Position $a$	Weight (kg)	Standard Bore Dia.																						
							Finished Bore Dia. $d$ Tolerance H8																						
							50	55	60	65	70	75	80	90	95	100	110	120	130	140	145	150	160	170	175	180	190	200	210
TB1	100	50	147	125	24	14.7																							
TB2	110	55	157	135	24	18.0																							
TB3	120	60	177	150	30	25.6																							
TB4	130	65	187	160	30	30.3																							
TB5	145	75	207	180	30	41.3																							
TB6	160	80	227	200	30	55.6																							
TB7	160	80	227	220	30	61.2																							
TB8	175	85	247	220	36	72.9																							
TB9	175	85	247	240	36	79.5																							
TB10	190	95	267	240	36	92.1																							
TB11	190	95	267	270	36	103.6																							
TB12	210	100	297	260	36	125.3																							

# Selecting Hub Specifications & Dimensions

## CW1 Selectable Hub

Hub No.	Max. Bore Dia. $d_{max}$	Pilot Bore Dia. $d$	Hub Dia. $H_D$	Hub Length $H_L$	Tap Position $a$	Weight (kg)	Standard Bore Dia.																				
							Finished Bore Dia. $d$											Tolerance H8									
							50	55	60	65	70	75	80	90	95	100	110	120	130	140	145	150	160	170	175	180	190
TC1	100	50	147	125	16	14.7																					
TC2	110	55	157	135	16	18.0																					
TC3	120	60	177	150	20	25.6																					
TC4	130	65	187	160	20	30.3																					
TC5	145	75	207	180	20	41.3																					
TC6	160	80	227	200	20	55.6																					
TC7	160	80	227	220	20	61.2																					
TC8	175	85	247	220	24	72.9																					
TC9	175	85	247	240	24	79.5																					
TC10	190	95	267	240	24	92.1																					
TC11	190	95	267	270	24	103.6																					
TC12	210	100	297	260	24	125.3																					

## 2. Keyway and Tap Specifications and Dimensions

### Keyway tolerance

- JIS key (JISB1301-1996)
- Standard key type (Js9)
- Old JIS (JISB1301-1959)
- Parallel key type 2 (E9)

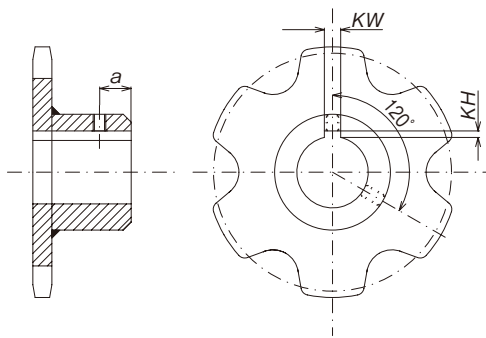
### Keyway phase

Phase alignment processing of tooth center and key center.

### Tap holes for set screws

Open the tap holes at 120° intervals. One of the holes must be located on the keyway. Refer to the list of selectable hub specifications and dimensions for size "a" in the direction of the shaft.

Note: No set screws are provided.



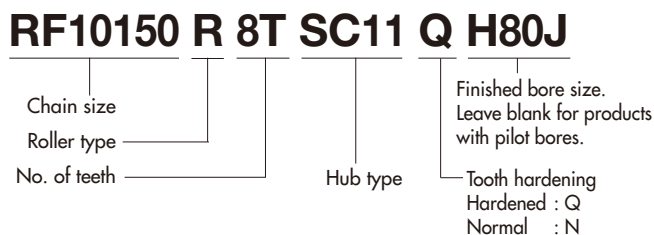
JIS Standard Key – Keyway Width Tolerance Js9				Old JIS Key Type 2 – Keyway Width Tolerance E9			
Applicable Bore Dia.	Keyway Width KW	Keyway Depth KH	Tap Size MX	Applicable Bore Dia.	Keyway Width KW	Keyway Depth KH	Tap Size MX
More than 22, up to 30	8	3.3	M 6	More than 20, up to 30	7	3	M 6
More than 30, up to 38	10	3.3	M 8	More than 30, up to 40	10	3.5	M 8
More than 38, up to 44	12	3.3		More than 40, up to 50	12	3.5	
More than 44, up to 50	14	3.8	M10	More than 50, up to 60	15	5	M10
More than 50, up to 58	16	4.3		More than 60, up to 70	18	6	
More than 58, up to 65	18	4.4	M12	More than 70, up to 80	20	6	M12
More than 65, up to 75	20	4.9		More than 80, up to 95	24	8	
More than 75, up to 85	22	5.4	M16	More than 95, up to 110	28	9	M16
More than 85, up to 95	25	5.4		More than 110, up to 125	32	10	
More than 95, up to 110	28	6.4	M20	More than 125, up to 140	35	11	M20
More than 110, up to 130	32	7.4		More than 140, up to 160	38	12	
More than 130, up to 150	36	8.4	M24	More than 160, up to 180	42	13	M24
More than 150, up to 170	40	9.4		More than 180, up to 200	45	14	
More than 170, up to 220	45	10.4	M24	More than 200, up to 224	50	15.5	M24
More than 200, up to 230	50	11.4		More than 224, up to 250	56	17.5	

When selecting a hub, select an outer diameter smaller than those listed below to avoid interference between the hub outer diameter and the chain link plates or plate balance holes.

No. of Teeth	6T	8T	10T	12T
	TSUBAKI Chain No.			
RF03075	83	129	176	223
RF03100	126	195	257	320
RF05075	–	120	167	214
RF05100	114	183	248	311
RF05125	158	243	326	235
RF05150	201	303	245	305
RF08125	162	246	324	235
RF08150	205	307	235	305
RF10100	107	169	232	294
RF10125	150	235	313	235
RF10150	194	296	235	295
RF12200	273	245	335	425
RF12250	235	345	445	555
RF17200	265	392	325	415
RF17250	352	325	435	545
RF17300	295	425	555	685
RF26200	242	365	315	395
RF26250	336	315	425	535
RF26300	275	405	535	665
RF36250	315	295	405	515
RF36300	408	385	525	655
RF430	125	194	262	328
RF204	–	105	149	193
RF450	121	184	248	312
RF650	198	302	235	305
RF214	110	179	246	313
RF205	–	122	174	225
RF6205	190	294	235	305
RF212	183	286	388	295

## 3. Model Number

Use the following model legend to specify your desired sprocket dimensions and selectable hub.





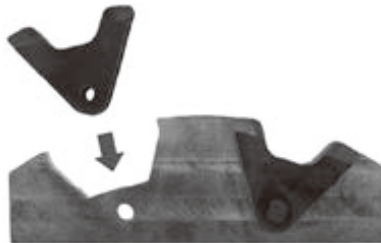
Sprocket teeth wear has a major impact on conveyor chain life.

When sprocket teeth wear, it is necessary to replace the worn areas of the teeth or the whole sprocket. Both of these involve massive maintenance and replacement costs. Further, when the tooth wall is worn away it makes maintaining and managing tooth profile precision difficult, which can shorten the life of the chain.

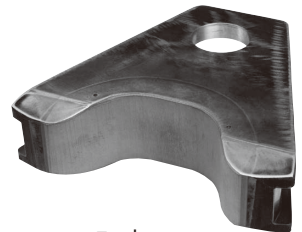
Tsubaki manufactures a variety of sprockets that can help you reduce your sprocket maintenance and replacement costs.

#### ● Replaceable tooth insert sprockets

Thanks to a deep quench hardened layer using unique Tsubaki know-how, these replaceable tooth insert sprockets are highly wear resistant, keeping wear to a minimum. Any worn teeth can be pulled from the sprocket and replaced individually for added convenience.



Any worn teeth can be pulled from the sprocket and replaced individually



Tooth insert

#### ● Thermally sprayed replaceable tooth insert sprocket

In addition to the features of regular replaceable tooth inserts, these inserts are thermally sprayed using the same technique for our long-lasting FA Series conveyor chain for even greater wear resistance. Test results show that they have over twice the life of non-thermally sprayed replaceable tooth inserts.



Tooth insert

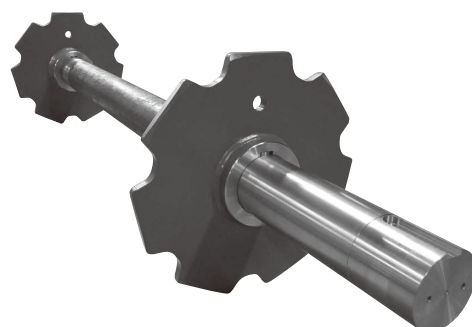
#### ● Split sprockets

The sprocket itself can be split, allowing it to be easily mounted and removed from the shaft or replaced as a whole. We can also provide ring-tooth type split sprockets where the section around the shaft remains the same while just the teeth are split.



#### ● Sprockets with shaft

Tsubaki can also deliver sprockets with the shaft attached, saving you from troublesome assembly work.

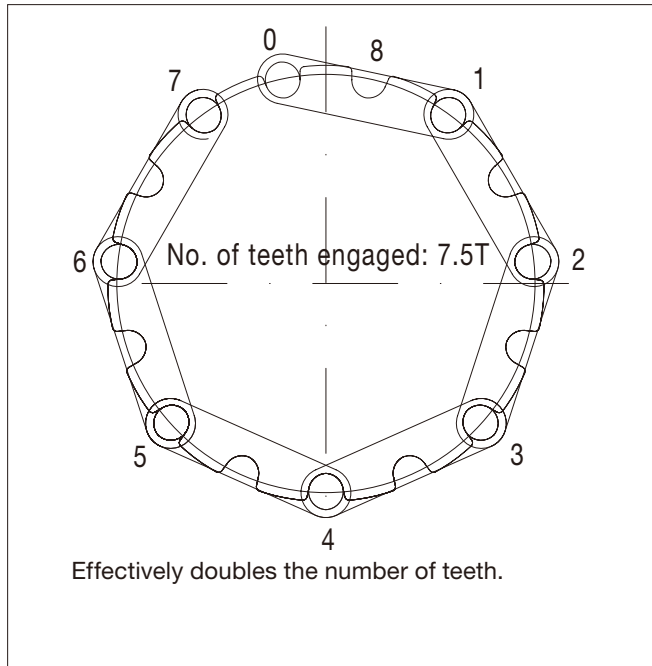


# Special Sprockets

## ● Hunting Tooth (Double Duty) Sprockets

These sprockets have an odd number of teeth (7.5T, 12.5T, etc.) and are half the pitch of the chain. Every time the sprocket makes one revolution, the chain engages with one set of teeth, ahead of the previously engaged set. Ideal for when there are severe wear conditions acting on the teeth. Select a standard hub with Hunting Tooth sprockets.

Hunting Tooth (Double Duty) Sprocket



Hunting Tooth Sprocket Number of Teeth and Plate Dimensions Unit : mm

TSUBAKI Chain Number	No. of Engaging Teeth	Pitch Dia. $D_p$	Outer Dia. ( $D_o$ )	Tooth Width $T$
<b>RF03075S</b>	7.5	184.4	194	11.9
	12.5	301.6	311	
<b>RF03100S</b>	7.5	245.9	253	18
	12.5	402.1	412	
<b>RF05100S</b>	7.5	245.9	257	18
	12.5	402.1	416	
<b>RF05125S</b>	7.5	307.3	313	22
	12.5	502.6	516	
<b>RF05150S</b>	7.5	368.8	369	22
	12.5	603.2	616	
<b>RF08125S</b>	7.5	307.3	321	22
	12.5	502.6	516	
<b>RF08150S</b>	7.5	368.8	378	22
	12.5	603.2	617	
<b>RF10125S</b>	7.5	307.3	322	22
	12.5	502.6	520	
<b>RF10150S</b>	7.5	368.8	378	22
	12.5	603.2	621	
<b>RF430S</b>	7.5	249.8	260	22
	12.5	408.5	421	
<b>RF450S</b>	7.5	249.8	263	28
	12.5	408.5	422	
<b>RF650S</b>	7.5	374.7	390	28
	12.5	612.8	628	
<b>RF12200S</b>	7.5	491.7	510	40
	12.5	804.2	825	
<b>RF12250S</b>	7.5	614.6	623	40
	12.5	1005.3	1026	
<b>RF17200S</b>	7.5	491.7	516	40
	12.5	804.2	828	
<b>RF17250S</b>	7.5	614.6	637	40
	12.5	1005.3	1029	
<b>RF17300S</b>	7.5	737.6	749	22
	12.5	1206.3	1230	
<b>RF6205S</b>	7.5	374.7	396	22
	12.5	612.8	634	

## Formula for Sprocket Dimensions

### ● Pitch diameter

$$D_p = P / \sin(180^\circ / N)$$

$P$  = Chain pitch (mm)

$N$  = Sprocket number of teeth

### ● Outer diameter (rough)

Precision welded teeth :  $D_o = D_p + 0.6R$

Machine cut teeth :  $D_o = D_p + 0.4R$

$R$  = Chain roller diameter (mm)

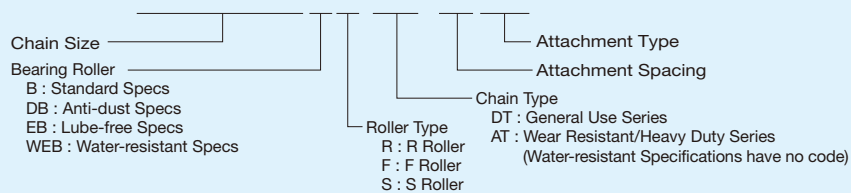
# Wear Resistant/ Heavy Duty Conveyor Chain

## Bearing Roller Conveyor Chain (Standard/Lube Free Series)

### Ordering Wear Resistant/ Heavy Duty Conveyor Chain

#### ● Chain Numbering Example

**RF03075BR-DT-1LA2**

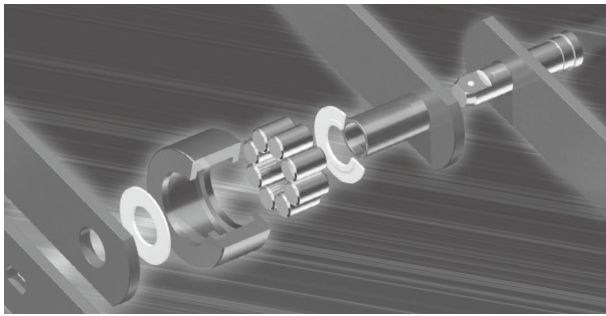


#### ● Ordering Example

Chain Size: RF10, Pitch: 150mm  
 Bearing Roller Type: Standard Series, Current Specs, F roller  
 Chain Type: General Use (DT Series)  
 Attachment Spacing/Type: A2 every link  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF10150BF-DT-1LA2</b>	400	L

# Bearing Roller Conveyor Chain



Tsubaki's Bearing Roller Conveyor Chain, with its unique cylindrical bearings within the rollers, is able to provide the high efficiency, reduced costs, suppression of stick-slip phenomenon, and longer roller/rail life that existing chains cannot.

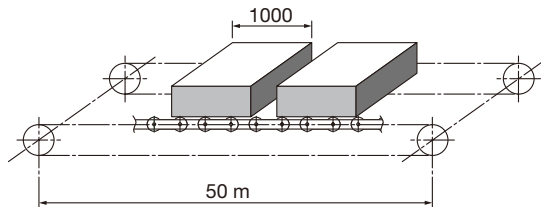


## ● Performance and Effects of Bearing Rollers

Standard Conveyor chains	Bearing Rollers Conveyor chains	Bearing Roller Features	Bearing Roller Effects
<p>Slip! Stick-slip!</p>	<p>Bearing rotate</p>	<ol style="list-style-type: none"> <li>1. Reduces chain running resistance (1/3 of DT Series)</li> <li>2. Greatly increases roller allowable load</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduces chain tension, required motor capacity</li> <li>2. Prevents stick-slip phenomenon during long-length/low speed conveyance</li> <li>3. Reduces rail wear and stops poor roller rotation</li> <li>4. Increases wear life (bush-roller)</li> <li>5. Reduces CO<sub>2</sub> output</li> </ol>

## ● Cost Comparison with Standard Conveyor Chains

### Selection Example



Conveyor length: 50 m  
 Chain speed: 10 m/min  
 Chain pitch: 250  
 Conveyed material: 2,000 kgf x 40 pcs  
 No. of strands: 2  
 F roller: A2 attachment

### When selecting using the conditions above

**For new installations**

RF standard conveyor chain	Bearing roller conveyor chain
RF26250F	RF12250BF
Chain tensile strength	
2 sizes down	Chain size
0.08 (when lubed)	0.03
1/3	Coefficient of friction
31.4 kN (3200 kgf)	11.8 kN (1200 kgf)
1/3	Chain tensile strength
13.5 kW	5.1 kW
1/2.5	Motor capacity

**Smaller chain design, energy savings**

**When replacing existing installations**

RF standard conveyor chain	Bearing roller conveyor chain
RF26250F	RF26250BF
Chain tensile strength	
No change in size	Chain size
0.08 (when lubed)	0.03
1/3	Coefficient of friction
31.4 kN (3200 kgf)	11.8 kN (1200 kgf)
1/3	Chain tensile strength
13.5 kW	5.1 kW
1/2.5	Motor capacity
1	Replacement costs
1/3 less	Wear life
	More than 3X

**Greatly increases chain life, allowing for less conveyor maintenance work and lower costs**

# Bearing Roller Conveyor Chain

## Specification Details

Series Specification		Standard Series				Lube-Free Series								
		Standard Specs		Anti-Dust Specs		Standard Specs		Completely Lube-Free Specs		Water Resistant Specs				
Type		BR BF		DBR DBF		EBR EBF		AEBR AEBF		WEBR WEBF				
Operating Environment		Room temperature, away from water and dust		Dust may be present (cannot be used when chain will be buried in dust)		Room temperature, away from water and dust		Room temperature, away from water and dust		Room temperature, in contact with water				
Roller Lubrication		Requires regular lube		Requires regular lube		Can be used without lubricating the roller		Packaged and shipped lubed, no further lubing necessary		Packaged and shipped lubed, no further lubing necessary (cannot be used in dust environments)				
Operating Temperature		-20°C to 80°C (can be manufactured to withstand up to 150°C)		-10°C to 80°C		-20°C to 50°C		-20°C to 50°C		0°C to 50°C				
Roller Allowable Load	R Roller	Chain Size	RF03	1.96kN { 200kgf}	—	—	1.96kN { 200kgf}	—	—	1.37kN { 140kgf}				
			RF05	3.04kN { 310kgf}	—	—	3.04kN { 310kgf}	3.04kN { 310kgf}	3.04kN { 310kgf}	2.13kN { 220kgf}				
			RF08	4.12kN { 420kgf}	—	—	4.12kN { 420kgf}	4.12kN { 420kgf}	4.12kN { 420kgf}	2.88kN { 290kgf}				
			RF10	5.49kN { 560kgf}	5.49kN { 560kgf}	5.49kN { 560kgf}	5.49kN { 560kgf}	5.49kN { 560kgf}	5.49kN { 560kgf}	3.84kN { 390kgf}				
			RF12	8.34kN { 850kgf}	8.34kN { 850kgf}	8.34kN { 850kgf}	8.34kN { 850kgf}	8.34kN { 850kgf}	8.34kN { 850kgf}	5.84kN { 600kgf}				
			RF17	14.1kN {1440kgf}	14.1kN {1440kgf}	14.1kN {1440kgf}	14.1kN {1440kgf}	14.1kN {1440kgf}	14.1kN {1440kgf}	9.87kN {1010kgf}				
			RF26	19.6kN {2000kgf}	19.6kN {2000kgf}	19.6kN {2000kgf}	19.6kN {2000kgf}	19.6kN {2000kgf}	19.6kN {2000kgf}	13.7kN {1400kgf}				
			RF36	27.5kN {2800kgf}	27.5kN {2800kgf}	27.5kN {2800kgf}	27.5kN {2800kgf}	27.5kN {2800kgf}	27.5kN {2800kgf}	19.3kN {1970kgf}				
			RF03	1.27kN { 130kgf}	—	—	1.27kN { 130kgf}	—	—	0.89kN { 90kgf}				
	F Roller	Chain Size	RF05	1.96kN { 200kgf}	—	—	1.96kN { 200kgf}	1.96kN { 200kgf}	1.96kN { 200kgf}	1.37kN { 140kgf}				
			RF08	2.65kN { 270kgf}	—	—	2.65kN { 270kgf}	2.65kN { 270kgf}	2.65kN { 270kgf}	1.86kN { 190kgf}				
			RF10	3.43kN { 350kgf}	3.43kN { 350kgf}	3.43kN { 350kgf}	3.43kN { 350kgf}	3.43kN { 350kgf}	3.43kN { 350kgf}	2.40kN { 240kgf}				
			RF12	5.49kN { 560kgf}	5.49kN { 560kgf}	5.49kN { 560kgf}	5.49kN { 560kgf}	5.49kN { 560kgf}	5.49kN { 560kgf}	3.84kN { 390kgf}				
			RF17	9.81kN {1000kgf}	9.81kN {1000kgf}	9.81kN {1000kgf}	9.81kN {1000kgf}	9.81kN {1000kgf}	9.81kN {1000kgf}	6.87kN { 700kgf}				
			RF26	13.7kN {1400kgf}	13.7kN {1400kgf}	13.7kN {1400kgf}	13.7kN {1400kgf}	13.7kN {1400kgf}	13.7kN {1400kgf}	9.59kN { 980kgf}				
			RF36	18.6kN {1900kgf}	18.6kN {1900kgf}	18.6kN {1900kgf}	18.6kN {1900kgf}	18.6kN {1900kgf}	18.6kN {1900kgf}	13.0kN {1330kgf}				
			Coefficient of Roller Rotation Friction		0.03		0.05*		0.03		0.03		0.03	
			Chain Allowable Speed	Sprocket No. of Teeth	6	15m/min	15m/min	—	—	—				
8	25m/min	25m/min			15m/min	15m/min	15m/min							
10	30m/min	30m/min			20m/min	20m/min	20m/min							
12	30m/min	30m/min			25m/min	25m/min	25m/min							

\*As Anti-Dust Specs are designed for use in dusty environments, their coefficient of friction is slightly higher. Contact a Tsubaki representative when selecting.

## Allowable Load for Standard A Attachments

Allowable vertical load for A type attachments is as per the table below. Where the load works with the roller, allowable roller load should be compared to that of the attachment, and the smaller value used.

Note: Values for K Attachments are double those of A Attachments.

Allowable Load for A Attachments kN{kgf}/pc

Chain Size	Standard Series DT	Standard Series AT
RF03075	0.78{80}	1.18{120}
RF03100	0.93{95}	1.42{145}
RF05075	1.03{105}	1.57{160}
RF05100	1.32{135}	1.96{200}
RF05125	1.52{155}	2.26{230}
RF05150	1.72{175}	2.55{260}
RF08125	2.45{250}	3.68{375}
RF08150	2.79{285}	4.17{425}
RF10100	2.06{210}	3.09{315}
RF10125	2.30{235}	3.48{355}
RF10150	2.60{265}	3.92{400}
RF12200	4.41{450}	5.30{540}
RF12250	5.30{540}	6.37{650}

Allowable Load for A Attachments kN{kgf}/pc

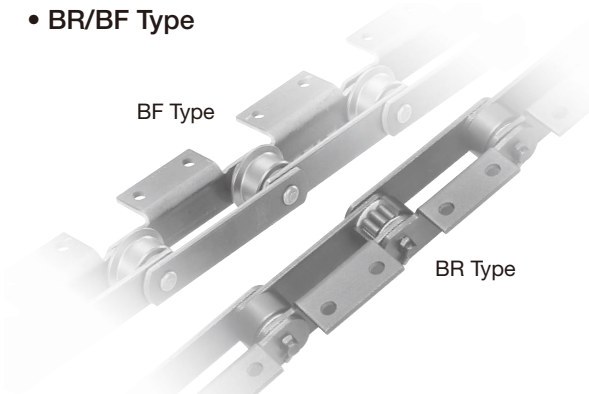
Chain Size	Standard Series DT	Standard Series AT
RF17200	4.85{495}	5.74{585}
RF17250	6.72{685}	6.86{700}
RF17300	8.68{885}	9.8{1000}
RF26200	4.41{450}	6.47{660}
RF26250	6.28{640}	9.12{930}
RF26300	8.14{830}	9.16{980}
RF26450	6.67{680}	6.67{680}
RF36300	3.33{340}	3.33{340}
RF36450	6.86{700}	6.86{700}
RF36600	8.63{880}	8.63{880}

# Bearing Roller Conveyor Chain

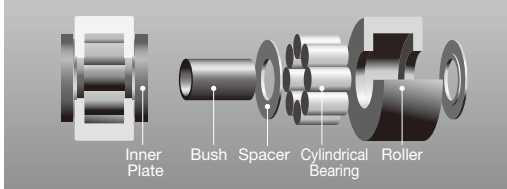
## Standard Series

### <Standard Specs>

- BR/BF Type

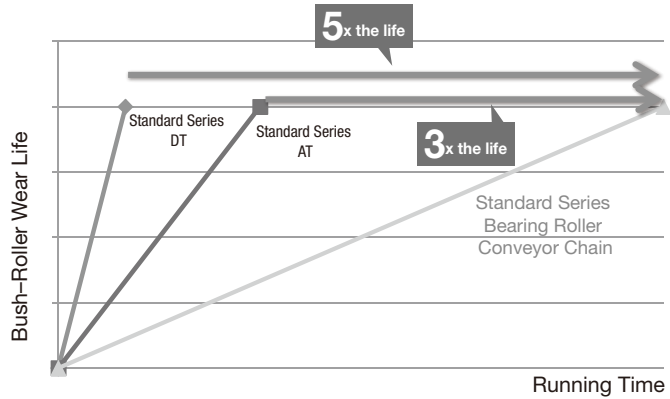


#### Construction



- Features cylindrical bearings between rollers and bushes.
- Same dimensions as standard R and F rollers on RF Conveyor Chains.

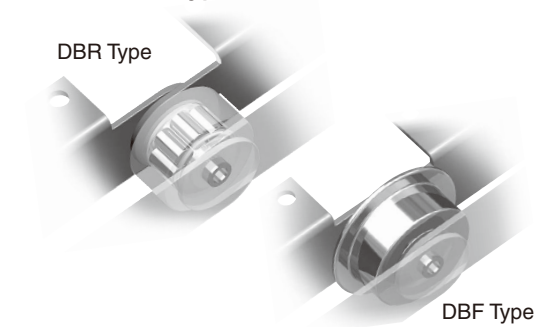
#### In-house test comparison, no additional lubrication



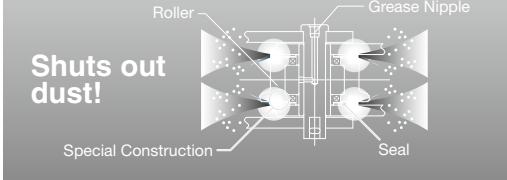
**5x the wear life of DT Series and 3x the wear life of AT Series, without additional lubrication.**

### <Anti-dust Specs>

- DBR/DBF Type

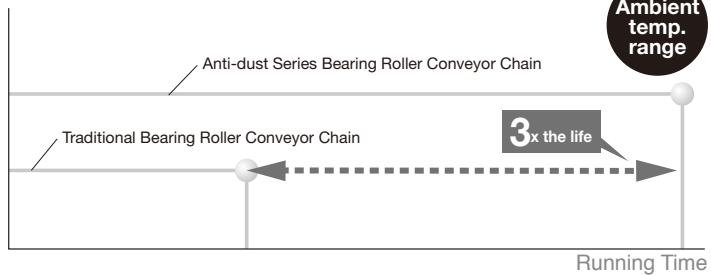


#### Construction



- Exhibits the same performance and efficiency of the Bearing Roller Conveyor Chain, even in dusty environments.
- Same dimensions as standard R or F rollers on RF Conveyor Chains.

#### Comparison of Wear Performance in Dusty Environments (in house test comparison, no additional lubrication)

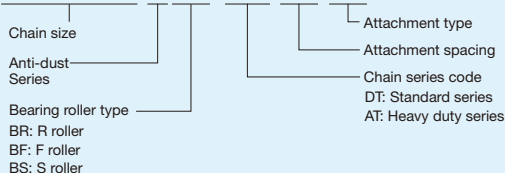


**3x the wear life of Bearing Roller Conveyor Chain Standard Specs.**

## Ordering Bearing Roller Conveyor Chain

### Chain Numbering Example

**RF10100 DBR -DT-1L-A2**



### Ordering Example

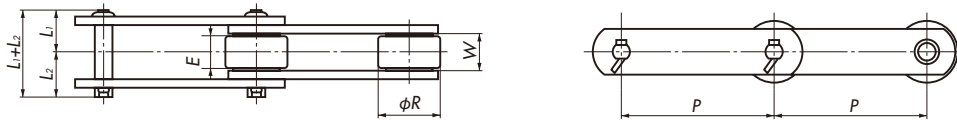
Chain size = RF03, Pitch = 75mm,  
 Bearing roller type = Standard series w/R roller,  
 Chain series = AT series  
 Attachment spacing/type = A2 att. every link  
 Quantity = 400L

Chain number	Quantity	Unit
<b>RF03075BR-AT-1LA2</b>	400	L



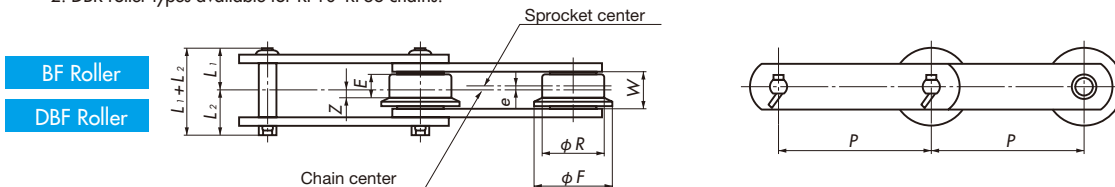
# Bearing Roller Conveyor Chain

BR Roller  
DBR Roller



Chain Size	Pitch $P$	Inner Link Inner Width $W$	Pin			R Roller		Roller Allowable Load $kN\{kgf\}/pc$	Approx. Mass $kg/m$	Max. Allowable Tension	
			$L_1+L_2$	$L_1$	$L_2$	Diameter $R$	Contact Width $E$			DT Series $kN\{kgf\}$	AT Series $kN\{kgf\}$
RF03075	75	16.1	38.0	18.0	20.0	31.8	14.0	1.96{200}	2.8	4.12{420}	7.85{800}
RF03100	100										
RF05100	100	22.0	53.5	25.0	28.5	40.0	19.0	3.04{310}	5.2	9.81{1000}	14.7{1500}
RF05125	125										
RF05150	150	4.2									
RF08125	125	27.0	65.5	31.0	34.5	44.5	24.0	4.12{420}	5.9	10.8{1100}	14.7{1500}
RF08150	150										
RF10100	100	30.0	69.0	33.0	36.0	50.8	26.0	5.49{560}	10.0	15.7{1620}	23.5{2400}
RF10125	125										
RF10150	150	8.0									
RF12200	200	37.1	83.5	40.5	43.0	65.0	32.0	8.34{850}	11.6	26.5{2700}	36.3{3700}
RF12250	250										
RF17200	200	51.4	109.5	51.5	58.0	80.0	44.0	14.1{1440}	20.0	34.3{3500}	54.9{5600}
RF17250	250										
RF17300	300	16.0									
RF26250	250	57.2	116.5	55.5	61.0	100.0	50.0	19.6{2000}	26.0	44.1{4500}	72.6{7400}
RF26300	300										
RF26450	450	19.0									
RF36300	300	66.7	146.0	68.0	78.0	125.0	56.0	27.5{2800}	40.0	67.7{6900}	97.1{9900}
RF36450	450										
RF36600	600	28.0									

Note: 1. Contact a Tsubaki representative for inch pitch size.  
2. DBR roller types available for RF10–RF36 chains.



BF Roller  
DBF Roller

Chain Size	Pitch $P$	Inner Link Inner Width $W$	Pin			F Roller					Roller Allowable Load $kN\{kgf\}/pc$	Approx. Mass $kg/m$	Max. Allowable Tension	
			$L_1+L_2$	$L_1$	$L_2$	Diameter $R$	Flange Diameter $F$	Contact Width $E$	Off- Center $e$	$Z$			DT Series $kN\{kgf\}$	AT Series $kN\{kgf\}$
RF03075	75	16.1	38.0	18.0	20.0	31.8	42.0	11.0	1.5	4.3	1.27{130}	2.9	4.12{420}	7.85{800}
RF03100	100													
RF05100	100	22.0	53.5	25.0	28.5	40.0	50.0	14.0	2.5	4.5	1.96{200}	5.4	9.81{1000}	14.7{1500}
RF05125	125													
RF05150	150	4.4												
RF08125	125	27.0	65.5	31.0	34.5	44.5	55.0	18.0	2.5	6.5	2.65{270}	6.2	10.8{1100}	14.7{1500}
RF08150	150													
RF10125	125	30.0	69.0	33.0	36.0	50.8	65.0	20.0	3.0	7.0	3.43{350}	9.0	15.7{1620}	23.5{2400}
RF10150	150													
RF12200	200	37.1	83.5	40.5	43.0	65.0	80.0	24.0	4.0	8.0	5.49{560}	12.1	26.5{2700}	36.3{3700}
RF12250	250													
RF17200	200	51.4	109.5	51.5	58.0	80.0	100.0	34.0	5.0	12.0	9.81{1000}	21.0	34.3{3500}	54.9{5600}
RF17250	250													
RF17300	300	16.0												
RF26250	250	57.2	116.5	55.5	61.0	100.0	125.0	38.0	6.0	13.0	13.7{1400}	27.0	44.1{4500}	72.6{7400}
RF26300	300													
RF26450	450	19.0												
RF36300	300	66.7	146.0	68.0	78.0	125.0	150.0	42.0	7.0	14.0	18.6{1900}	42.0	67.7{6900}	97.1{9900}
RF36450	450													
RF36600	600	29.0												

Note: 1. Contact a Tsubaki representative for inch pitch size.  
2. DBF roller types available for RF10–RF36 chains.

# Bearing Roller Conveyor Chain

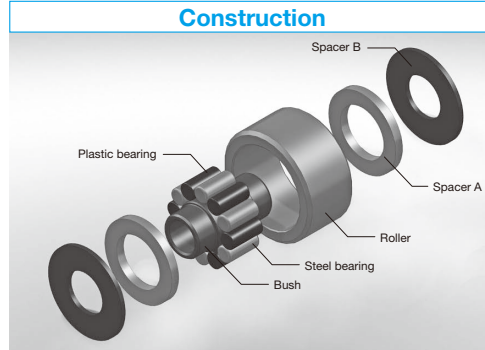
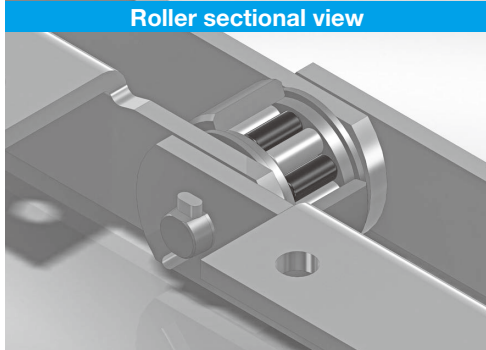
## Lube-Free Series

### (Standard Specs)

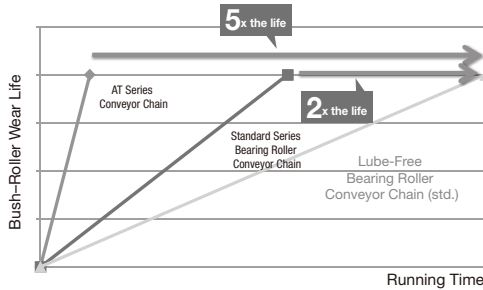
- EBR/EBF Type

Tsubaki's Lube-Free Series uses special cylindrical bearings with self-lubricating functions between the bush and roller. Can be used without lubricating the rollers.

Note: RT Series: Pin, bush, and roller are SUS 400 series for greater corrosion resistance.



In-house test comparison, no additional lubrication

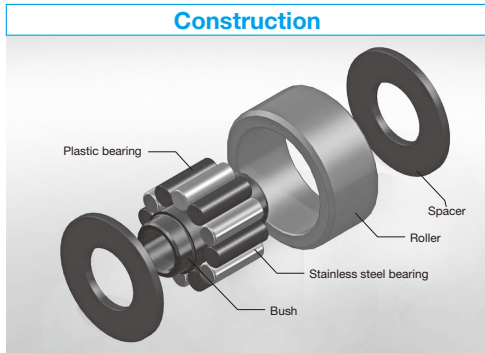
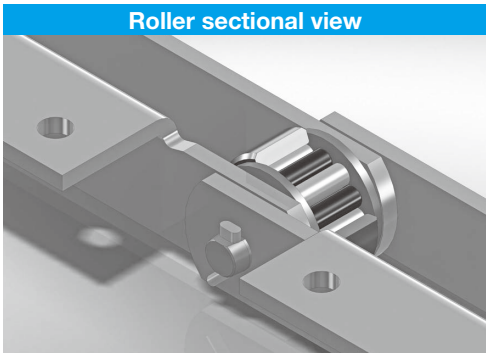


**Has 5x the wear life of Standard Conveyor Chain DT Series and 2x the wear life of Bearing Roller Conveyor Chain Standard Specs without additional lubrication.**

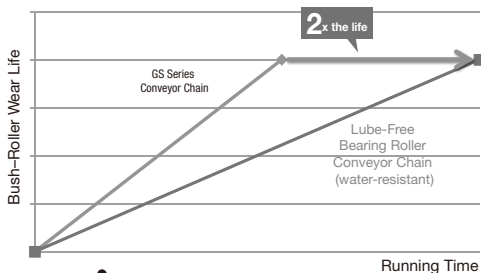
### (Water Resistant Specs)

- WEBR/WEBF Type

Tsubaki's Lube-Free Series uses special cylindrical bearings with self-lubricating functions between the bush and roller. Can be used without lubricating the rollers.



In-house test comparison, no additional lubrication

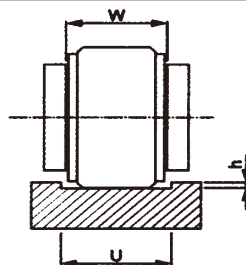


**2x the wear life of Standard Conveyor Chain RT Series without additional lubrication.**



### Rail mounting

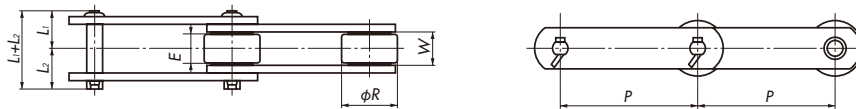
When using Lube-free Series Water Resistant Specs, be sure to use a grooved rail. There is little difference in roller and spacer diameters, so the groove width (U) needs to be larger than the inner link inner width (W). Recommended rail groove depth can be found in the table on the right.



Chain size	Rail groove depth h
RF03	1.6
RF05	1.6
RF08	1.6
RF10	2.1
RF12	2.1
RF17	2.1
RF26	2.1
RF36	2.6

# Bearing Roller Conveyor Chain

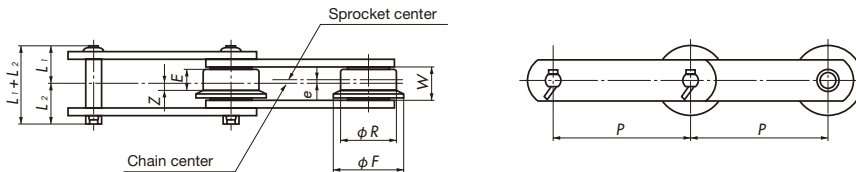
EBR Roller  
WEBR Roller



Chain Size	Pitch P	Inner Link Inner Width W	Pin			R Roller		Roller Allowable Load kN(kgf)/pc	Approx. Mass kg/m	Max. Allowable Tension	
			L <sub>1</sub> +L <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	Diameter R	Contact Width E			AT Series kN(kgf)	WZBR Series kN(kgf)
RF03075	75	16.1	38.0	18.0	20.0	31.8	14.0 (12.3)	1.96{200} (1.37{140})	2.8	5.50{560}	2.88{290}
RF03100	100										
RF05100	100	22.0	53.5	25.0	28.5	40.0	19.0 (17.0)	3.04{310} (2.13{220})	5.2	10.3{1050}	6.87{700}
RF05125	125										
RF05150	150										
RF08125	125	27.0	65.5	31.0	34.5	44.5	24.0 (21.0)	4.12{420} (2.88{290})	5.9	10.3{1050}	7.56{770}
RF08150	150										
RF10100	100	30.0	69.0	33.0	36.0	50.8	26.0 (23.0)	5.49{560} (3.84{390})	10.0	16.5{1680}	11.0{1120}
RF10125	125										
RF10150	150										
RF12200	200	37.1	83.5	40.5	43.0	65.0	32.0 (28.0)	8.34{850} (5.84{600})	11.6	25.4{2590}	18.6{1900}
RF12250	250										
RF17200	200	51.4	109.5	51.5	58.0	80.0	44.0 (40.0)	14.1{1440} (9.87{1010})	20.0	38.4{3920}	24.0{2450}
RF17250	250										
RF17300	300										
RF26250	250	57.2	116.5	55.5	61.0	100.0	50.0 (46.0)	19.6{2000} (13.7{1400})	26.0	50.8{5180}	30.9{3150}
RF26300	300										
RF26450	450										
RF36300	300	66.7	146.0	68.0	78.0	125.0	56.0 (55.0)	27.5{2800} (19.3{1970})	40.0	68.0{6930}	47.4{4830}
RF36450	450										
RF36600	600										

Note: 1. Contact a Tsubaki representative for inch pitch size. 2. Numbers in ( ) are when WEBR roller type is used. 3. WEBR roller types not available for RF26450, RF36450, and RF36600.

EBF Roller  
WEBF Roller



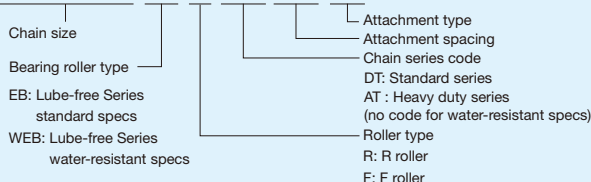
Chain Size	Pitch P	Inner Link Inner Width W	Pin			F Roller					Roller Allowable Load kN(kgf)/pc	Approx. Mass kg/m	Max. Allowable Tension	
			L <sub>1</sub> +L <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	Diameter R	Flange Diameter F	Contact Width E	Off-Center e	Z			AT Series kN(kgf)	WZBF Series kN(kgf)
RF03075	75	16.1	38.0	18.0	20.0	31.8	42.0	11.0 (9.1)	1.5 (1.6)	4.3 (3.0)	1.27{130} (0.89{90})	2.9	5.50{560}	2.88{290}
RF03100	100													
RF05100	100	22.0	53.5	25.0	28.5	40.0	50.0	14.0 (13.0)	2.5 (2.0)	4.5	1.96{200} (1.37{140})	5.4	10.3{1050}	6.87{700}
RF05125	125													
RF05150	150													
RF08125	125	27.0	65.5	31.0	34.5	44.5	55.0	18.0 (17.0)	2.5 (2.0)	6.5	2.65{270} (1.86{190})	6.2	10.3{1050}	7.56{770}
RF08150	150													
RF10125	125	30.0	69.0	33.0	36.0	50.8	65.0	20.0 (18.5)	3.0 (2.3)	7.0	3.43{350} (2.40{240})	9.0	16.5{1680}	11.0{1120}
RF10150	150													
RF12200	200													
RF12250	250	37.1	83.5	40.5	43.0	65.0	80.0	24.0 (22.0)	4.0 (3.0)	8.0	5.49{560} (3.84{390})	12.1	25.4{2590}	18.6{1900}
RF17200	200													
RF17250	250	51.4	109.5	51.5	58.0	80.0	100.0	34.0 (32.0)	5.0 (4.0)	12.0	9.81{1000} (6.87{700})	21.0	38.4{3920}	24.0{2450}
RF17300	300													
RF26250	250													
RF26300	300	57.2	116.5	55.5	61.0	100.0	125.0	38.0 (36.0)	6.0 (5.0)	13.0	13.7{1400} (9.59{980})	27.0	50.8{5180}	30.9{3150}
RF26450	450													
RF36300	300													
RF36450	450	66.7	146.0	68.0	78.0	125.0	150.0	42.0 (43.0)	7.0 (6.0)	14.0 (15.0)	18.6{1900} (15.0{1330})	42.0	68.0{6930}	47.4{4830}
RF36600	600													

Note: 1. Contact a Tsubaki representative for inch pitch size. 2. Numbers in ( ) are when WEBR roller type is used. 3. WEBF roller types not available for RF26450, RF36450, and RF36600.

## Ordering Bearing Roller Conveyor Chain

### Chain Numbering Example

**RF03075 EB R-DT-1L A2**



### Ordering Example

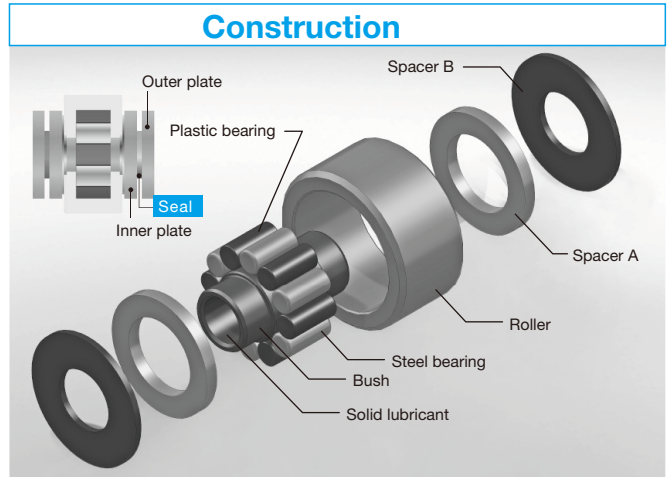
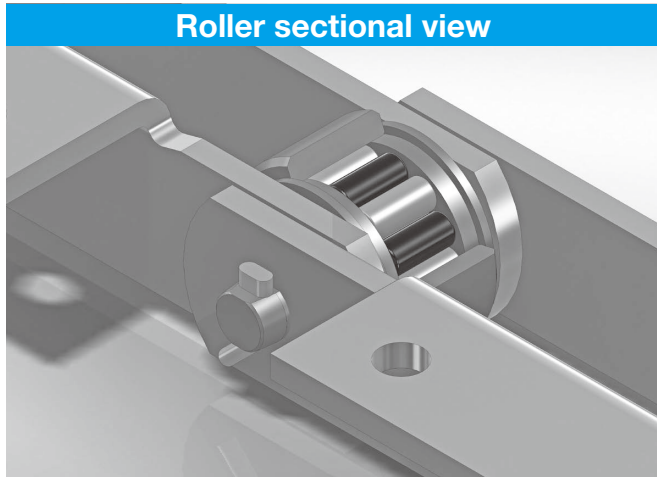
Chain size = RF03, Pitch = 75mm,  
Bearing roller type = Standard series w/R roller,  
Chain series = AT series  
Attachment spacing/type = A2 att. every link  
Quantity = 400L

Chain number	Quantity	Unit
<b>RF03075EBR-AT-1LA2</b>	400	L

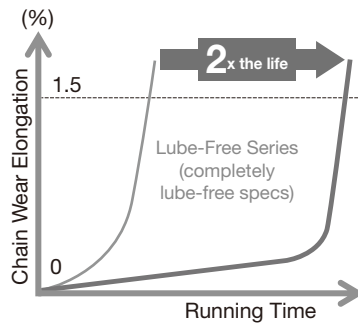
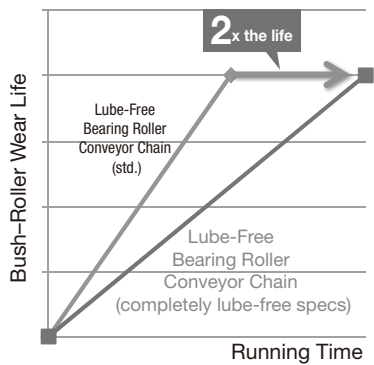
# Bearing Roller Conveyor Chain

## ■ Lube-Free Series (Completely Lube-Free Specs)

Completely Lube-Free Bearing Roller Conveyor Chain uses special cylindrical bearings with self-lubricating functions between the bushes and rollers, and further includes a solid lubricant to eliminate the need for additional lubrication.



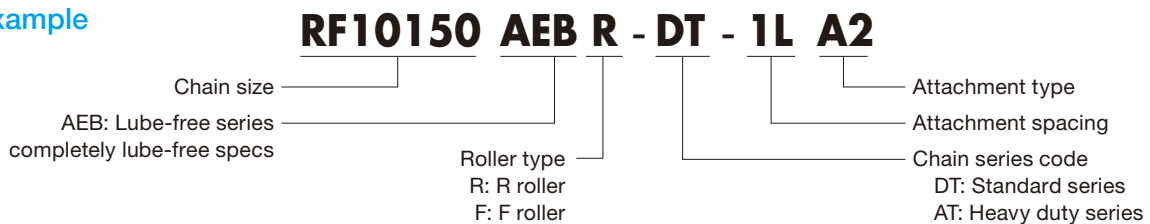
### In-house test comparison, no additional lubrication



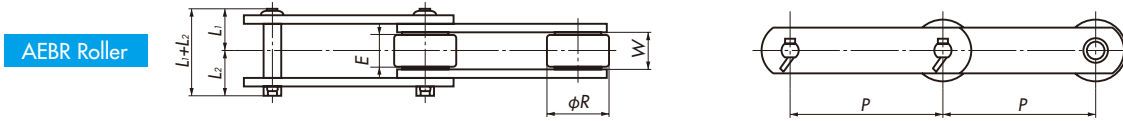
- Bush-roller  
2x the wear life of Bearing Roller Conveyor Chain (standard specs) without additional lubrication
- Pin-bush  
2x the wear life of Lube-Free Series (standard specs) without additional lubrication

### Ordering Bearing Roller Conveyor Chain

#### ● Chain Numbering Example

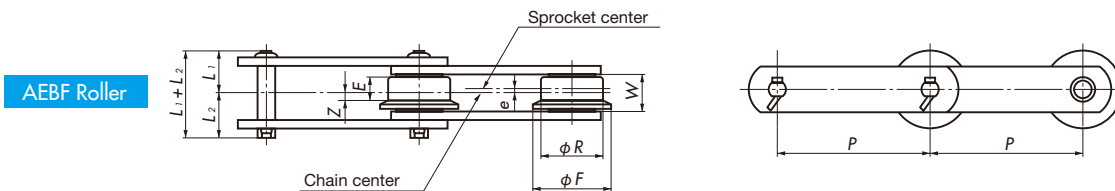


# Bearing Roller Conveyor Chain



Chain Size	Pitch P	Inner Link Inner Width W	Pin			R Roller		Roller Allowable Load kN{kgf}/pc	Approx. Mass kg/m	Max. Allowable Tension	
			L <sub>1</sub> +L <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	Diameter R	Contact Width E			DT Series kN{kgf}	AT Series kN{kgf}
RF05100	100								5.2		
RF05125	125	23.0	58.0	27.0	31.0	40.0	19.0	3.04{310}	4.5	6.87{700}	10.3{1050}
RF05150	150								4.2		
RF08125	125								5.9		
RF08150	150	28.5	70.5	33.5	37.0	44.5	24.0	4.12{420}	5.6	7.56{770}	10.3{1050}
RF10100	100								10.0		
RF10125	125	31.5	74.0	35.5	38.5	50.8	26.0	5.49{560}	8.7	11.0{1120}	16.5{1680}
RF10150	150								8.0		
RF12200	200								11.6		
RF12250	250	37.5	87.0	42.0	45.0	65.0	32.0	8.34{850}	10.4	18.6{1900}	25.4{2590}
RF17200	200								20.0		
RF17250	250	51.5	113.0	53.5	59.5	80.0	44.0	14.1{1440}	17.0	24.0{2450}	38.4{3920}
RF17300	300								16.0		
RF26250	250								26.0		
RF26300	300	57.5	120.0	57.5	62.5	100.0	50.0	19.6{2000}	23.0	30.9{3150}	50.8{5180}

Note: This chain is interchangeable with standard large size conveyor chain and can use the existing sprocket. However, the L<sub>1</sub> + L<sub>2</sub> dimension is different.



Chain Size	Pitch P	Inner Link Inner Width W	Pin			R Roller					Roller Allowable Load kN{kgf}/pc	Approx. Mass kg/m	Max. Allowable Tension	
			L <sub>1</sub> +L <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	Diameter R	Flange Diameter F	Contact Width E	Off-Center e	Z			DT Series kN{kgf}	AT Series kN{kgf}
RF05100	100											5.4		
RF05125	125	23.0	58.0	27.0	31.0	40.0	50.0	14.0	2.5	4.5	1.96{200}	4.6	6.87{700}	10.3{1050}
RF05150	150											4.4		
RF08125	125											6.2		
RF08150	150	28.5	70.5	33.5	37.0	44.5	55.0	18.0	2.5	6.5	2.65{270}	5.8	7.56{770}	10.3{1050}
RF10125	125											9.0		
RF10150	150	31.5	74.0	35.5	38.5	50.8	65.0	20.0	3.0	7.0	3.43{350}	8.3	11.0{1120}	16.5{1680}
RF12200	200											12.1		
RF12250	250	37.5	87.0	42.0	45.0	65.0	80.0	24.0	4.0	8.0	5.49{560}	10.8	18.6{1900}	25.4{2590}
RF17200	200											21.0		
RF17250	250	51.5	113.0	53.5	59.5	80.0	100.0	34.0	5.0	12.0	9.81{1000}	18.0	24.0{2450}	38.4{3920}
RF17300	300											16.0		
RF26250	250											27.0		
RF26300	300	57.5	120.0	57.5	62.5	100.0	125.0	38.0	6.0	13.0	13.7{1400}	24.0	30.9{3150}	50.8{5180}

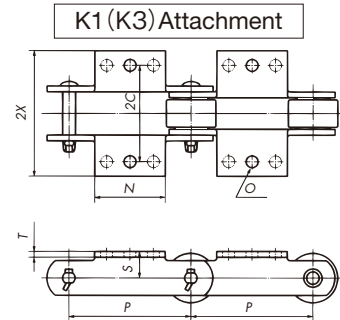
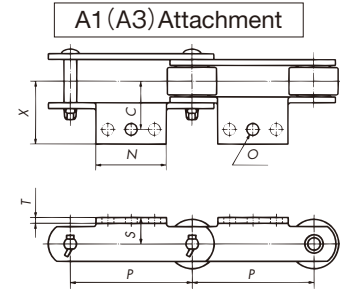
Note: This chain is interchangeable with standard large size conveyor chain and can use the existing sprocket. However, the L<sub>1</sub> + L<sub>2</sub> dimension is different.

# Bearing Roller Conveyor Chain

## Attachment Dimensional Chart

### A1/K1 Attachments

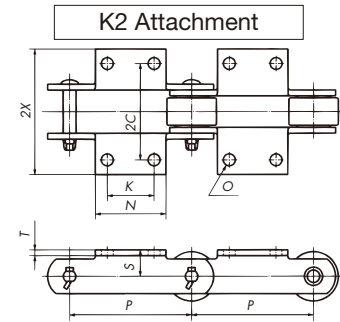
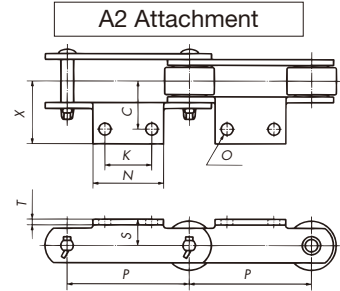
TSUBAKI Chain Number	Bearing Roller Type			Pitch P	S	C	2C	X	2X	N	T	O	Bolt Used	Additional Mass/Each kg
	R Roller	F Roller	S Roller											
RF03075	○	○	—	75	20	30	60	46	92	55	3.2	10	M8	0.06
RF03100	○	○	—	100						65				0.07
RF05100	○	○	—	100						65				0.07
RF05125	○	○	—	125	22	35	70	47	94	75	4.5	10	M8	0.08
RF05150	○	○	—	150						85				0.10
RF08125	○	○	—	125	28	50	100	64	128	80	6.3	12	M10	0.19
RF08150	○	○	—	150						90				0.23
RF10100	○	—	○	100						70				0.16
RF10125	○	○	○	125	28	50	100	67	134	80	6.3	12	M10	0.18
RF10150	○	○	○	150						90				0.20
RF12200	○	○	○	200	38	60	120	79	158	120	7.9	15	M12	0.44
RF12250	○	○	○	250						170				0.61
RF17200	○	○	—	200						120				0.64
RF17250	○	○	—	250	45	75	150	100	200	170	9.5	15	M12	0.88
RF17300	○	○	—	300						220				1.26
RF26250	○	○	—	250	55	80	160	108	216	170	9.5	15	M12	1.01
RF26300	○	○	—	300						220				1.34



Note: 1. The weight of the A attachment in the table is the additional weight per attachment. This value should be double for K attachments.  
 2. Please contact a Tsubaki representative if the A or K attachment side face requires a guide.  
 3. When attaching a slot or the like between two strands of chain, the slots should be attached to either outer link – outer link or inner link – inner link.  
 4. Inch sizes available upon request.

### A2/K2 Attachments

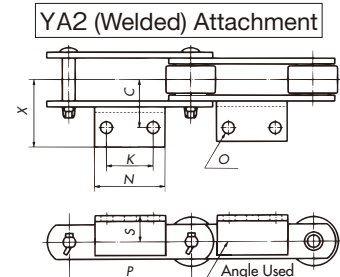
TSUBAKI Chain Number	Bearing Roller Type			Pitch P	S	C	2C	X	2X	N	K	T	O	Bolt Used	Additional Mass/Each kg
	R Roller	F Roller	S Roller												
RF03075	○	○	—	75	20	30	60	46	92	55	30	3.2	10	M8	0.06
RF03100	○	○	—	100						65	40				0.07
RF05100	○	○	—	100						65	40				0.07
RF05125	○	○	—	125	22	35	70	47	94	75	50	4.5	10	M8	0.08
RF05150	○	○	—	150						85	60				0.10
RF08125	○	○	—	125	28	50	100	64	128	80	50	6.3	12	M10	0.19
RF08150	○	○	—	150						90	60				0.23
RF10100	○	—	○	100						70	40				0.16
RF10125	○	○	○	125	28	50	100	67	134	80	50	6.3	12	M10	0.18
RF10150	○	○	○	150						90	60				0.20
RF12200	○	○	○	200	38	60	120	79	158	120	80	7.9	15	M12	0.44
RF12250	○	○	○	250						170	125				0.61
RF17200	○	○	—	200						120	80				0.64
RF17250	○	○	—	250	45	75	150	100	200	170	125	9.5	15	M12	0.88
RF17300	○	○	—	300						220	180				1.26
RF26250	○	○	—	250	55	80	160	108	216	170	125	9.5	15	M12	1.01
RF26300	○	○	—	300						220	180				1.34



Note: 1. The weight of the A attachment in the table is the additional weight per attachment. This value should be double for K attachments.  
 2. Please contact a Tsubaki representative if the A or K attachment side face requires a guide.  
 3. When attaching a slot or the like between two strands of chain, the slots should be attached to either outer link – outer link or inner link – inner link.  
 4. Inch sizes available upon request.

### YA2 (Welded) Attachments

TSUBAKI Chain Number	Bearing Roller Type			Pitch P	S	C	2C	X	2X	N	K	O	Angle Used	Bolt Used	Additional Mass/Each kg
	R Roller	F Roller	S Roller												
RF26450	○	○	—	450	55	80	160	123.5	247	320	280	15	L75 × 75 × 9	M12	3.19
RF36300	○	○	—	300						160	100				2.4
RF36450	○	○	—	450	70	100	200	160	320	330	280	19	L100 × 100 × 10	M16	4.9
RF36600	○	○	—	600						410	360				6.1



Note: 1. When attaching a slot or the like between two strands of chain, the slots should be attached to either outer link – outer link or inner link – inner link.  
 2. Inch sizes available upon request.

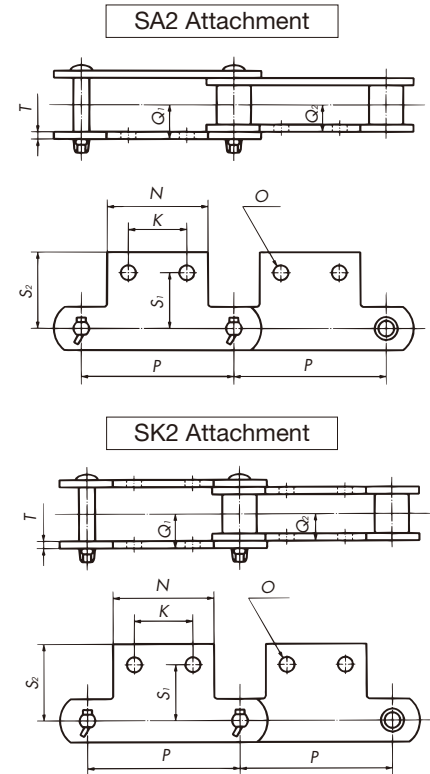


# Bearing Roller Conveyor Chain

## SA2/SK2 Attachments

TSUBAKI Chain Number	Bearing Roller Type			Pitch P	S <sub>1</sub>	S <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	N	K	T	O	Bolt Used	Additional Mass/Each kg
	R Roller	F Roller	S Roller											
RF03075	○	–	–	75	33	49	15.5	11.5	55	30	3.2	10	M8	0.06
RF03100	○	–	–	100					65	40				0.07
RF05100	○	–	–	100	33.4	50.7	21	15.5	65	40	4.5	10	M8	0.07
RF05125	○	–	–	125					75	50				0.08
RF05150	○	–	–	150	46.1	60.7	27	20	85	60	6.3	12	M10	0.10
RF08125	○	–	–	125					80	50				0.19
RF08150	○	–	–	150	46.1	63	28.5	21.5	90	60	6.3	12	M10	0.23
RF10100	○	–	○	100					70	40				0.16
RF10125	○	–	○	125	46.1	63	28.5	21.5	80	50	6.3	12	M10	0.18
RF10150	○	–	○	150					90	60				0.20
RF12200	○	–	○	200	55	75.7	35.5	26.5	120	80	7.9	15	M12	0.44
RF12250	○	–	○	250					170	125				0.61

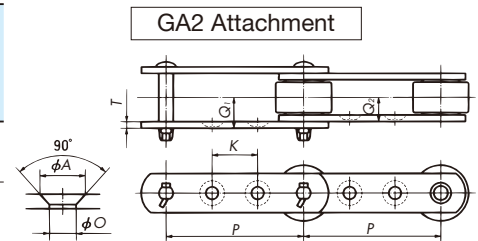
Note: 1. When attaching a slat or the like between two strands of chain, the slats should be attached to either outer link – outer link or inner link – inner link.  
2. Inch sizes available upon request.



## GA2 Attachments

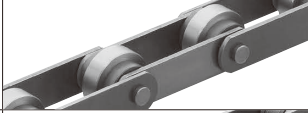


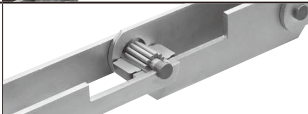

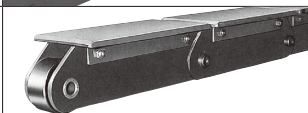


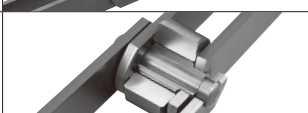

TSUBAKI Chain Number	Bearing Roller Type			Pitch P	K	T	Q <sub>1</sub>	Q <sub>2</sub>	A	O	Max. Length of Attached Bolt		Bolt Used
	R Roller	F Roller	S Roller								Outer Link	Inner Link	
RF03075	○	–	–	75	30	3.2	15.5	11.5	13.5	8	26	19	M6
RF03100	○	–	–	100	50								
RF05100	○	–	–	100	40	4.5	21	15.5	15	10	36	26	M8
RF05125	○	○	–	125	50								
RF05150	○	○	–	150	60	6.3	27	20	20	12	45	31	M10
RF08150	○	○	–	150	60								
RF10100	–	–	○	100	30	6.3	28.5	21.5	20	12	49	35	M10
RF10125	○	–	○	125	40								
RF10150	○	○	○	150	60	7.9	35.5	26.5	26	15	63	45	M12
RF12200	○	○	○	200	80								
RF12250	○	○	○	250	125	9.5	45.5	35	26	15	81	61	M12
RF17200	○	○	–	200	70								
RF17250	○	○	–	250	110	9.5	48.5	38	26	15	88	67	M12
RF17300	○	○	–	300	150								
RF26300	○	○	–	300	140	12.7	60	46	32	19	105	75	M16
RF26450	○	○	–	450	220								
RF36450	○	○	–	450	220	12.7	60	46	32	19	105	75	M16
RF36600	○	○	–	600	300								

Note: 1. The weight of a GA2 attachment is the same as the weight of the base chain.  
2. When attaching a slat or the like between two strands of chain, the slats should be attached to either outer link – outer link or inner link – inner link.  
3. Inch sizes available upon request.

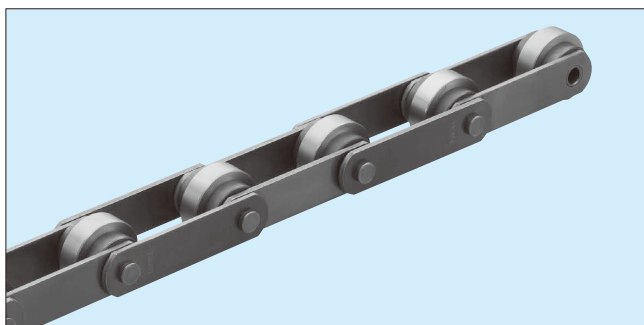


# Specialty Conveyor Chains

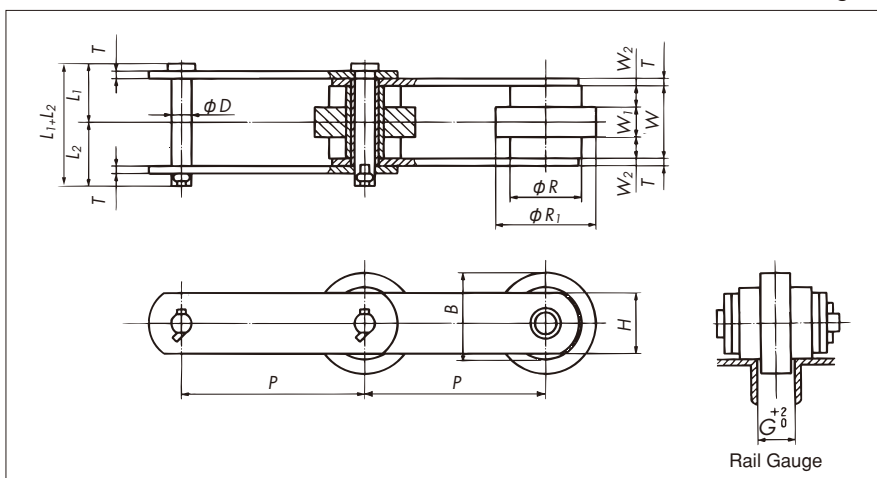
## Specialty Conveyor Chain Line-up

Application	Name	Features	Photo	Page
Free Flow Conveyance	Double Plus Conveyor Chain	Conveyance speed is 2.3 times chain speed thanks to the size difference between its large and small diameter rollers.		62
	Top Roller Conveyor Chain	A top roller is added in between chain pitches to any conveyor chain specification, allowing for direct conveyance on the top roller.		63
	Outboard Roller Conveyor Chain	An outboard roller is attached to the S roller of any conveyor chain specification.		64
Indexing Conveyance	Bearing Bush Conveyor Chain	Features needle bearings between the pin and bush. Reduces wear elongation to the absolute minimum possible. Suitable for index positioning and tact conveyance.		65
Direct Conveyance	Deep Link Conveyor Chain	A small R roller with little frictional resistance is added to a wide link plate on any conveyor chain specification to allow for direct conveyance of heavy objects.		67
Low Friction/Very Heavy Object Conveyance	Coil Transfer Conveyor Chain	This reinforced chain has extremely high rigidity for conveying extremely heavy objects, such as containers, steel structures, and cold/hot coils used in steelworks.		68
Fly Ash Conveyance	Flow Conveyor Chain	By conveying fly ash in a sealed case, there is no scattering of ash, making this loose material conveyor chain ideal for preventing damage.		70
Bucket Elevator Conveyance	Bucket Elevator Conveyor Chain	This specialty chain features high wear resistance and fatigue strength.		77
Waste Treatment	Waste Treatment Conveyor Chain	Tsubaki has recognized the kinds of wear found in each waste treatment facility process and has created this chain especially for this industry.		81
Special Applications	Block Chain	This strong chain features a simple construction with superior rigidity. It has high tensile strength for its mass.		84

# Double Plus Conveyor Chain



- 1. Conveying**  
The frictional force between the large and small diameter rollers cause them to rotate in unison, and the difference in the roller diameters allow for items to be conveyed at 2.3 times the speed of the base chain.
- 2. Accumulating**  
As there is a braking force acting on the large diameter roller, slip occurs between the large and small diameter rollers, allowing for free flow conveyance.
- 3. Energy Savings/Lower Costs**  
The small coefficient of friction means low required energy, reducing necessary chain size and costs.
- 4. Longer Life**  
Chain speed is 1/2.3 with a large roller allowable load, giving the chain over twice the life of standard chains. (Compared to Top Roller Chain.)
- 5. Stable Running**  
The height from rail to conveyed goods is low, allowing for stable running.



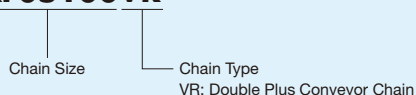
TSUBAKI Chain Number	Pitch P	Roller		Height			Plate		Pin			B	G	Max. Allowable Tension kN{kgf}	Roller Allowable Load kN{kgf/each}	Approx. Mass (kg/m)	
		R1	R	W1	W2	W	T	H	D	L1+L2	L1						L2
RF03075VR RF03100VR	75 100	42.0	31.8	12	8.5	30	3.2	22	8.0	51.5	24.5	27	36.9	14.5	4.12{420}	1.27{130}	4.7 4
RF05100VR RF05125VR RF05150VR	100 125 150	53.0	40.0	16	11	39	4.5	32	11.3	70.5	33.5	37	46.5	18.5	9.81{1000}	2.35{240}	8 7 6
RF10125VR RF10150VR	125 150	67.0	50.8	20	14	54	6.3	38.1	14.5	93	45	48	58.9	25	15.7{1600}	3.43{350}	14 12
RF6205VR RF12200VR	152.4 200	75.5	57.2	22	16	62	7.9	44.5	15.9	108.5	53	55.5	66.3	28	26.5{2700}	4.90{500}	18 15
RF17200VR	200	86.0	65.0	25	18	69	9.5	50.8	19.1	127	60.5	66.5	75.5	31	34.3{3500}	6.08{620}	20

Note: Contact a Tsubaki representative regarding delivery.

## Ordering Double Plus Conveyor Chain

### Chain Numbering Example

**RF05100VR**

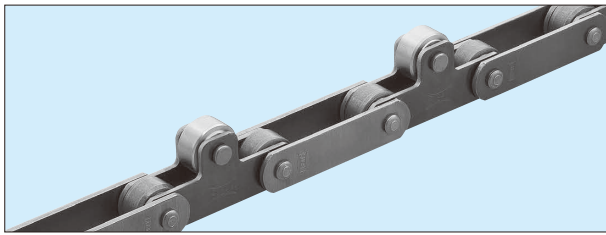


### Ordering Example

Chain Size: RF05, Pitch: 100mm  
Chain Type : Double Plus Conveyor Chain  
Quantity : 400 links

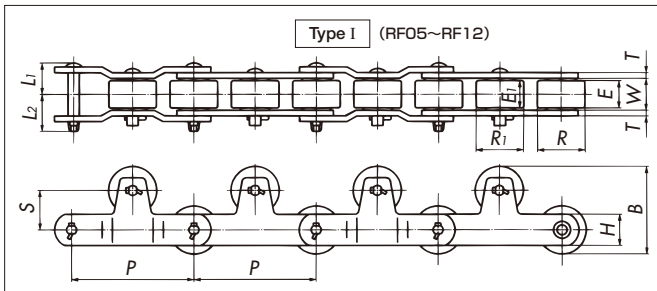
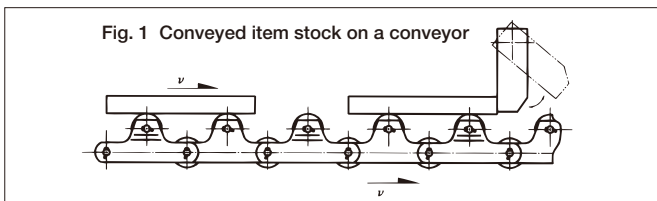
Chain Number	Quantity	Unit
<b>RF05100VR</b>	400	L

# Top Roller Conveyor Chain (Free Flow Conveyance)



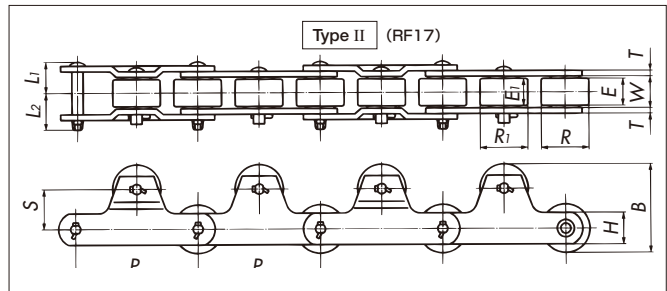
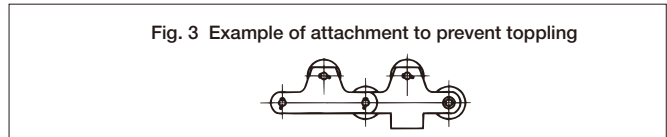
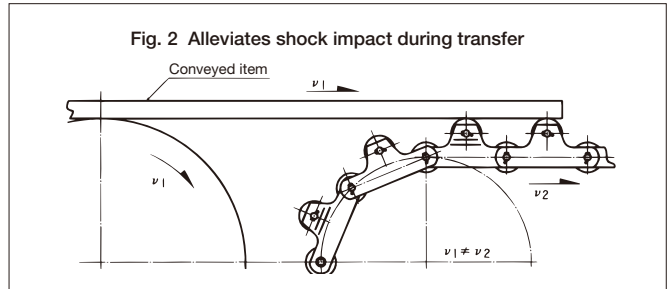
### Applications

1. Chain can be run continuously, and conveyed items can be accumulated or temporarily stopped on top of the conveyor through the use of dogs. (Fig. 1)
2. Conveying and stopping can be performed simultaneously on top of the same chain. (Fig. 1)
3. Alleviates shock impact during operation. (Fig. 2)



Top rollers are attached to a base conveyor chain between pitches, allowing for direct support of conveyed items. Tsubaki manufactures top rollers in any series.

- Tsubaki can manufacture engineering plastic and bearing roller top rollers.
- Tsubaki manufactures attachments to prevent toppling as well. (Fig. 3)
- Standard sprockets cannot be used as their teeth contact the top rollers. Use only top roller sprockets. Contact a Tsubaki representative regarding top roller sprockets.



TSUBAKI Chain Number	Pitch P	Roller		Inner Link Inner Width W	Plate		Pin		S	Top Roller		B	Type	Chain Approx. Mass kg/m	Additional Mass per Top Roller kg	Top Roller Allowable Load kN(kgf/each)	
		Dia. R	Contact Width E		Height H	Thickness T	L1	L2		R1	E1					Untreated	Hardened
* RF03075R-TR * RF03100R-TR	75 100	31.8	15.5	16.1	22	3.2	18	20	23.1	40	PL:20 RL:13	59	*	2.7 2.3	0.18	0.34{35}	0.59{60}
RF05100R-TR RF05150R-TR	100 150	40	19	22	32	4.5	25	28.5	30	40	19	70	I	5.0 4.1	0.26	0.64{65}	1.03{105}
RF08150R-TR	150	44.5	23	27	28.6	6.3	31	34.5	30	40	23	72.2	I	5.5	0.35	0.78{80}	1.27{130}
RF10150R-TR	150	50.8	27	30	38.1	6.3	33	36	30	50.8	27	80.8	I	7.9	0.56	1.13{115}	1.91{195}
RF6205R-TR	152.4	57.2	32	37.1	44.5	7.9	40.5	43	37.8	57.2	32	95	I	12.1	0.91	1.47{150}	2.50{255}
RF12200R-TR	200	65	32	37.1	44.5	7.9	40.5	43	45	65	32	110	I	11.4	1.15	1.47{150}	2.50{255}
RF17200R-TR	200	80	44	51.4	50.8	9.5	51.5	58	65	80	44	145	II	19	2.58	2.45{250}	4.12{420}

- Note 1. Sizes marked with \* have flat plates. E1 dimensions are PL: 20 (width of roller attached to outer link), PL: 13 (width of roller attached to inner link).  
 2. Top roller allowable load is shown under lubricated conditions.  
 3. MoS2 grease is applied between top roller and top roller pin when shipped.

## Ordering Top Roller Conveyor Chain

### Chain Numbering Example

**RF17200R-AT-2LTRH**



### Ordering Example

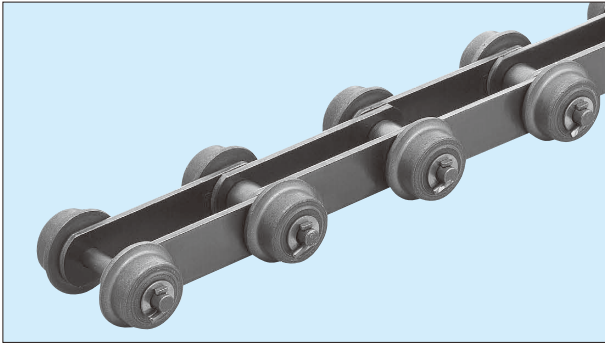
Please indicate the following when ordering:

1. Chain size and base specifications
2. Top roller specifications (hardened/unhardened) and attachment spacing. (Note that top rollers attached every even link will be attached on the inner link.)

Chain Size: RF17, Pitch: 200mm, Roller Type: R Roller  
 Chain Specs: Reinforced AT Series  
 Attachment Spacing Every 2nd Link  
 Attachment Type: Tempered Top Roller  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF17200R-AT-2LTRH</b>	400	L

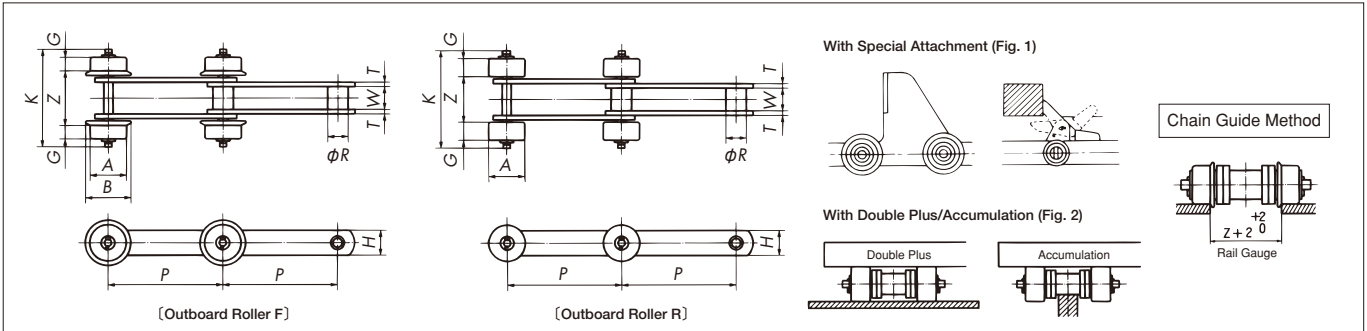
# Outboard Roller Conveyor Chain (Free Flow Conveyance)



This chain features an outboard roller on the S roller of a base conveyor chain. The sprocket engages the center S rollers, while the outboard rollers handle running. Tsubaki can manufacture outboard rollers for any series.

### Applications

1. For special attachments to the plate. (Fig. 1)
2. For when supporting loads on the center S roller is difficult.
3. For when having a guide on the chain's return side is difficult.
4. For giving double plus and accumulation capabilities to R roller outboard rollers. (Fig. 2)



TSUBAKI Chain Number	Pitch P	Roller Dia. R	Inner Link Inner Width W	Plate		Total Width K	Outboard Roller F Roller				Outboard Roller R Roller			Additional Mass of SR (both sides) kg	SR Allowable Load (both sides) kN{kgf}	
				Height H	Thickness T		A	B	G	Z	A	G	Z		SR Untreated	SR Hardened
RF03075S-SR RF03100S-SR	75 100	15.9	16.1	22	3.2	76	31.8	42	12	38	31.8	15.5	31	0.3	0.69{70}	1.08{110}
RF430S-SR	101.6	20.1	22.6	25.4	4.8	104	38.1	50	15	56.5	38.1	20	46.5	0.5	0.98{100}	1.57{160}
RF05075S-SR RF05100S-SR RF05125S-SR RF05150S-SR	75 100 125 150	22.2	22	32	4.5	102	40	50	14	55	40	19	45	0.5	1.17{120}	1.96{200}
RF450S-SR	101.6	22.2	27	28.6	6.3	130	44.5	55	20	70.5	44.5	26	58.5	0.7	1.67{170}	2.35{240}
RF10100S-SR RF10125S-SR RF10150S-SR	100 125 150	29	30	38.1	6.3	136	50.8	65	20	73	50.8	26	61	1.0	1.96{200}	3.24{330}
RF6205S-SR	152.4	34.9	37.1	44.5	7.9	167	57.2	70	25	90.5	57.2	32	76.5	1.3	2.75{280}	4.61{470}
RF12200S-SR RF12250S-SR	200 250	34.9	37.1	44.5	7.9	167	65	80	24	92.5	65	32	76.5	1.8	2.75{280}	4.61{470}
RF17200S-SR RF17250S-SR RF17300S-SR	200 250 300	40.1	51.4	50.8	9.5	189	65	80	24	112.5	65	32	96.5	1.8	3.14{320}	5.30{540}
RF26200S-SR RF26250S-SR RF26300S-SR	200 250 300	44.5	57.2	63.5	9.5	230	80	100	34	124.5	80	44	104.5	3.8	4.90{500}	8.43{860}
RF36250S-SR RF36300S-SR RF36450S-SR	250 300 450	50.8	66.7	76.2	12.7	268	100	125	38	150.5	100	50	126.5	6.9	6.57{670}	11.1{1130}

Note 1. SR allowable load values indicated are under lubricated conditions.  
 Note 2. Basic chain specifications are the same as RF Conveyor Chain.

## Ordering Outboard Roller Conveyor Chain

### Chain Numbering Example

**RF03075S-DT-1LSRFH**

Chain Size  
 Roller Type  
 Chain Series

Outboard Roller Type  
 SRFN: Outboard Roller Untreated  
 SRFH: Outboard Roller Hardened  
 SRRN: Outboard Roller Untreated  
 SRRH: Outboard Roller Hardened  
 Attachment Spacing

### Ordering Example

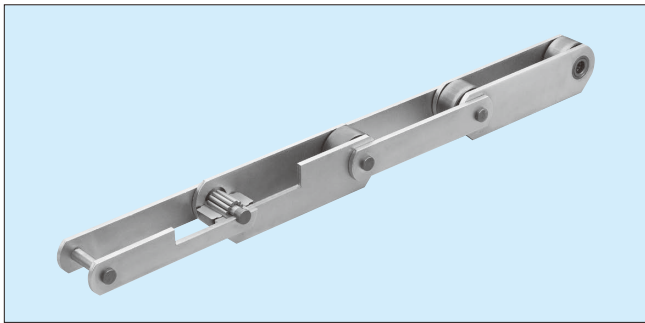
Please indicate the following when ordering:

1. Chain size and base specifications
2. Top roller specifications (hardened/unhardened) and attachment spacing. (Note that top rollers attached every even link will be attached on the inner link.)

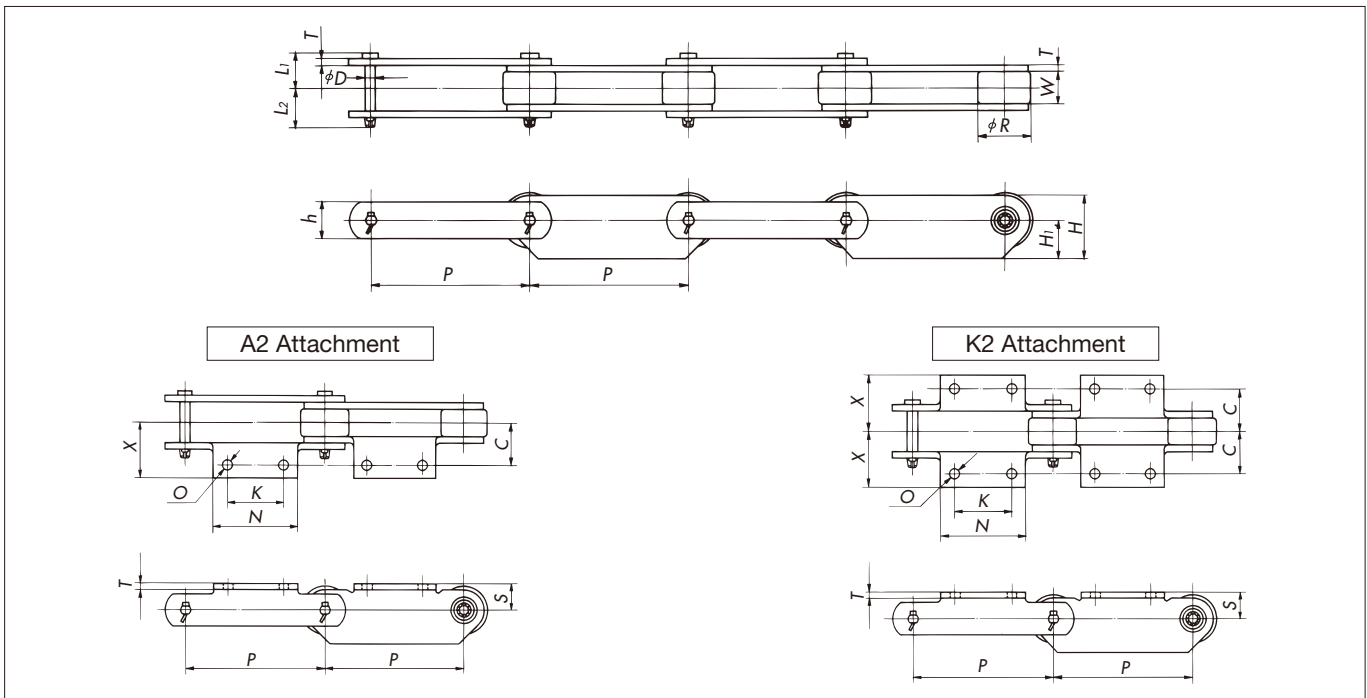
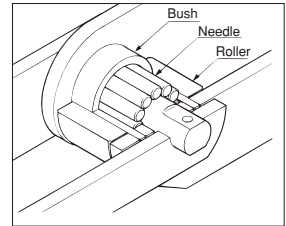
Chain Size: RF17, Pitch: 200mm, Roller Type: R Roller  
 Chain Specs: Reinforced AT Series  
 Attachment Spacing Every 2nd Link  
 Attachment Type: Tempered Top Roller  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF17200S-AT-2LSRFH</b>	400	L

# Bearing Bush Conveyor Chain



Features needle bearings between the pin and bush.  
Reduces wear elongation to the absolute minimum possible.  
Suitable for index positioning and tact conveyance.



TSUBAKI Chain Number	Max. Allowable Tension		Roller Allowable Load		Pitch $P$	Roller Dia. $R$	Inner Link Inner Width $W$	Plate				Pin			Approx. Mass $\text{kg/m}$
	kN	{kgf}	kN	{kgf}				Height $h$	Height $H$	Height $H_1$	Thickness $T$	Dia. $D$	$L_1$	$L_2$	
RF03075R-NB	2.45	{250}	0.54	{55}	75	31.8	16.1	22	35	20	3.2	8.0	18	20	3.0
RF05100R-NB	4.90	{500}	1.03	{105}	100	40	22	32	47	26	4.5	11.3	25	28.5	5.8
RF10150R-NB	7.85	{800}	1.77	{180}	150	50.8	30	38.1	61	35	6.3	14.5	33	36	8.7
RF12200R-NB	9.81	{1000}	2.50	{255}	200	65	37.1	44.5	71	40	7.9	15.9	40.5	43	13.0
RF17200R-NB	12.7	{1300}	4.02	{410}	200	80	51.4	50.8	85	51	9.5	19.1	51.5	58	21.5
RF26250R-NB	19.6	{2000}	5.30	{540}	250	100	57.2	63.5	105	64	9.5	22.2	55.5	61	28.5
RF36300R-NB	24.5	{2500}	7.45	{760}	300	125	66.7	76.2	125	75	12.7	25.4	68	78	41.5

TSUBAKI Chain Number	Pitch $P$	Attachment								Load Mass Per Attachment $\text{kg}$	
		$S$	$C$	$X$	$K$	$N$	$T$	$O$	A2	K2	
RF03075R-NB	75	20	30	46	30	55	3.2	10	0.05	0.10	
RF05100R-NB	100	22	35	47	40	65	4.5	10	0.08	0.16	
RF10150R-NB	150	28	50	67	60	90	6.3	12	0.20	0.40	
RF12200R-NB	200	38	60	79	80	120	7.9	15	0.45	0.90	
RF17200R-NB	200	45	75	100	80	120	9.5	15	0.66	1.32	
RF26250R-NB	250	55	80	108	125	170	9.5	15	1.07	2.14	
RF36300R-NB	300	70	100	135 *	150 *	220 *	12.7	19	1.8	3.6	

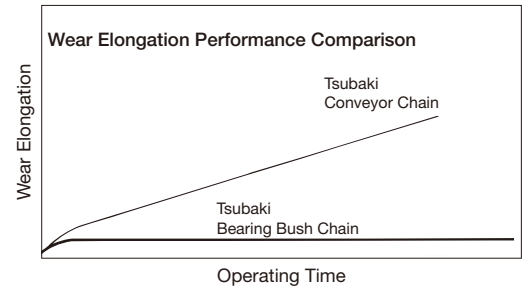
Note 1. Attachment dimensions marked with \* differ from the attachment dimensions of RF Conveyor Chain.  
2. Roller allowable load values given are for lubricated chain.



# Bearing Bush Conveyor Chain

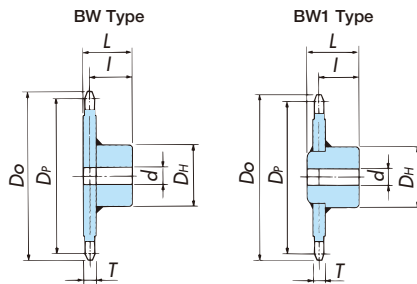
## Bearing Bush Conveyor Chain Selection

1. R roller rotational coefficient of friction: 0.21
2. Chain speed: max. 30m/min
3. Operating temperature: -10°C to 60°C
4. Needles in the bearing area may fall out when pin is extracted during chain connection or other operations. Follow handling instructions carefully.
  - The basic three dimensions (chain pitch, R roller diameter, width between inner linkplates) are the same as standard conveyor chain.
  - Space between pin and bush have already been lubricated.
  - Plates are nickel plated.
  - Not for use in dusty environments.
  - Consult a Tsubaki representative for specifications with a simple seal along the needle area.



## Sprockets for Bearing Bush Conveyor Chain

Sprocket teeth are precision machined to maximize performance of the chain. Teeth are machined for minimum clearance with the roller.



### Sprocket Hole Processing

Tsubaki will process shaft holes and keyways upon request. Please include the following information in your request.

- Shaft hole diameter and clearance : Hole dimensions and processing precision.
- Keyway dimensions : New JIS (JISB1901-1976) or old JIS (JISB1901-1959) parallel or tapered keys, processing clearance (normal or precise).
- Used parallel in strands : Specify number of strands for parallel use.
- Standard processing specifications for Bearing Bush Conveyor Chain sprockets are H7 holes, new JIS key. Customers wishing to perform their own hole processing should use the sprocket outer circumference as a base.

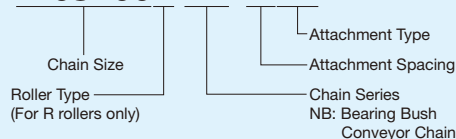
TSUBAKI Sprocket Number	No. of Teeth	Series	Pitch Diameter $D_p$	Outer Diameter $D_o$	Tooth Width $T$	Shaft Diameter $d$		Hub Diameter $D_H$	Hub Length $L$	Center Distance to Shaft $l$	Approx. Mass kg	Material
						Pilot Hole	Max.					
RF03075R-NB-8T	8	BW	196.0	209	11.9	18	55	83	62	56	4.8	Carbon steel for machinery use
RF03075R-NB-10T	10		18	60		93	67	61	7.1			
RF03075R-NB-12T	12		18	60		93	67	61	9.0			
RF05100R-NB-8T	8	BW	261.3	272	18.0	28	75	107	86	77	12.0	Carbon steel for machinery use
RF05100R-NB-10T	10		33	80		117	94	85	17.4			
RF05100R-NB-12T	12		33	85		127	104	95	24.4			
RF10150R-NB-8T	8	BW	392.0	408	22	38	100	147	123	112	33.2	Carbon steel for machinery use
RF10150R-NB-10T	10		38	110		157	133	122	47.6			
RF10150R-NB-12T	12		38	115		167	144	133	65.2			
RF12200R-NB-8T	8	BW1	522.6	551	28	60	120	177	150	125	67.4	Carbon steel for machinery use
RF12200R-NB-10T	10		65	130		187	160	135	96.6			
RF12200R-NB-12T	12		75	145		207	180	155	136.9			
RF17200R-NB-8T	8	BW1	522.6	562	40	75	145	207	180	148	98.1	Carbon steel for machinery use
RF17200R-NB-10T	10		75	145		207	180	148	134.0			
RF17200R-NB-12T	12		80	160		227	200	168	190.1			
RF26250R-NB-8T	8	BW1	653.3	703	45	80	160	227	200	164	159.7	Carbon steel for machinery use
RF26250R-NB-10T	10		85	175		247	240	204	244.1			
RF26250R-NB-12T	12		85	175		247	240	204	321.4			
RF36300R-NB-8T	8	BW1	783.9	853	55	95	190	267	240	198	276.2	Carbon steel for machinery use
RF36300R-NB-10T	10		95	190		267	270	228	398.9			
RF36300R-NB-12T	12		100	210		297	260	218	550.8			

- Note: 1. Tsubaki also manufactures other sprockets with hardened tooth tips besides those listed here.  
 2. Sprockets with a mass over 30kg may be drilled with a hanging hole near the teeth.

## Ordering Bearing Bush Conveyor Chain

### Chain Numbering Example

**RF05100R-NB-1LA2**

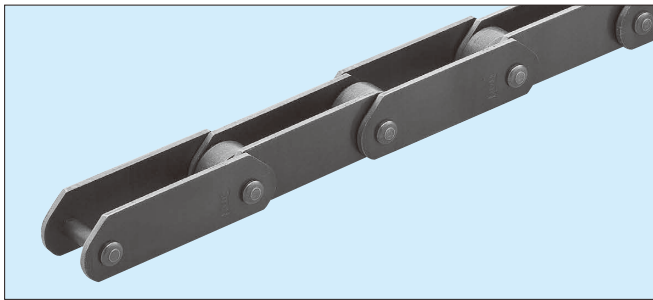


### Ordering Example

Chain Size: RF05, Pitch: 100mm, Roller Type: R Roller  
 Chain Type: Bearing Bush Conveyor Chain  
 Attachment Spacing/Type: A2 every link  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF05100R-NB-1LA2</b>	400	L

# Deep Link Conveyor Chain Direct Conveyance

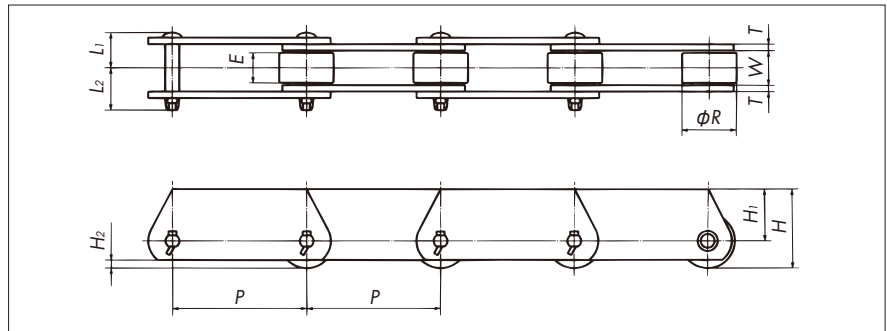


Wide link plates and R rollers with low frictional resistance are added to a base conveyor chain to allow for direct conveyance on the chain links.

1. Tsubaki also manufactures Deep Link Conveyor Chain with R rollers from Bearing Roller Conveyor Chains. These rollers will give the chain a low coefficient of friction and a higher roller allowable load, allowing users to go down two chain sizes. (It will be necessary to check allowable tension.)
2. Tsubaki can also manufacture Deep Link Conveyor Chains with top plates.
3. Tsubaki can manufacture Deep Link Chains to any specification.

### Applications

1. Sheet or shaped steel conveyor lines at steelworks.
2. Automotive assembly lines, container assembly lines, others

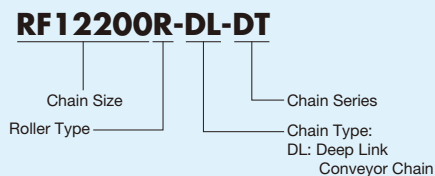


TSUBAKI Chain Number	Pitch P	Roller		Inner Link Inner Width W	Chain Height H	Plate			Pin		Approx. Mass kg/m	Roller Allowable Load kN{kgf}/each			Average Tensile Strength kN{kgf}	
		Dia. R	Contact Width E			H <sub>1</sub>	H <sub>2</sub>	Thickness T	L <sub>1</sub>	L <sub>2</sub>		DT Series	AT Series	Bearing Roller	DT Series	AT Series
RF03075R-DL RF03100R-DL	75 100	31.8	15.5	16.1	36.9	21	4.9	3.2	18	20	3.2 2.8	0.54{55}	0.88{90}	1.96{200}	29.4{3000}	69.6{7100}
RF05100R-DL RF05150R-DL	100 150	40	19	22	44	24	4	4.5	25	28.5	5.9 4.9	1.03{105}	1.72{175}	3.04{310}	68.6{7000}	142{14500}
RF08150R-DL	150	44.5	23	27	50.3	28	8	6.3	31	34.5	7.0	1.27{130}	2.11{215}	4.12{420}	78.5{8000}	142{14500}
RF10150R-DL RF10200R-DL	150 200	50.8	27	30	57.4	32	6.4	6.3	33	36	9.7 8.5	1.77{180}	2.94{300}	5.49{560}	113{11500}	226{23000}
RF6205R-DL	152.4	57.2	32	37.1	63.6	35	6.1	7.9	40.5	43	14.0	2.50{255}	4.17{425}	-	186{19000}	279{28500}
RF12200R-DL RF12250R-DL	200 250	65	32	37.1	73.5	41	10	7.9	40.5	43	14.9 13.5	2.50{255}	4.17{425}	8.34{850}	186{19000}	279{28500}
RF17250R-DL RF17300R-DL	250 300	80	44	51.4	90	50	13.8	9.5	51.5	58	22.5 21.5	4.02{410}	6.67{680}	14.1{1440}	245{25000}	387{39500}
RF26300R-DL	300	85 *	50	57.2	95.5	53	10.5	9.5	55.5	61	24.3	5.30{540}	8.83{900}	16.7{1700}	314{32000}	520{53000}
RF36300R-DL RF36400R-DL	300 400	100 *	56	66.7	112	62	12	12.7	68	78	39.0 34.2	7.45{760}	12.4{1260}	22.0{2240}	476{48500}	682{69500}
RF52450R-DL	450	110 *	65	77	125	70	17	16	82	90	46.0	9.81{1000}	16.6{1690}	-	500{51000}	1030{105000}

Note: 1. Contact a Tsubaki representative regarding delivery.  
2. Roller diameters marked with \* are different from RF Conveyor chain diameters and require a special sprocket.

## Ordering Deep Link Conveyor Chain

### Chain Numbering Example

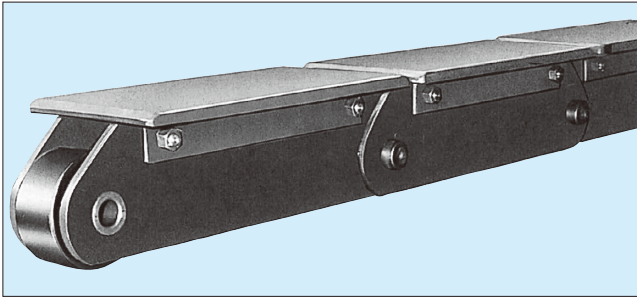


### Ordering Example

Chain Size: RF12, Pitch: 200mm, Roller Type: R Roller  
Chain Specs: Standard DT Series  
Quantity: 400 links

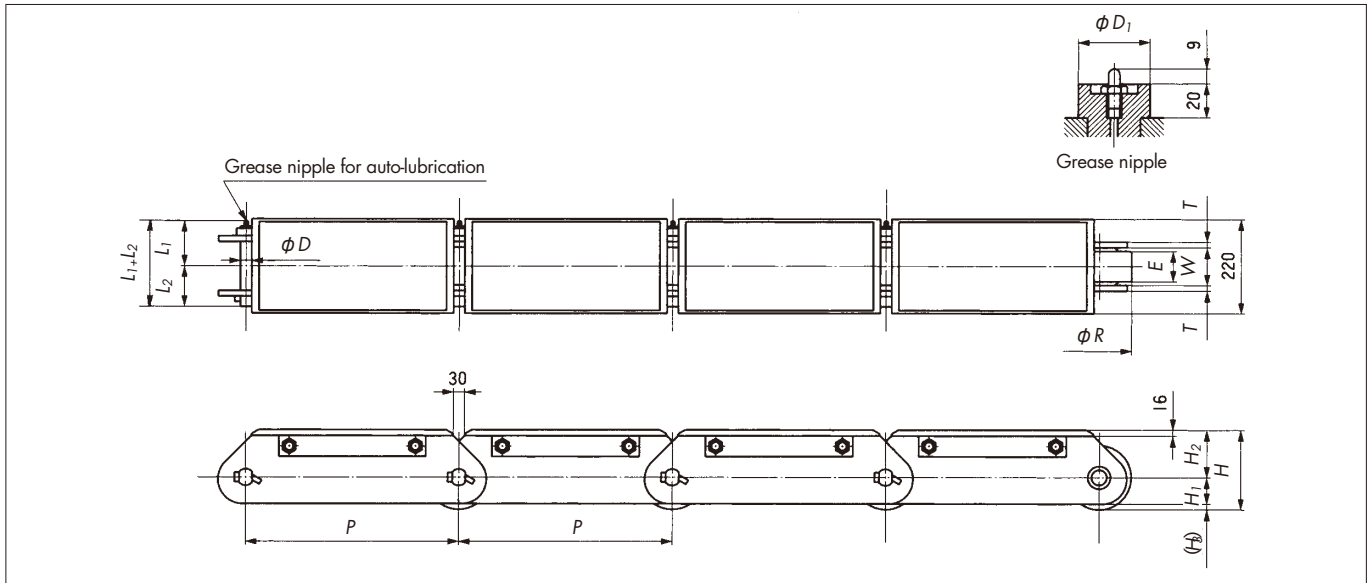
Chain Number	Quantity	Unit
<b>RF12200R-DL-DT</b>	400	L

# Coil Transfer Conveyor Chain For low friction/heavy load applications



This extremely rigid reinforced chain is used for conveying especially heavy objects, such as containers, steel structures, and cold/hot coils and slabs at steelworks.

1. Uses Tsubaki's unique bearing system of cylindrical bearings between the roller and bush.
2. This solid chain has low running resistance (coefficient of friction: 0.03), and the top plate can be easily attached or removed, making maintenance a snap.
3. Rollers are designed with extremely high fracture resistance.



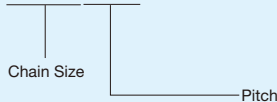
TSUBAKI Chain Number	Pitch P	Roller		Inner Link Inner Width W	Plate Thickness T	Chain Height				Pin				Approx. Mass (kg/m)	Max. Allowable Tension kN{kgf}	Roller Allowable Load kN{kgf/each}	Average Tensile Strength kN{kgf}	
		Dia. R	Contact Width E			H	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	Dia. D	Head Dia. D <sub>1</sub>	L <sub>1</sub> +L <sub>2</sub>	L <sub>1</sub>					L <sub>2</sub>
CT60300	300													90				
CT60400	400	125	60	65	12.7	171	42.5	108.5	20	28	36	165	88	77	82	83.3	29.4	588
CT60500	500														78	{8500}	{3000}	{60000}
CT90300	300														99			
CT90400	400	135	65	79	12.7	182.5	54	115	13.5	30	36	179	95	84	91	126	35.3	883
CT90500	500														87	{12800}	{3600}	{90000}
CT130300	300														123			
CT130400	400	150	70	84	16	195	61	120	14	38	46	197	104	93	112	181	42.2	1270
CT130500	500														105	{18500}	{4300}	{130000}
CT160400	400														135			
CT160500	500	175	80	91	16	227	69	139.5	18.5	41	46	205	108	97	126	224	55.9	1570
CT160600	600														118	{22800}	{5700}	{160000}
CT200600	600	180	90	102.6	19	225	76	135	14	45	50	229	119	110	141	279	64.7	1960
																{28500}	{6600}	{200000}

Note: 1. Contact a Tsubaki representative regarding delivery.  
 2. Roller allowable load values are when rail tensile strength is 400N/mm<sup>2</sup>{41kgf/mm<sup>2</sup>}.  
 3. Top plate sizes over 220 available upon request. Contact a Tsubaki representative for more information.

## Ordering Coil Transfer Conveyor Chain

### Chain Numbering Example

**CT90300**

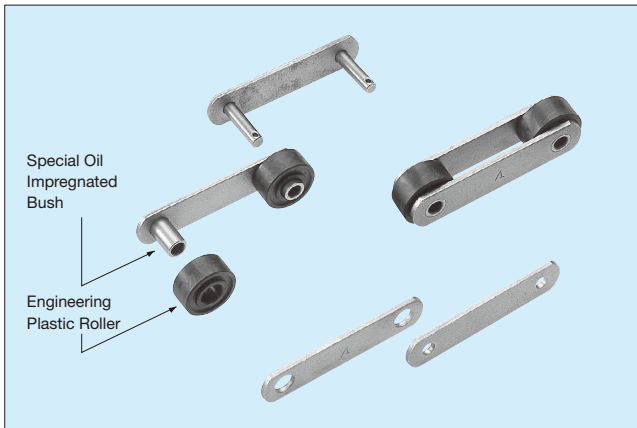


### Ordering Example

Chain Size: CT90, Pitch: 300mm  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>CT90300</b>	400	L

# Lambda<sup>®</sup> Plastic Roller Conveyor Chain



- Lube-free, long life**  
Wear life between pin-bush and bush-roller is seven times that of DT Series while being lube-free.
- Low noise**  
5-7db quieter than steel rollers. No grating sound when rollers rotate.
- Low running resistance**  
55% lower than steel rollers. (Unlubricated)
- Clean**  
Suppresses generation of metal wear dust.
- Lightweight**  
30% lighter than steel rollers.
- Compatible**  
Dimensionally compatible with conveyor chains--users can switch to Lambda Plastic Roller Conveyor Chain with no additional changes. (It is necessary to check strength and other factors.)

## Specifications

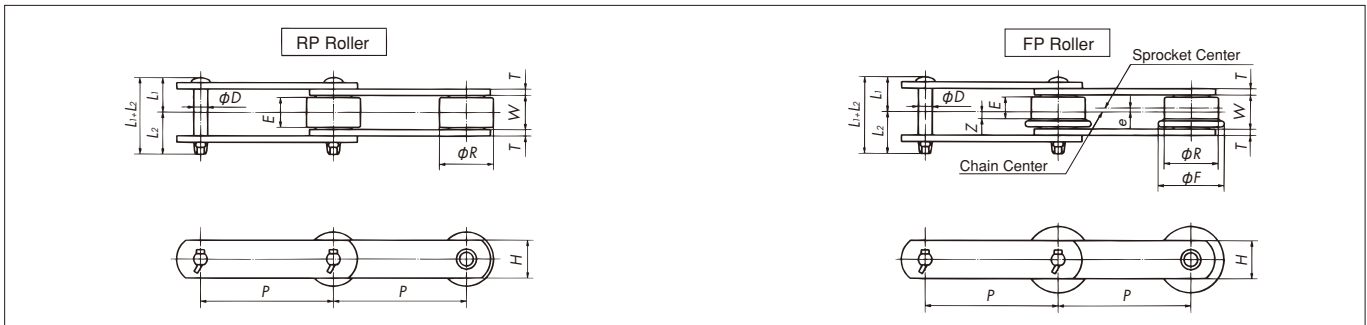
Unit : kN{kgf}

Material			Usage Temp.	Roller Rotational Coefficient of Friction	Chain Speed	Sprocket
Roller	Bush	Other Parts				
Engineering Plastic	Special Oil Impregnated Bush	Steel	0°C to 50°C	0.07 (lube-free)	25m/min or less	RF Standard Sprocket

Sprocket Teeth No TSUBAKI Chain Number	6		7		8		9		10	
	kN	{kgf}	kN	{kgf}	kN	{kgf}	kN	{kgf}	kN	{kgf}
RF03075-LMC	1.47	{150}	1.86	{190}	1.96	{200}	1.96	{200}	1.96	{200}
RF03100-LMC	1.86	{190}	1.96	{200}	1.96	{200}	1.96	{200}	1.96	{200}
RF05100-LMC	2.65	{270}	3.33	{340}	4.21	{430}	5.20	{530}	5.20	{530}
RF05125-LMC	3.74	{380}	4.71	{480}	5.20	{530}	5.20	{530}	5.20	{530}
RF05150-LMC	4.90	{500}	5.20	{530}	5.20	{530}	5.20	{530}	5.20	{530}

- Note:
- Link plates are black-coated carbon steel.
  - Roller coefficient of friction values assume a low dust, room temperature, indoor environment.
  - R roller max. allowable tension values shown above are for chain speeds under 25m/min.
  - F rollers have 70% of the above values.
  - Refer to selection pages for chain tension calculations.

## Dimensions Base chain and attachments are the same as RF Conveyor Chain.

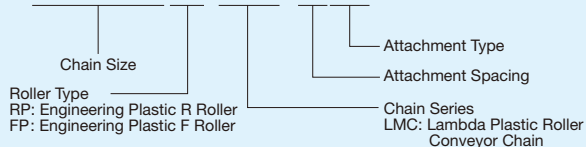


TSUBAKI Chain Number	Pitch P	RP Roller		FP Roller					Inner Link Inner Width W	Plate		Pin			Roller Allowable Load (each)		Approx. Mass kg/m	Attachment Type	
		Dia. R	Contact Width E	Dia. R	Flange Dia. F	Flange Dia. F	Off-center e	Z		Height H	Thickness T	Dia. D	L1+L2	L1	L2	kN			{kgf}
RF03075-LMC	75	31.8	15.5	31.8	42	12	1.8	4.3	16.1	22	3.2	8.0	38	18	20	0.49	{50}	1.9	A
RF03100-LMC	100																	1.7	K
RF05100-LMC	100																	3.6	SA
RF05125-LMC	125	40	19	40	50	14	2.5	4.5	22	32	4.5	11.3	53.5	25	28.5	0.83	{85}	3.4	SK
RF05150-LMC	150																	3.2	G

## Ordering Lambda Plastic Roller Conveyor Chain

### Chain Numbering Example

**RF03100RP-LMC-1LK2**



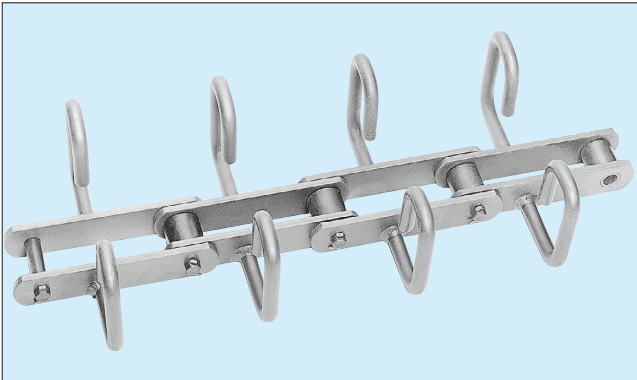
### Ordering Example

Chain Size: RF03, Pitch: 100mm  
Roller Type: Engineering Plastic R roller  
Quantity: 400 links

Product Code	Chain Number	Quantity	Unit
<b>B22</b>	<b>RF03100RP-LMC</b>	400	L

# Flow Conveyor Chain

## Horizontal Flow Conveyor Chain

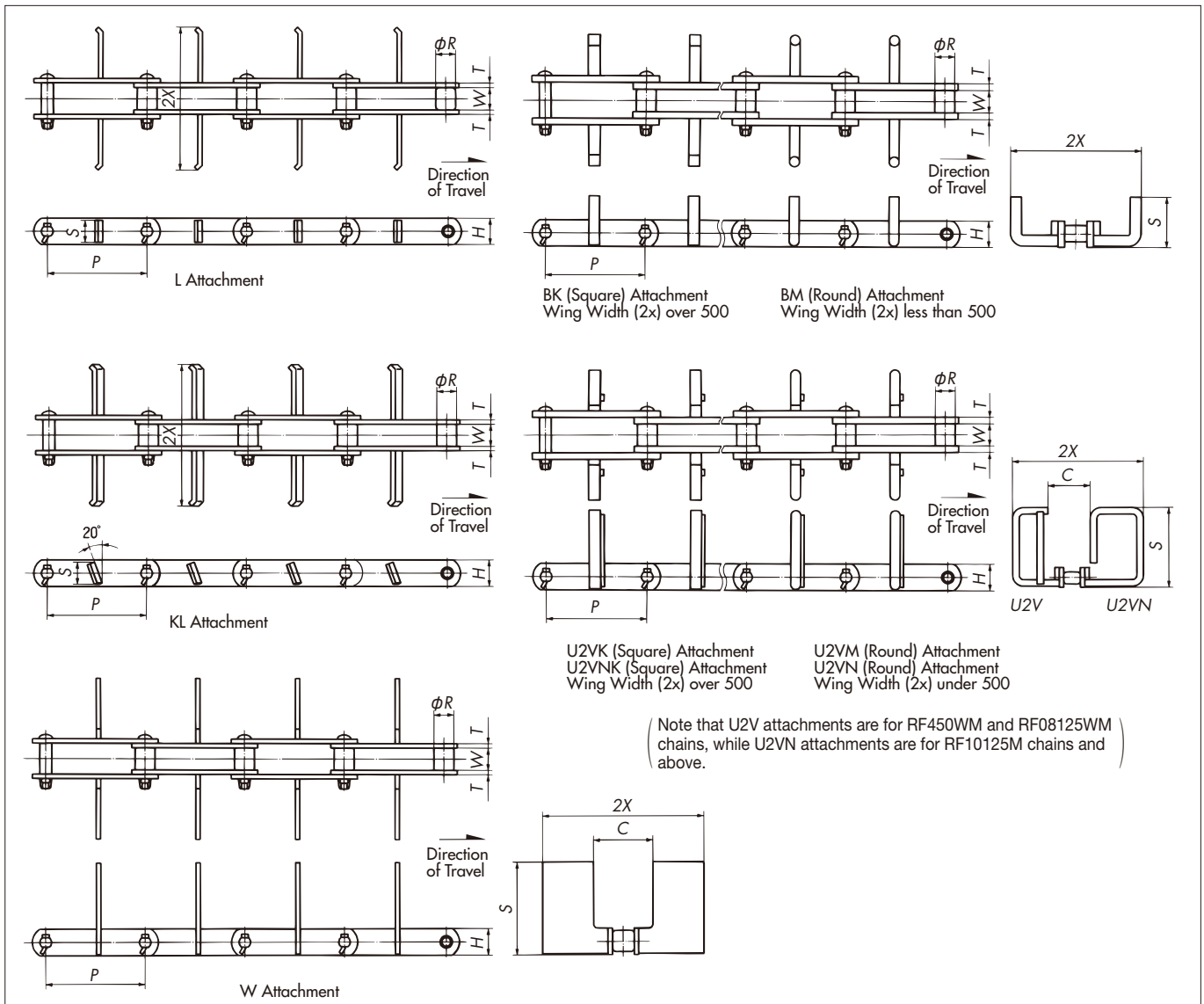
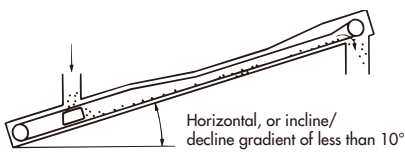


Flow Conveyor Chain conveys powders in a sealed case, which prevents dispersal, making it optimal for conveying loose materials safely.

This attachment chain is designed just for flow conveyors, and boasts Tsubaki's advanced technology and numerous examples of success. Tsubaki offers different attachment types to match any application requirement. Carbon steel attachments are standard, but stainless steel attachments can be manufactured upon request. The base chain is either standard conveyor chain or reinforced AT Series, but users can select other specifications to match the nature of the conveyed material.

- Consider replaceable tooth sprockets as well.
- Coal Dust Chain: Tsubaki recommends the RT Series for conveying corrosive coal dust.

### Standard Free Flow Chain



# Flow Conveyor Chain

TSUBAKI Chain Number	Old Chain Number	Case Inner Width	Pitch P	Roller Diameter R	Inner Link Inner Width W	Plate		Average Tensile Strength kN{kgf}	
						Height H	Thickness T	DT Series	AT Series
RF450WM	F4 · FW4	150	101.6	25.4	27	31.8	6.3	108{11000}	142{14500}
RF08125WM		200	125	25.4	27	31.8	6.3	108{11000}	142{14500}
RF10125M		200	125	31.8	30	38.1	6.3	113{11500}	226{23000}
RF10150M		270	150						
RF6205M	F6 · FA6	270	152.4	38.1	37.1	44.5	7.9	186{19000}	279{28500}
RF12200M		350	200	38.1	37.1	44.5	7.9	186{19000}	279{28500}
RF17200M		350	200	44.5	51.4	50.8	9.5	245{25000}	387{39500}
RF17250M		450	250						
RF26200M	F8 · FA8	410	200	50.8	57.2	63.5	9.5	314{32000}	520{53000}
RF26250N		450	250					299{30500}	564{57500}
RF26300N		580	300					299{30500}	564{57500}
RF36300M	F12 · FA12	580	300	57.2	66.7	76.2	12.7	476{48500}	682{69500}
RF36300N								-	868{88500}

TSUBAKI Chain Number	Wing Width 2X	L Attachment		KL Attachment		B Attachment		U2V(U2VN) Attachment			W Attachment		
		Height S	Mass kg/m	Height S	Mass kg/m	Height S	Mass kg/m	Height S	C	Mass kg/m	Height S	C	Mass kg/m
RF450WM	135	Contact a Tsubaki representative	6.5	Contact a Tsubaki representative	6.5	55	7.4	80	60	9.1	80	80	8.1
RF08125WM	185		6.5		6.5	80	8.2	115	85	10.1	115	85	10.3
RF10125M	185		8.1		8.1	80	8.9	115	85	10.1	115	85	11.3
RF10150M	250					100	9.8	140	105	12	140	105	13.0
RF6205M	250		12		12	100	14.4	140	105	18.5	140	105	17.2
RF12200M	330		12		12	125	16.3	185	130	20	185	130	22.6
RF17200M	330		17		17	125	18.7	185	130	23	185	130	26.3
RF17250M	430					160	19.3	230	135	23.7	230	135	31.5
RF26200M	390		28		28	150	25	233	100	33.4	233	100	41.7
RF26250N	430		23		23	160	25	230	135	29	230	135	35.7
RF26300N	560		23		23	200	27	290	160	30.6	290	160	53.0
RF36300M	560		34		34	200	27	290	160	40	290	160	61.3
RF36300N													

## Attachment Types and Applications

Attachment Type	Application
L	Conveying grain or cement
KL	Conveying adhesive powder
W	Conveying powder that flashes easily
BM (Round)	Conveying loose material like flour or cement with higher conveying efficiency than L attachments
BK (Square)	Conveying massive, loose, or adhesive materials that are hard to convey with B (Round) attachments
U2VM (Round), U2VNM (Round)	For use on larger or inclined conveyors
U2VK (Square), U2VNK (Square)	Conveying massive, loose, or adhesive materials that are hard to convey with U2V(U2VN)M attachments

## Ordering Horizontal Flow Conveyor Chain

### Chain Numbering Example

**RF17250M-DT-1LKL45**



### Ordering Example

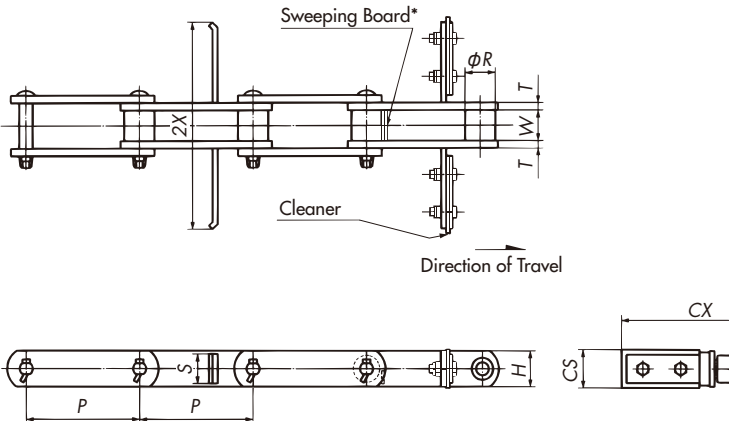
Chain Size: RF17, Pitch: 250mm, Roller Type: M Roller  
 Chain Specs: Standard DT Series  
 Attachment Spacing/Type: KL every Link  
 Inner Case Width: 450mm  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF17250M-DT-1LKL45</b>	400	L



# Flow Conveyor Chain

## Flow Conveyor Chain for Grain



These chains are specially designed for grain conveying horizontal flow conveyors (incline/decline gradient less than 10°).

The sweeping board prevents material on the rail from being crushed, while the cleaner prevents grain from remaining in the case.

Cleaner attachment spacing is every 6m.

Attachments are normally spaced every two links.

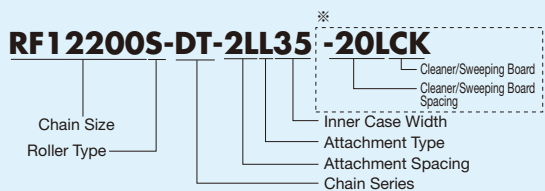
\* Sweeping boards are not attached for forward and reverse operation.

TSUBAKI Chain Number	Case Inner Width	Pitch P	Roller Diameter R	Inner Link Inner Width W	Plate		Attachment		Cleaner		Approx. Mass kg/m	Average Tensile Strength	
					Height H	Thickness T	Wing Width 2X	Height S	Width CX	Height CS		DT Series	kN
RF03075S	110	75	15.9	16.1	22.0	3.2	95		105	28	2.1	29.4	{3000}
RF430S	150	101.6	20.1	22.6	25.4	4.8	135		145	32	3.4	53.9	{5500}
RF450S	150	101.6	22.2	27.0	28.6	6.3	135		145	34	5.0	78.5	{8000}
RF08125S	200	125	22.2	27.0	28.6	6.3	185		195	34	5.0	78.5	{8000}
RF10125S	200	125	29	30.0	38.1	6.3	185	Contact a Tsubaki representative	195	47	6.8	113	{11500}
	225						235		7.3				
RF10150S	270	150	29	30.0	38.1	6.3	250		265	47	6.9	113	{11500}
	320						315		7.2				
RF6205S	270	152.4	34.9	37.1	44.5	7.9	250		265	53	10.5	186	{19000}
RF12200S	350	200	34.9	37.1	44.5	7.9	330		345	53	10.3	186	{19000}
RF17200S	350	200	40.1	51.4	50.8	9.5	330		345	58	14.0	245	{25000}
	450						445		16.0				
RF26200S	450	200	44.5	57.2	63.5	9.5	430		445	68	21.0	314	{32000}

Specialty Conveyor Chains

### Ordering Flow Conveyor Chain for Grain

#### Chain Numbering Example



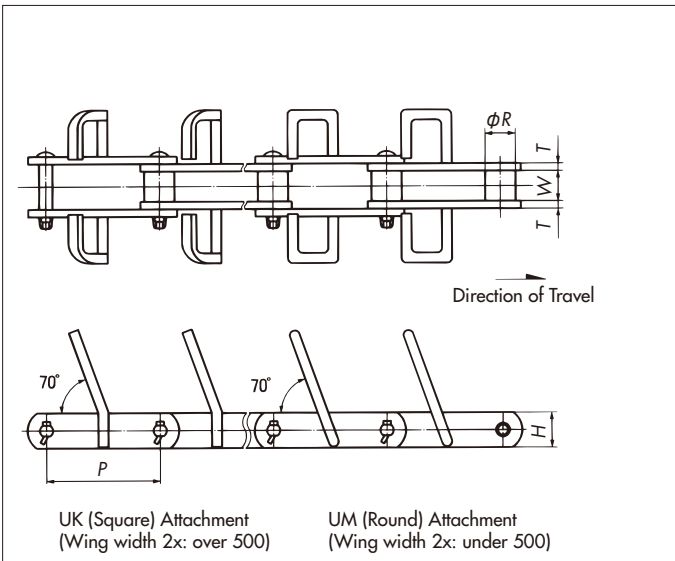
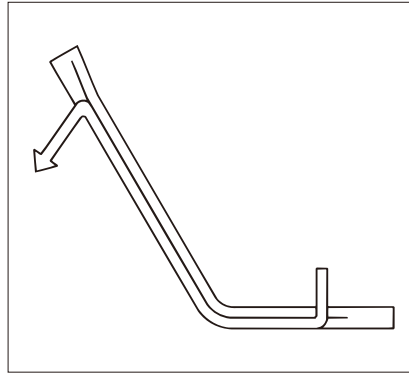
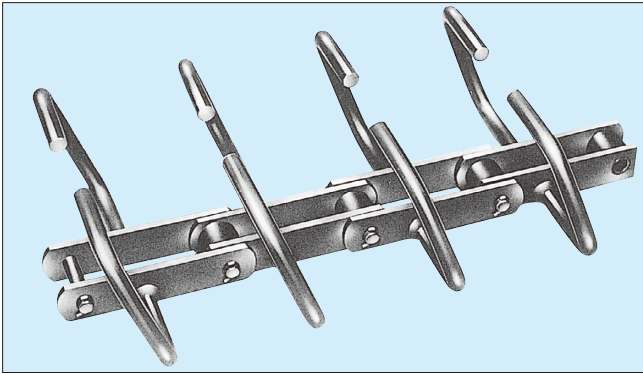
#### Ordering Example

Chain Size: RF12, Pitch: 200mm, Roller Type: S Roller  
 Chain Specs: Standard DT Series  
 Attachment Spacing/Type: L Attachment every 2nd Link  
 Inner Case Width: 350mm, Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF12200S-DT-2LL35*-20LCK</b>	400	L

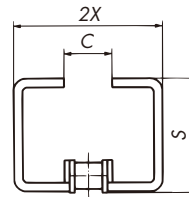
# Flow Conveyor Chain

## Inclined Flow Conveyor Chain

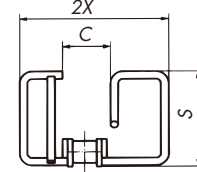


### Attachment Type and Application

Attachment Type	Application
UM (Round)	Conveying general loose materials
UK (Square)	Conveying massive, loose, or adhesive materials
U2M (Round), U2NM (Round)	Conveying materials at a higher efficiency than UM
U2K (Square), U2NK (Square)	Conveying materials at a higher efficiency than UK



U Attachment



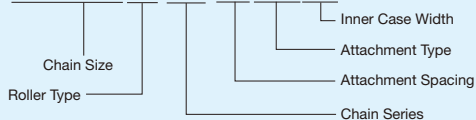
U2 Attachment (For RF450WM) U2N Attachment (For RF10125M and over)

TSUBAKI Chain Number	Case Inner Width	Pitch P	Roller Dia. R	Inner Link Inner Width W	Plate		Wing Width 2X	U Attachment			U2(U2N) Attachment			Average Tensile Strength kN{kgf}	
					Height H	Thickness T		Height S	C	Mass kg/m	Height S	C	Mass kg/m	DT Series	AT Series
RF450WM	160	101.6	25.4	27	31.8	6.3	145	110	50	10.1	110	50	10.9	108{11000}	142{14500}
RF10125M	240	125	31.8	30	38.1	6.3	225	140	65	14.3	140	65	15.7	113{11500}	226{23000}
RF6205M	320	152.4	38.1	37.1	44.5	7.9	300	175	80	20.1	175	80	21.7	186{19000}	279{28500}
RF17200M	410	200	44.5	51.4	50.8	9.5	390	220	100	27.9	220	100	30.3	245{25000}	387{39500}
RF26200M	410	200	50.8	57.2	63.5	9.5	390	220	100	30.9	220	100	33.3	314{32000}	520{53000}
RF26200N														299{30500}	564{57500}
RF36300M	500	300	57.2	66.7	76.2	12.7	480	260	120	42.5	260	120	44.8	476{48500}	-
	600						580	305	140	47	305	140	48.1		
RF36300N	500	300	57.2	66.7	76.2	12.7	480	260	120	42.5	260	120	44.8	-	868{88500}
	600						580	305	140	47	305	140	48.1		

### Ordering Inclined Flow Conveyor Chain

#### Chain Numbering Example

**RF6205M-DT-1LUM32**



#### Ordering Example

Chain Size: RF6205, Pitch: 152.4mm, Roller Type: M Roller  
 Chain Specs: Standard DT Series  
 Attachment Spacing/Type: U attachment every Link  
 Inner Case Width: 320mm  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF6205M-DT-1LUM32</b>	400	L

# FA Series Fly Ash Conveyor Chain



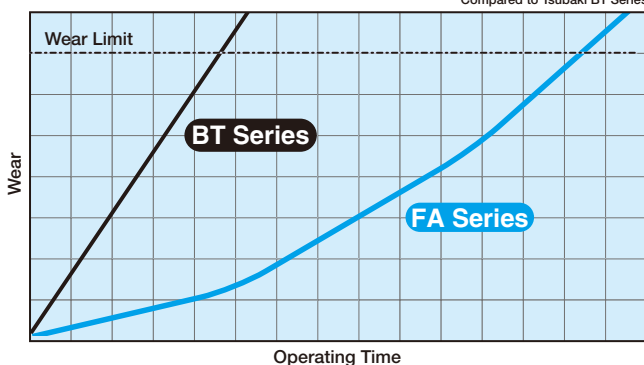
## When wear is a problem

Coal fly ash, a highly abrasive constituent of cement, has seen increasing use in recent years. In order to extend the wear life of our Fly Ash Conveyor Chain, we further improved our popular anti-wear Series and implemented a special hardening treatment that gives remarkable strength to the rollers' anti-wear properties, greatly increasing wear life.

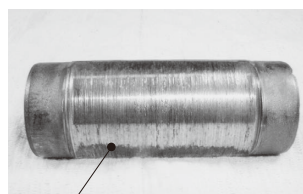


## 3 Optimal for Fly Ash Conveyance x the chain life

### Chain Life Comparison (Bushing/Roller Wear) Compared to Tsubaki BT Series

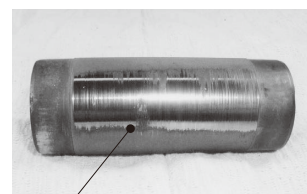


### Bush wear comparison after use



BT Series

Fly ash has infiltrated between bush and roller, causing abrasive wear on the bush outer diameter.



FA Series

Fly ash has infiltrated between bush and roller, but the special hardening on the bush outer diameter has greatly reduced wear.

## Applications

Fly ash conveyor lines in cement tankers and cement factories, and on other extremely abrasive conveyor lines.



## Application Example

This Flow Chain with W attachments is finding use in this fly ash conveyor line.



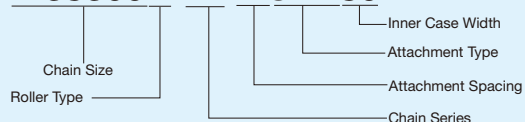
### Note:

- Sprocket teeth must be tempered hardened steel.
- Take measures to prevent wear on rails.

## Ordering Fly Ash Flow Conveyor Chain

### Chain Numbering Example

**RF36300N-FA-1LU2M60**

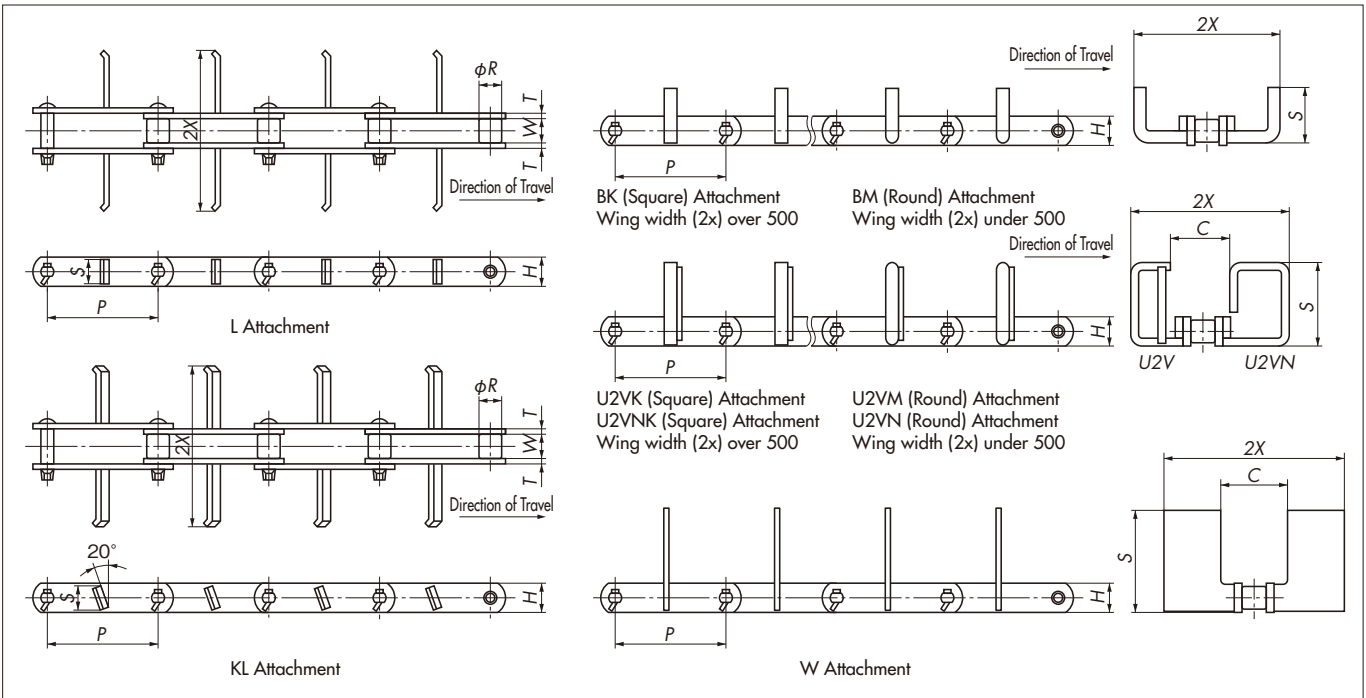
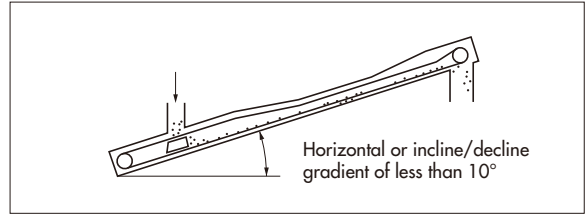
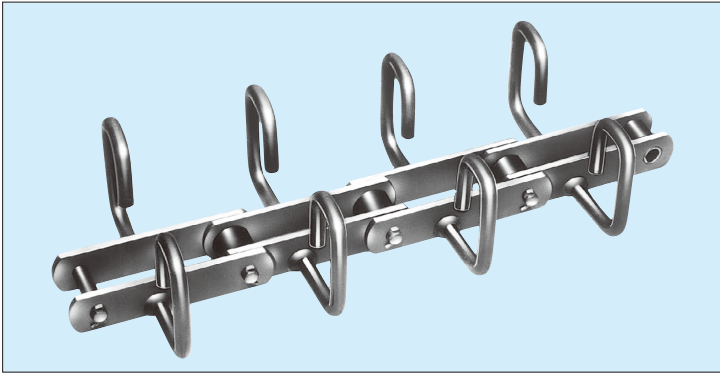


### Ordering Example

Chain Size: RF36, Pitch: 300mm, Roller Type: N Roller  
Chain Specs: FA Series  
Attachment Spacing/Type: U2 Attachment every Link  
Inner Case Width: 600mm  
Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF36300N-FA-1LU2M60</b>	400	L

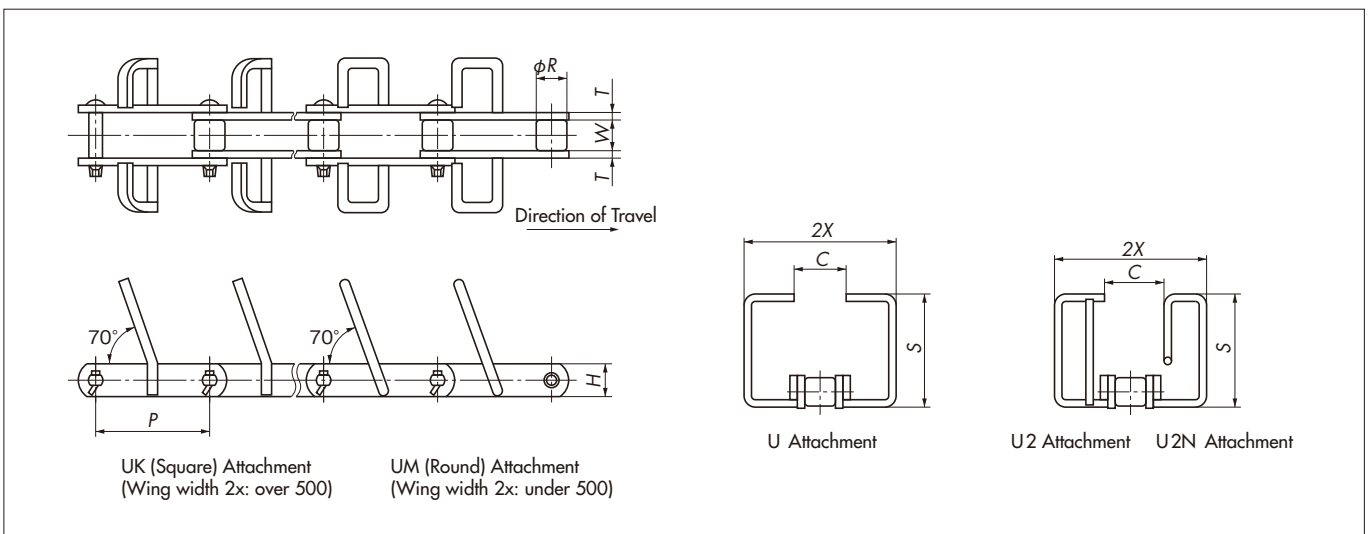
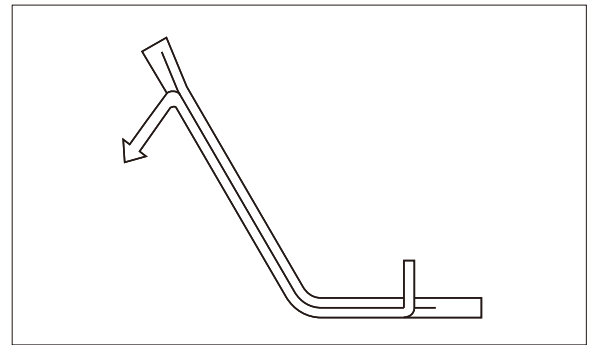
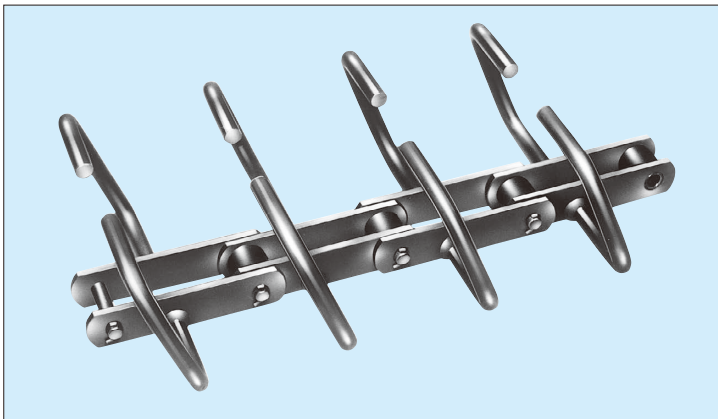
# FA Series Fly Ash Conveyor Chain (Horizontal Conveyance)



TSUBAKI Chain Number	Nominal Size	Case Inner Width	Pitch P	Roller Diameter R	Inner Link Inner Width W	Plate		Average Tensile Strength	
						Height H	Thicknes T	FA Series	
								kN	{kgf}
RF17200M	35	350	200	44.5	51.4	50.8	9.5	387	{39500}
RF17250M	45	450	250						
RF26200M	41	410	200	50.8	57.2	63.5	9.5	520	{53000}
RF26250N	45	450	250						
RF26300N	58	580	300						
RF36300N	58	580	300	57.2	66.7	76.2	12.7	868	{88500}
RF36350N	75	750	350						
RF60350N	75	750	350	70	77	90	12.7	1040	{106000}

TSUBAKI Chain Number	Wing Width 2X	L Attachment		KL Attachment		B Attachment		U2V(U2VN) Attachment			W Attachment		
		Height S	Mass kg/m	Height S	Mass kg/m	Height S	Mass kg/m	Height S	C	Mass kg/m	Height S	C	Mass kg/m
RF17200M	330	Contact a Tsubaki representative	17	Contact a Tsubaki representative	17	125	18.7	185	130	23	185	130	26.3
RF17250M	430					160	19.3	230	135	23.7	230	135	31.5
RF26200M	390					28	25	233	100	33.4	233	100	41.7
RF26250N	430					23	25	230	135	29	230	135	35.7
RF26300N	560					23	27	290	160	30.6	290	160	53.0
RF36300N	560					34	37	290	160	40	290	160	61.3
RF36350N	720					36	47	350	180	67	350	180	76.3
RF60350N	720					46	54	350	180	75	350	180	85

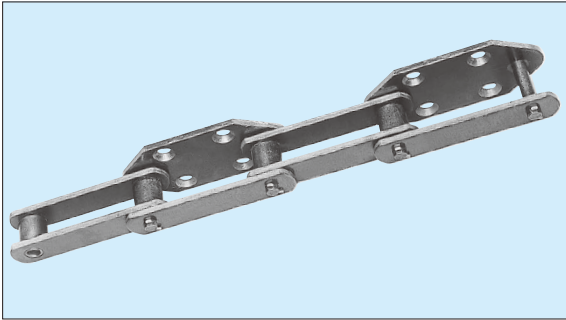
# FA Series Fly Ash Conveyor Chain (Inclined Conveyance)



TSUBAKI Chain Number	Nominal Size	Case Inner Width	Pitch P	Roller Dia. R	Inner Link Inner Width W	Plate		Wing Width 2X	U Attachment			U2(U2N) Attachment			Average Tensile Strength	
						Height H	Thickness T		Height S	C	Mass kg/m	Height S	C	Mass kg/m	kN	{kgf}
RF17200M	41	410	200	44.5	51.4	50.8	9.5	390	220	100	27.9	220	100	30.3	387	{39500}
RF26200M	41	410	200	50.8	57.2	63.5	9.5	390	220	100	30.9	220	100	33.3	520	{53000}
RF26200N															564	{57500}
RF36300N	50	500	300	57.2	66.7	76.2	12.7	480	260	120	42.5	260	120	44.8	868	{88500}
	60	600						580	305	140	47	305	140	48.1		

# Bucket Elevator Conveyor Chain

Specialty chain with high wear resistance and fatigue strength.

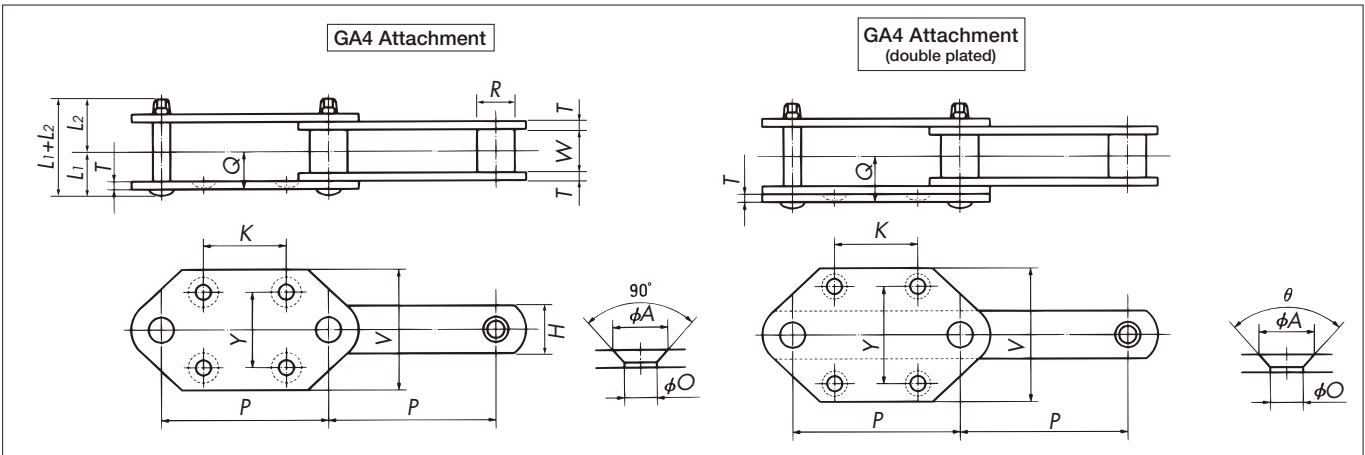


**Standard Wear Resistant Series** ————— **CT or BT Series**

This chain focuses on highly wear inducing cement, with optimal part material, hardness, and spacing for cement conveyance.

**Coal Dust Series** ————— **RT or Y Series**

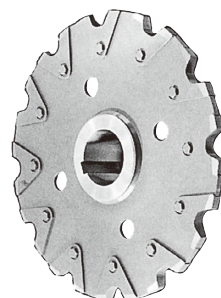
Specially designed chain for conveying corrosive coal dust.



TSUBAKI Chain Number	Pitch P	Roller Dia. R	Inner Link Inner Width W	Plate		Pin			Average Tensile Strength							
				Height H	Thickness T	L1+L2	L1	L2	CT Series		BT Series		RT Series		Y Series	
									kN	{kgf}	kN	{kgf}	kN	{kgf}	kN	{kgf}
B10150S	150	29	30	38.1	6.3	69	33	36	113	{11500}	226	{23000}	177	{18000}	191	{19500}
B12006S	152.4	34.9	37.1	44.5	7.9	83.5	40.5	43	186	{19000}	279	{28500}	186	{19000}	279	{28500}
B12200S	200															
B17200S	200	40.1	51.4	50.8	9.5	109.5	51.5	58	245	{25000}	387	{39500}	245	{25000}	378	{38500}
B17250S	250															
B26200N	200	50.8	57.2	63.5	9.5	117	56	61	299	{30500}	564	{57500}	299	{30500}	461	{47000}
B26250N	250															
B26300N	300															
B36250N	250	57.2	66.7	76.2	12.7	129.5*	68.5*	78	-	-	868	{88500}	-	-	765	{78000}
B36300N	300															
B36350N	350															
B60300N	300	70	77	90	12.7	172*	88*	84	-	-	1040	{106000}	-	-	843	{86000}
B60350N	350															
B60400N	400															
B90350N	350	85	88	100	16	197.5*	102*	95.5	-	-	1630	{166000}	-	-	1334	{136000}
B90400N	400															
B120400N	400	100	100	130	19	227.5*	119.5*	108	-	-	2210	{225000}	-	-	1814	{185000}

Note: \* indicates GA4 attachment (double plated) dimensions.

■ Contact a Tsubaki representative regarding replaceable tooth insert sprockets.





# Bucket Elevator Conveyor Chain

## GA4 Attachment

TSUBAKI Chain Number	P	V	K	Y	T	Q	A	O	$\theta$	Bolt Used	Mass with Attachment Every 2 Links kg/m
B10150S	150	110	75	70	6.3	28.5	26	15	90°	M12	7.5
B12006S	152.4	110	75	70	7.9	35.5	26	15	90°	M12	11
B12200S	200	120	100	80						M14	10
B17200S	200	120	100	80	9.5	45.5	26	15	90°	M14	14
B17250S	250	150	140	100			32	19		M16	15
B26200N	200	120	100	80	9.5	48.5	26	15	90°	M14	20
B26250N	250	150	140	100			32	19		M16	19
B36250N	250	150	140	100	12.7	60	32	19	90°	M16	30

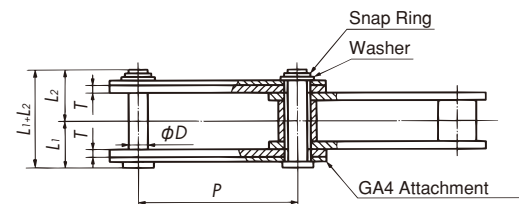
## GA4 Attachment (Double Plated)

TSUBAKI Chain Number	P	V	K	Y	T	Q	A	O	$\theta$	Bolt Used	Mass with Attachment Every 2 Links kg/m
B26300N	300	200	170	140	12	60	38	24	90°	M20	24
B36300N	300	200	170	140	12	72	38	24	90°	M20	33
B36350N	350	240	200	170	12	72	40	28	60°	M24	34
B60300N	300	200	170	140	12	77	38	24	90°	M20	41
B60350N	350	240	200	170	12	77	40	28	60°	M24	43
B60400N	400	280	230	200	12	81	50	35	60°	M30	46
B90350N	350	240	200	170	16	89.5	40	28	60°	M24	60
B90400N	400	280	230	200	16	93.5	50	35	60°	M30	64
B120400N	400	280	230	200	16	105.5	50	35	60°	M30	85

## Connecting Link

The following chains come with an easy to assemble/disassemble connecting link, which greatly reduces attachment time. A special bush is press-fitted into the pin hole of the connecting link plate, creating a slip-fit between pin and bush.

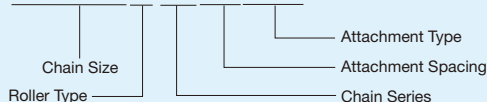
TSUBAKI Chain Number	Pitch P	D	L <sub>1</sub>	L <sub>2</sub>	L <sub>1</sub> +L <sub>2</sub>	T
B36300N · B36350N	300 · 350	28	83	81	164	22
B60300N · B60350N · B60400N	300 · 350 · 400	35	88	88	176	22
B90350N · B90400N	350 · 400	42	102.5	101.5	204	16
B120400N	400	50	114.5	115.5	230	19



## Ordering Bucket Elevator Conveyor Chain

### Chain Numbering Example

**B12200S-CT-2LGA4**



### Ordering Example

Chain Size: B12, Pitch: 200mm, Roller Type: S Roller  
 Chain Specs: Reinforced CT Series  
 Attachment Spacing/Type: GA4 every 2nd Link  
 Quantity: 400 links

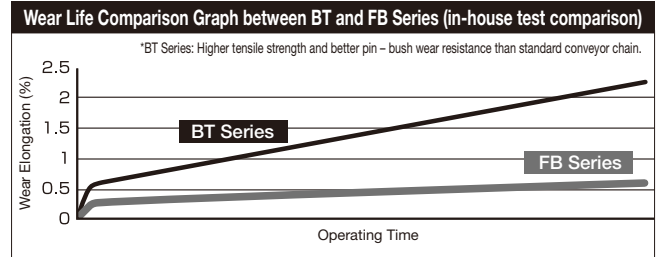
Chain Number	Quantity	Unit
<b>B12200S-CT-2LGA4</b>	400	L

## Over twice the wear life of previous bucket elevator chains and sprockets

### FB Series Conveyor Chain (RF10 – 26, RF205, and RF6205 sizes only)



A solid lubricant is bonded between pin and bush, and an O ring is attached between links to provide over twice the wear elongation life of previous bucket elevator conveyor chain. It is also quieter (-2dB<sub>(A)</sub>).



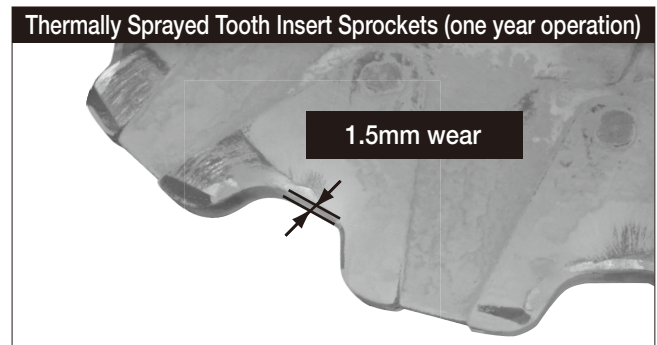
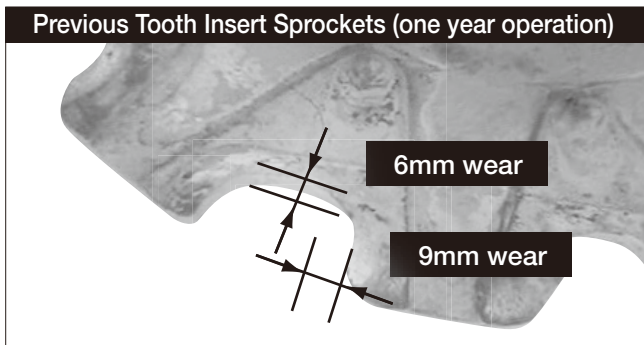
### Condition of pin after one year operation (FB Series)



\*24hrs/day, 365 days/year

### Thermally Sprayed Replaceable Tooth Insert Sprockets

While normal replaceable tooth insert sprockets suffered on average 6.0 – 9.0mm of wear in one year of operation, thermally sprayed tooth insert sprockets suffered only 1.5mm of wear.

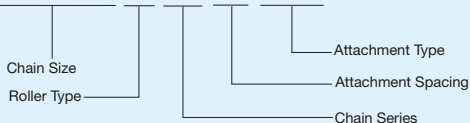


We gave the tooth inserts the same hardening found on FA Series conveyor chain to increase the surface hardness and double the wear life over the previous series. Contact a Tsubaki representative regarding thermally sprayed replaceable tooth insert sprockets.

## Ordering FB Series Conveyor Chain & Thermally Sprayed Replaceable Tooth Insert Sprockets

### Chain Numbering Example

**RF10150 S -FB-2L GA4**



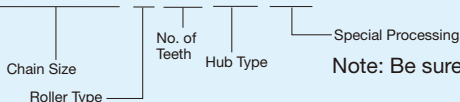
### Ordering Example

Chain size = RF10, Pitch = 150mm, Roller type = S roller  
 Chain series = FB Series  
 Attachment type/spacing = GA4 attachment every 2L  
 Quantity = 400 links

Chain Number	Quantity	Unit
<b>RF10150S-FB-2LGA4</b>	400	L

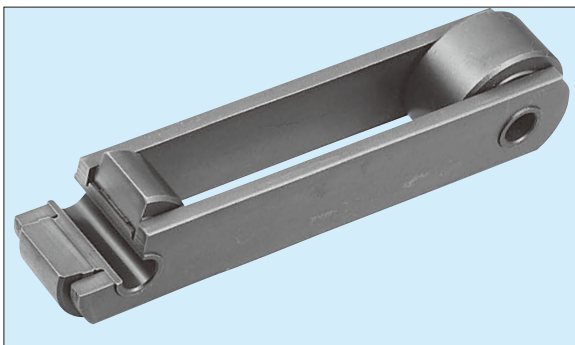
### Sprocket Model Numbering Example

**RF10150 S 8T-BW-TK**

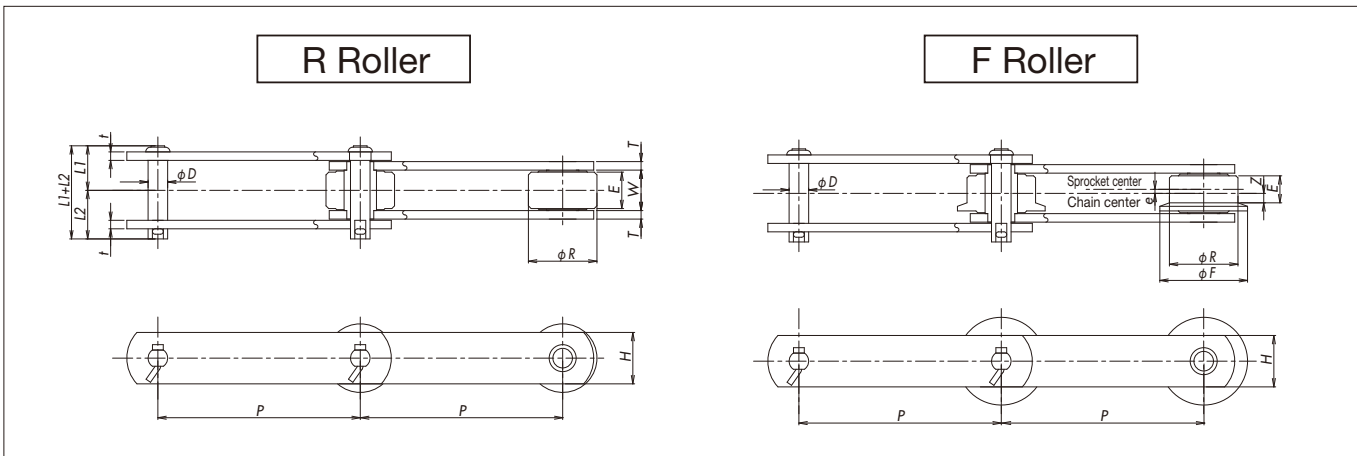


Note: Be sure to indicate thermally sprayed replaceable tooth insert sprockets.

# Shoulder Bush Conveyor Chain



Has the same base outer dimensions as a standard conveyor chain, but the larger bush diameter increases the roller allowable load, allowing for conveyance of heavier objects. The bush also employs various measures against outer diameter wear. The chain's coefficient of running friction is 0.10 (lubricated) or 0.18 (unlubricated).



TSUBAKI Chain Number	Roller Type	Pitch P	Roller							Inner Link Inner Width W	Plate		Pin			Roller Allowable Load kN{kgf}		Approx. Mass		
			R Roller			F Roller					Height H	Thickness T	Dia. D	L1+L2	L1	L2	DT Series	GT · AT Series	R Roller	F Roller
			Dia. R	Contact Width E	Dia. R	Flange Dia. F	Contact Width E	Off-Center e	Z											
RF10100-DB	R	100	50.8	27	50.8	65	20	3	7	30	38.1	6.3	14.5	69	33	36	2.06 {210}	3.38 {345}	10	-
RF10150-DB	R, F	150	50.8	27	50.8	65	20	3	7	30	38.1	6.3	14.5	69	33	36	2.06 {210}	3.38 {345}	8	8.3
RF6205-DB	R, F	152.4	57.2	32	57.2	70	25	3.5	9	37.1	44.5	7.9	15.9	83.5	40.5	43	3.04 {310}	5.00 {510}	12.2	12.6
RF12200-DB	R, F	200	65	32	65	80	24	4	8	37.1	44.5	7.9	15.9	83.5	40.5	43	3.04 {310}	5.00 {510}	11.6	12.1
RF12250-DB	R, F	250																	10.4	10.8
RF17200-DB	R, F	200	80	44	80	100	34	5	12	51.4	50.8	9.5	19.1	109.5	51.5	58	4.09 {500}	8.04 {820}	20	21
RF17250-DB	R, F	250																	17	18
RF17300-DB	R, F	300																	16	16
RF26250-DB	R, F	250																	26	27
RF26300-DB	R, F	300	100	50	100	125	38	6	13	57.2	63.5	9.5	22.2	116.5	55.5	61	6.37 {650}	10.6 {1080}	23	24
RF26450-DB	R, F	450																	19	19
RF36300-DB	R, F	300	125	56	125	150	42	7	14	66.7	76.2	12.7	25.4	146	68	78	8.73 {890}	14.4 {1470}	40	42
RF36450-DB	R, F	450																	32	33
RF36600-DB	R, F	600																	28	29

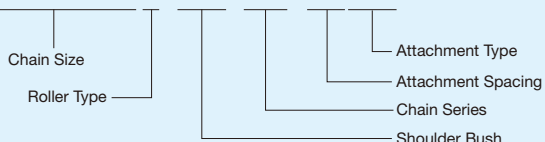
Note:

- Roller allowable load values indicated are under lubricated conditions.
- Basic chain and attachment specifications are the same as RF Conveyor Chain.
- Confirm attachment allowable load when selecting chain.

## Ordering Shoulder Bush Conveyor Chain

### Chain Numbering Example

**RF12200F-DB-AT-1LA2**



### Ordering Example

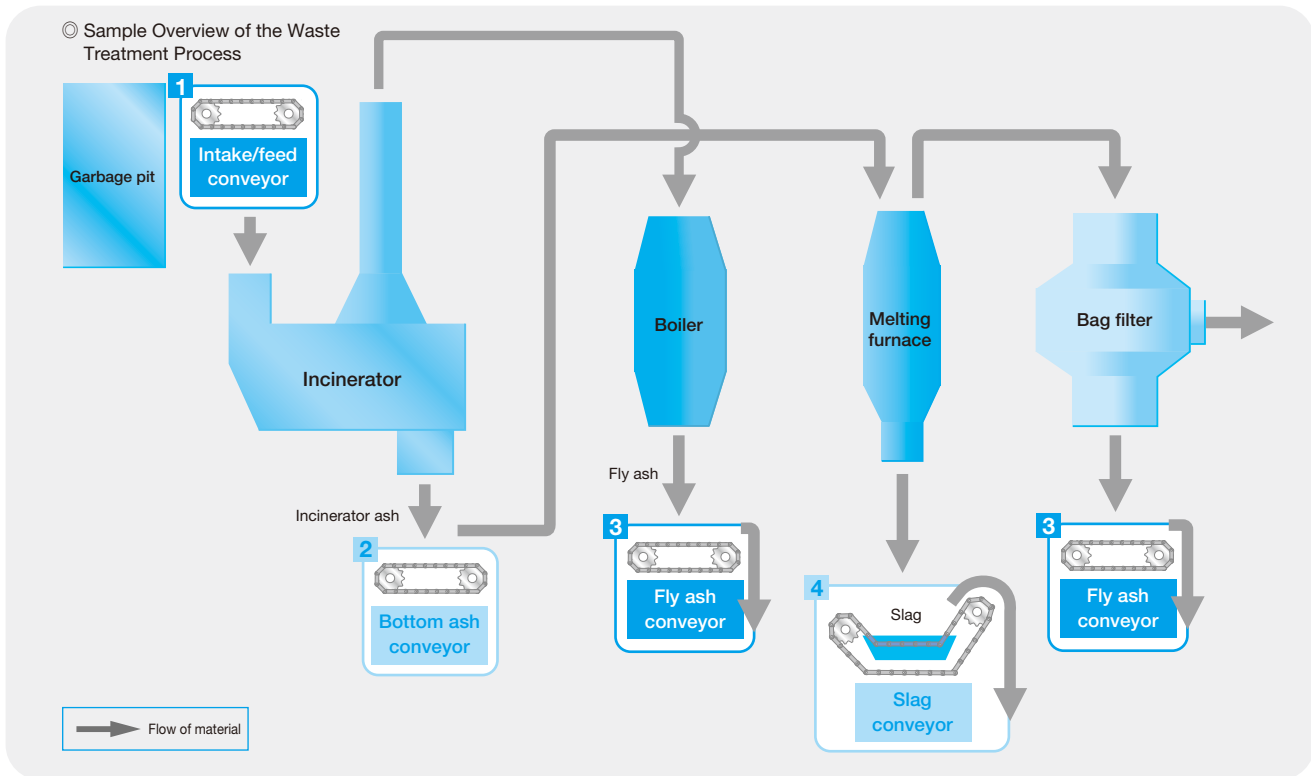
Chain Size: RF12, Pitch: 200mm, Roller Type: F Roller  
 Chain Specifications: Shoulder Bush/AT Series  
 Attachment Spacing/Type: A2 every Link  
 Quantity: 400 links







Chain Number	Quantity	Unit
<b>RF12200F-DB-AT-1LA2</b>	<b>400</b>	<b>L</b>

# Waste Treatment Conveyor Chain

## The perfect conveyor chain for each process, however harsh the conditions.

The different equipment in each process at waste treatment facilities all have different features. We looked at the chains used in each process, checked the wear conditions present, and created a chain line-up perfect for each one. These are Tsubaki Waste Treatment Chains.



<p><b>1 Intake/feed conveyor</b></p> <p>This first line in a waste treatment facility conveys collected waste. Often subject to heavy loads and impacts.</p> <p><b>For intake/feed conveyors:</b> KG/KA Series</p>  <p>• <b>Conveyed mat.:</b> Collected waste</p>	<p><b>2 Bottom ash conveyor</b></p> <p>Conveys bottom ash after incineration. Sometimes conveys bottom ash that has been dropped through a water screen to cool.</p> <p><b>For bottom ash (dry) conveyors</b> AG/AA Series</p>  <p>• <b>Conveyed mat.:</b> Bottom ash</p> <p><b>For bottom ash (wet) conveyors</b> AM/AP Series</p>  <p>• <b>Conveyed mat.:</b> Wet bottom ash</p>	<p><b>3 Fly ash conveyor</b></p> <p>Conveys fly ash (and occasionally treated fly ash) from the incinerator or boiler. Chain is often coated with the substance.</p> <p><b>For fly ash (general) conveyors</b> FG Series</p>  <p>• <b>Conveyed mat.:</b> Fly ash after incineration</p> <p><b>For fly ash (corrosive) conveyors</b> FP Series</p>  <p>• <b>Conveyed mat.:</b> Fly ash after treatment in a cooling tower, etc.</p>	<p><b>4 Slag conveyor</b></p> <p>Conveys the slag from the slag furnace. Slag will sometimes turn the water highly alkaline or highly acidic.</p> <p><b>For slag conveyors</b> YP Series</p>  <p>• <b>Conveyed mat.:</b> Slag</p>
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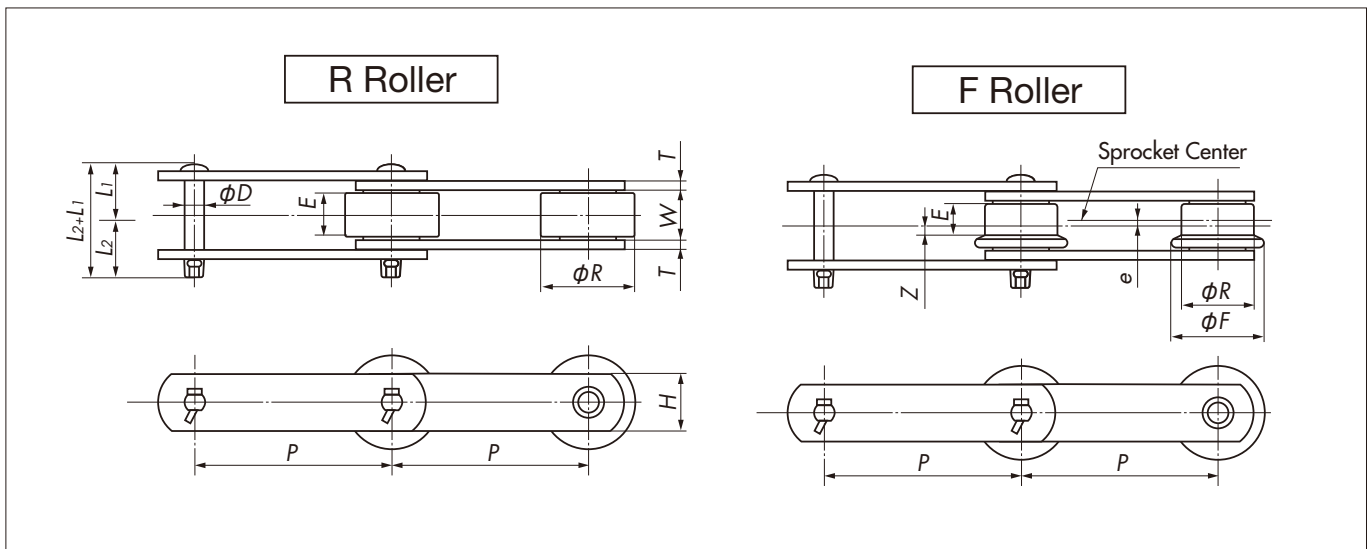
# Waste Treatment Conveyor Chain

## Waste Treatment Chain Series

Conveyor Type	Chain Series		Features Required for Each Process				
			Wear Resistance	Corrosion Resistance	Good Articulation	Good Roller Rotation	
Intake/feed conveyor	KG	KA	◎		○	○	
Bottom ash conveyor	Dry	AG	AA	○		○	○
		AM			○	○	○
	Wet	AP		◎	○	○	
Fly ash conveyor	Normal	FG	○		◎	○	
	Corrosive	FP		◎	◎	○	
Slag conveyor	YP		◎	◎	○	○	

Legend ◎ : Ideal ○ : Suitable

- Each series has features suited to the different waste treatment processes.
- KA and AA Series are stronger (double the tensile strength) versions of the KG, AG, and AM Series.

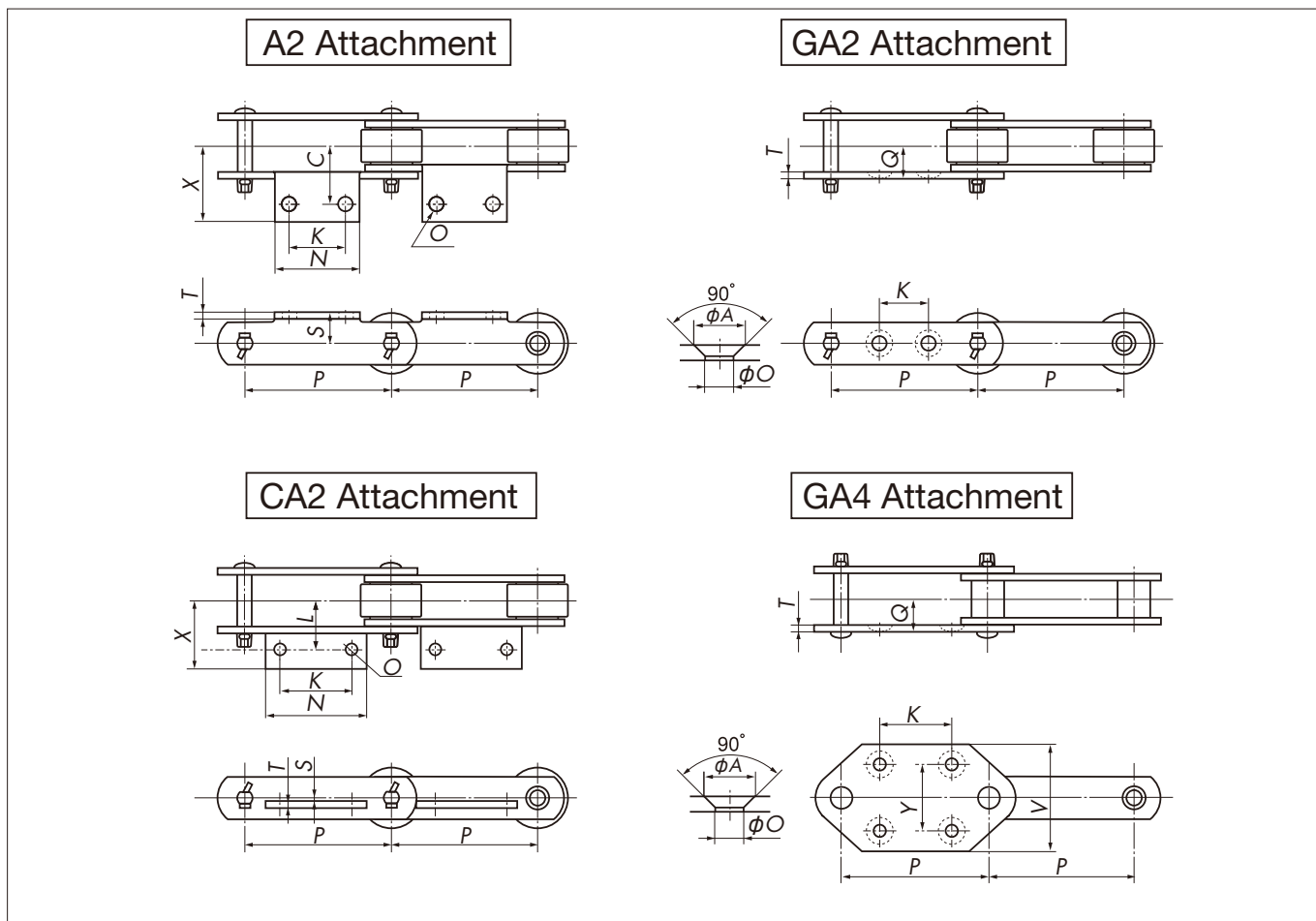


Specialty Conveyor Chains

## Chain Dimensions

TSUBAKI Chain Number	Roller Type	Pitch P	Roller Type							Inner Width W	Plate		Pin			
			R Roller		F Roller						H	T	D	L1+L2	L1	L2
			R	E	R	F	E	e	Z							
RF03075	R.F	75														
RF03100	R.F	100	31.8	14.5	31.8	42	11	1.8	3.8	15.1	22	3.2	8.0	38	18	20
RF05100	R.F	100														
RF05125	R.F	125	40	19	40	50	14	2.5	4.5	21	32	4.5	11.3	53.5	25	28.5
RF05150	R.F	150														
RF10100	R	100														
RF10125	R.F	125	50.8	25	50.8	65	19	3	6.5	28	38.1	6.3	14.5	69	33	36
RF10150	R.F	150														
RF12200	R.F	200														
RF12250	R.F	250	65	32	65	80	24	4	8	35.1	44.5	7.9	14.5	83.5	40.5	43
RF17200	R.F	200														
RF17250	R.F	250	80	44	80	100	34	5	12	49.4	50.8	9.5	15.9	109.5	51.5	58
RF26250	R.F	250														
RF26300	R.F	300	100	50	100	125	38	6	13	55.2	63.5	9.5	19.1	116.5	55.5	61

# Waste Treatment Conveyor Chain



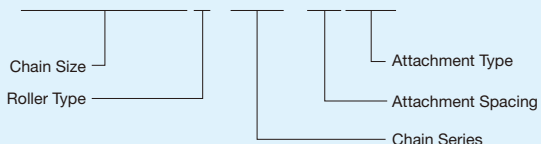
## Attachment Dimensions

TSUBAKI Chain Number	Roller Type	A2 Attachment					CA2 Attachment					A2 CA2	GA2	GA4 Attachment			GA2 GA4			
		C	X	K	N	S	L	X	K	N	S	T	O	K	V	Y	K	A	O	Q
RF03075	R, F	30	46	30	55	20	35	46	30	55	0	3.2	10	30	—	—	—	13.5	8	15.5
RF03100	R, F			40	65				40	65				50	—	—	—			
RF05100	R, F	35	47	40	65	22	40	52	40	65	3	4.5	10	40	—	—	—	15	10	21
RF05125	R, F			50	75				50	75				50	—	—	—			
RF05150	R, F			60	85				60	85				60	—	—	—			
RF10100	R	50	67	40	70	28	50	65	40	70	4	6.3	12	30	—	—	—	20	12	28.5
RF10125	R, F			50	80				50	80				60	—	—	—			
RF10150	R, F			60	90				60	90				60	110	70	75			
RF12200	R, F	60	79	80	120	38	60	79	80	120	5	7.9	15	80	110	70	100	26	15	35.5
RF12250	R, F			125	170				125	165				125	—	—	—			
RF17200	R, F	75	100	80	120	45	75	98	80	120	6	9.5	15	70	120	80	100	26	15	45.5
RF17250	R, F			125	170				125	165				110	150	100	140			
RF26250	R, F	80	108	125	170	55	80	105	125	165	6	9.5	15	—	150	100	140	26	15	48.5
RF26300	R, F			180	220				180	220				140	150	100	180			

## Ordering Waste Treatment Conveyor Chain

### Chain Numbering Example

**RF12250F-KG-1LA2**



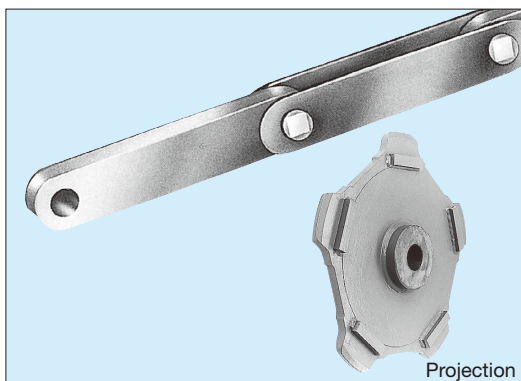
### Ordering Example

Chain Size (Waste Treatment): RF12, Pitch: 250mm  
 Roller Type: F Roller  
 Chain Specs: KG Series  
 Attachment Type/Spacing: A2 every Link  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>RF12250F-KG-1LA2</b>	400	L



# Block Chain



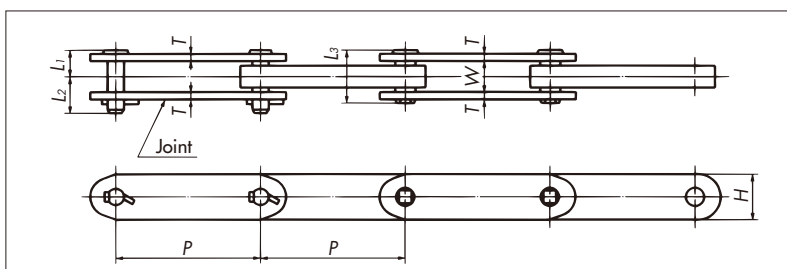
## Simple, Yet Tough

This chain, consisting of two outer plates, one or two inner plates, and pins, offers structurally superior rigidity with the largest tensile strength by chain mass for toughness. The main parts use tempered steel for outstanding wear and heat resistance. Dogs are often attached as per the diagrams below.

### Applications

1. Shuttle traction
2. Conveying high temperature items
3. Draw benches

■ Please use an outer plate support to reduce inner chain tension on the sprocket. Contact a Tsubaki representative for more information.

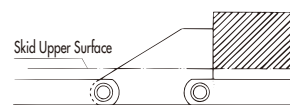


TSUBAKI Chain Number	Pitch P	Link Height H	Pin			Outer Plate Thickness T	Outer Link Inner Width W	Approx. Mass kg/m	Average Tensile Strength	
			L1	L2	L3				kN	{kgf}
NF30150	150	38.1	24	32	49	7.9	23.3	7.0	309	{31500}
NF30200	200									
NF40150	150	44.5	25.5	33.5	52	7.9	26.5	9.0	397	{40500}
NF40200	200									
NF56200	200	54	29.5	40.5	60	9.5	29.5	12.3	554	{56500}
NF56250	250									
NF63200	200	57	30.5	41.5	62	9.5	31.5	13.7	618	{63000}
NF63250	250									
NF70200	200	63.5	31.5	42.5	64	9.5	33.5	16.2	721	{73500}
NF70250	250									
NF90200	200	72	34.5	45.5	70	10.5	38	21.0	907	{92500}
NF90250	250									
NF115250	250	76.2	38	49	77	12.7	40	25.0	1120	{114000}
NF115300	300									
NF140250	250	85	44	54	88	14	47.5	32.0	1400	{143000}
NF140300	300									
NF180300	300	95	48.5	58.5	97	16	52.5	39.0	1740	{177500}
NF180350	350									
NF210300	300	110	51.5	61.5	103	16	59	50.0	2150	{219500}
NF210350	350									
NF250300	300	112	58.5	68.5	117	19	66	58.8	2440	{248500}
NF250350	350									
NF280300	300	122	58.5	68.5	117	19	67	66.0	2720	{277500}
NF280350	350									

There are many types of dogs, but the following outlines some of the most common ones.

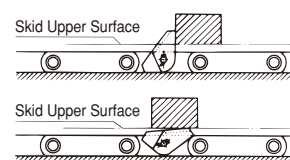
### ① Fixed Dog

The inner or outer plate is heightened to push conveyed items.



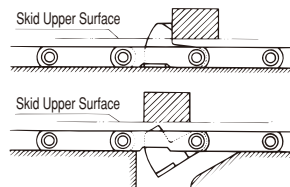
### ② Tilting Dog

Conveyed items in front are pushed along as with the fixed dog, but when items come from behind the dog tilts forward to allow the item to pass by. Once the item has passed, the dog automatically returns to its former position.



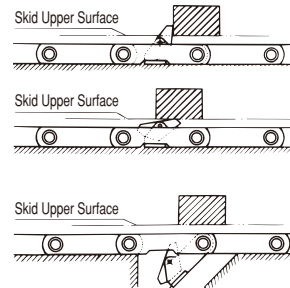
### ③ Ducking Dog

This dog conveys items traveling on the guide rail, but when there is a break in the guide rail the dog ducks and the conveyed item is lowered as is.



### ④ Tilting Ducking Dog

This dog combines both the functions of tilting and ducking dogs. Conveyed items running on the guide rail are pushed along, while items coming from behind are allowed to pass. When there is a break in the guide rail the conveyed item is lowered as is.



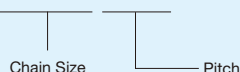
Note: Contact a Tsubaki representative regarding delivery.

Specialty Conveyor Chains

## Ordering Block Chain

### ● Chain Numbering Example

**NF56200**



### ● Ordering Example

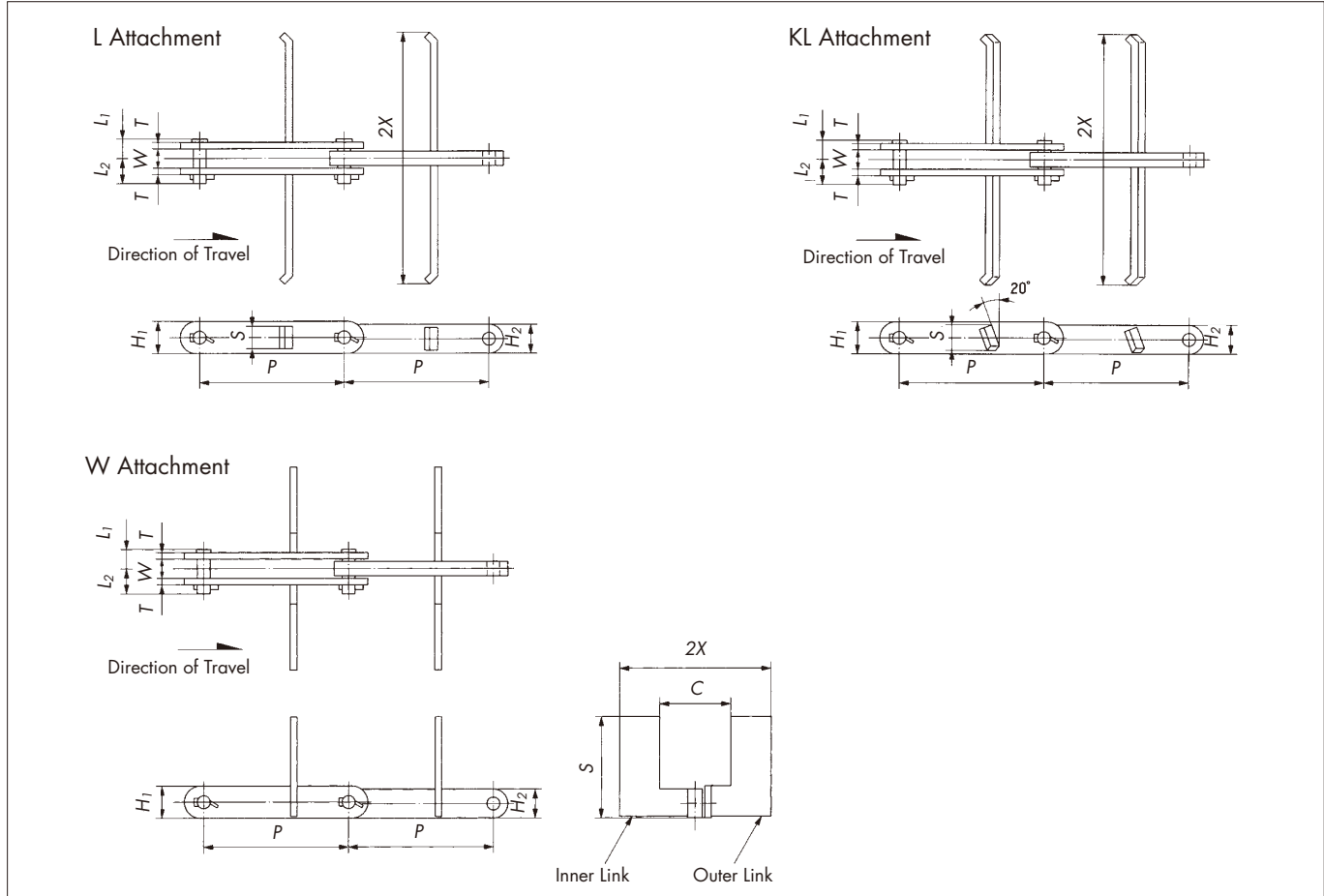
Chain Specs: Block Chain  
Chain Size: NF56  
Pitch: 200mm  
Quantity: 400 links

Chain Number	Quantity	Unit
<b>NF56200</b>	<b>400</b>	<b>L</b>

# Block Chain for Flow Conveyors

Block Chain for Flow Conveyors consists of two outer plates, one inner plate, and pins, with one of various attachments for flow conveyors added. Special alloy steel gives the chain toughness, and its high allowable wear makes it perfect for conveying highly abrasive items, relatively damp items, and high temperature items.

■ Please use an outer plate support to reduce inner chain tension on the sprocket.

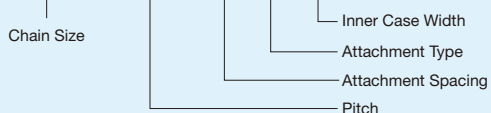


TSUBAKI Chain Number	Pitch P	Link Height		Pin Length		Outer Plate Thickness T	Outer Plate Inner Width W	Approx. Mass {kg/m}	Average Tensile Strength kN{kgf}	Wing Width 2X	L Attachment		KL Attachment		W Attachment		Case Inner Width (mm)							
		H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>						Height S	Additional Mass/Each (kg)	Height S	Additional Mass/Each (kg)	Height S	C		Additional Mass/Each (kg)						
NFX30150 NFX30200	150 200	44.5	38.1	24.5	32	7.9	23.3	7.9	309	135	Contact a Tsubaki representative	0.18	Contact a Tsubaki representative	0.18	80	60	0.33	150						
																			185	0.26	115	85	0.68	200
																			250	0.36	140	105	1.12	270
																			330	0.74	185	130	2.94	350
																			430	0.98	230	135	5.14	450
NFX56200 NFX56250	200 250	63.5	54.0	28.5	39.5	9.5	29.5	14.7	554	390	Contact a Tsubaki representative	1.3	Contact a Tsubaki representative	1.3	233	100	5.0	410						
																			430	1.44	230	135	5.2	450
																			430	1.44	230	135	5.2	450
																			560	1.92	290	160	8.6	580

## Ordering Block Chain for Flow Conveyors

### ● Chain Numbering Example

**NFX30150-1LKL15**



### ● Ordering Example

Chain Specs: Block Chain for Flow Conveyors  
 Chain Size: NFX30, Pitch: 150mm  
 Attachment Spacing/Type: KL every Link  
 Inner Case Width: 150mm  
 Quantity: 400 links

Chain Number	Quantity	Unit
<b>NFX30150-1LKL15</b>	<b>400</b>	<b>L</b>

# Special Attachment

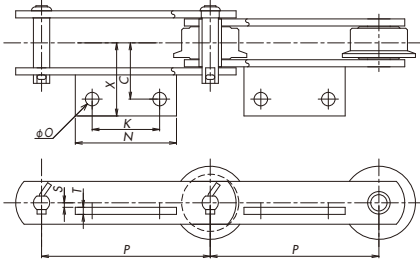
## Conveyor Chain

CA2 Attachment . . . . .	87	Guide Shoe (GS) . . . . .	91
AA3 Attachment . . . . .	87	Guide Roller (GR) . . . . .	91
A2R Attachment . . . . .	87	Fixed Dog (KD) . . . . .	92
MG2 Attachment . . . . .	88	Dog Roller (RD) . . . . .	92
AS2 Attachment . . . . .	88	Tilting Dog (CD) . . . . .	93
AF2 Attachment . . . . .	88	Roller Tilting Dog (RCD) . . . . .	93
WSAO Attachment . . . . .	89	Ducking Dog (DD) . . . . .	93
Extended Pin (EP) . . . . .	89		
Stay Pin (TN) . . . . .	89		
Top Plate (TP) . . . . .	90		
Trolley Roller (TRO) . . . . .	90		
Outboard Roller (OR) . . . . .	90		

# Special Attachment Conveyor Chain

## CA2 Attachment

This attachment is for mounting a wire mesh or other endless belt to an inelastic chain. Contact a Tsubaki representative about changes to the S dimension and diagonal attachments.



TSUBAKI Chain Number	Pitch P	C	X	N	K	T	O	S
RF05100	100	40	52	65	40	4.5	10	3
RF05150	150	40	52	85	60	4.5	10	3
RF450	101.6	50	64	70	40	6.3	12	4
RF10100	100	50	65	70	40	6.3	12	4
RF10150	150	50	65	90	60	6.3	12	4
RF6205	152.4	60	79	100	60	7.9	15	5
RF12200	200	60	79	120	80	7.9	15	5
RF12250	250	60	79	165	125	7.9	15	5
RF17200	200	75	98	120	80	9.5	15	6
RF17250	250	75	98	165	125	9.5	15	6
RF26200	200	80	105	120	80	9.5	15	6
RF26250	250	80	105	165	125	9.5	15	6
RF36300	300	100	125	180	120	12	19	8

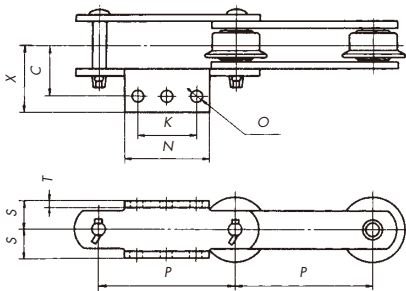
Note: If CA attachment positioning is below chain center, T pin insertion will be opposite. (Basically, CA attachments are attached below chain center. Separate instructions are needed for attaching above chain center. The base chain is equivalent to a conveyor chain.)

Suitable Roller Types: R/F/S

Chain Numbering Example: RF03075S-DT-2LCA2

## AA3 Attachment

This bracket-shaped attachment allows for mounting both above and below the chain. Perfect for times when slight phase differences from scrapers, etc. cause a variable load on the chain (use the center hole), or when a strong moment of inertia is applied to the scraper.



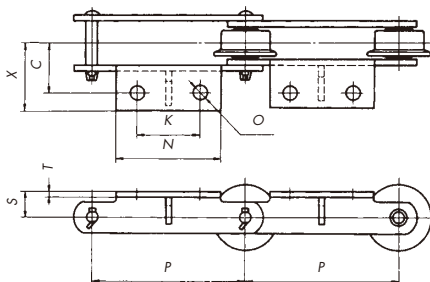
TSUBAKI Chain Number	Pitch P	S	C	X	N	K	T	O
RF05100	100	22	35	52	65	40	4.5	10
RF05150	150	22	35	52	85	60	4.5	10
RF10100	100	28	50	65	70	40	6.3	12
RF10150	150	28	50	65	90	60	6.3	12
RF6205	152.4	38	60	79	100	60	7.9	15
RF12200	200	38	60	79	120	80	7.9	15
RF12250	250	38	60	79	165	125	7.9	15

Suitable Roller Types: R/F/S

Chain Numbering Example: RF05100F-DT-2LAA3

## A2R Attachment

This attachment features a supporting rib on an A2 attachment for 2-3 times the bending strength.



TSUBAKI Chain Size	Pitch P	S	C	X	N	K	T	O	Bolt Used
RF05100	100	22	35	47	65	40	4.5	10	M 8
RF05150	150	22	35	47	85	60	4.5	10	M 8
RF10100	100	28	50	67	70	40	6.3	12	M10
RF10150	150	28	50	67	90	60	6.3	12	M10
RF6205	152.4	38	60	79	100	60	7.9	15	M12
RF12200	200	38	60	79	120	80	7.9	15	M12
RF12250	250	38	60	79	170	125	7.9	15	M12
RF17200	200	45	75	100	120	80	9.5	15	M12
RF17250	250	45	75	100	170	125	9.5	15	M12

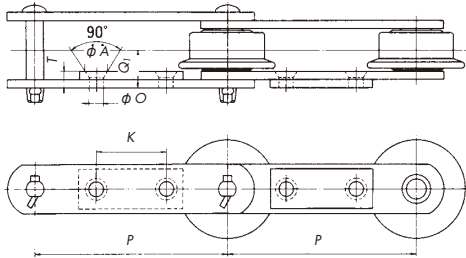
Suitable Roller Types: R/F/S

Chain Numbering Example: RF05100F-DT-2LA2R

# Special Attachment Conveyor Chain

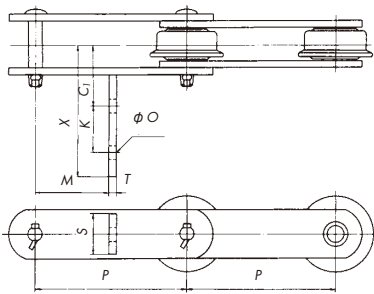
## MG2 Attachment

The mounting face is flush, so only one type of attachment is needed (pan, apron, bolt).



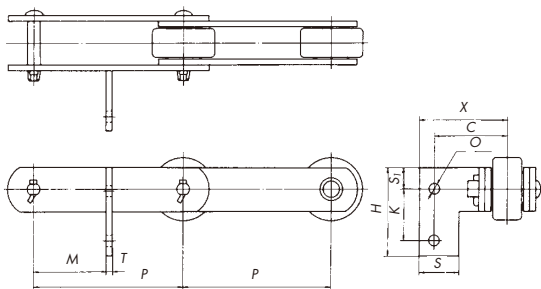
## AS2 Attachment

The perfect shape for mounting scrapers and other attachments. Can be attached to both sides of the chain (KS2). (KS2 type).



## AF2 Attachment

The perfect shape for mounting scrapers and other attachments. Especially ideal for deep scrapers.



TSUBAKI Chain Number	Roller Type	Pitch P	K	T	Q1	A	O	Max. Length of Att. Bolt		Bolt Used
								Outer Link	Inner Link	
RF05100	R · S	100	40	9	21	15	10	31	26	M8
RF05150	R · F · S	150	60							
RF10150	R · F · S	150	60	12.6	28.5	20	12	43	35	M10
RF6205	R · F · S	152.4	50	15.8	35.5	26	15	55	45	M12
RF12200	R · F · S	200	80							
RF12250	R · F · S	250	125	15.8	35.5	26	15	55	45	M12
RF17200	R · F · S	200	70							
RF17250	R · F · S	250	110	19	45.5	26	15	71	61	M12
RF17300	R · F · S	300	150							
RF26300	R · F · S	300	140							
RF26450	R · F · S	450	220	19	48	26	15	78	67	M12
RF36450	R · F · S	450	220	25.4	59.5	32	19	92	75	M16
RF36600	R · F · S	600	300							

Chain Numbering Example: RF05100R-DT-2LMG2

TSUBAKI Chain Number	Pitch P	C1	K	X	O	S	M	T
RF03075	75							
RF03100	100	28.3	20	61	9	20	36	3.2
RF05100	100	38.8	20	72	9	28	37	4.5
RF05150	150							
RF450	101.6	46.6	25	85	11	25	37	6
RF10100	100							
RF10150	150	54.6	30	100	11	34	47	6
RF6205	152.4	63.9	50	132	14	40	57	6
RF12200	200							
RF12250	250	63.9	60	132	14	40	57	6
RF17200	200							
RF17250	250	80.8	70	175	14	46	66	9
RF17300	300							
RF26200	200							
RF26250	250	91.7	100	215	14	58	75	9
RF26300	300							
RF26450	450							
RF36300	300							
RF36450	450	110	120	260	18	70	84	12

Suitable Roller Types: R/F/S

Chain Numbering Example: RF03075F-DT-2LAS2

TSUBAKI Chain Number	Pitch P	C	X	K	S1	H	S	O	M	T
RF03075	75									
RF03100	100	31.3	48	20	10	40	32	9	36	3.2
RF05100	100									
RF05150	150	36.9	53	25	14	53	32	9	37	4.5
RF450	101.6	46.1	65	25	12.5	50	38	11	37	6
RF10100	100									
RF10150	150	47.6	67	30	17	64	38	11	47	6
RF6205	152.4	57.4	80	50	20	90	44	14	57	6
RF12200	200									
RF12250	250	57.4	80	50	20	90	44	14	57	6
RF17200	200									
RF17250	250	70.8	96	70	23	116	50	14	70	9
RF17300	300									
RF26200	200									
RF26250	250	73.7	99	100	29	158	50	14	80	9
RF26300	300									
RF26450	450									
RF36300	300									
RF36450	450	92.4	125	120	35	190	65	18	90	12

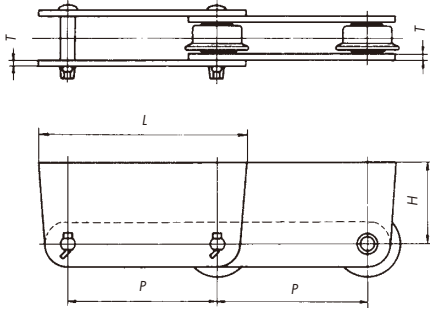
Suitable Roller Types: R/F/S

Chain Numbering Example: RF03075R-DT-2LAF2

# Special Attachment Conveyor Chain

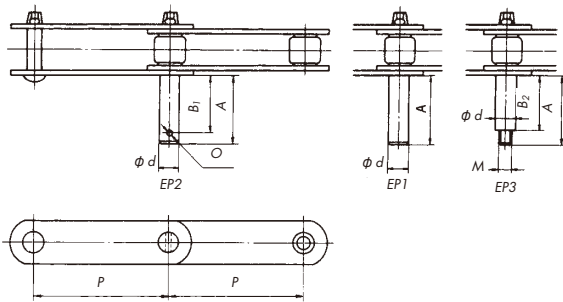
## WSAO Attachment

One side of the plate is made taller to prevent conveyed items from spilling over.  
Normally used with CA attachments. (See pg. 87.)



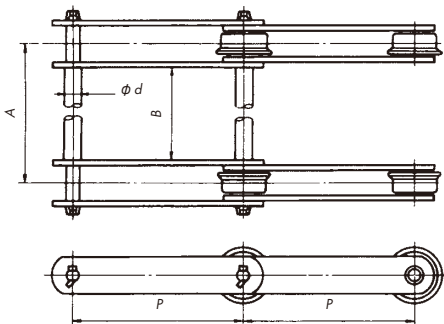
## Extended Pin (EP)

One side of the pin is extended.  
There are three different types, depending on pin shape.  
See pg. 15 for attachment spacing chart.



## Stay Pin (TN)

Two strands of chain are connected by one pin.  
Items can be carried on top of the pin, or nets, aprons, etc. can be mounted using a CA2 attachment.



TSUBAKI Chain Number	Pitch P	H	L	T
RF03100	100	60	160	3.2
RF05100	100	70	170	4.5
RF10100	100	80	180	6.3
RF10150	150		230	
RF6205	152.4	100	250	7.9
RF12200	200	100	300	7.9
RF12250	250		350	
RF17200	200	120	320	9.5
RF17250	250		370	

Suitable Roller Types: R/F/S

Chain Numbering Example: RF03100F-DT-2LWSAO

TSUBAKI Chain Number	Pitch P	$\phi d$	A	B <sub>1</sub>	B <sub>2</sub>	O	M
RF03100	100	11	40	34	27	4	M10
RF05100	100	15	50	42	34	5	M12
RF05150							
RF450	101.6	15	50	42	34	5	M12
RF10100	100	18	60	51	40	6	M16
RF10150							
RF6205	152.4	20	70	61	50	6	M16
RF12200	200	20	70	61	50	6	M16
RF12250	250						
RF17200	200	22	80	71	56	6	M20
RF17250	250						
RF17300	300						
RF36250	250	28	90	78	61	8	M24
RF36300	300						
RF26450	450						
RF36300	300	30	100	85	71	10	M24
RF36450	450						

Suitable Roller Types: R/F/S

Chain Numbering Example: RF03100S-DT-2LEP1

TSUBAKI Chain Number	Pitch P	$\phi d$	A MAX	B
RF03100	100	11	500	A-31
RF05100	100	15	700	A-42
RF05150				
RF450	101.6	15	800	A-55
RF10100	100	18	1000	A-58
RF10150				
RF6205	152.4	50	1100	A-71
RF12200	200	20	1100	A-71
RF12250	250			
RF17200	200	22	1300	A-92
RF17250	250			
RF17300	300			
RF26250	250	28	1500	A-98
RF26300	300			
RF26450	450			
RF36300	300	30	1500	A-120
RF36450	450			

A dimension (B dimension) can be manufactured to customer specifications within the range on the dimensional chart.

Suitable Roller Types: R/F/S

Chain Numbering Example: RF03100F-DT-2LTN



# Special Attachment Conveyor Chain

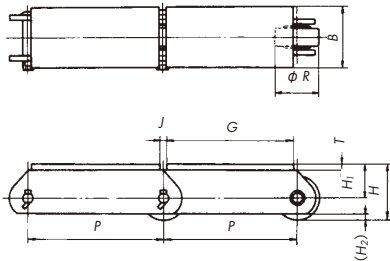
## Top Plate (TP)

Top Plates are welded onto Deep Link Conveyor Chain so as not to damage items placed directly on the chain.

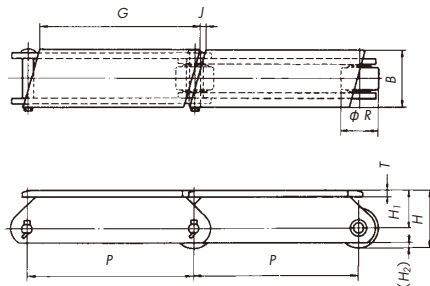
There are two different plate types. Type 2 prevents round objects from falling into the chain.

(Can also be manufactured as Bearing Roller Conveyor Chain.)

TP Type 1

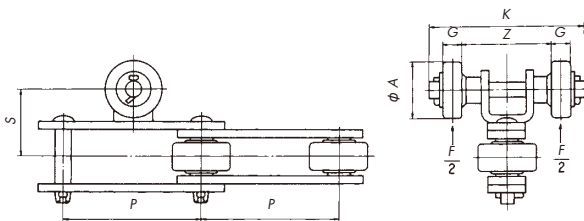


TP Type 2



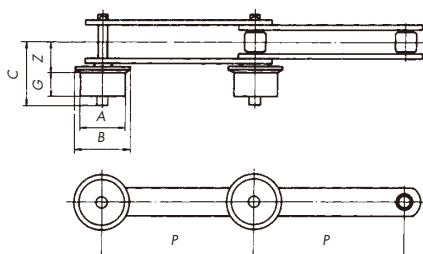
## Trolley Roller (TRO)

The roller supports the chain and heavy loads on horizontal revolving conveyors.



## Outboard Roller (OR)

An outboard roller is attached to one side of this chain to support heavy loads without damaging the pin. Bearing, anti-dust bearing, and bearing roller types are available to match your application needs.



TSUBAKI Chain Number	Pitch P	Roller Dia. R	G	J	B	H	H <sub>1</sub>	Cleavage H <sub>2</sub>	T
RF03100R	100	31.8	95	5	50	41.4	25.5	4.9	4.5
RF05100R	100	40	95	5	65	50	30	4	6
RF05150R	150		145						
RF10150R	150	50.8	145	5	75	66.4	41	6.3	9
RF6205R	152.4	57.2	147.5	5	90	72.6	44	6.3	9
RF12200R	200	65	195	5	90	82.5	50	10	9
RF12250R	250		245						
RF17250R	250	80	240	10	125	102	62	14.6	12
RF17300R	300		290						
RF26300R	300	85	290	10	125	107.5	65	10.7	12
RF36300R	300	100	290	10	150	128	78	11.9	16
RF36450R	450		440						

Chain Numbering Example: RF03100R-DT-1LTP1

Note: Contact a Tsubaki representative when using a Bearing Roller Conveyor Chain. It will be necessary to change the roller (spacer) material.

TSUBAKI Chain Number	Pitch P	S	A	G	Z	K	Trolley Roller Allowable Load F (Total for both sides) kN{kgf}
RF03075R	75	35	31.8	12	50	88	0.69{70}
RF03100R	100						
RF05100R	100	45	40	14	60	107	1.18{120}
RF05150R	150						
RF10100R	100	60	50.8	20	75	138	1.96{200}
RF10150R	150						
RF6205R	152.4	70	57.2	25	85	173	2.75{280}
RF12200R	200	70	57.2	25	90	178	2.75{280}
RF12250R	250						
RF17200R	200	85	65	25	105	185	3.14{320}
RF17250R	250						

Chain Numbering Example: RF03075R-DT-2LTRO

TSUBAKI Chain Number	Pitch P	A	B	G	Z	Max. Dims. C	Allowable Load per Roller kN{kgf}
RF10150S	150	50.8	65	20	37	72	1.77{180}
RF12200S	200	65	80	24	46	87	1.96{200}
RF12250S	250						
RF17200S	200	80	100	34	60	116	2.26{230}
RF17250S	250						
RF26250S	250	100	125	38	65	125	3.53{360}
RF26300S	300						
RF36300S	300	100	125	38	76	137	5.00{510}
RF36450S	450						

Note: Roller Allowable Load is for when attachments are added to the outboard roller side.

Chain Numbering Example: RF10150S-DT-2LOR

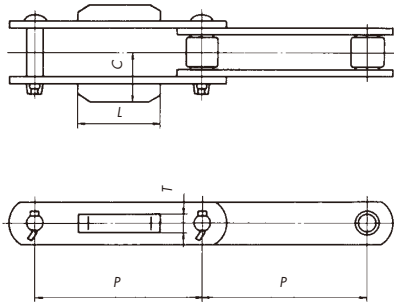
# Special Attachment Conveyor Chain

## Guide Shoe (GS)

Used to prevent chain meandering.

Contact a Tsubaki representative if the shoe needs tempering.

When a shoe is attached on one side of the chain it is referred to as GSA, and when attached to both sides it is GSK.



TSUBAKI Chain Number	Pitch P	L	T	C
RF03075	75	50	9.5	25
RF03100	100			
RF430	101.6	60	13	35
RF05100	100	60	13	34
RF05150	150			
RF450	101.6	60	13	40
RF08150	150	60	13	40
RF10100	100	60	16	45
RF10150	150			
RF214	101.6	60	16	49
RF6205	152.4	100	19	52
RF12200	200	100	19	52
RF12250	250			
RF17200	200	130	22	68
RF17250	250			
RF17300	300			
RF26200	200	130	28	77
RF26250	250			
RF26300	300			
RF26450	450			
RF36250	250	150	32	92
RF36300	300			
RF36450	450			
RF36600	600			

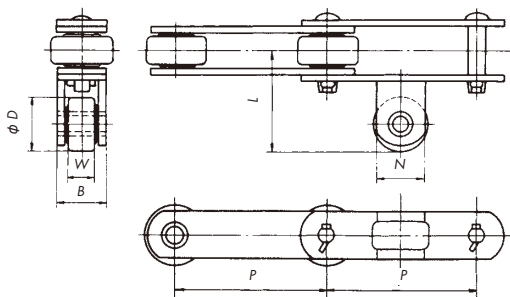
Suitable Roller Types: R/S

Chain Numbering Example: RF03075S-DT-2LGSK

## Guide Roller (GR)

Guide rollers can be used to prevent meandering and as a running roller with horizontal revolving conveyors.

The roller can be made from various materials, and heat treatment allows it to be used together with A, SA, G, and other attachments and pushers.



TSUBAKI Chain Size	Pitch P	D	W	B	N	L	Standard Guide Roller Allowable Load kN{kgf}
RF03075R	75	31.8	15.5	22.6	22	53	0.54{55}
RF03100R	100						
RF430R	101.6	31.8	15.5	22.6	22	60	0.54{55}
RF05100R	100	31.8	15.5	22.6	22	59	0.54{55}
RF05150R	150						
RF450R	101.6	31.8	15.5	22.6	22	65	0.54{55}
RF10100R	100	40	19	31.0	32	76	1.03{105}
RF10150R	150						
RF214R	101.6	40	19	31.0	32	80	1.03{105}
RF6205R	152.4	40	19	31.0	32	83	1.03{105}
RF12200R	200	40	19	31.0	32	83	1.03{105}
RF12250R	250						
RF17200R	200	44.5	23	39.6	28.6	100	1.27{130}
RF17250R	250						
RF17300R	300						

Chain Numbering Example: RF03075R-DT-2LGR

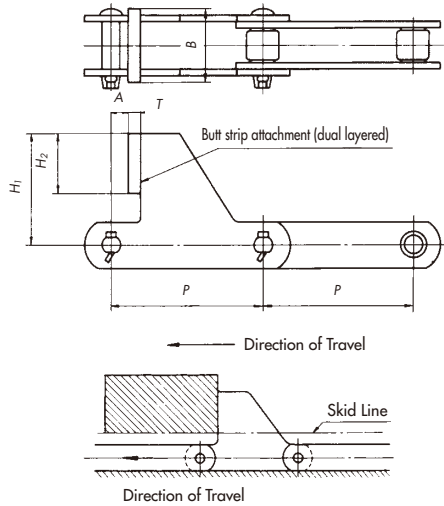
# Special Attachment Conveyor Chain

## Fixed Dog (KD)

This attachment chain is used for conveying items on skids and pushing carts.

Type 1: No butt strip on attachment (KD1)

Type 2: Butt strip on attachment (KD2)



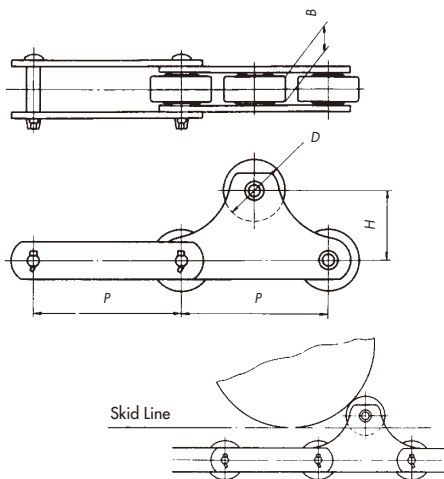
TSUBAKI Chain Number	Pitch P	Butt Strip Attached (dual layer)					No Butt Strip (single layer)	
		H <sub>1</sub>	H <sub>2</sub>	A	T	B	H <sub>1</sub>	A
RF03075	75	70	50	20	4.5	40	50	24.5
RF03100	100							
RF05100	100	100	75	25	6.0	50	70	31
RF05150	150							
RF10100	100	130	100	30	9	65	90	39
RF10150	150							
RF6205	152.4	150	110	40	9	90	100	49
RF12200	200	150	110	40	9	90	100	49
RF12250	250							
RF17200	200	180	125	50	12	100	120	62
RF17250	250							
RF26200	200	210	150	60	12	110	-	-
RF26250	200							
RF26300	250	240	170	70	16	150	-	-
RF36250	250							
RF36300	300							
RF36450	450							

Suitable Roller Types: R/S

Chain Numbering Example: RF03075S-DT-30LKD1

## Dog Roller (RD)

This attachment chain is used to prevent damage on the push side when cylindrical items are being conveyed by rolling, and to reduce rolling resistance.



TSUBAKI Chain Number	Pitch P	H	D	B
RF03075	75	50	31.8	15.5
RF03100	100			
RF05100	100	60	40	19
RF05150	150			
RF10100	100	70	50.8	27
RF10150	150			
RF6205	152.4	80	57.2	32
RF12200	200	80	65	32
RF12250	250			
RF17200	200	120	85	50
RF17250	250			
RF26250	250	120	85	50
RF26300	300			
RF36300	300	150	100	56
RF36450	450			

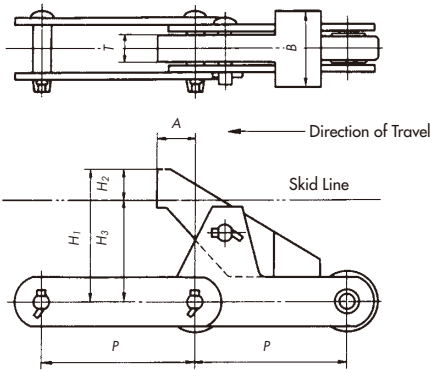
Suitable Roller Types: R/S

Chain Numbering Example: RF03075R-DT-10LRD

# Special Attachment Conveyor Chain

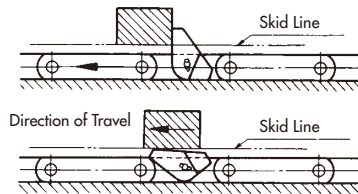
## Tilting Dog (CD)

A tilting dog can push items in front of it, but when items come from behind the dog tilts forward to allow the conveyed items to pass by. Once the conveyed items have passed by, the dog automatically returns to its original position. A side roller can also be used as the return side, or to prevent the dog from rising during conveyance.



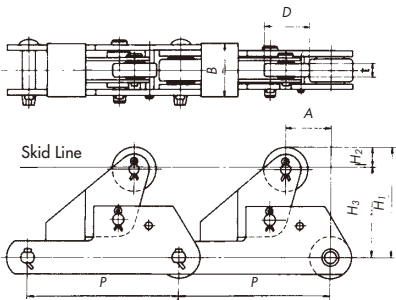
TSUBAKI Chain Size	Pitch P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	A	T	B	Dog Allowable Push Strength kN{kgf}	
								W/O Side Roller	W/Untreated Side Roller
RF03100R	100	70	15	55	10	15	22	2.75{280}	1.08{110}
RF05100R	100	90	20	70	13	21	32	5.88{600}	1.47{150}
RF05150R	150							5.10{520}	2.16{220}
RF10100R	100	95	20	75	22	28	45	9.02{920}	2.26{230}
RF10150R	150							9.02{920}	3.43{350}
RF6205R	152.4	130	30	100	30	35	55	14.2{1450}	3.63{370}
RF12200R	200	130	30	100	30	35	55	12.7{1300}	4.71{480}
RF12250R	250							9.81{1000}	5.88{600}
RF17200R	200	160	40	120	30	50	70	19.6{2000}	4.41{450}
RF17250R	250							14.7{1500}	5.59{570}
RF26250R	250	195	50	145	30	55	75	24.5{2500}	7.16{730}
RF26300R	300							20.6{2100}	8.63{880}
RF36300R	300	265	70	195	55	65	90	36.3{3700}	8.53{870}
RF36450R	450							25.5{2600}	12.8{1310}

Chain Numbering Example: RF03100R-DT-30LCD



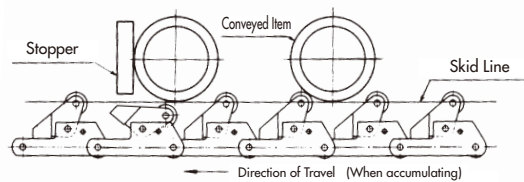
## Roller Tilting Dog (RCD)

Allows for rolling conveyance of cylindrical items. It prevents items from escaping on downgrades, and when there are conveyed items in front the dog tilts, allowing for accumulation.



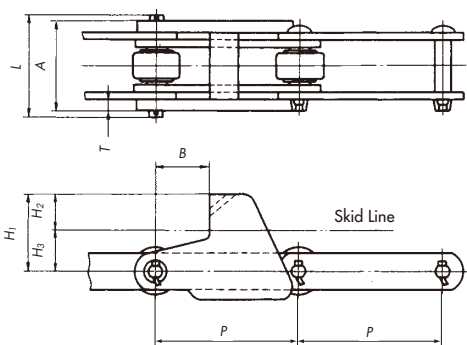
TSUBAKI Chain Size	Pitch P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	A	D	t	B	Tilting Dog Allowable Push Strength kN{kgf}
RF10150R	150	120	20	100	35	44.5	15	55	2.94{300}
RF12200R	200	150	30	120	50	57.2	20	75	4.90{500}
RF17250R	250	200	50	150	60	70	33	150	8.83{900}

Chain Numbering Example: RF10150R-DT-30LRCD



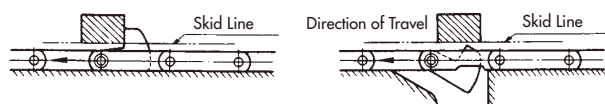
## Ducking Dog (DD)

The dog conveys items on the guide rail, but when there is a break in the guide rail the dog ducks, letting conveyed items pass below.



TSUBAKI Chain Number	Pitch P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	A	B	L	T	Dog Allowable Push Strength kN{kgf}
RF03100R	100	45	15	30	43	60	65	6	3.43{350}
RF05100R	100	55	20	35	60	50	83	9	6.86{700}
RF10100R	100	60	20	40	82	40	110	12	8.83{900}
RF10150R	150								
RF6205R	152.4	85	30	55	103	70	134	16	10.8{1100}
RF12200R	200	85	30	55	103	70	134	16	10.8{1100}
RF12250R	250								
RF17200R	200	100	40	60	131	100	168	19	15.7{1600}
RF17250R	250								

Chain Numbering Example: RF03100R-DT-30LDD



# Chains and Sprockets for Water Treatment

## Ordering Water Treatment Chain

Line 1	Tsubaki Chain No. (Main chain)	No. of links	Ex: ACR15152W	376 links
Line 2	Tsubaki Chain No. (Attachment)	No. of links	ACR15152W-SF4	20 links
Line 3	Tsubaki Chain No. (Offset link)	No. of links	ACR15152W-OL	2 links
Line 4	Chain formation		18 strands × 20 links (one link w/SF4),	
Other	Special specifications (Coating, etc.)		2 strands × 18 links (one link w/SF4), extra OL (2 strands × 1 link), Epoxy resin, black	

- Note:
1. If offset links are not needed, please provide formation and specification information starting from line 4.
  2. Please indicate JWVA when conformance to water specifications is required.
  3. Coating consists of a three-layer chaplet, followed by an immersion application.
  4. The total number of links on the main chain and attachment area are combined with the total link formation number.
  5. Please detail special or detailed formation separately.

## Ordering Sprockets for Water Treatment Chains

Line 1	Tsubaki Chain No. (Main chain), type (code), no. of teeth, amount	Ex. 1: ACS15152W-C-11T	Ex. 2: JAC10152F-PJWH-C-11T
Line 2	Specifications (material, hub diameter × hub length × shaft hole diameter)	One strand SCS2 φ200 × 140L × φ100 Oiles #500, w/seal	FCD600 φ200 × 140L × φ110H7 New JIS keyway, w/tap
Other	Indicate pilot holes by ▽, prepared holes by code	Zinc rich primer, single Epoxy plastic	

- Note:
1. There are five code types. Indicate:  
C: Solid type, D-split: Ring teeth, C-split: Split type, C-block: Block teeth. Water screen chains are either plastic roller type or SUS304 roller type.
  2. Material can be combined as follows.  
Hub (and arm): SCS2, FCD600, SCS13, SS400 (for SS400 only, both hub and arm are welded construction)  
Teeth: Indicate SCS2 or plastic for D-split types.  
C-block blocks are SCS2. Teeth are normally SCS2 or heat treated FCD600.
  3. Indicate dimensions if the left and right symmetry along the hub length is slightly different.  
For example, with a hub length of 140mm, and left is 80mm and right 60mm, indicate 140 (80+60)L.
  4. Coating will be as follows unless otherwise specified.  
Pilot hole: Single zinc rich primer  
Prepared hole: Single zinc rich primer, double Epoxy resin  
Shaft holes and hub end faces are not coated. Please detail other special coating requests separately.
  5. Please describe specification in detail separately.

# Water Treatment Chains and Sprockets

## Chains

Application	Chain Type	Specification	Material	Chain Size	
Collector	ACR	With rollers	SUS 400 series	ACR810	
				ACR815	
				ACR816	
				ACR816	
	ACP	Non-Metallic Chain	Engineering plastic	ACP04152	
	ACP04152P				
ACR	Stainless steel	SUS 300 series	ACR810SS		
Collector	ACS	Standard material (bushed type)	SUS 400 series	ACS13078W	
				ACS13103W	
				ACS13152W	
				ACS13152W	
				ACS19152W	
				ACS25152W	
				ACS35152W	
Water Screen	JAC	PJ	Standard material (bushed type) S, F rollers	SUS 400 series	JAC08152□-PJ
					JAC10152□-PJ
					JAC10152□-PJ-H
					JAC6205□-PJ
					JAC6205□-PJ-H
					JAC21152□-PJ
		JAC26152□-PJ			
		PJW	Alternating F rollers	SUS 400 series	JAC10152F-PJW
					JAC10152F-PJW-H
					JAC6205F-PJW
	JAC6205F-PJW-H				
	SJ	SUS S, F rollers	SUS 300 series	JAC08152□-SJ	
				JAC10152□-SJ	
				JAC6205□-SJ	
				JAC21152□-SJ	
	SJW	Alternating F rollers	SUS 300 series	JAC10152F-SJW	
				JAC6205F-SJW	
	—	Plastic F rollers (Low noise type)	F roller: Plastic Pin, bush, link plate: SUS 300 series	JAC21152FP-SJW	
				JAC6205FP-SJW	
	Drive Chains	ACRD	With roller	SUS 400 series	ACRD08
ACRD10					
ACRD12					
ACRD17					
ACRD17					
BF		Standard material (bushed type)	SUS 400 series	BF120	
				BF140	
				BF140-TK	
				BF160	
				BF160-TK	
				BF200	
				BF200-TK	
				BF240	
				BF240	
EPCD		Plastic	Engineering plastic	EPC78D	
	EPC90D				

## Sprockets

Tsubaki provides sprockets that can satisfy the type, material, or dimensional requirements of any main or drive chain.

### Scraper Parts

Part Name	Material
Flight	FRP
Shoe	Plastic, FCD, SCS
Distance Block	Plastic



# Water Treatment Chains and Sprockets

	Ave. Tensile Strength kN(kgf) (Ave. Fracture Strength)	Min. Tensile Strength kN(kgf) (Guaranteed Fracture Strength)	Features	Attachment Type	Page
	98.1 {10000}	88.3 { 9000}	Roller contact is made possible through roller waste treatment chains with rollers and tooth block sprockets, increasing wear resistance. Lightening the chain will also result in cost savings through by reducing the necessary drive power.  Using a plastic chain with a plastic sprocket will result in superior wear and corrosion resistance. And as plastic chains are lighter than steel chains, the lower power requirement will result in lower costs.  A total SUS chain with rollers is stronger than plastic chains and has increased reusability.	SF4 • Dimensions of attachment holes can be changed.	97
	147 {15000}	132 {13500}			
	157 {16000}	142 {14500}			
	186 {19000}	172 {17500}			
	39.2 { 4000}	35.3 { 3600}			
	29.4 { 3000}	24.5 { 2500}			
	58.8 { 6000}	52.9 { 5400}			
	132 {13500}	123 {12500}	This chain was the first to use tempered stainless steel for increased wear and corrosion resistance	SF4 LA1 Extended pin • LA1 uses hardened tensile steel	99
	147 {15000}	137 {14000}			
	186 {19000}	172 {17500}			
	245 {25000}	226 {23000}			
	343 {35000}	314 {32000}			
	142 {14500}	132 {13500}	The right combination of material will give you the right chain for any application.  PJ Series: Provides excellent wear resistance SJ Series: Provides superb corrosion resistance PJW Series: Same as PJ Series but with alternating flanges SJW Series: Same as SJ Series but with alternating flanges • The inner link plate width on heavy duty specifications is wider. • PJW/SJW Series are wider than standard material chains.  Low Noise Series: Less running noise due to plastic F roller. • The rollers on attachment links are steel. • Uses special sprockets. Be sure to indicate chain specifications.  • Insert roller type code in the □ area.	Y A2 (1) A2 (2) • Attachments can be hardened tensile steel or SUS 400/300 series. • Y attachments can be hardened tensile steel or SUS 300/400series.	101
	167 {17000}	152 {15500}			
	186 {19000}	172 {17500}			
	235 {24000}	216 {22000}			
	265 {27000}	245 {25000}			
	353 {36000}	324 {33000}			
	490 {50000}	451 {46000}			
	167 {17000}	152 {15500}			
	186 {19000}	172 {17500}			
	235 {24000}	216 {22000}			
	265 {27000}	245 {25000}			
	68.6 { 7000}	58.8 { 6000}			
	108 {11000}	93.2 { 9500}			
	132 {13500}	113 {11500}			
	186 {19000}	157 {16000}			
	250 {25500}	211 {21500}			
	108 {11000}	93.2 { 9500}			
	132 {13500}	113 {11500}			
	186 {19000}	157 {16000}			
	108 {11000}	93.2 { 9500}			
	132 {13500}	113 {11500}			
	186 {19000}	157 {16000}			
	142 {14500}	132 {13500}	Roller contact is made possible through roller waste treatment chains with rollers and tooth block sprockets, increasing wear resistance.  Uses SUS material for increased wear resistance. • Can also be made from SUS 300 series stainless steel.		107
	186 {19000}	172 {17500}			
	235 {24000}	216 {22000}			
	353 {36000}	324 {33000}			
	108 {11000}	99.0 {10100}			
	137 {14000}	127 {13000}			
	147 {15000}	132 {13500}			
	181 {18500}	167 {17000}			
	233 {23800}	196 {20000}			
	309 {31500}	284 {29000}			
	353 {36000}	324 {33000}			
	392 {40000}	363 {37000}			
	19.6 { 2000}	17.7 { 1800}			
	37.3 { 3800}	32.4 { 3300}	This plastic drive chain for collector combines engineering plastic and SUS 300 pins.		

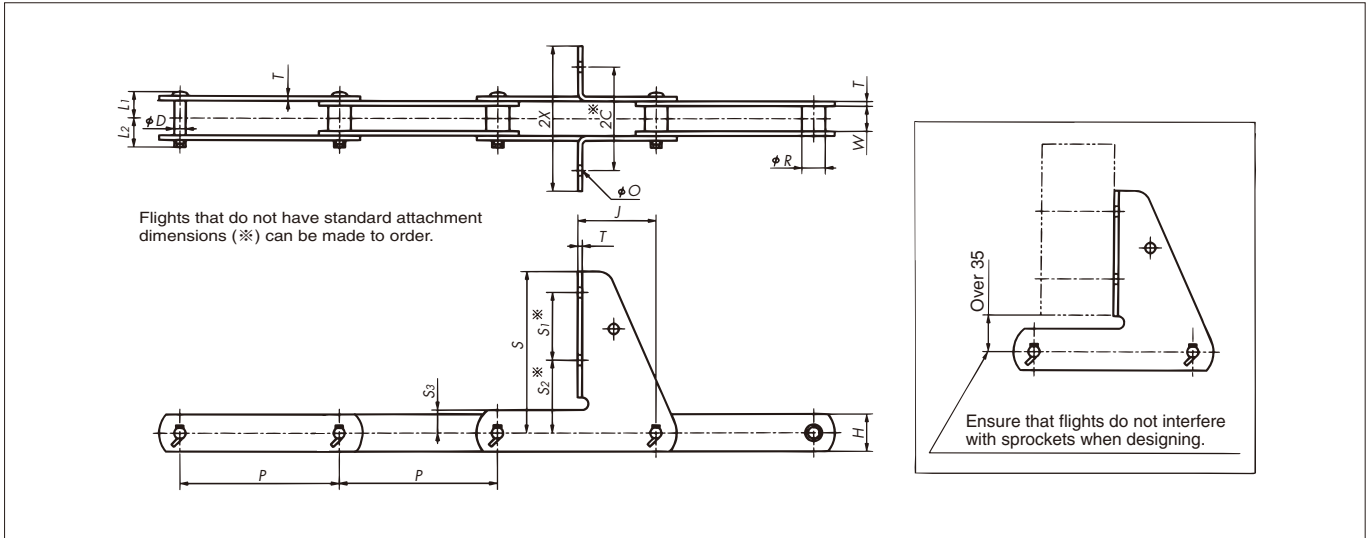
## Tsubaki E&M Co. Products

Application	Product Name		External Forces	Note
Overload protection	Shock monitor, Shock relay	Electric overload protection devices		Contact a Tsubaki E&M representative for more details.
Scum skimmer	Power cylinder for scum skimmers	Electric cylinder for pipe skimmers	Thrust: 250kgf, 500kgf	
Hopper switch	Power cylinder	Electric cylinders for hoppers	Thrust: 2000kgf, 4000kgf	
Reducer	Worm reducer, Water miter gear box			

# ACR Collector Chain

The Japan Sewage Works Corporation Examination for Privately Developed Technology  
(Certificate No. 109)

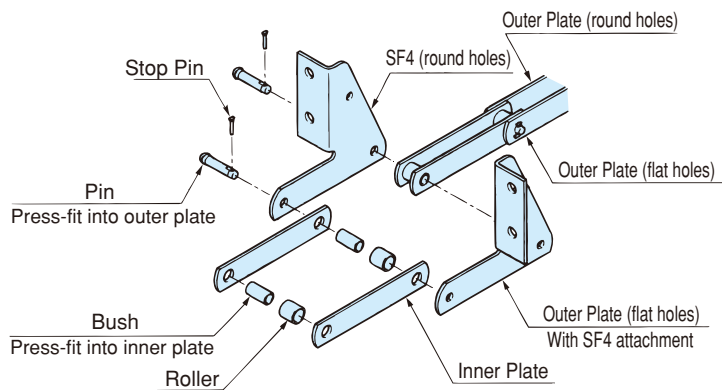
## SF4 Attachment



Tsubaki Chain Number	Ave. Tensile Strength kN{kgf}	Min. Tensile Strength kN{kgf}	Pitch P	Roller Dia R	Inner Link Inner Width W	Pin			Inner Plate		Outer Plate		Mass kg/m
						D	L <sub>1</sub>	L <sub>2</sub>	T	H	T	H	
ACR810	98.1 {10000}	88.3 {9000}	152.4	22.2	22	11.3	25	28.5	4.5	33	4.5	33	3.2
ACR815	147 {15000}	132 {13500}	152.4	22.2	27.6	11.3	31	34.5	6	38	6	38	5
ACR816	157 {16000}	142 {14500}	152.4	25	26	12.7	30	34	6	38	6	38	5
ACR819	186 {19000}	172 {17500}	152.4	29	30.6	14.5	33	36	6	44	6	38	6
ACR810SS	58.8 {6000}	52.9 {5400}	152.4	22.2	22	11.3	25	28.5	4.5	29	4.5	25	2.5

Tsubaki Chain Number	Attachment Dimensions									Mass kg/each
	2C	2X	J	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	O	T	
ACR810-SF4	100	140	76	155	65	70	22	14	4.5	1.0
ACR815-SF4	100	140	76	157	65	70	22	14	6	1.4
ACR816-SF4									6	1.4
ACR819-SF4	100	142.5	76	157	65	70	22	14	6	1.4
ACR810SS-SF4	100	140	76	155	65	70	22	14	4.5	1.0

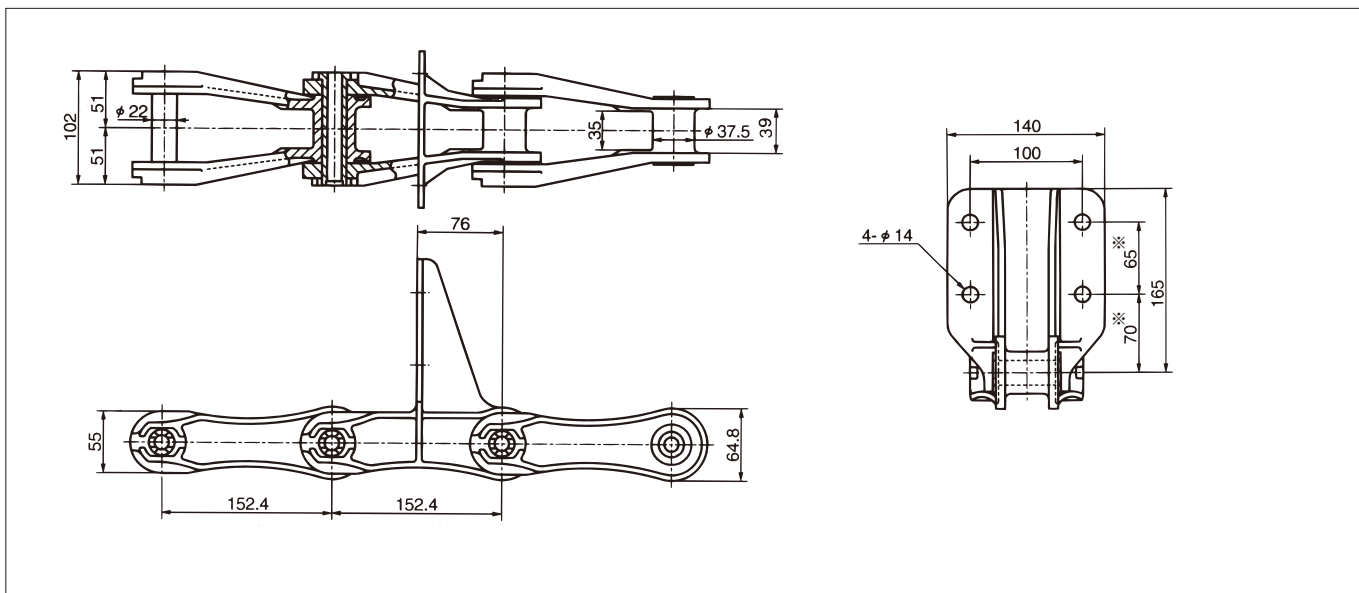
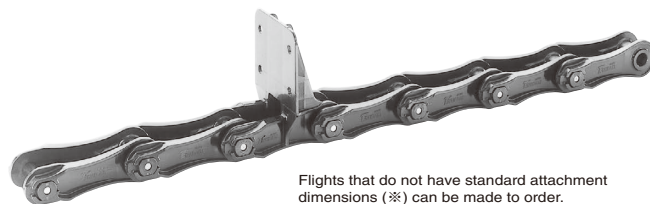
## ACR Chain



# ACP Non-metallic Collector Chain

ACP Chains do not suffer corrosion wear, and in combination with ultrahigh molecular polyethylene sprockets they offer unsurpassed wear resistance. They are also lighter than steel chains (chain: 1/4 – 1/2 lighter, sprocket: 1/3 lighter), making them easy to handle.

## SF4 Attachment



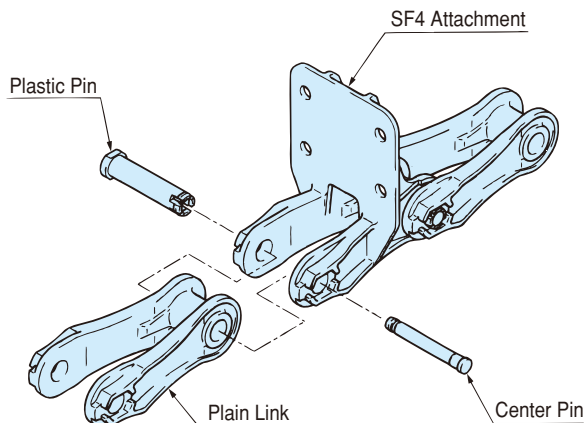
Tsubaki Chain Number	Ave. Tensile Strength kN{kgf}	Min. Tensile Strength kN{kgf}	Chain Mass kg/m	Attachment Mass kg/each set	Specific Gravity
ACP04152-SF4	39.2{4000}	35.3{3600}	2.9	0.25	1.75
ACP04152P-SF4	29.4{3000}	24.5{2500}	2.4	0.25	1.45

### Model Numbering Example

**ACP04152**

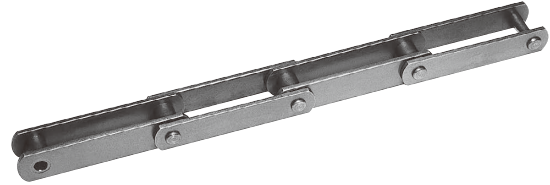
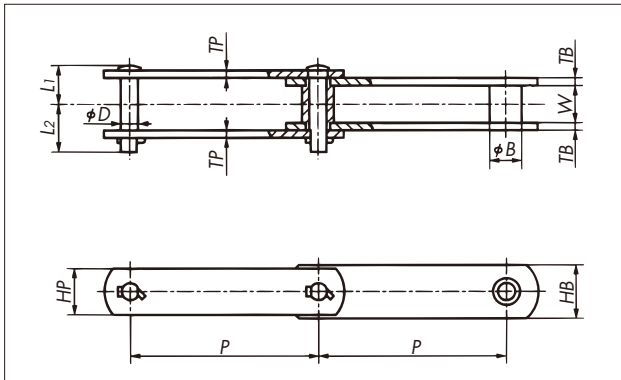
P: Plastic Center Pin  
No Code: SUS Center Pin

### ACP Chain



# ACS Heavy Duty Collector Chains

## Main Chain

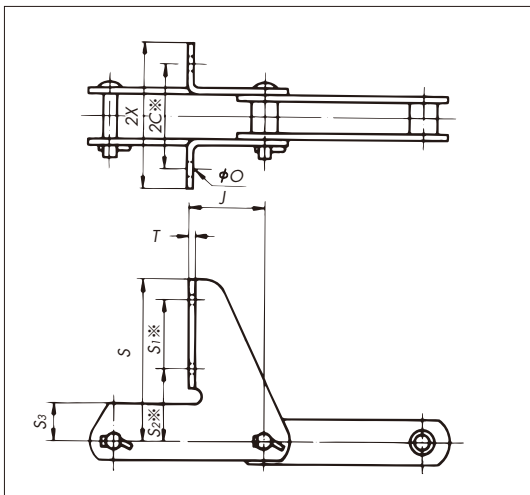


Tsubaki Chain Number	Ave. Tensile Strength kN{kgf}	Min. Tensile Strength kN{kgf}	Pitch P	Bush Dia. B	Inner Link Inner Width W	Pin			Inner Plate		Outer Plate		Approx. Mass kg/m
						Dia. D	L1	L2	Thickness TB	Height HP	Thickness TP	Height HP	
ACS13078W	132{13500}	123{12500}	78.11	23	26	12.7	28	32	5	36	5	33	5.2
ACS13103W			103.2										4.6
ACS13152W			152.4										3.6
ACS15152W	147{15000}	137{14000}	152.4	24	26	13.5	29	33	6	38	5	36	4.8
ACS19152W	186{19000}	172{17500}	152.4	26{*30}	30	14.5	32	39.5	6	44	6	38	5.8{*6.8}
ACS25152W	245{25000}	226{23000}	152.4	29	30	15.8	35	41	7	54	6	44	7.9
ACS35152W	343{35000}	314{32000}	152.4	35	38	19.0	41	46	7	60	7	54	10.9

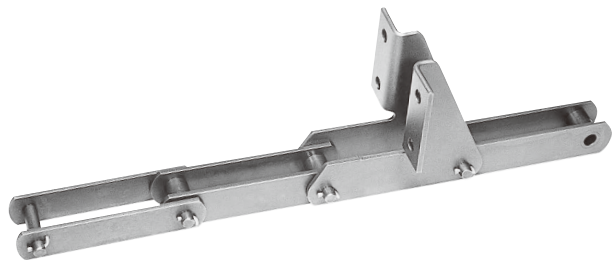
Note: 1. Offset links available 2. \* Indicates Tokyo specifications

## SF4 Attachment

Flight attachment for sediment conveyors and collectors



Flights that do not have standard attachment dimensions (\*\*:\*) can be made to order.

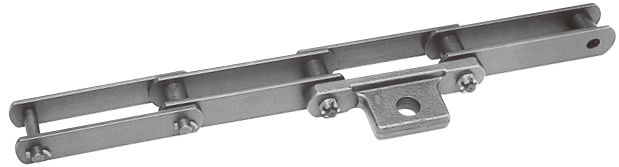
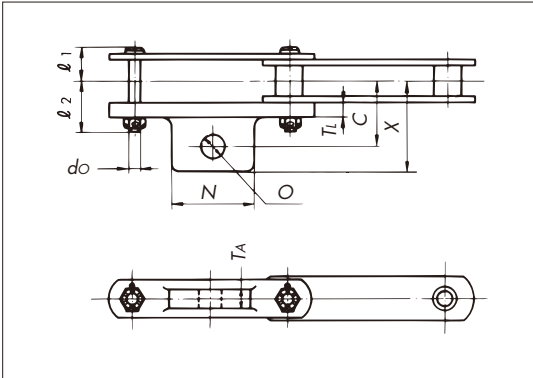


Tsubaki Chain Number	Pitch	Attachment Dimensions									Additional Mass per Set kg
		2C	2X	J	S	S1	S2	S3	O	T	
ACS13078W-SF4	78.11	90	131.5	38	110	35	55	28	14	5	0.6
ACS13103W-SF4	103.2			52							0.7
ACS13152W-SF4	152.4			76							1.0
ACS15152W-SF4	152.4	100	143.5	76	155	65	70	35	14	5	1.2
ACS19152W-SF4	152.4	100	141.5	76	157	65	70	38	14	6	1.4
ACS25152W-SF4	152.4	100	143.5	76	154	65	70	38	14	6	1.4
ACS35152W-SF4	152.4	100	152.0	76	160	65	75	40	14	7.9	1.6

# ACS Heavy Duty Collector Chains

## LA1 Attachment

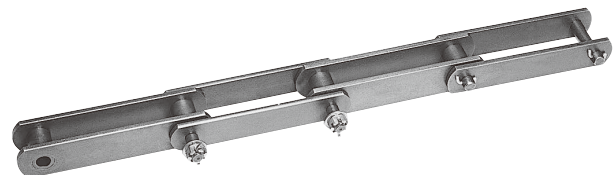
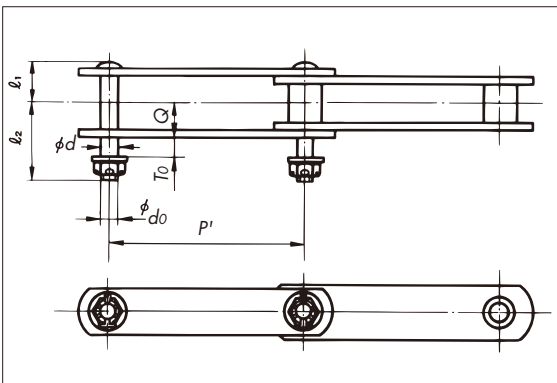
Bucket attachment for sediment collector. Buckets attach easily.



Tsubaki Chain Number		Attachment Dimensions									Additional Mass per Set kg
		$d_o$	$l_1$	$l_2$	$C$	$X$	$N$	$O$	$T_A$	$T_L$	
ACS13078W-LA1	78.11	M10	29.5	41.5	55	77	40	19	16	12	0.4
ACS13103W-LA1	103.2						56				0.6
ACS15152W-LA1	152.4	M12	30.5	44.5	55	77	68	19	16	12	0.8
ACS19152W-LA1	152.4	M12	33.5	51.5	65	90	80	24	20	16	1.2
ACS25152W-LA1	152.4	M14	36.5	53.5	65	90	80	24	20	16	1.4
ACS35152W-LA1	152.4	M16	42.5	61.5	75	102	80	26	24	19	2.0

## Long Pin Attachment

Bucket attachment for sediment collector. Buckets attach easily.

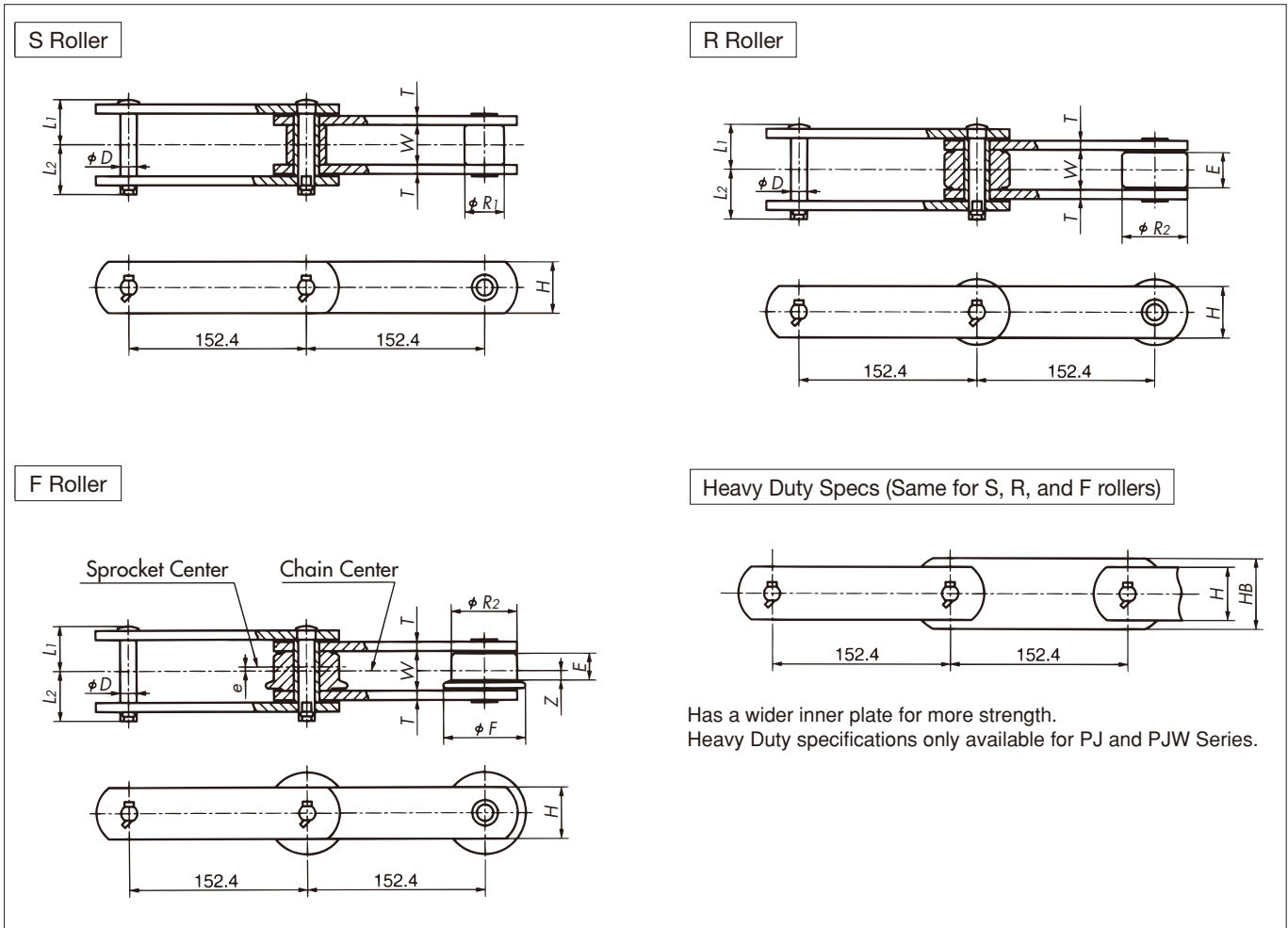


Tsubaki Chain Number		Attachment Dimensions								Additional Mass per Set kg
		$P$	$P'$	$d$	$d_o$	$l_1$	$l_2$	$Q$	$T_o$	
ACS13078W-LONGPIN	78.11	77.7	12	M10	28	49	24	12	0.06	
ACS13103W-LONGPIN	103.2	102.8							0.06	
ACS15152W-LONGPIN	152.4	152.0	13	M12	29	51	25	12	0.10	
ACS19152W-LONGPIN	152.4	151.9	14	M12	32	59	28	16	0.11	
ACS25152W-LONGPIN	152.4	151.9	15.5	M14	35	62	29	16	0.14	
ACS35152W-LONGPIN	152.4	151.8	18.5	M16	41	72	34.2	19	0.20	

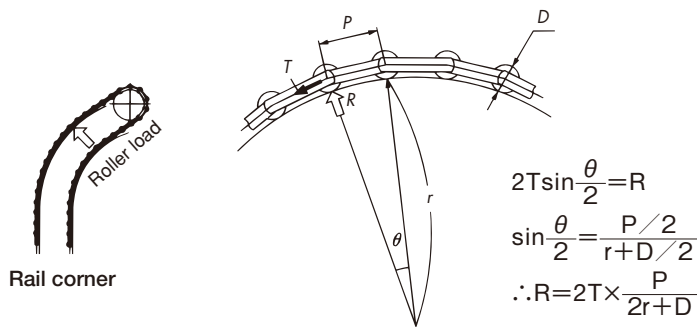
Note: P: Nominal dimensions P': Actual dimensions

# JAC Water Screen Chain Wide selection available

- **NVJ Series**                      Tsubaki's most economical chain. Highly durable and wear resistant.
- **PJ Series**                              Offers superb wear and corrosion resistance.
- **SJ Series**                                Our most corrosion resistant chain.
- **PJW Series**                            A PJ Series chain with alternating flanges, preventing chain from falling off of guide rail.
- **SJW Series**                            An SJ Series chain with alternating flanges, preventing chain from falling off of guide rail.
- **FP-SJW Series**                      Reduced running noise thanks to engineering plastic F rollers.  
(Low Noise Series)



Note: The following needs to be considered for FP-SJW Series (low noise type).  
Use the following formula to calculate the rail reactive force R generated by chain tension T on the corner rail area.



$$2T \sin \frac{\theta}{2} = R$$

$$\sin \frac{\theta}{2} = \frac{P/2}{r + D/2}$$

$$\therefore R = 2T \times \frac{P}{2r + D}$$

Next, use the following formula to calculate the Hertz stress Q (contact compression stress) from the rail reactive force.

$$Q = 0.591 \sqrt{R/L \times [E_1 + E_2 / (E_1 + E_2) \times (r - d) / (r \times d)]}$$

$$Q \leq 49 \text{ [N/mm}^2\text{]}$$

L: Rail width [mm]

E<sub>1</sub>: Roller Young modulus (plastic: 3.43 x 10<sup>3</sup>N/mm<sup>2</sup>)    E<sub>2</sub>: Rail Young modulus (SUS304: 1.89 x 10<sup>5</sup>N/mm<sup>2</sup>)



# JAC Water Screen Chain

Wide selection available

## Water Screen Chain Dimensional Chart

Series	Material	Tsubaki Chain Number	Ave. Tensile Strength kN{kgf}	Min. Tensile Strength kN{kgf}	Roller Type	Inner Link Inner Width W	S Roller			R Roller			F Roller				Pin			Plate			Approx. Mass kg/m			
							Dia. R <sub>1</sub>	Dia. R <sub>2</sub>	Contact Width E	Dia. R <sub>2</sub>	Flange Dia. F	Contact Width E	Off-center e	Z	Dia. D	L <sub>1</sub>	L <sub>2</sub>	H	HB	T	S Roller	F Roller	R Roller			
NVJ	*1	JAC08152 □-NVJ	147 {15000}	127 {13000}	S	26.2	22.2	-	-	-	-	-	-	-	-	-	-	31	34.5	28.6	-	6.3	3.9	-	-	
		JAC10152 □-NVJ	216 {22000}	196 {20000}	SRF	29.0	29.0	50.8	26	50.8	65	20	3	7				33	36	38.1	-	6.3	5.9	8.0	7.6	
		JAC6205 □-NVJ	275 {28000}	250 {25500}	SRF	35.9	34.9	65	32	65	85	24	4	8				40.5	43	44.5	-	7.9	9.3	14.5	13.5	
		JAC21152 □-NVJ	382 {39000}	343 {35000}	SRF	35.7	40.1	70	32	70	90	24	4	8				44.5	51	50.8	-	9.5	12.6	18.1	17.1	
		JAC26152 □-NVJ	510 {52000}	461 {47000}	SRF	55.6	44.5	80	52	80	95	40	5	15				55.5	61	63.5	-	9.5	17.8	29.3	28.0	
PJ	SUS 400 Series	JAC08152 □-PJ	142 {14500}	132 {13500}	S	27.0	22.2	-	-	-	-	-	-	-	-	-	11.3	31.0	34.5	38.0	-	6.0	5.0	-	-	
		JAC10152 □-PJ	167 {17000}	152 {15500}	SRF	30.0	29.0	50.8	26.0	50.8	65.0	20.0	3.0	7.0	14.5	33.0	36.0									
		JAC10152 □-PJ-H	186 {19000}	172 {17500}	SRF																					
		JAC6205 □-PJ	235 {24000}	216 {22000}	SRF	37.1	34.9	65.0	32.0	65.0	85.0	24.0	4.0	8.0	15.9	39.5	42.0									
		JAC6205 □-PJ-H	265 {27000}	245 {25000}	SRF																					
		JAC21152 □-PJ	353 {36000}	324 {33000}	SRF	37.1	40.1	70.0	32.0	70.0	90.0	24.0	4.0	8.0	19.1	44.0	50.0	54.0	-	9.0	12.8	19.0	18.1			
		JAC26152 □-PJ	490 {50000}	451 {46000}	SRF	55.2	44.5	80.0	32.0	80.0	95.0	40.0	5.0	15.0	22.2	56.0	61.5	63.5	-	10.0	18.6	30.0	28.7			
PJW	SUS 400 Series	JAC10152 F-PJW	167 {17000}	152 {15500}	F	36.2	-	-	-	50.8	65.0	20.0	26.0	10.0	14.5	36.5	39.5	38.0								
		JAC10152 F-PJW-H	186 {19000}	172 {17500}	F																					44.0
		JAC6205 F-PJW	235 {24000}	216 {22000}	F	44.5	-	-	-	65.0	85.0	24.0	32.0	12.0	15.9	43.0	45.5	44.5								
		JAC6205 F-PJW-H	265 {27000}	245 {25000}	F																					54.0
SJ	SUS 300 Series	JAC08152 □-SJ	68.6 {7000}	58.8 {6000}	S	27.0	22.2	-	-	-	-	-	-	-	-	-	11.3	31.0	34.5	28.6	-	6.0	3.8	-	-	
		JAC10152 □-SJ	108 {11000}	93.2 {9500}	SRF	30.0	29.0	50.8	26.0	50.8	65.0	20.0	3.0	7.0	14.5	33.0	36.0	38.1	-	6.0	5.6	7.5	7.9			
		JAC6205 □-SJ	132 {13500}	113 {11500}	SRF	37.1	34.9	65.0	32.0	65.0	85.0	24.0	4.0	8.0	15.9	40.5	43.0	44.5	-	8.0	9.1	13.2	14.2			
		JAC21152 □-SJ	186 {19000}	157 {16000}	SRF	37.1	40.1	70.0	32.0	70.0	90.0	24.0	4.0	8.0	19.0	44.5	52.0	50.8	-	10.0	13.3	18.2	17.2			
		JAC26152 □-SJ	250 {25500}	211 {21500}	SRF	57.2	44.5	80.0	52.0	80.0	95.0	40.0	5.0	15.0	22.2	55.5	62.0	63.5	-	10.0	18.8	30.0	28.7			
SJW	SUS 300 Series	JAC10152 F-SJW	108 {11000}	93.2 {9500}	F	36.0	-	-	-	50.8	65.0	20.0	26.0	10.0	14.5	36.0	39.0	38.1	-	6.0	-	8.3	-			
		JAC6205 F-SJW	132 {13500}	113 {11500}	F	44.5	-	-	-	65.0	85.0	24.0	32.0	12.0	15.9	44.5	46.5	44.5	-	8.0	-	15.3	-			
		JAC21152 F-SJW	186 {19000}	157 {16000}	F	44.5	-	-	-	70.0	90.0	24.0	-	12.0	19.1	49.0	55.5	50.8	-	10.0	-	19.1	-			
SJW (Plastic)	F roller: Engineering plastic Pin, bush, link plate: SUS 300 Series*2	JAC10152 FP-SJW	108 {11000}	93.2 {9500}	F	36.0	-	-	-	50.8	65.0	20.0	-	10.0	14.5	36.0	39.0	38.1	-	6.0	-	6.0	-			
		JAC6205 FP-SJW	132 {13500}	113 {11500}	F	44.5	-	-	-	65.0	85.0	24.0	-	12.0	15.9	44.5	46.5	44.5	-	8.0	-	9.5	-			
		JAC21152 FP-SJW	186 {19000}	157 {16000}	F	44.5	-	-	-	70.0	90.0	24.0	-	12.0	19.0	49.0	55.5	50.8	-	10.0	-	12.2	-			

\*1: NVJ Series material: Pin/bush use SUS400 Series stainless steel, while roller/link plate use alloy steel.

\*2: SJW Plastic Series material: F roller uses plastic, while pin/bush/link plate use SUS300 Series stainless steel.

Note: 1. Offset link available. 2. Contact a Tsubaki representative regarding tensile strengths, chain pitches, and so on not shown above.

3. Insert roller type in the □ box. 4. The rollers on the attachments on engineering plastic F roller chains (low noise chains) are stainless steel.

5. The E dimension is the rolling contact width. E2 is the length of the roller (real rolling contact width) when there are alternating flanges (SJW, PJW).

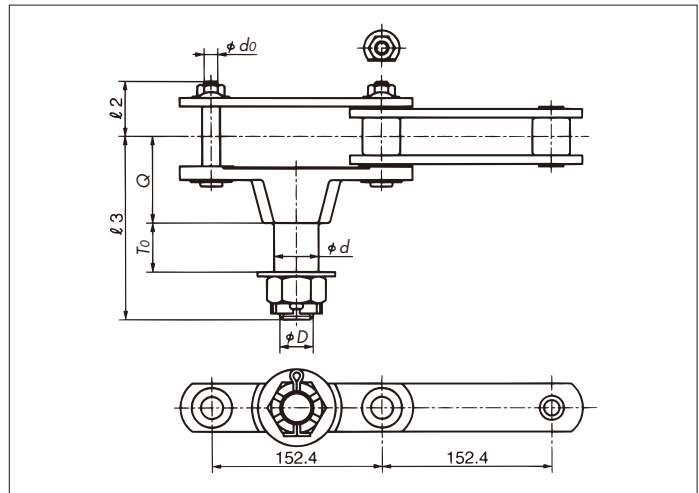
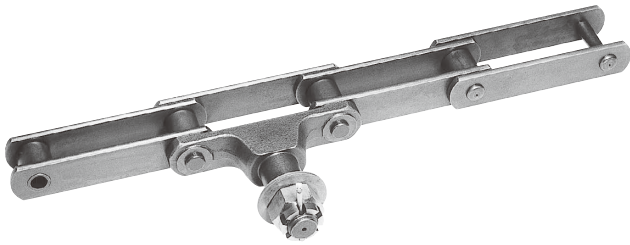
6. NVJ Series is equivalent to the VJ Series using different material for some parts.

# JAC Water Screen Chain Wide selection available

## Attachment Dimensions

### Y Attachment

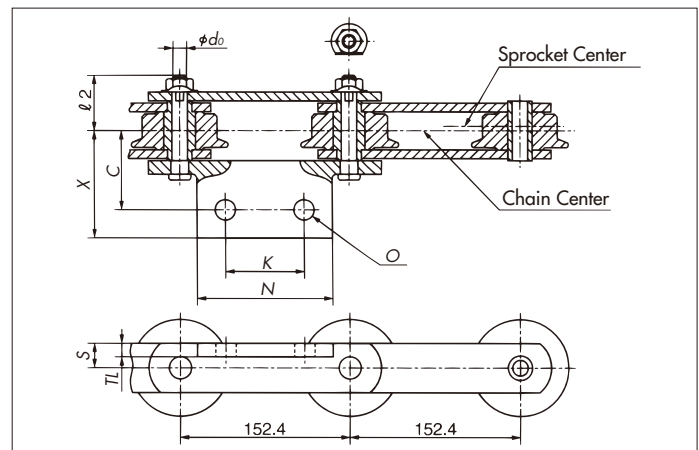
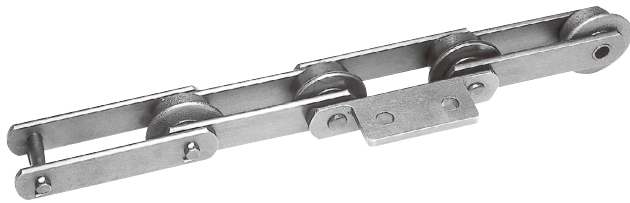
For rotating-rake Water Screens



Series	Tsubaki Chain Number	Roller Type	$d$	$do$	$D$	$l_2$	$l_3$	$Q$	$To$	Add. Mass per Set kg/set
PJ	JAC08152	S	25	M10	M20	38	120	60	30	1.1
	JAC10152	c	35	M12	M27	42	148.5	70	40	1.9
	JAC6205	R/S	40	M12	M30	49	164.5	78	44	2.7
	JAC21152	S	45	M16	M36	55	174	78	46	3.2
	JAC26152	S	50	M16	M45	65	204	95	50	5.1

### A2 Attachment (Type 1)

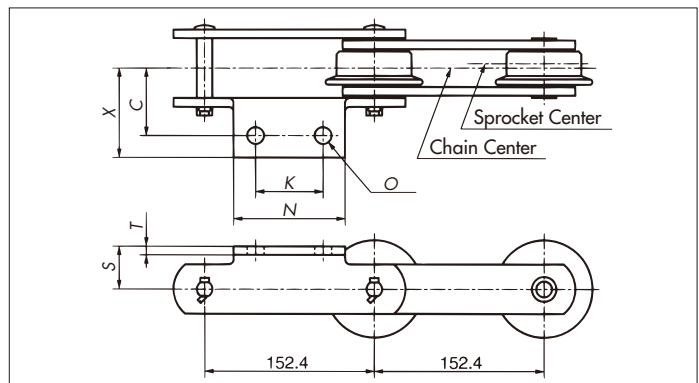
For fixed rake Water Screens



Series	Tsubaki Chain Number	Roller Type	$do$	$l_2$	$C$	$X$	$K$	$N$	$S$	$O$	$TL$	Add. Mass per Set kg/set
PJ·SJ	JAC10152	R/F	M12	42	60	80	65	110	19.0	15	9.5	0.6
	JAC6205	R/F	M12	49	70	95	70	120	22.2	18	12	0.9

### A2 Attachment (Type 2)

For sediment conveyors



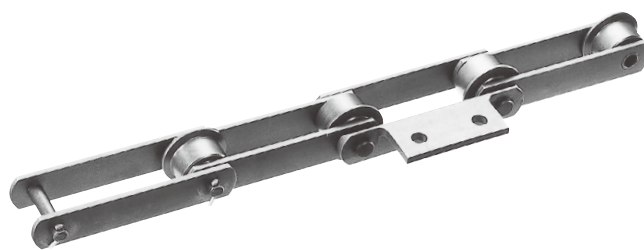
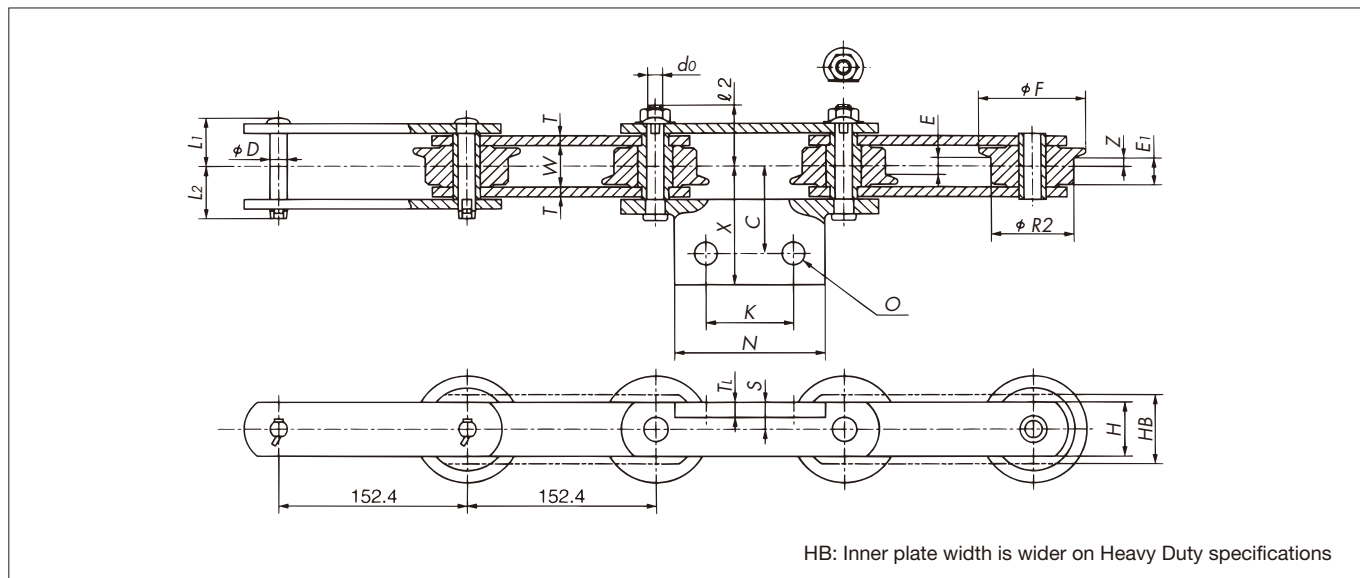
Series	Tsubaki Chain Number	Roller Type	$C$	$X$	$K$	$N$	$S$	$O$	$T$			Add. Mass per Set kg/set
									VJ Series	PJ Series	SJ Series	
PJ·SJ	JAC10152	R/F	50	65	60	90	32	12	6.3	6	6	0.20
	JAC6205	R/F	60	79	60	100	38	15	7.9	7	8	0.37

# JAC Water Screen Chain

Wide selection available

## PJW, SJW Series (A2 Attachment, Type 1)

For fixed rake Water Screens. Special sprockets are required.



### PJW Series

Tsubaki Chain Number	Attachment Dimensions									Add. Mass per Set kg/set
	$d_o$	$l_2$	$C$	$X$	$K$	$N$	$S$	$O$	$T_l$	
JAC10152F	M12	45	63	83	65	110	19.0	15	9.5	0.6
JAC6205F	M12	51.5	74	99	70	120	22.2	18	12	0.9

### SJW Series

Tsubaki Chain Number	Attachment Dimensions									Add. Mass per Set kg/set
	$d_o$	$l_2$	$C$	$X$	$K$	$N$	$S$	$O$	$T_l$	
JAC10152F	M12	45	63	83	65	110	19.0	15	9.5	0.6
JAC6205F	M12	53	74	99	70	120	22.2	18	12	0.9
JAC21152F	M16	62	80	105	70	120	25.4	23	12	1.4

Note: Attachment dimensions are the same with plastic F rollers.

# Sprockets for Water Treatment Chains

Chain life can be greatly affected by the choice of sprocket. Tsubaki has developed a block tooth sprocket with anti-wear/corrosion properties in mind. We can also manufacture made to order products using different materials and/or dimensions.

## Collector Tank Chains

Tsubaki Chain Number	Chain Pitch	No. of Teeth	Outer Dia.	Pitch Dia.	Tooth Width	Hub Dim.		Pilot Bore Dia. <i>d</i>	Max. Shaft Dia	Type/Material	Approx. Mass kg
						Dia. DH	Length L				
ACR810	152.4	11	565	540.9	18	210	140	90	130	C Block: SS400 (Arm, hub: welded) C: SCS2 or SCS13	47
ACR815		11	567	540.9	22	210	140	90	130		53
ACR816		11	566	540.9	22	210	140	90	130		53
ACR819		11	570	540.9	25	210	140	90	130		53
ACR810SS		11	565	540.9	18	200	130	80	125	C: SCS13	55
ACPO4152	152.4	11	575	540.9	28	320	145	—	—	C: (Square boss solid ass'y)	—
ACPO4152P		11	575	540.9	28	210	145	90	130	D-split: (Plastic teeth)	64

## Collector Tank, Sediment Collector Tank Chains

Tsubaki Chain Number	Chain Pitch	No. of Teeth	Outer Dia.	Pitch Dia.	Tooth Width	Hub Dim.		Pilot Bore Dia. <i>d</i>	Max. Shaft Dia	Type/Material	Approx. Mass kg
						Dia. DH	Length L				
ACS13078W	78.11	11	300	277.3	22	140	110	60	85	C, C-split: FCD600 or SCS2 D-split: FCD600 (Hub, arm) SCS2 (teeth) C-block: SS400 or FCD600 (Hub, arm) SCS2 (teeth)	15
ACS13103W	103.2	11	390	366.3	22	150	110	50	90		22
ACS13152W	152.4	11	565	540.9	22	150	130	60	90		36
ACS15152W	152.4	11	565	540.9	22	170	130	60	105		44
ACS19152W	152.4	11	565	540.9	25	210	140	80	130		51
ACS25152W	152.4	11	565	540.9	25	210	140	80	130		51
ACS35152W	162.4	11	574	574	30	210	140	80	130		62

## Water Screen Chains

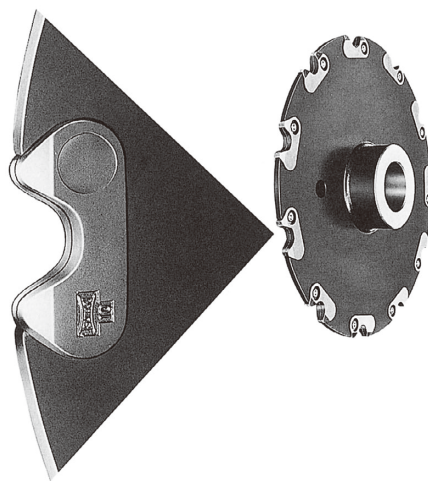
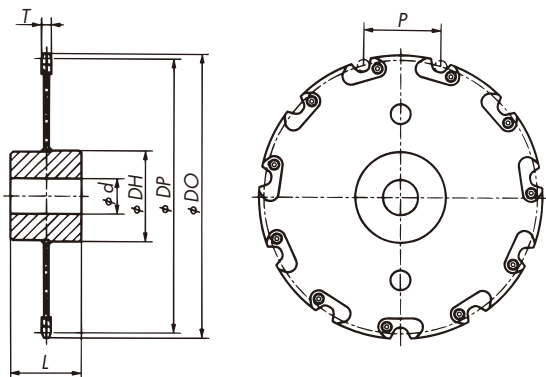
Tsubaki Chain Number	Chain Pitch	No. of Teeth	Outer Dia.	Pitch Dia.	Tooth Width	Boss Dim.		Pilot Bore Dia. <i>d</i>	Max. Shaft Dia	Type/Material	Approx. Mass kg
						Dia. DH	Length L				
JAC08152S	152.4	11	556	540.9	22	180	130	90	110	C, C-split: FCD600 or SCS2  Note: Indicate when ordering sprockets for plastic rollers.	51
JAC10152S	152.4	11	561	540.9	24	190	130	90	115		45
JAC10152F	152.4	10	528	493.2	16	170	120	80	105		36
		11	576	540.9	16	180	130	90	110		46
JAC6205S	152.4	11	565	540.9	30	220	170	110	135		80
JAC6205F	152.4	10	539	493.2	21	180	130	90	110		47
		11	586	540.9	21	220	160	110	135		65
JAC21152S	152.4	11	569	540.9	30	230	170	110	140		78
JAC21152F	152.4	10	542	493.2	21	170	120	80	105		41
		11	590	540.9	21	230	170	110	140		68
JAC26152S	152.4	11	572	540.9	48	260	190	120	160		110
JAC26152F	152.4	10	549	493.2	26	230	170	110	140		68
		11	597	540.9	26	260	190	120	160		98
JAC10152F-PJW	152.4	10	528	493.2	16	170	120	80	105		35
		11	576	540.9	16	180	130	90	110		42
JAC6205F-PJW	152.4	10	539	493.2	21	180	130	90	110		43
		11	586	540.9	21	220	160	110	135		62
JAC10152F-SJW JAC6205FP-SJW (Plastic roller)	152.4	10	528	493.2	16	170	120	80	105		35
		11	576	540.9	16	180	130	90	110		42
JAC6205F-SJW JAC6205FP-SJW (Plastic roller)	152.4	10	539	493.2	21	180	130	90	110		43
		11	586	540.9	21	220	160	110	135	62	
JAC21152F-SJW JAC21152FP-SJW (Plastic roller)	152.4	10	542	493.2	21	180	120	80	110	41	
		11	590	540.9	21	220	160	110	135	68	

- Note 1. Indicate drive shaft diameter and key dimensions, driven shaft sleeve outer diameter, and hub dimensions when ordering.  
 2. Standard number of teeth is listed. Tsubaki can manufacture sprockets with teeth numbers other than listed above. Contact a Tsubaki representative for more details.  
 3. Sprockets must be made to order if chain rollers are SUS300 series stainless steel or plastic.

# Sprockets for Water Treatment Chains

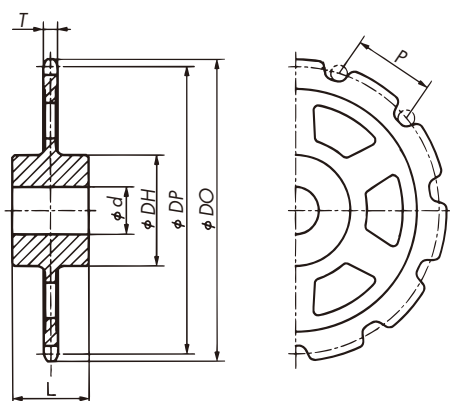
## ACR Sprockets

IC Type (Block tooth)

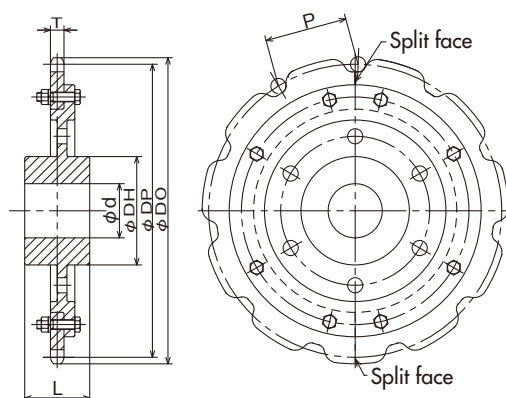


## ACS, JAC Sprockets

C Type (Solid)

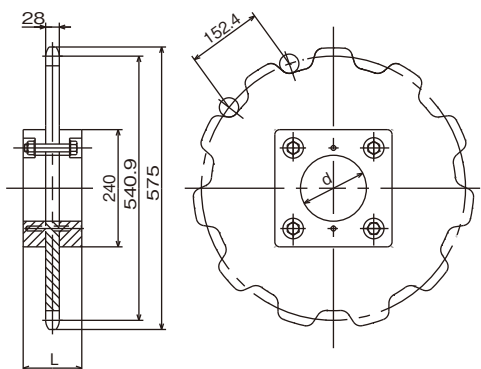


D-split (Ring tooth)

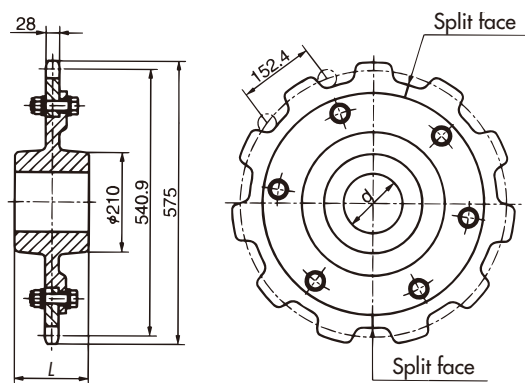


## ACP Sprockets (For ACP04152 Chain)

C Type (Compound type)



D-split (Teeth: Plastic Hub: FCD600)

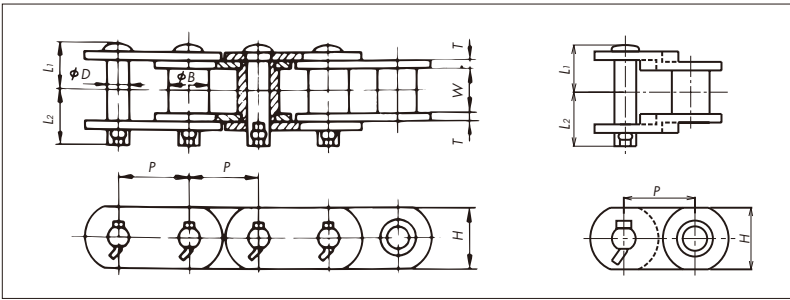


Note:

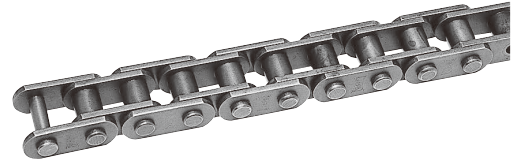
1. Indicate prepared hole for a square hub assembly on ACP sprockets
2. Maximum shaft diameter for prepared hole is 160mm.

# Drive Chains

## BF Chain

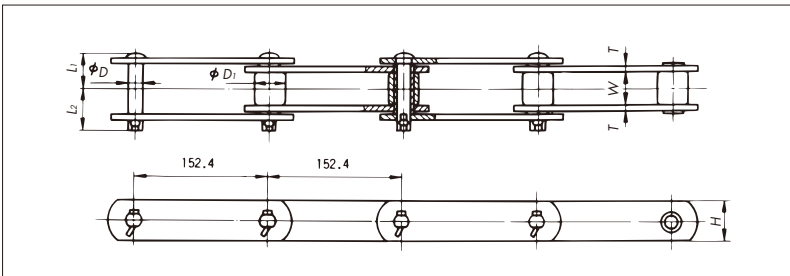


Uses a thick pin for high wear resistance. All parts use tempered SUS400 series stainless steel, giving BF chains high strength and resistance to pitting. JIS roller chain sprockets can be used as is.

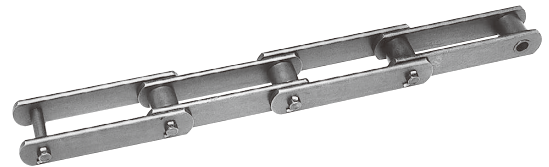


Tsubaki Chain Number	Ave. Tensile Strength kN{kgf}	Min. Tensile Strength kN{kgf}	Pitch P	Bush Dia. B	Inner Link Inner Width W	Plate		Pin			Approx. Mass kg/m
						Thickness T	Height H	Dia D	L1	L2	
BF120	108 {11000}	99 {10100}	38.10	22.23	25.4	5	33.0	12.70	27.5	31.5	6.8
BF140	137 {14000}	127 {13000}	44.45	25.40	25.4	6	38.0	14.45	29.5	37.0	9.5
BF140-TK	147 {15000}	132 {13500}					44.0				10.6
BF160	181 {18500}	167 {17000}	50.80	28.58	31.7	6	44.0	15.78	34.5	40.5	10.9
BF160-TK	233 {23800}	196 {20000}				7	44.5	14.29	35.5	38.5	12.5
BF200	309 {31500}	284 {29000}	63.50	39.69	38.1	9	54.0	22.10	45.5	50.5	20.7
BF200-TK	353 {36000}	324 {33000}						19.10	44.0	50.5	20.9
BF240	392 {40000}	363 {37000}	76.20	47.62	47.6	10	63.5	25.27	53.5	57.5	27.8

## ACRD Chain



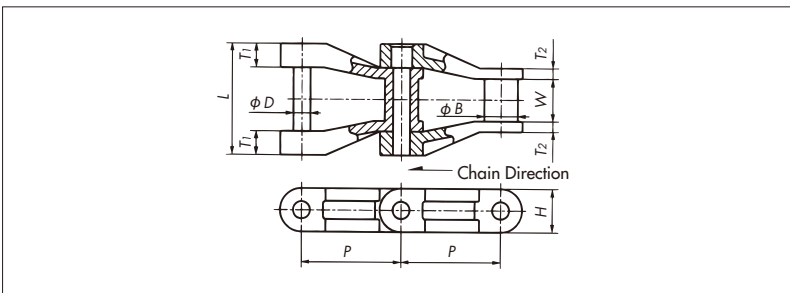
Uses an all-stainless steel chain with rollers and block tooth sprockets.



Tsubaki Chain Number	Pitch P	Ave. Tensile Strength kN{kgf}	Min. Tensile Strength kN{kgf}	Inner Width W	Roller Dia. B	Pin			Plate		Approx. Mass kg/m
						Dia D	L1	L2	T	H	
ACRD 08	101.6	142 {14500}	132 {13500}	27.6	22.2	11.3	31	34.5	6	38	6
ACRD 10	127	186 {19000}	172 {17500}	30.6	29	14.5	33	36	6	38	6.4
									6	44	
ACRD 12	152.4	235 {24000}	216 {22000}	38.9	34.9	15.9	39.4	42	7	44.5	8.2
ACRD 17	152.4	353 {36000}	324 {33000}	38.1	40.1	19.1	44	50	9	54	12.8

Note: ACRD10 outer plate: 6t x 38, inner plate: 6t x 44

## EPCD Chain Plastic Drive Chain



Tsubaki Chain Number	Ave. Tensile Strength kN{kgf}	Min. Tensile Strength kN{kgf}	Allowable Tensile Strength kN{kgf}	Pitch P	Bush Dia. B	Link Inner Width W	Pin Dia. D	Outer Width L	Plate Thickness		Plate Height H	Approx. Mass kg/m
									T1	T2		
EPC78D	19.6 {2000}	17.7 {1800}	3.24 {330}	66.27	22.2	27.4	11.3	74.3	16	7	28.6	2.3
EPC90D	37.3 {3800}	32.4 {3300}	6.18 {630}	90	35	30	12.7	82.9	16	10	40.0	2.9

Note: Chain should be selected by Allowable Tensile Strength



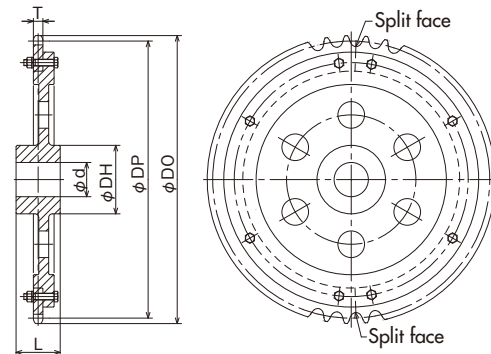
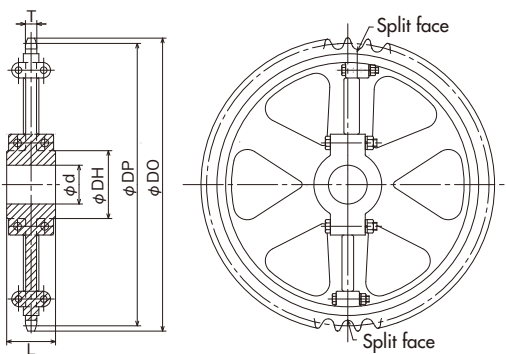
Tsubaki Chain Number	Chain Pitch	No. of Teeth	Outer Dia.	Pitch Dia.	Tooth Width	Hub Dim.		Pilot Bore Dia. $d$	Max. Shaft Dia.	Type/Material	Approx. Mass kg
						Dia. $DH$	Length $L$				
ACRD08	101.6	12	419	392.6	22	140	115	50	85	SS400 (Hub) SCS2 (Teeth)	26
		24	803	778.4	22	160	135	60	95		77
ACRD10	127	10	433	411	25	150	125	50	90		29
		18	751	731.4	25	180	150	70	110		74
ACRD12	152.4	9	480	445.6	30	160	135	60	95		40
		15	765	733	30	190	160	80	115		90
ACRD17	152.4	9	476	445.6	30	180	150	70	110		45
		15	760	733	30	230	200	100	140		110

Tsubaki Chain Number	Chain Pitch	No. of Teeth	Outer Dia.	Pitch Dia.	Tooth Width	Hub Dim.		Pilot Bore Dia. $d$	Max. Shaft Dia.	Type/Material	Approx. Mass kg
						Dia. $DH$	Length $L$				
BF120	38.10	15	202	183.25	24	110	100	55	65	C, C-split: SCS2 D-split: FCD600 (Hub) SCS2 (teeth) Only C Type is available with 25 or fewer teeth.	9
		23	300	279.8	24	120	100	55	75		17
		40	207	485.6	24	170	130	80	105		49
		45	568	546.19	24	170	130	75	105		50
BF140	44.45	11	178	157.78	24	100	100	40	60		8
		23	350	326.44	24	120	100	55	70		21
		35	521	495.88	24	150	100	50	90		45
		40	591	566.54	24	170	110	60	105		60
		45	662	637.22	24	170	110	60	105		73
		50	733	707.91	24	170	110	60	105		87
BF160	50.80	11	204	180.31	30	115	120	40	70	12	
		17	302	276.46	30	130	120	62	80	18	
		23	400	373.07	30	130	120	55	80	29	
		25	433	405.32	30	190	170	80	112	55	
		30	514	485.99	30	170	110	60	105	55	
		35	595	566.71	30	170	110	60	105	71	
		40	676	647.47	30	200	130	70	125	98	
		45	757	728.25	30	200	130	70	125	119	
BF200	63.50	11	254	225.39	36	145	120	50	85	21	
		24	520	486.49	36	160	110	70	95	61	
		35	744	708.39	36	250	160	90	155	150	
		40	845	809.34	36	250	160	90	155	185	
		45	946	910.31	36	280	180	100	175	242	
BF240	76.20	11	305	270.47	45	150	120	50	90	29	
		37	941	898.52	45	250	150	125	155	250	
		40	1014	971.21	45	250	160	125	155	293	

Note: Standard number of teeth is listed. Tsubaki can manufacture sprockets with teeth numbers other than listed above. Contact a Tsubaki representative for more details.

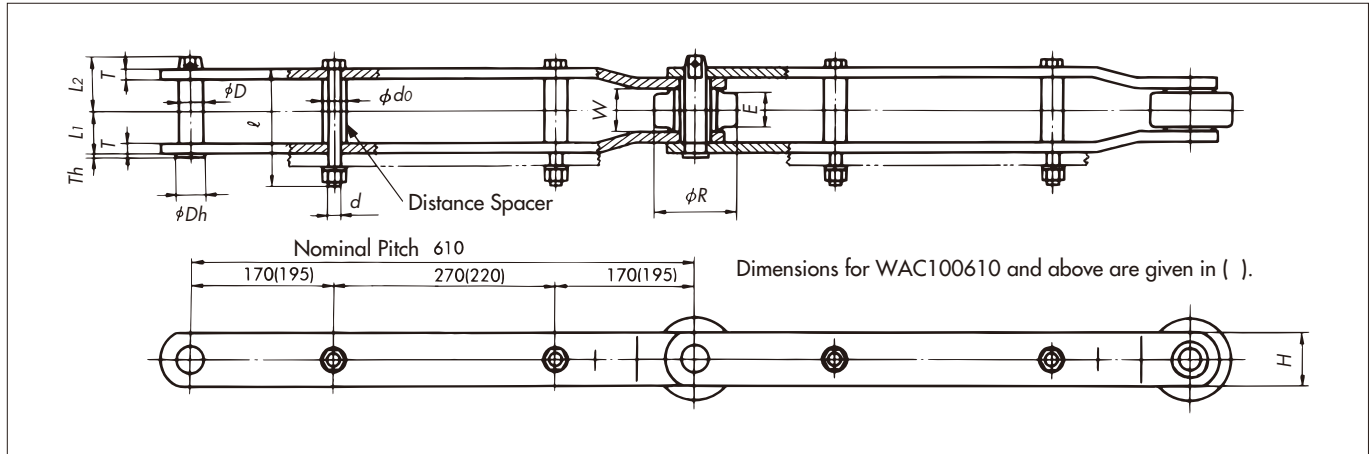
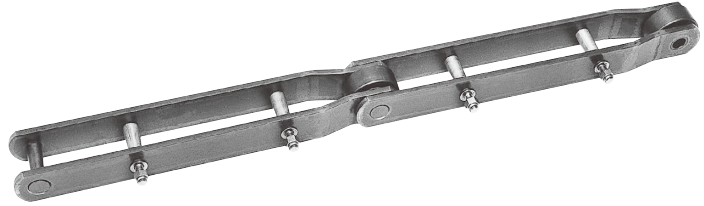
## C-split (Split solid)

## D-split (Ring teeth)



# WAC Chain for Water Screens

WAC Chain for water screens is used for automatic water screens, such as those found in water intakes at thermal power plants. The pins, bushes, and rollers use tempered SUS400 series stainless steel, giving them the corrosion and wear resistance necessary to operate continuously in both seawater and air. There are special plastic bearings in the roller inner diameter, allowing for lube-free operation in seawater for easy maintenance.

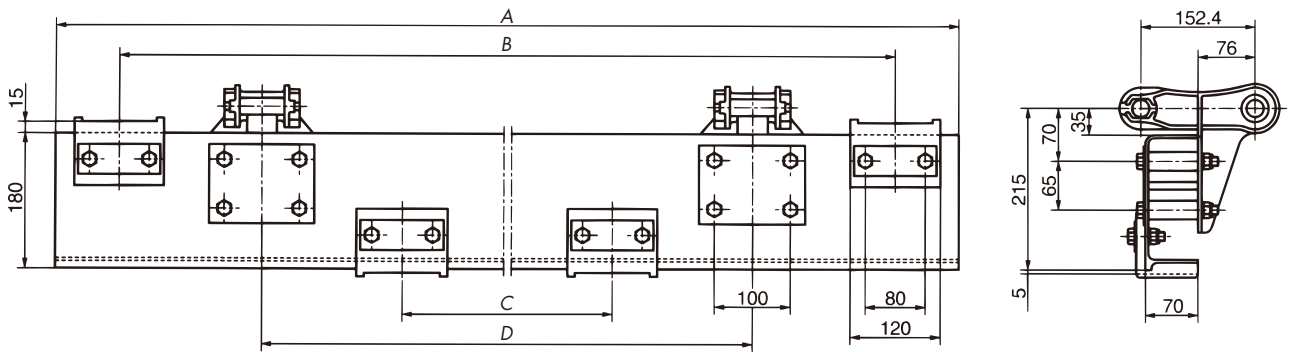
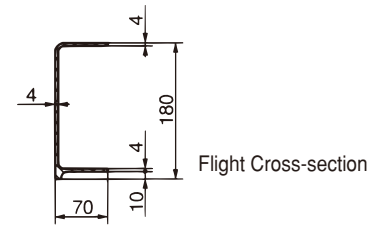


Tsubaki Chain Number	Ave. Tensile Strength kN{kgf}	Min. Tensile Strength kN{kgf}	Roller		Inner Width W	Plate		Pin				Distance Spacer			Approx. Mass kg/m	
			Dia. R	E		T	H	Dia. D	L1	L2	Th	Dh	do	d		l
WAC25610	245 {25000}	216 {22000}	100	41	50	9.5	63.5	22.2	45.0	57.0	4	28	27.2	M16	130	17.0
WAC32610	314 {32000}	275 {28000}	100	41	50	12.7	63.5	26.1	51.5	65.5	4	32	27.2	M16	140	20.5
WAC45610	441 {45000}	382 {39000}	100	41	50	12.7	76.2	26.1	51.5	65.5	4	32	27.2	M16	145	23.8
WAC55610	539 {55000}	461 {47000}	100	41	50	12.7	76.2	26.1	51.5	65.5	4	32	27.2	M16	140	23.8
WAC65610	637 {65000}	549 {56000}	110	41	50	16	76.2	31.8	58.7	76.3	4	38	27.2	M20	165	30.0
WAC75610	735 {75000}	628 {64000}	110	58	66.7	16	80	31.8	67.0	84.0	4	38	27.2	M20	180	34.0
WAC100610	981{100000}	834 {85000}	130	58	66.7	22	100	35.0	79.0	98.5	8	40	34	M22	210	53.1
WAC120610	1180{120000}	1000{102000}	150	62	70	22	115	40.0	80.7	100	8	46	34	M22	210	64.5

# Accessories for Collection Tank Chains

## F Type Flight

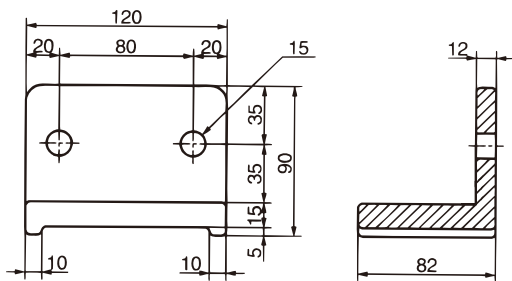
Specific Gravity: 1.9  
 Mass: 2.4kg/m  
 Material: FRP  
 Color: Blue



Note: Indicate A, B, C, D dimensions when ordering flights.  
 Attach the SF4 attachment, distance block, flight, and retainer plate, or flight and shoe, with SUS300 bolts, nuts, washers, spring washers, etc.

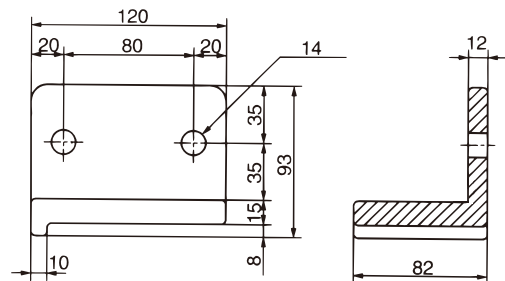
## Shoe (dual collars)

Specific Gravity: 1.14      Mass: 260g  
 Material: Polyurethane      Color: Black



## Shoe (single collar)

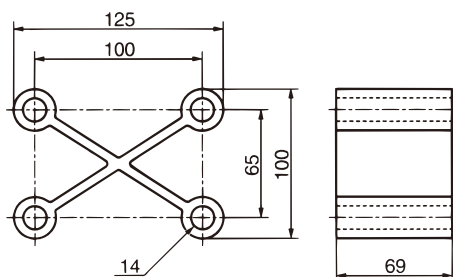
Specific Gravity: 1.17      Mass: 290g  
 Material: Polyurethane      Color: Black



Note: Tsubaki can custom make shoes in other dimensions.  
 Contact a Tsubaki representative for further details.

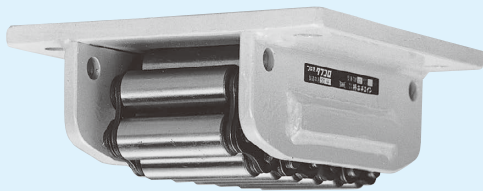
## Distance Spacer

Specific Gravity: 1.4  
 Material: Plastic  
 Mass: 240g  
 Color: Black

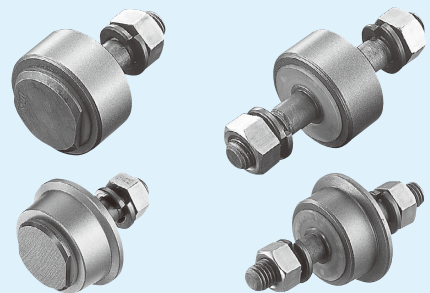


# Large Size Conveyor Chain Related Products

Toughroller . . . . . 112



Bearings,  
Bearing Rollers for Attachments . . . . 118

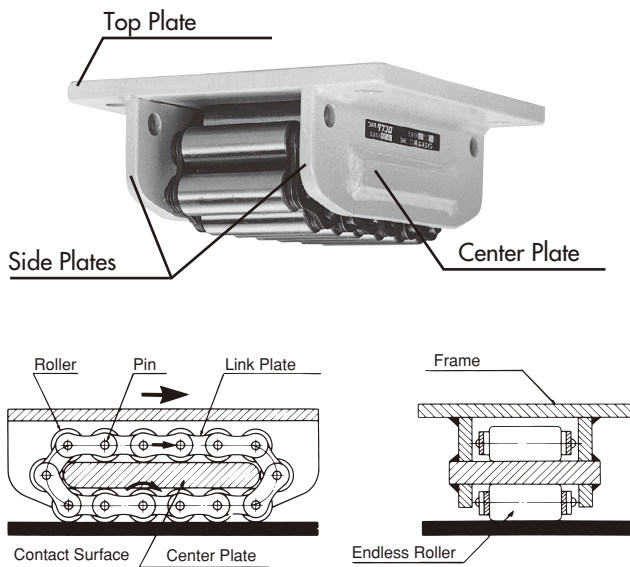


# Toughroller (Endless-type Roller)

## Outstanding performance when conveying, transferring, or moving heavy items.

Consisting of a frame and endless rollers, the endless rollers (roller, pin, and link plates) wrap around a center plate on the frame. In contrast to a standard bearing, the operating principle behind Toughroller's operation is that the center plate is the inner ring, the rollers are the balls, the link plates and pins are the ball cage, and the contact surface is the outer ring.

### Construction



### Applications

1. Transferring/conveying heavy items.
2. When items are conveyed only infrequently and do not warrant conveyor use.
3. When efficient use of space is important.
4. As a slide guide for long items.

#### Steel Roller Type

Basic Load Allowance: 14.7kN (1500kgf) - 1961kN (200,000kgf)  
 The steel roller Toughroller is a compact device with a high load allowance made from a tempered center plate and rollers.

#### Plastic Roller Type

Basic Load Allowance: 2.94kN (300kgf) - 34.3kN (3500kgf)  
 Tsubaki's Plastic Toughroller uses engineering plastic for its rollers, which gives it increased functionality over the basic features of steel rollers. And Tsubaki's Plastic Toughroller Jr. is an economical, lightweight, simple design for easy use.

### Selection

The permissible load (vertical load) for one Toughroller varies with rail material, hardness, and usage frequency. Use the following formula to select the appropriate size.

$$\frac{\text{Toughroller working load}}{\text{Rail coefficient} \times \text{Frequency coefficient}} \leq \text{Basic load allowance}$$

#### Rail coefficient chart

Rail Material		Rail Coefficient	
		Steel Rollers	Plastic Rollers
Steel	SS400{SS41}	1.0	1.0
	780N{80kgf} class high tensile rail	1.5	
Concrete		—	1.0
Linoleum/vinyl tiles		—	0.3

Note: Do not use TUF-J on 780N{80kgf} class high tensile steel rails.

#### Selection example (Traditional units)

Rail mat.: SS400	Operational frequency: 4 - 5 times/day
Rail replaceable	Working load per unit: 5000kg (max)
Rail coefficient	Operational frequency
TUF12 (basic load capacity 118kN) is chosen.	

#### Rail frequency coefficient chart

Usage Conditions	Frequency Coefficient
A) When operated 1-2 times/day, rail is replaceable	1.0
B) Between A) and C)	0.5
C) When operated 10 times/day and rail needs to be protected or rail cannot be replaced	0.2
D) When using plastic rollers	1.0

#### Loading position

Position the Toughroller so that the weight of the conveyed items is distributed evenly, and load so that left/right and front/back are balanced.

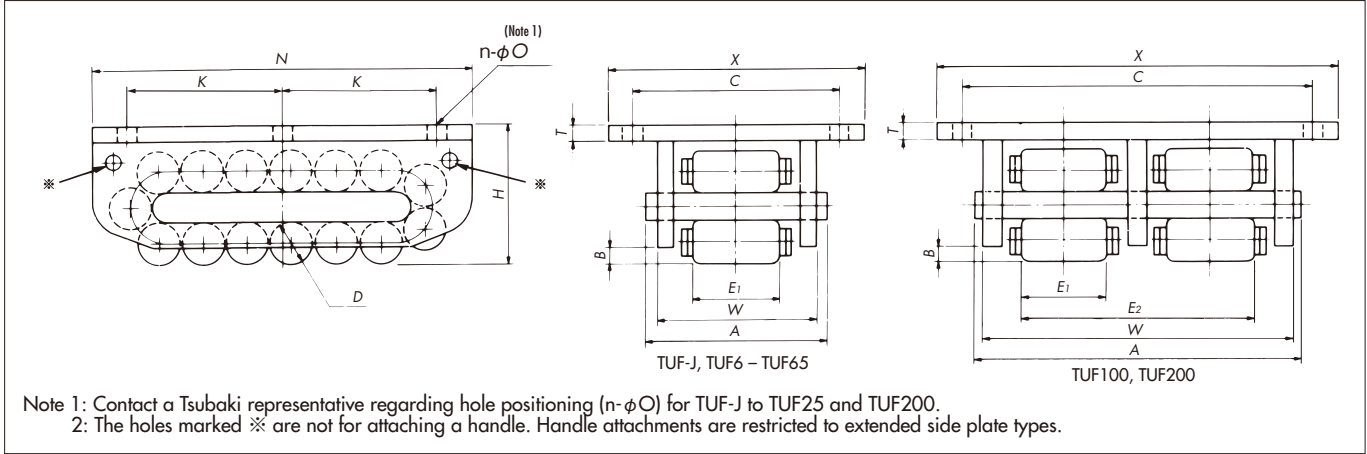
#### Working load

Calculate the working load for each Toughroller with consideration for center of gravity and rail surface unevenness.

# Toughroller (Endless-type Roller)

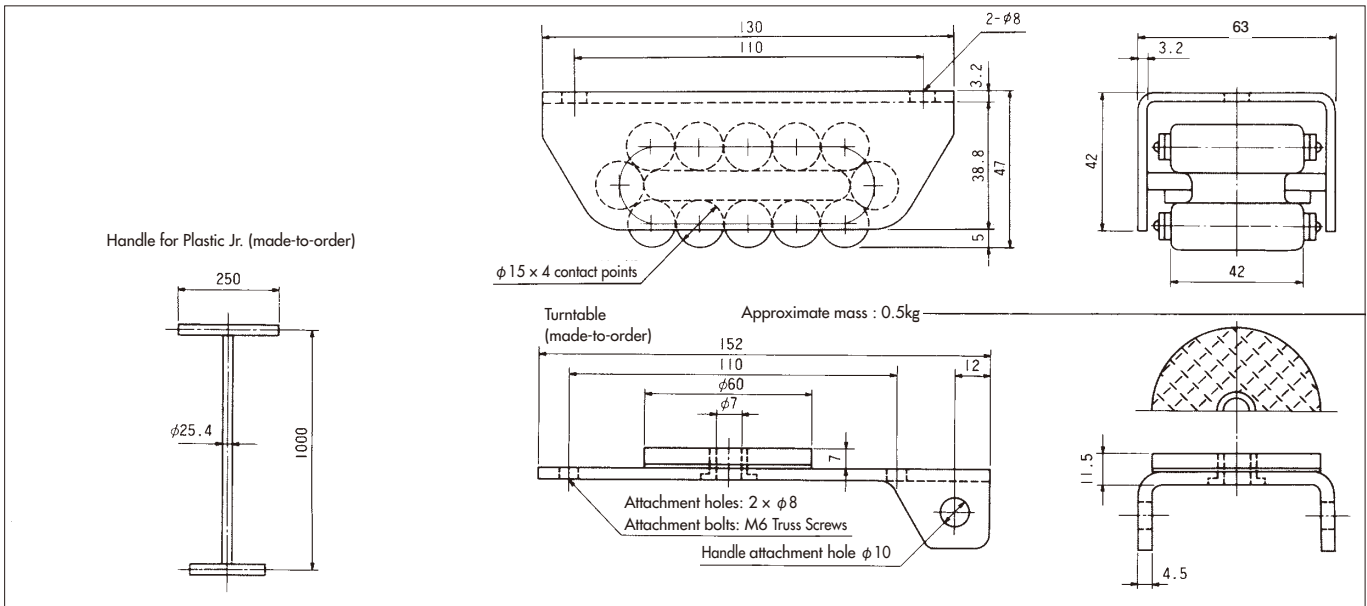
## Dimensional Chart

### Steel Roller Type



Model Number	Basic Load Capacity		Frame						Top Plate				Roller				Approx. Mass kg
	kN	{Tons}	Width X	Length N	Height H	Side Plate Width W	Center Plate Width A	Space B	C	K	n-φO	T	D	E <sub>1</sub>	E <sub>2</sub>	Rollers in Contact W/Ground	
TUF-J	14.7	1.5	135	120	51.1	72.6	85.5	5	105	90	4-10	8	15	42	—	4	2.5
TUF6	58.8	6	150	160	66	92	105	6	120	120	4-12	9	18	50	—	5	5
TUF12	118	12	200	210	85	120	133	9.5	160	160	4-15	12	24	70	—	5	11
TUF25	245	25	250	300	130	162	183	14	210	240	4-18	16	36	90	—	5	31
TUF40	392	40	300	440	164	186	210	20	240	180	6-22	19	50	100	—	5	70
TUF65	637	65	300	600	167	192	215	20	240	250	6-22	22	50	100	—	8	105
TUF100	980	100	500	500	167	362	385	20	420	200	6-26	22	50	100	268	12	160
TUF200	1961	200	730	700	240	544	574	20	640	200	8-33	28	72	150	410	12	500

### Plastic Toughroller Jr.

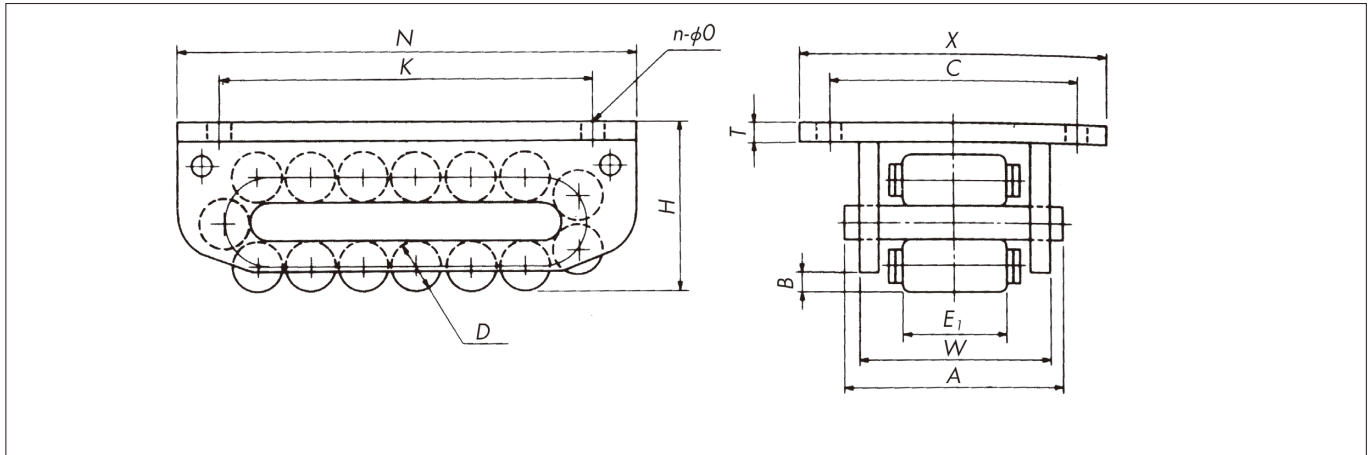


Model Number	Basic Load Capacity		Roller Type	Approximate Mass
	kN	{Tons}		
TUF -JP	2.94	0.3	Plastic roller	0.9



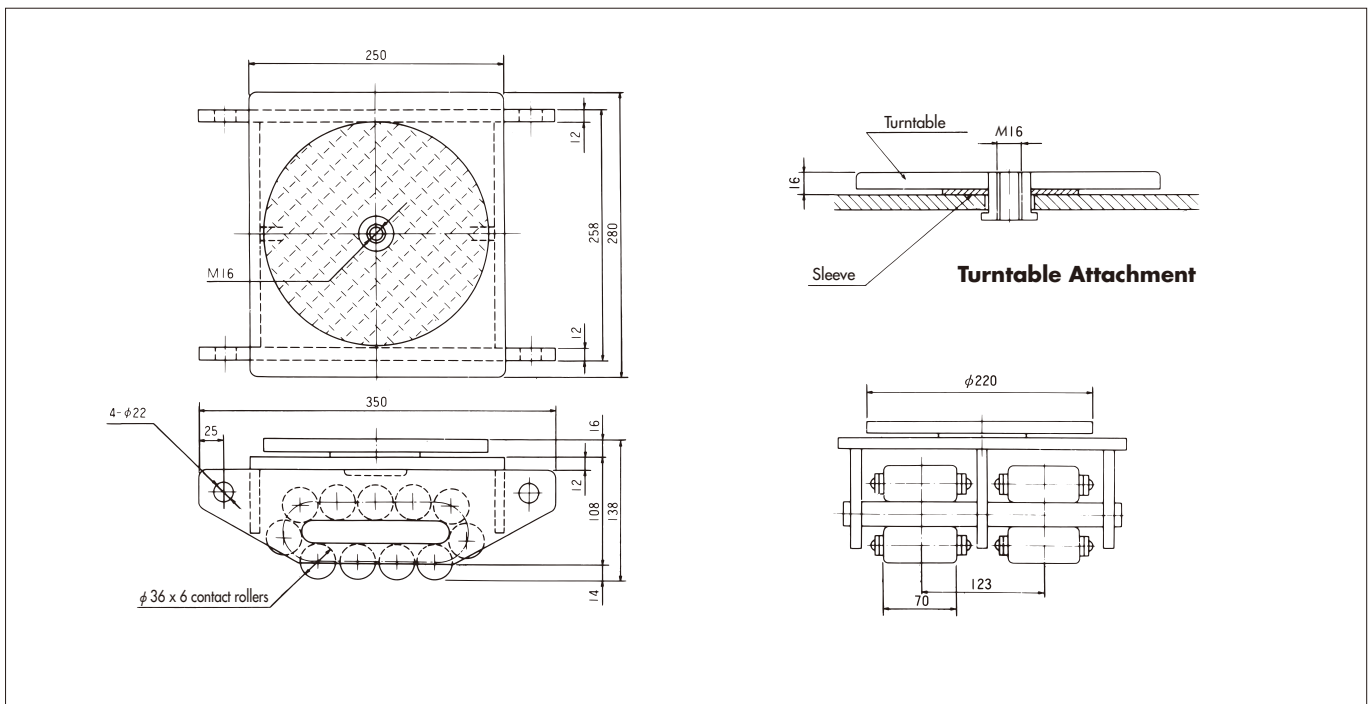
# Toughroller (Endless-type Roller)

## ● Plastic Roller Type



Model Number	Basic Load Capacity		Frame						Top Plate				Roller		Approx. Mass kg	
	kN	{Tons}	Width X	Length N	Height H	Side Plate Width W	Center Plate Width A	Space B	C	K	n-φO	T	D	E <sub>1</sub>		Rollers in Contact W/Ground
TUF 1P	9.8	1	150	160	61	81	90	5	120	120	4-12	4.5	18	50	5	2.2
TUF 2P	19.6	2	200	210	79	112	120	9.5	160	160	4-15	6	24	70	5	5
TUF 4P	34.3	3.5	250	300	122	146	160	14	210	240	4-18	8	36	90	5	17

## ● Steel Double Roller Type (Multi-directional Type)



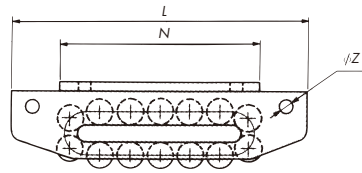
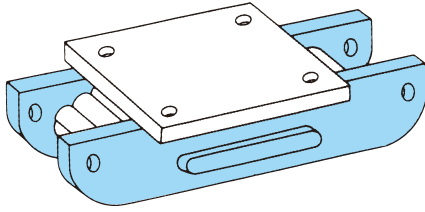
Model Number	Basic Load Capacity		Roller Type	Approximate Mass kg
	kN	{Tons}		
TUF 25W	245	25	Steel roller	42
TUF 4WP	34.3	3.5	Plastic roller	32

Note: Extended side plates with a turntable attachment is standard for Steel Double Roller Types.

# Toughroller Attachments (Optional)

## 1. Extended side plates

For hand pulling, directional travel, and connection with other Toughrollers.



Attachment Dimensions

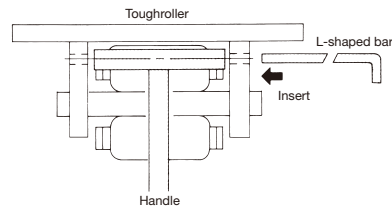
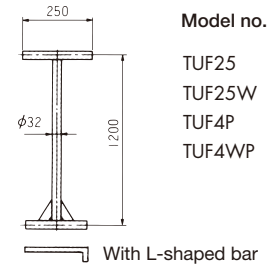
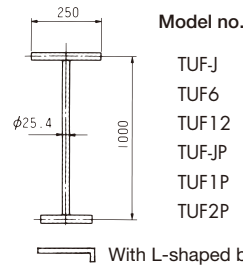
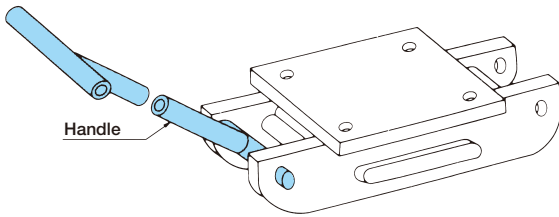
Model No.	L	Z	Approximate Mass kg
TUF-J	170	17	3
TUF 6	230	17	6
TUF12	300	17	12
TUF25	400	22	33
TUF1P	230	17	2.4
TUF2P	300	17	6
TUF4P	400	22	19

Made-to-order.

## 2. Handle

For hand pulling and directional travel

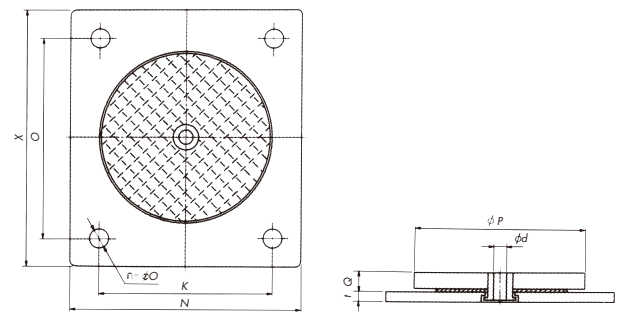
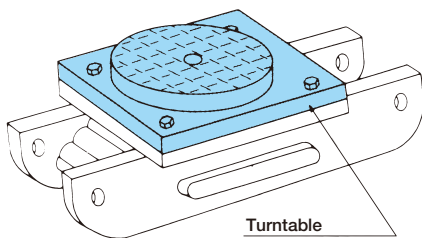
Handles can only be attached to Toughrollers with extended side plates.



Made-to-order.

## 3. Turntable

For directional travel



Attachment Dimensions

Model No.	$\phi P$	$\phi d$	Q	t	Mounting Bolt	Approximate Mass kg
TUF-J	90	7	10	6	M8	1.3
TUF1P, TUF6	120	10	13	6	M10	2.4
TUF2P, TUF12	160	14	13	9	M12	5.3
TUF4P, TUF25	200	17.5	17	12	M16	12.1

The turntable is attached to the top plate of the Toughroller by bolts. Dimensions not listed above will be the same as the Toughroller dimensions.

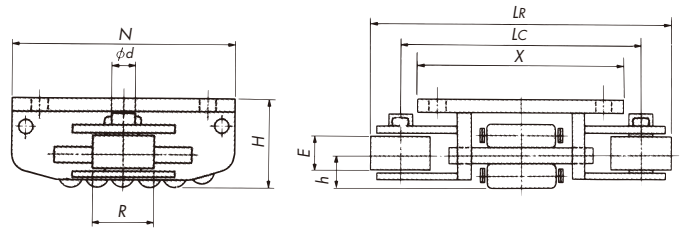
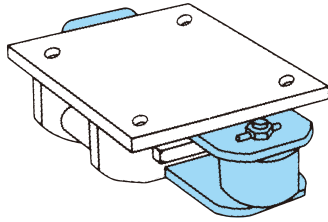
Note: Made-to-order.

# Toughroller Attachments (Optional)

## 4. Side guide roller

Side guide rollers can be installed on one or both sides.

For preventing lateral vibration and for when there are lateral forces.



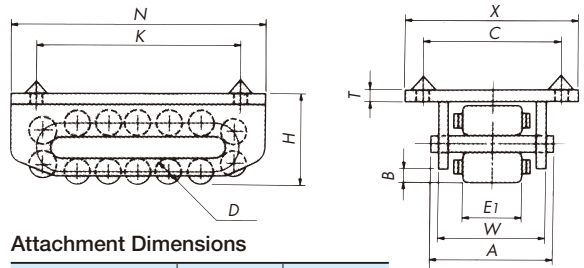
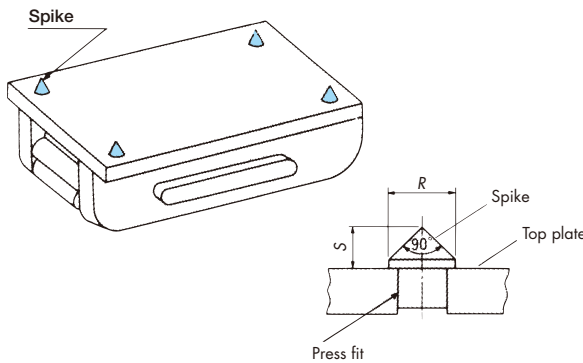
Attachment Dimensions

Model No.	N	X	H	R	E	d	h	LC	LR
TUF-J	120	135	51	38	16	14.5	20	142	180
TUF6	160	150	66	44.5	23	22	27	174	218
TUF12	210	200	85	60	38	22	40	220	280
TUF25	300	250	130	75	62	31.5	60	285	360

Note: Made-to-order.

## 5. Spikes

For use with wooden pallets



Attachment Dimensions

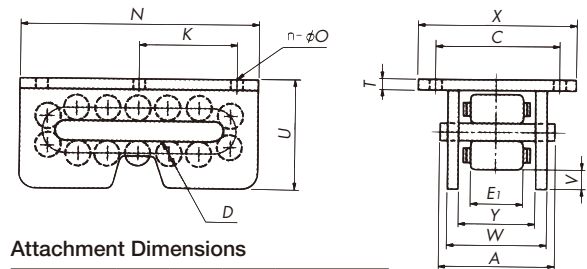
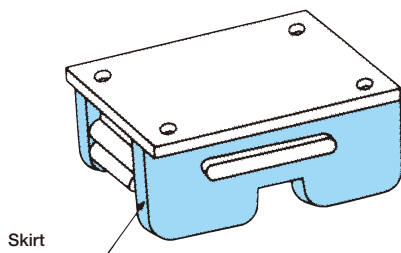
Model No.	R	S
TUF-J	12	7
TUF6	14	8
TUF12	19	10.5

Dimensions not listed above will be the same as the Toughroller dimensions.

## 6. Skirt

Skirts can be attached to one or both sides. Skirts are normally attached to one side.

For preventing lateral vibration and when there are lateral forces.



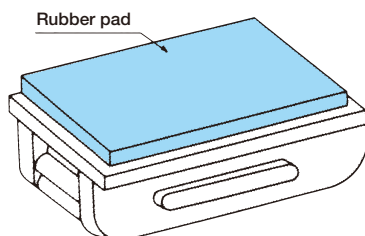
Attachment Dimensions

Model No.	U	V	Y	Approx. Mass kg (skirts on both sides)
TUF-J	65	14.0	56.5	3
TUF6	85	19.2	72	6.3
TUF12	112	27.0	100	14.5
TUF25	166	36.0	130	37.8

Dimensions not listed above will be the same as the Toughroller dimensions. Skirts are welded on and cannot be attached later.  
Note: Made-to-order.

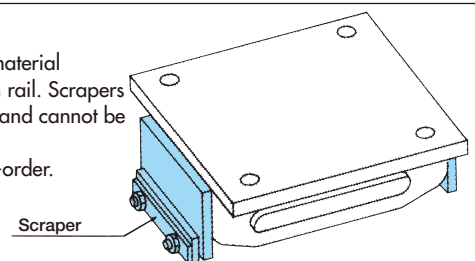
## 7. Rubber pad

Perfect for equally divided loads, uneven surfaces, and preventing slippage. For use with wooden pallets.  
Note: Made-to-order.



## 8. Scraper

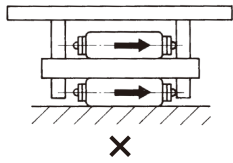
For use when material accumulates on rail. Scrapers are welded on and cannot be attached later.  
Note: Made-to-order.



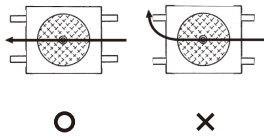
# Toughroller (Endless-type Roller)

## Notes on Handling

1. Standard Toughrollers cannot take thrust loads along the roller axis. If thrust loads are present, consider using the optional side guide roller and skirt, or have a rail bear the thrust load.



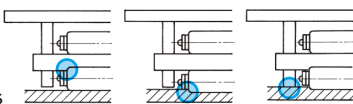
2. Except for double roller types, do not change directions while Toughroller is in motion, as this will cause a thrust load as described in 1. above. Jack up the Toughroller or use other means to change direction.



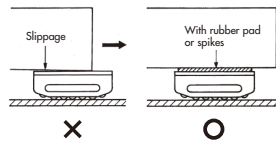
3. When using in corrosive environments (outdoors, in the rain, etc.) wash the unit and lubricate the entire chain with SAE30-40 oil each time. Tsubaki offers stainless steel specifications for use in extremely corrosive environments. Use in high temperatures will accelerate lube deterioration. Always lube regularly.

4. Usage limits are when any of the following begins to occur:

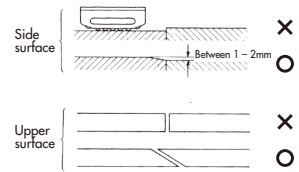
- Center plates touch link plates
- Link plates touch rails
- Side plates touch rails



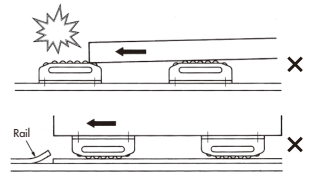
5. Ensure there is no slippage between conveyed material and the Toughroller. Tsubaki offers Toughrollers with rubber pads and spikes for this purpose. See 7. and 8. on pg. 116.



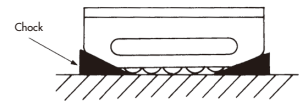
6. Ensure a gradient of less than 1.0-2.0mm when there is a step in rail connections. The rail seams should be smooth or like as shown on the right.



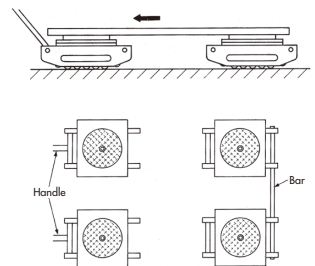
Ensure there are no severe impacts on the rollers



7. Toughrollers do not have a stopping mechanism. When leaving a Toughroller in a stopped position, insert chocks between the side plates and rail.



8. When using a Toughroller with a turntable, the manner shown in the drawing on the right is ideal. Attaching a bar between two rear Toughrollers will allow for smooth travel.



9. After use, remove dust and the like with a brush and apply a coat of lube or grease before storing.

## Toughroller® (with endless rollers) Ordering Example

### Product Numbering Example



Size (TUF-J for junior types)

Roller types  
Steel rollers: No code  
Plastic rollers: P  
Double rollers: W

Note: Refer to individual sections for possible model (size/roller type) and attachment assemblies. Contact a Tsubaki representative regarding installing attachments before shipping.

Attachment  
Extended side plates: ESP  
Handle: HDL  
Turntable: TTB  
Lateral guide roller: SGR  
(One side: SGR-1, both sides: SGR-2)  
Spikes: SPK  
Skirts: SKT  
(One side: SKT-1, both sides: SKT-2)  
Rubber pad: GPD  
Scrapers: SCR










### Ordering Example

Size= TUF4  
Roller type= Plastic rollers  
Attachment= Turntable  
Quantity= 1

Model no.	Qty	Unit
TUF4P	1	K
TUF4P-TTB	1	K

# Bearings and Bearing Roller Attachments

## Series Overview

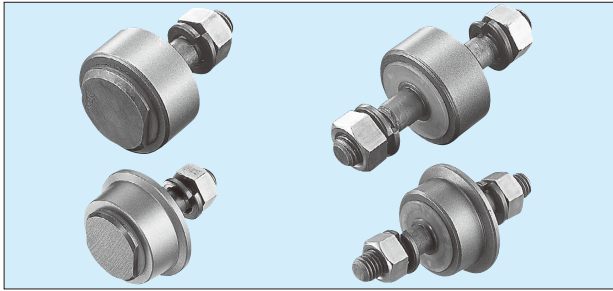
Bearing Specification Roller Specification	Lubed Specifications	Non-lubed Specifications	Water Resistant Specifications	Heat Resistant Specifications
	1. Coefficient of Friction: 0.03 2. Operating Temp: -20 to 80°C 3. Lubed	1. Coefficient of Friction: 0.03 2. Operating Temp: -20 to 50°C 3. Non-lubed (However, an anti-rust oil is applied during shipping.)	1. Coefficient of Friction: 0.03 2. Operating Temp: 0 to 50°C 3. Non-lubed (However, an anti-rust oil is applied during shipping.)	1. Coefficient of Friction: 0.03 2. Operating Temp: -20 to 150°C 3. Heat resistant lube (Includes grease nipple)
Usage Environment	Ambient temperatures away from water and dust	Ambient temperatures away from water and dust	Ambient temperatures in contact with water	Ambient temperatures away from water and dust
Axle Bearing Roller Series	 JBR Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.96 - 15.7kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.96 - 15.7kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 11.0kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.96 - 15.7kN
	 JBF Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 9.81kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 9.81kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 9.81kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 9.81kN
	 JBFF Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN
	 JBTF Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN
	 JBUR Roller Dia: $\phi 40 - \phi 100$ Allowable Load: 0.29 - 2.94kN * Operating Temp: 0 to 50°C	Roller Dia: $\phi 40 - \phi 100$ Allowable Load: 0.29 - 2.94kN * Operating Temp: 0 to 50°C		
Attachment Bearing Roller Series	 ABR Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.96 - 27.5kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.96 - 27.5kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 19.3kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.96 - 27.5kN
	 ABF Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 18.6kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 18.6kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 18.6kN	Roller Dia: $\phi 31.8 - \phi 125$ Allowable Load: 1.27 - 18.6kN
	 ABFF Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN	Roller Dia: $\phi 31.8 - \phi 80$ Allowable Load: 1.27 - 6.86kN
	 ABUR Roller Dia: $\phi 40 - \phi 100$ Allowable Load: 0.29 - 2.94kN * Operating Temp: 0 to 50°C	Roller Dia: $\phi 40 - \phi 100$ Allowable Load: 0.29 - 2.94kN * Operating Temp: 0 to 50°C		

Note:

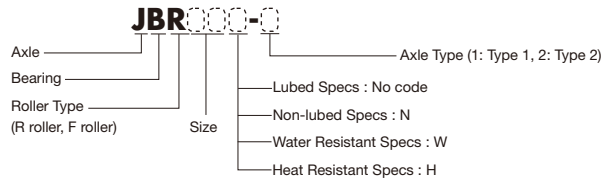
1. Tsubaki can manufacture roller diameters not listed.
2. Allowable load may differ for Type 2. Heat resistant specifications may not be available for all models. See specification pages for details.

# Bearings and Bearing Roller Attachments

## Standard Axle Bearing Roller



### Model Numbering Example



### [Available Specifications]

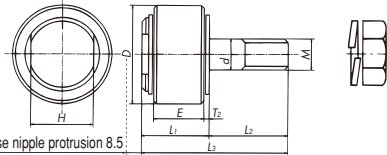
Lubed
Non-lubed
Water Resistant
Heat Resistant

Note: Check allowable load

Size	Available Bolt Length	Size	Available Bolt Length
03	14mm	17	32mm
05	20mm	26	38mm
10	22mm	36	44.5mm
12	25mm		

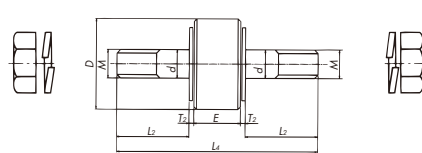
## Dimensions/Specifications

### JBR-1

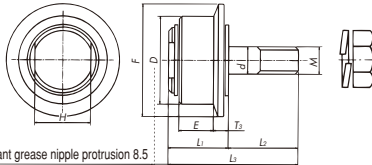


\*Heat resistant grease nipple protrusion 8.5

### JBR-2

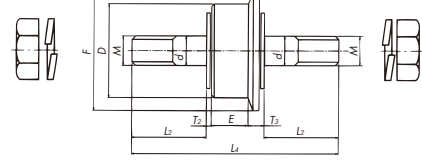


### JBF-1



\*Heat resistant grease nipple protrusion 8.5

### JBF-2



Attachment Plate  
Do not chamfer, as there is only slight clearance with the axle.

Attachment Plate  
Do not chamfer, as there is only slight clearance with the axle.

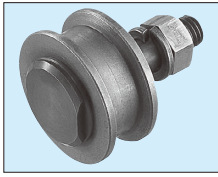
Note : Axle cannot be inserted from one side. Configure roller so that attachment plate can be removed.

Roller Specification, Size, Axle Type				Allowable Load		Allowable No. of Rotations /min	Max. Bolt Tightening Torque N·m (kgf·m)	Axle Dia. d	Outer Dia. D	Flange Dia. F	H	Bolt Dia. M	E	T <sub>2</sub>	T <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	Approx. Mass kg		Attachment Plate			
				kN	(kgf)															Type1	Type2	A	T	W	
R Roller	JBR03	Type 1	Type 2	1.96	200	180 (120)	11.8	1.2	10	31.8	-	19 (16)	M10	14	2 (4.5)	-	20 (25)	24.5	44.5 (49.5)	67 (72)	0.14	0.14	10.2	10-13	18 (23)
	JBR05	Type 1	Type 2	3.04	310	185 (120)	58.8	6	12	40	-	27 (21)	M12	19	2.5 (4.5)	-	26.5 (31)	35.5	62 (66.5)	95 (99)	0.28	0.30	12.2	15-20	24 (28)
	JBR10	Type 1	Type 2	5.49	560	190 (120)	78.4	8	16	50.8	-	32 (24)	M16	26	3 (6)	-	35 (41.5)	40	75 (81.5)	112 (118)	0.59	0.69	16.2	17-21	32 (38)
	JBR12	Type 1	Type 2	8.34	850	150 (100)	78.4	8	20	65	-	38 (27)	M20	32	3 (7.5)	-	41.5 (51)	48.5	90 (99.5)	135 (144)	1.15	1.23	20.2	21-25	38 (47)
	JBR17	Type 1	Type 2	9.81 (141)	1000 (1440)	120 (80)	162	16.5	24	80	-	48 (30)	M24	44	4 (10.5)	-	56.5 (70)	62.5	119 (132.5)	177 (190)	2.47	2.60	24.2	28-34	52 (65)
	JBR26	Type 1	Type 2	12.7 (19.6)	1300 (2000)	95 (60)	245	25	27	100	-	55 (34)	M27	50	4 (10.5)	-	63.5 (77)	73.5	137 (150.5)	205 (218)	3.60	3.80	27.2	32-39	58 (71)
	JBR36	Type 1	Type 2	15.7 (27.5)	1600 (2800)	75 (50)	529	54	30	125	-	70 (45)	M30	56	5.5 (12.5)	-	73.5 (90)	86.5	160 (176.5)	240 (254)	6.50	6.70	30.2	39-47	67 (84)
F Roller	JBF03	Type 1	Type 2	1.27	130	180 (120)	11.8	1.2	10	31.8	42	19 (16)	M10	11	2 (4.5)	5 (7.5)	20 (25)	24.5	44.5 (49.5)	67 (72)	0.15	0.15	10.2	10-13	18 (23)
	JBF05	Type 1	Type 2	1.96	200	185 (120)	58.8	6	12	40	50	27 (21)	M12	14	2.5 (4.5)	7.5 (9.5)	26.5 (31)	35.5	62 (66.5)	95 (99)	0.31	0.33	12.2	15-20	24 (28)
	JBF10	Type 1	Type 2	3.43	300	190 (120)	78.4	8	16	50.8	65	32 (24)	M16	20	3 (6)	9 (12)	35 (41.5)	40	75 (81.5)	112 (118)	0.6	0.76	16.2	17-21	32 (38)
	JBF12	Type 1	Type 2	5.49	560	150 (100)	78.4	8	20	65	80	38 (27)	M20	24	3 (7.5)	11 (15.5)	41.5 (51)	48.5	90 (99.5)	135 (144)	1.24	1.32	20.2	21-25	38 (47)
	JBF17	Type 1	Type 2	6.86 (9.81)	700 (1400)	120 (80)	162	16.5	24	80	100	48 (30)	M24	34	4 (10.5)	14 (20.5)	56.5 (70)	62.5	119 (132.5)	177 (190)	2.75	2.85	24.2	28-34	52 (65)
	JBF26	Type 1	Type 2	8.83 (13.7)	900 (1400)	95 (60)	245	25	27	100	125	55 (34)	M27	38	4 (10.5)	16 (22.5)	63.5 (77)	73.5	137 (150.5)	205 (218)	3.90	4.10	27.2	32-39	58 (71)
	JBF36	Type 1	Type 2	9.81 (18.6)	1040 (1900)	75 (50)	529	54	30	125	150	70 (45)	M30	42	5.5 (12.5)	19.5 (26.5)	73.5 (90)	86.5	160 (176.5)	240 (254)	7.0	7.20	30.2	39-47	67 (84)

- Note:
- Allowable loads shown in ( ) are for Type 2. No ( ) indicate the same values for both Type 1 and 2.
  - Values for allowable no. of rotations shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicate no difference between specifications.
  - 03 and 05 sizes for Type 2 heat resistant specifications are unavailable.
  - The allowable load values above for JBR water resistant specifications are multiplied by a coefficient of 0.7.
  - Stock Items
    - Lubed Specifications: Type 1 JBR03 - 17, JBF03 - 17
    - Non-lubed Specifications: Type 1 JBR03N - 12N, JBF03N - 12N
- All other models are made-to-order.



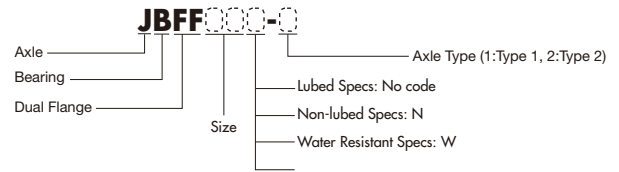
# Bearings and Bearing Roller Attachments



### [Available Specifications]

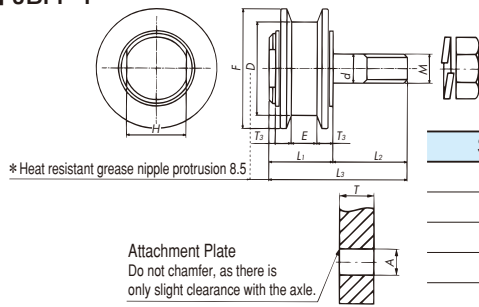
- Lubed
- Non-lubed
- Water Resistant
- Heat Resistant

### ● Model Numbering Example



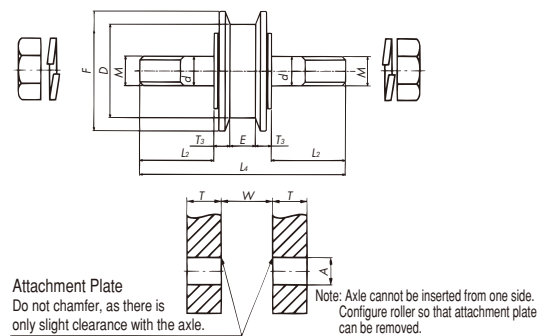
### ● Dimensions/Specifications

#### ■ JBFF-1



Size	Available Bolt Length
03	14mm
05	20mm
10	22mm
12	25mm
17	32mm

#### ■ JBFF-2



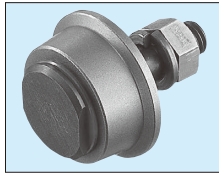
Roller Specification, Size, Axle Type			Allowable Load		Allowable No. of Rotations r/min	Max. Bolt Tightening Torque		Axle Dia. d	Outer Dia. D	Flange Dia. F	H	Bolt Dia. M	E	T <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	Approx. Mass kg		Attachment Plate		
			kN	(kgf)		N·m	(kgf·m)												Type1	Type2	A	T	W
JBFF03	Type 1	Type 2	1.27	130	180 (120)	11.8	1.2	10	31.8	42	19 (16)	M10	12	5 (7.5)	24.5 (29.5)	24.5	49 (54)	71 (76)	0.19	0.19	10.2	10~13	22.5 (27)
JBFF05	Type 1	Type 2	1.67	170	185 (120)	58.8	6	12	40	50	27 (21)	M12	12	7.5 (9.5)	29.5 (34)	35.5	65 (69.5)	98 (102)	0.37	0.39	12.2	15~20	27 (31)
JBFF10	Type 1	Type 2	2.75	280	190 (120)	78.4	8	16	50.8	65	32 (24)	M16	16	9 (12)	37 (43.5)	40	77 (83.5)	114 (120)	0.75	0.85	16.2	17~21	34 (40)
JBFF12	Type 1	Type 2	3.63	370	150 (100)	78.4	8	20	65	80	38 (27)	M20	16	11 (15.5)	41.5 (51)	48.5	90 (99.5)	135 (144)	1.30	1.40	20.2	21~25	38 (47)
JBFF17	Type 1	Type 2	6.86	700	120 (80)	162	16.5	24	80	100	48 (30)	M24	24	14 (20.5)	56.5 (70)	62.5	119 (132.5)	177 (190)	3.0	3.10	24.2	28~34	52 (65)

Note:

1. Allowable loads shown in ( ) are for Type 2. No ( ) indicate the same values for both Type 1 and 2.
2. 03 and 05 sizes for Type 2 heat resistant specifications are unavailable.
3. Made-to-order item.

# Bearings and Bearing Roller Attachments

## Tapered Roller Axle Bearing Roller

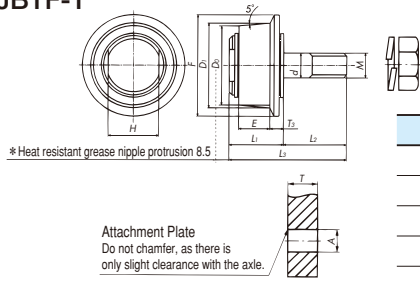


[Available Specifications]

- Lubed
- Non-lubed
- Water Resistant
- Heat Resistant

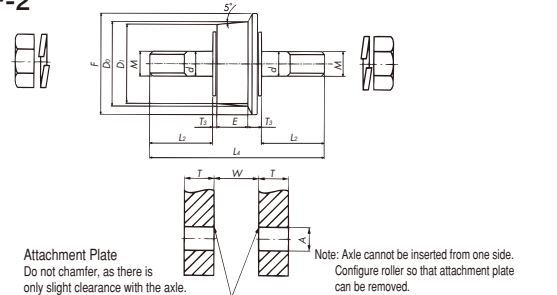
### Dimensions/Specifications

#### JBTF-1

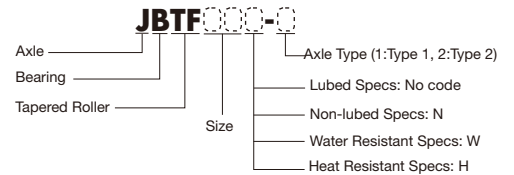


Size	Available Bolt Length
03	14mm
05	20mm
10	22mm
12	25mm
17	32mm

#### JBTF-2



### Model Numbering Example



Roller Specification, Size, Axle Type		Allowable Load		Allowable No. of Rotations r/min	Max. Bolt Tightening Torque N·m {kgf·m}	Axle Dia. d	Outer Dia. D <sub>1</sub>	Outer Dia. D <sub>2</sub>	Flange Dia. F	H	Bolt Dia. M	E	T <sub>2</sub>	T <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	Approx. Mass kg		Attachment Plate					
		kN	{kgf}																Type 1	Type 2	A	T	W			
F Roller	JBTF03	Type 1	Type 2	1.27	130	180 (120)	11.8	1.2	10	31.8	33.7	42	19 (16)	M10	11	2 (4.5)	5 (7.5)	20 (25)	24.5	44.5 (49.5)	67 (72)	0.15	0.15	10.2	10-13	18 (23)
		Type 1	Type 2	1.96	200	185 (120)	58.8	6	12	40	42.5	50	27 (21)	M12	14	2.5 (4.5)	7.5 (9.5)	26.5 (31)	35.5	62 (66.5)	95 (99)	0.31	0.33	12.2	15-20	24 (28)
	JBTF10	Type 1	Type 2	3.43	350	190 (120)	78.4	8	16	50.8	54.3	65	32 (24)	M16	20	3 (6)	9 (12)	35 (41.5)	40	75 (81.5)	112 (118)	0.66	0.76	16.2	17-21	32 (38)
		Type 1	Type 2	5.49	560	150 (100)	78.4	8	20	65	69.2	80	38 (27)	M20	24	3 (7.5)	11 (15.5)	41.5 (51)	48.5	90 (99.5)	135 (144)	1.24	1.32	20.2	21-25	38 (47.4)
	JBTF17	Type 1	Type 2	6.86 (981)	700 (1000)	120 (80)	162	16.5	24	80	86.0	100	48 (30)	M24	34	4 (10.5)	14 (20.5)	56.5 (70)	62.5	119 (132.5)	177 (190)	2.72	2.85	24.2	28-34	52 (65)

- Note:
- Allowable loads shown in ( ) are for Type 2. No ( ) indicate the same values for both Type 1 and 2.
  - Values for allowable no. of rotations shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicate no difference between specifications.
  - 03 and 05 sizes for Type 2 heat resistant specifications are unavailable.
  - Made-to-order item.

## Urethane-lined Roller Axle Bearing Roller

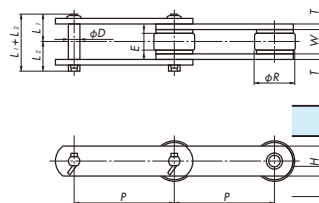


[Available Specifications]

- Lubed
- Non-lubed

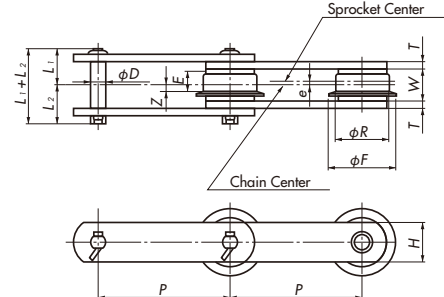
### Dimensions/Specifications

#### JBUR-1

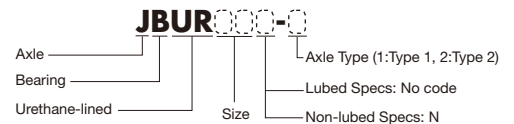


Size	Available Bolt Length
03	14mm
05	20mm
10	22mm
12	25mm
17	32mm

#### JBUR-2



### Model Numbering Example

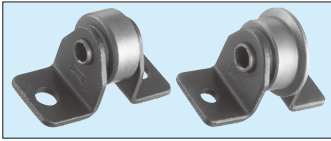


Roller Specification, Size, Axle Type		Allowable Load		Allowable No. of Rotations r/min	Max. Bolt Tightening Torque N·m {kgf·m}	Axle Dia. d	Outer Dia. D	H	Bolt Dia. M	E	T <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	Approx. Mass kg		Attachment Plate					
		kN	{kgf}													Type 1	Type 2	A	T	W			
R Roller	JBUR03	Type 1	Type 2	0.29	30	180 (120)	11.8	1.2	10	40	19 (16)	M10	14	2 (4.5)	20 (25)	24.5	44.5 (49.5)	67 (72)	0.14	0.14	10.2	10-13	18
		Type 1	Type 2	0.59	60	185 (120)	58.8	6	12	50	27 (21)	M12	19	2.5 (4.5)	26.5 (31)	35.5	62 (66.5)	95 (99)	0.28	0.30	12.2	15-20	24
	JBUR10	Type 1	Type 2	0.98	100	190 (120)	78.4	8	16	60	32 (24)	M16	26	3 (6)	35 (41.5)	40	75 (81.5)	112 (118)	0.59	0.69	16.2	17-21	32
		Type 1	Type 2	1.47	150	150 (100)	78.4	8	20	80	38 (27)	M20	32	3 (7.5)	41.5 (51)	48.5	90 (99.5)	135 (144)	1.15	1.23	20.2	21-25	38
	JBUR17	Type 1	Type 2	2.94	300	120 (80)	162	16.5	24	100	48 (30)	M24	44	4 (10.5)	56.5 (70)	62.5	119 (132.5)	177 (190)	2.47	2.60	24.2	28-34	52

- Note:
- Values for allowable no. of rotations shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicate no difference between specifications.
  - Made-to-order item.

# Bearings and Bearing Roller Attachments

## Standard Attachment Bearing Roller



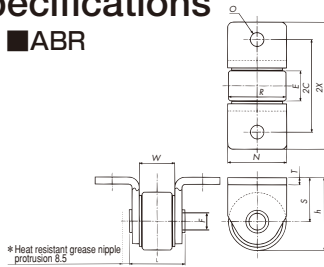
[Available Specifications]

- Lubed
- Non-lubed
- Water Resistant
- Heat Resistant

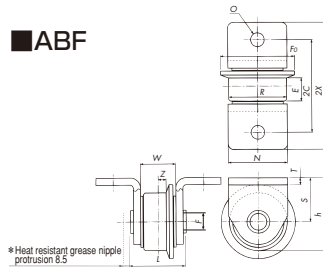
Note: Check allowable load

### Dimensions/ Specifications

■ ABR



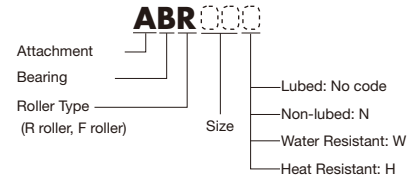
■ ABF



\* Heat resistant grease nipple protrusion 8.5

\* Heat resistant grease nipple protrusion 8.5

### Model Numbering Example



Roller Specification, Size	Allowable Load		Allowable Running Speed m/min	R	E	L	h	S	T	2C	2X	N	O	W	F	Fo	Z	Approx. Mass kg	
	kN	{kgf}																	
R Roller	ABR03	1.96	200	18 (12)	31.8	14	28	40	24.1	3.2	50	70	32	10	17.2	7.6	-	-	0.15
	ABR05	3.04	310	23 (15)	40	19	36.8	50	30	4.5	60	84	40	10	23	11	-	-	0.33
	ABR10	5.49	560	30 (20)	50.8	26	48.8	64	38.6	6.3	80	110	52	12	31	14	-	-	0.74
	ABR12	8.34	850	30 (20)	65	32	58.4	80	47.5	7.9	90	130	70	15	37.4	15.5	-	-	1.48
	ABR17	14.1	1440	30 (20)	80	44	76.4	100	60	9.5	130	180	80	18	51.4	18	-	-	2.94
	ABR26	19.6	2000	30 (20)	100	50	82.6	120	70	9.5	140	200	100	21	57.6	22	-	-	5.20
	ABR36	27.5	2800	30 (20)	125	56	98.5	145	82.5	12.7	180	240	125	24	67	25	-	-	9.80
F Roller	ABF03	1.27	130	18 (12)	31.8	11	28	40	24.1	3.2	50	70	32	10	17.2	7.6	42	4.3	0.16
	ABF05	1.96	200	23 (15)	40	14	36.8	50	30	4.5	60	84	40	10	23	11	50	4.5	0.35
	ABF10	3.43	350	30 (20)	50.8	20	48.8	64	38.6	6.3	80	110	52	12	31	14	65	7	0.78
	ABF12	5.49	560	30 (20)	65	24	58.4	80	47.5	7.9	90	130	70	15	37.4	15.5	80	8	1.60
	ABF17	9.81	1000	30 (20)	80	34	76.4	100	60	9.5	130	180	80	18	51.4	18	100	12	3.10
	ABF26	13.7	1400	30 (20)	100	38	82.6	120	70	9.5	140	200	100	21	57.6	22	125	13	5.50
	ABF36	18.6	1900	30 (20)	125	42	98.5	145	82.5	12.7	180	240	125	24	67	25	150	14	10.3

Note:

- Allowable running speeds shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicate no difference between specifications.
- 03 size for heat resistant specifications are unavailable.
- The allowable load values above for ABR water resistant specifications are multiplied by a coefficient of 0.7.
- Stock Items    ◯Lubed Specifications: ABR03-17    ◯Non-lubed Specifications: ABR03N-012N  
All other models are made-to-order.

## Dual Flange Roller Attachment Bearing Roller

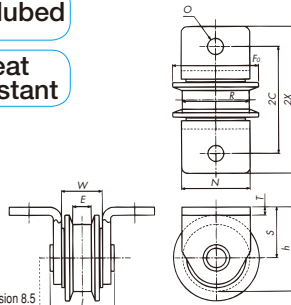


[Available Specifications]

- Lubed
- Non-lubed
- Water Resistant
- Heat Resistant

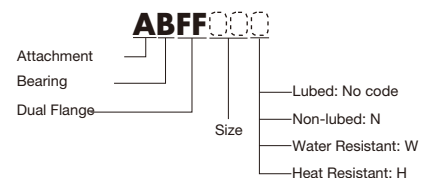
### Dimensions/ Specifications

■ ABFF



\* Heat resistant grease nipple protrusion 8.5

### Model Numbering Example



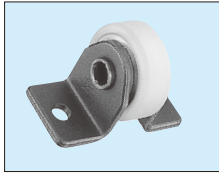
Roller Specification, Size	Allowable Load		Allowable Running Speed m/min	R	E	L	h	S	T	2C	2X	N	O	W	Fo	Approx. Mass kg
	kN	{kgf}														
ABFF03	1.27	130	18 (12)	31.8	12	32	40	24.1	3.2	50	74	32	10	21.7	42	0.20
ABFF05	1.67	170	23 (15)	40	12	39.8	50	30	4.5	60	87	40	10	26	50	0.42
ABFF10	2.75	280	30 (20)	50.8	16	50.8	64	38.6	6.3	80	112	52	12	33	65	0.90
ABFF12	3.63	370	30 (20)	65	16	58.4	80	47.5	7.9	90	130	70	15	37.4	80	1.65
ABFF17	6.86	700	30 (20)	80	24	76.4	100	60	9.5	130	180	80	18	51.4	100	3.45

Note:

- Allowable running speeds shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicates no difference between specifications.
- Made-to-order item.

# Bearings and Bearing Roller Attachments

## Urethane-lined Roller Attachment Bearing Roller



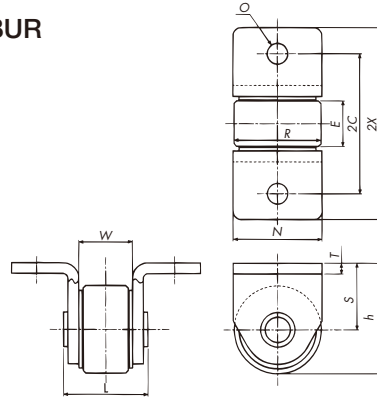
[Available Specifications]

Lubed

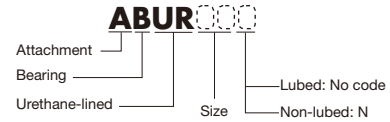
Non-lubed

■ ABUR

### Dimensions/ Specifications



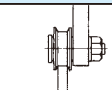
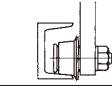
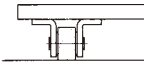
### Model Numbering Example



Roller Specification, Size		Allowable Load		Allowable Running Speed m/min	R	E	L	h	S	T	2C	2X	N	O	W	Approx. Mass kg
		kN	{kgf}													
R Roller	ABUR03	0.29	30	18 (12)	40	14	28	44.1	24.1	3.2	50	70	32	10	17.2	0.15
	ABUR05	0.59	60	23 (15)	50	19	36.8	55	30	4.5	60	84	40	10	23	0.33
	ABUR10	0.98	100	30 (20)	60	26	48.8	68.6	38.6	6.3	80	110	52	12	31	0.74
	ABUR12	1.47	150	30 (20)	80	32	58.4	87.5	47.5	7.9	90	130	70	15	37.4	1.48
	ABUR17	2.94	300	30 (20)	100	44	76.4	110	60	9.5	130	180	80	18	51.4	2.94

Note:  
 1. Allowable running speeds shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicate no difference between specifications.  
 2. Made-to-order item.

## Applications

Name	Model	Features	Applications
Dual Flange Roller	JBFF ABFF	Flanges are attached to both sides of the F roller to prevent meandering.	 Application ex: Rail running
Tapered Roller	JBTF	Roller has a 5° taper so that the channel taper can be used as a rail.	 Application ex: Channel running
Urethane-lined Roller	JBUR ABUR	Roller is urethane lined - low noise, will not damage rail.	 Application ex: Concrete floors

## Notes on Use

- Allowable load values are determined by roller-rail wheel contact pressure or bearing rotation strength. Use rails with SS400 or stronger material. Do not use bearing rollers with curved rails.
- For lubed specifications, lack of lubrication will cause poor rotation. Use non-lubed or water resistant specifications in environments where bearing roller may come in contact with water.
- Be aware that precision is much coarser than with cam followers.
- Do not use in acidic or alkaline environments. Water resistant specifications (SUS400 Series parts) may rust in certain usage environments.
- Due to the small clearance between axle and hole, do not chamfer the attachment hole for Axle Bearing Rollers. Be sure not to exceed the maximum screw tightening torque when attaching the nut.
- Do not allow roller to come into contact with severe shock
- This product does not come equipped with a brake. Consider installing one on the equipment side.
- When re-lubricating lubed specifications, be sure to drip a few drops at a time between the roller and spacer on either side. Once lubrication has degraded, lube every 1-3 months with ISO VG100-150 {SAE30-40} oil.
- Rotational resistance of bearings and spacers will increase if worn. Be sure to replace as necessary. Use the following to determine usage limit.
  - Over 0.5mm of play between roller and bearing.
  - When resin spacer has worn away.
- All parts are coated with an anti-rust agent before shipment.

# Accessories

Accessories

## Automatic Conveyor Chain Lubricator

### TCL Automatic Conveyor Chain Lubricator

The TCL lubricator is designed for use with conveyor chains. The chain roller pushes up the checker arm on the lubricator pump, activating the pump and causing an appropriate amount of lubrication to discharge from the nozzle. Thus, no electric or other power source is required, making installation easy and exact, stable lubrication possible.

#### No Power Source Required

- The lubricator pump is activated when the chain runs, making electric, air, or other power sources unnecessary. Installation and maintenance are a snap!

#### Correct Lubrication

- Lubrication is in tandem with chain operation for correct, stable lubrication every time.

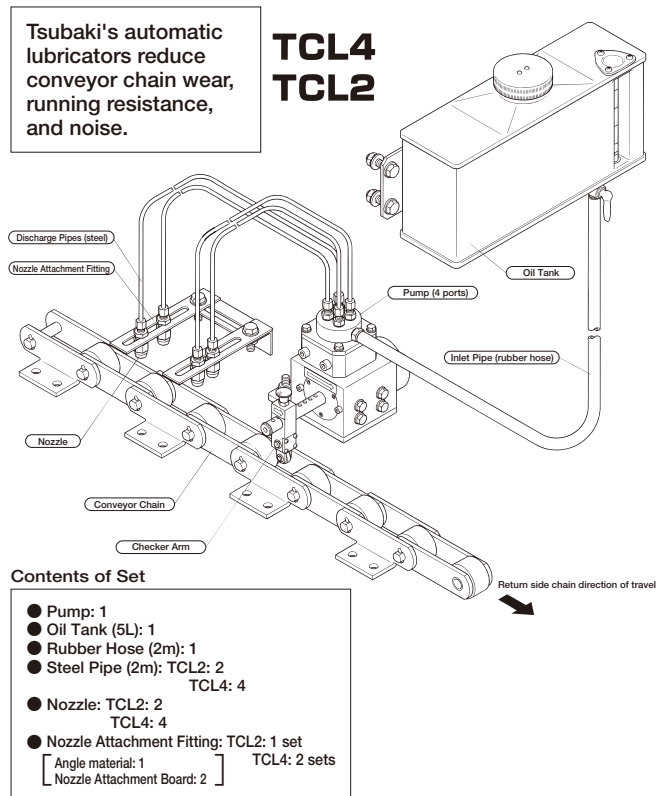
#### Compact, Low Price

- Lighter and more compact than existing conveyor chain lubricators, making it easy to handle and cost effective.

#### Lubricator Performance

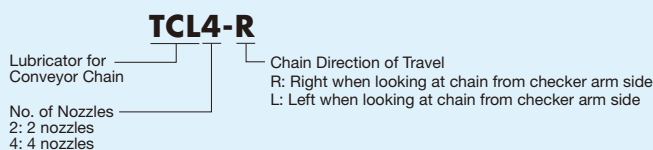
Type	TCL4	TCL2
Nozzle	4 ports	2 ports
Number of Operations	Max. 3 times/sec. Refer to the chart on the following page for pitch and chain speed.	
Discharge Amount	Fixed: 0.05cc/shot/nozzle	
Timing Sensor	Checker arm sensor	
ON/OFF	Replace checker arm manually after stopping the conveyor.	
Oil Tank	5 L	
Operational Temperature	-10°C to 120°C	

Note: Operational temperature is the temperature at which the nozzle tip can function. The operational temperature of the actual unit is -10°C to 60°C.



### Ordering Automatic Conveyor Chain Lubricator

#### Product Numbering Example



#### Ordering Example

Type: TCL4  
Chain Direction of Travel: R  
Quantity: 1

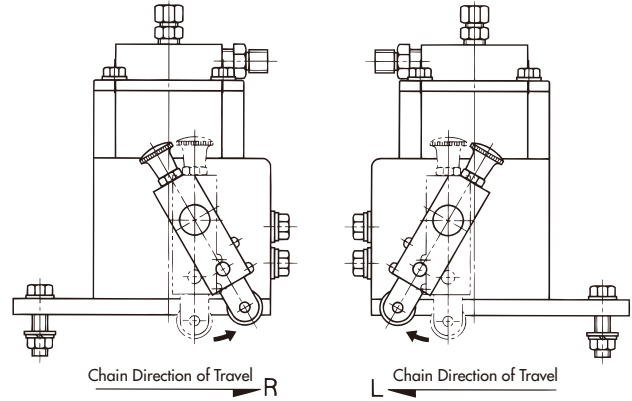
Product Number	Quantity	Unit
<b>TCL4-R</b>	1	S

# Automatic Conveyor Chain Lubricator

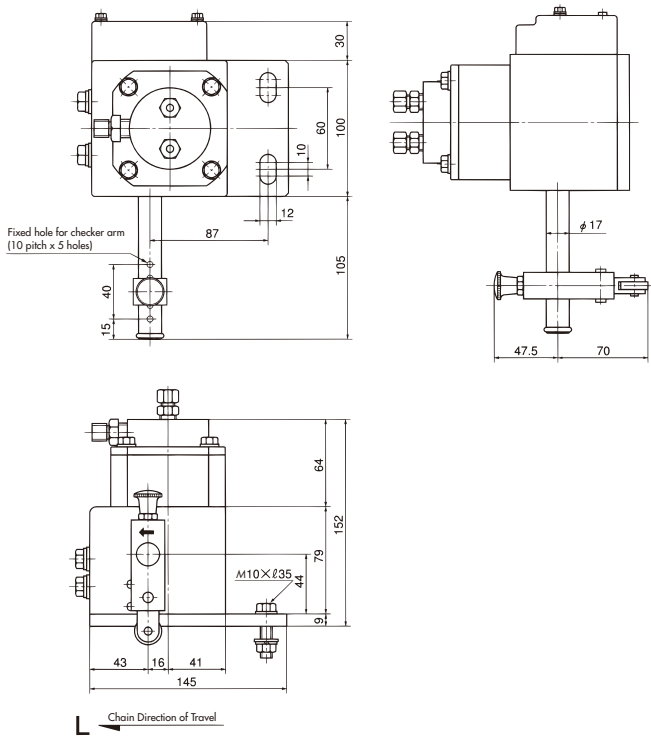
## Allowable Chain Pitch and Speed

Chain Pitch mm \ Chain Speed m/min	5	10	15	20	25	30
75	○	×	×	×	×	×
100	○	○	*S	×	×	×
150	○	○	○	○	○	*S
200	○	○	○	○	○	*S
250~600	○	○	○	○	○	○

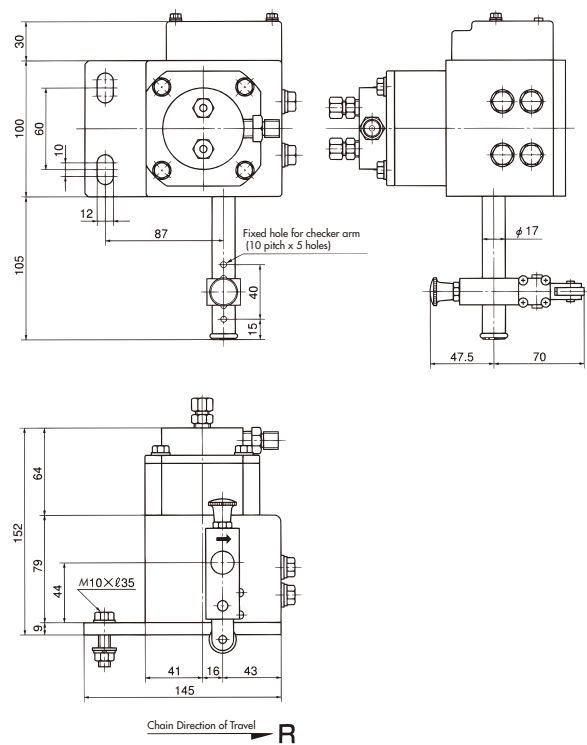
Note:  
 1. Boxes marked with \* S mean only S rollers can be used.  
 2. Cannot be used only with RF03 S rollers, as the chain inner width interferes with the checker arm.



## Pump TCL□-L



## Pump TCL□-R



## Pump

Type	TCL4-R TCL4-L	TCL2-R TCL2-L
Nozzle	4 nozzles	2 nozzles
Discharge Amount	0.05cc/shot/nozzle	
Number of Operations	Max. 3 times/sec	
Discharge Pressure	0.196Pa {2kg/cm <sup>2</sup> }	
Color	Cream	
Mass	5.3kg	
Fittings	Attachment bolts (M10 × 35L), nuts (2)	

## Pipe (Nuts fitted at both ends)

Pipe	Discharge Pipe	Inlet Pipe
Material	Steel	Rubber hose (black)
Diameter	Outer dia. φ5	Outer dia. φ16
	Inner dia. φ3	Inner dia. φ8.5
Length	2000mm	2000mm

## Lubricant

Lubricants with a viscosity index of ISO VG32-100 can be used.

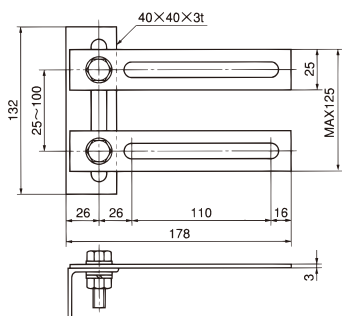
Note: Lubricants with additives such as MoS<sub>2</sub> (molybdenum dioxide) may clog nozzles. Do not use.



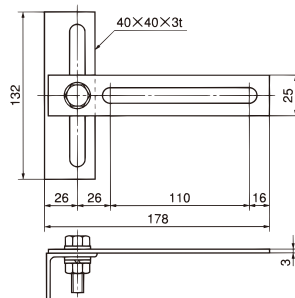
# Automatic Conveyor Chain Lubricator

## ■ Nozzle Attachment Fitting

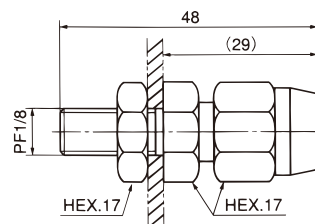
When two nozzle attachment plates are attached to the angle bar.



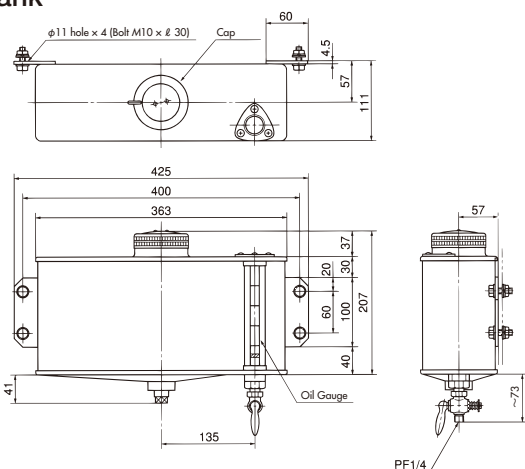
When one nozzle attachment plate is attached to the angle bar.



## ■ Nozzle



## ■ Oil Tank



## Oil Tank

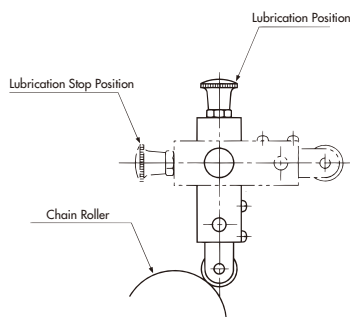
Capacity	5 l
Filter	50 mesh filters
Color	Dark green
Mass	5.3kg
Fittings	Attachment bolts (M10 x 30L), nuts (4)

## ■ Notes on Usage

- It is necessary to switch the checker arm ON to operate. Ensure a safe working area for this purpose.
- The pump should be installed where there is minimal lateral chain vibration or vertical movement, where it will be easy to install, and where it will be parallel to the ground.
- Attach pump (nozzle) on the chain's return side (slack side) near the sprocket to ensure maximum penetration of lubricant between pin and bush and bush and roller. (See diagram below.)
- Install oil tank 300mm or higher than the pump.
- Install the oil tank parallel to the ground and 300mm or higher than the pump.
- Pump will not operate if chain is run backwards. This is done so that the checker arm does not suffer any damage. (See diagram below.)
- Amount of lubrication necessary depends on chain size and usage conditions. 2-3 shots per spot is normal. Stop lubrication once the necessary amount of lubricant has been applied. (See diagram below.) Continuous operation will drastically hasten checker arm roller wear damage.
- Stopping lubrication using the oil tank plug while the pump is still in operation will drastically hasten wear damage on the pump and checker arm. Always stop lubrication with the checker arm. (See diagram below.)
- Be sure that the oil tank does not run out of lubrication. Operating the lubricator with no lubricant will drastically hasten wear damage on the pump. Once lubrication runs out air will enter the pump, requiring the air to be pumped out before lubrication can begin again.
- Lubrication will reduce wear on chain parts and reduce necessary power. Lubrication should generally take place more than once a week. Clean the chain first for effective lubrication.
- Pump piston may lock when not in use for extended periods. Start lubricator up once a month to prevent locking.

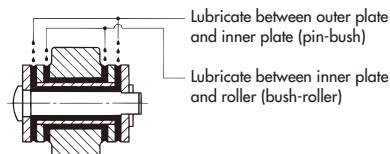
### Stopping Lubrication

When stopping lubrication, always stop the conveyor first. Pull the knob on top of the checker arm, tilt the arm 90° until it locks into the anchor hole. Once you are sure that it is not touching the conveyor chain, stop pump operation.



### Safety Feature for Reverse Chain Running

The roller of the checker arm will spring up when chain is run in reverse. (The spring will also automatically return it to position.)



# Cutting Tools

All items are made to order items. Refer to the Selection and Handling section for more details.

## ① T Pin Bending Tool

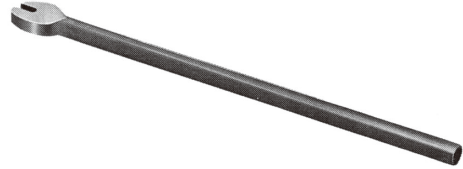
Be sure to inform your Tsubaki representative of the chain number.

Applicable chain numbering in the chart below indicates the --- part of RF03100S

T Pin Nominal Diameter	Applicable Chain
φ 3(2.6)×15ℓ	RF03
φ 4(3.6)×20ℓ	RF05·RF08·RF430·RF204·RF450·RF650
φ 4(3.6)×25ℓ	RF10·RF12·RF205·RF6205·RF214
φ 6(5.6)×33ℓ	RF17·RF26·RF212
φ 8.5(8.1)×45ℓ	RF36
φ 8.5(8.1)×50ℓ	RF36N·RF52
φ 8.5(8.1)×55ℓ	RF60
φ 10(9.7)×65ℓ	RF90
φ 10(9.7)×70ℓ	RF120

Note:

1. Bending tools for T pin diameters not listed above are also available.
2. The ( ) next to the nominal diameter indicates actual diameter.



## ② Holding Tool

Contact a Tsubaki representative with chain size.

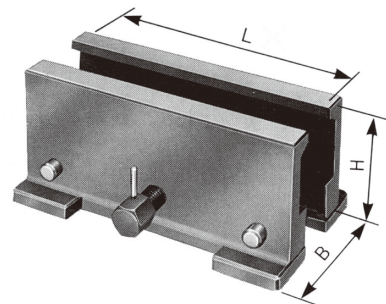


## ③ Hydraulic Pin Extractor

Contact a Tsubaki representative with chain size.

## ④ Chain Vice

Product Number	Applicable Chain	Dimensions		
		L	H	B
CV-4	RF03-RF17	300	135	120-180



# Selection and Handling

## ■ Conveyor Chain Selection and Steps

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2. Decide conveyor type · · · · · 130
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4. Decide roller type · · · · · 131
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## ■ Handling Conveyor Chain

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7. Usage limits of conveyor chain · · · 147
8. Other points to remember · · · · · 148
9. Troubleshooting · · · · · 149
10. Replacing chains and sprockets · · 152

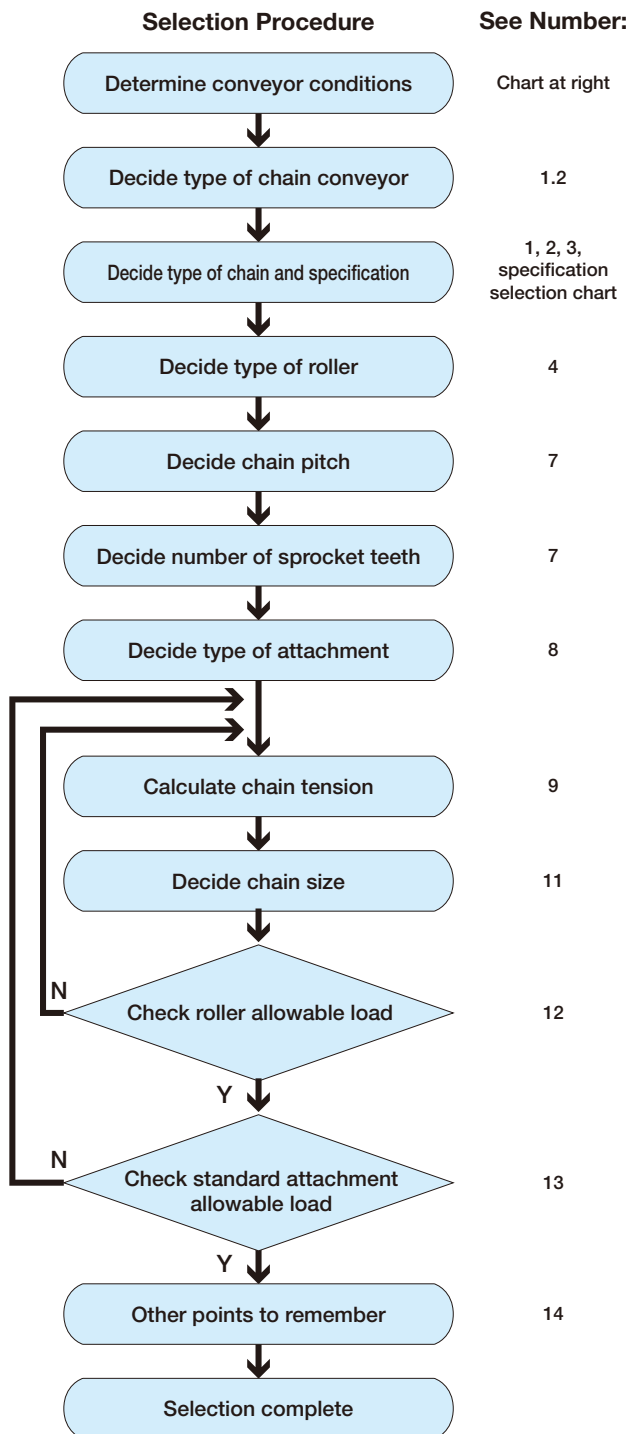
# Selection and Handling

## Chain Selection and Handling

Selecting conveyor chains for chain conveyors requires comprehensive knowledge and experience. However, the following are general points for selecting the optimum chain for your application.

### 1. Determine Conveyance Conditions

Determine the conveyance conditions of the conveyor chain.

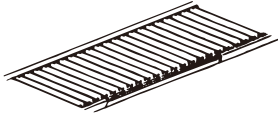
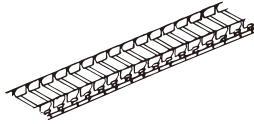
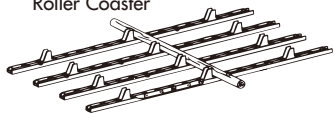
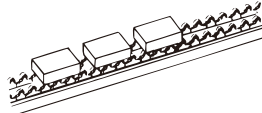
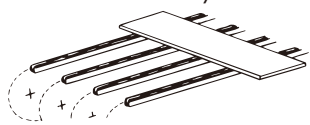


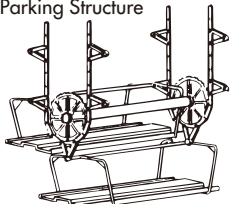
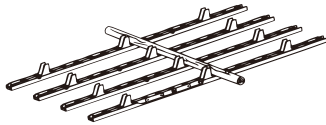
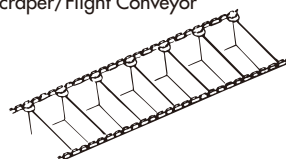
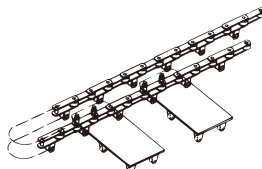
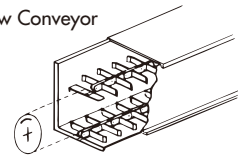


### Determining Conveyor Chain Conveyance Conditions

Machine	:	
Conveyed Material	:	
Corrosion	:	
Wear	:	
Temp. of Material Conveyed	:	Room Temp. °C
Dimensions of Conveyed Items	:	
Mass of Material Conveyed	:	MAX kg/each
Conveyed Amount (Loose Materials)	:	MAX t/h
Conveyed Amount (Item)	:	MAX kg/conveyor
Conveyor Length	:	m
Lift	:	m
Number of Chain Strands	:	(spaced m apart)
Chain Speed	:	m/min
Average Tensile Strength	:	kN{kgf}
Chain Pitch	:	mm
Attachment Type and Spacing	:	att. every link
Conveyance Method	:	Pushed by dog, direct conveyance, other
Operating Time	:	h/d
Lubrication	:	Yes / No
Motor	:	AC/DC kW, r/min, unit(s)
Number of Sprocket Teeth	:	NT (PCD mm)
Sprocket Bore Diameter	:	φ H8 / H7
Boss	:	Type φ × L
Keyway	:	Unnecessary, JIS b xt Parallel/beveled
Sprocket Tooth Finishing	:	Precision Welded, Machine Cut, Induction Hardened

1. We recommend using standard chain from a cost/delivery perspective.
2. When unable to choose between a standard or specialty chain, the materials and attachments make it a special chain with special specifications. See sections regarding conveyor chain category and type.

## 2. Deciding Conveyor Type

Basic Conveyor Types	Conveyed Items						
	Item Conveyance	Chain Type	See Pg.	Loose Material	Chain Type	See Pg.	
Top Loading Conveyance	<ul style="list-style-type: none"> <li>● Slat Conveyor</li> </ul> 	RF-BR RF-NB RF (CT)	50 65 20 68	<ul style="list-style-type: none"> <li>● Apron/Pan Conveyor</li> </ul> 	RF	20	
	<ul style="list-style-type: none"> <li>● Push Conveyor, Tow Conveyor, Roller Coaster</li> </ul> 	RF RF-NB NF RF-SR	20 65 84 64				
	<ul style="list-style-type: none"> <li>● Free Flow Conveyor</li> </ul> 	RF-VR RF-TR RF-SR	62 63 64				
	<ul style="list-style-type: none"> <li>● Standard Chain Conveyor</li> </ul> 	RF NF EPC RF-NB	20 84 107 65				
Suspension Conveyance	<ul style="list-style-type: none"> <li>● Trolley Conveyor</li> </ul>	RF	20	<ul style="list-style-type: none"> <li>● Bucket Elevator</li> </ul> 	RF B Class Chain	20 77	
	<ul style="list-style-type: none"> <li>● Tray Elevator</li> </ul> 	RF-NB RF NF	65 20 84				Special Chain
	<ul style="list-style-type: none"> <li>● Vertical Parking Structure</li> </ul> 	RF Specialty Chain	20				
Push Conveyance, Frictional Conveyance	<ul style="list-style-type: none"> <li>● Push Conveyor</li> </ul> 	RF NF RF-NB	20 84 65	<ul style="list-style-type: none"> <li>● Scraper/Flight Conveyor</li> </ul> 	RF	20	
	<ul style="list-style-type: none"> <li>● Horizontal Revolving Conveyor</li> </ul> 	RF RF-NB	20 65	<ul style="list-style-type: none"> <li>● Flow Conveyor</li> </ul> 	RF NFX	20 85	
					<ul style="list-style-type: none"> <li>● Drag Chain Conveyor</li> </ul>	Special Chain	

Note: See pg. 143, Table 13 regarding item wear and corrosion properties.

# Selection and Handling

## 3. Deciding Chain Type

When selecting conveyor chain type, it is necessary to identify the physical properties of the materials conveyed. Method of conveyance and chain conveyor type should then be determined, keeping cost performance in mind. Three basic types of conveyor are shown on pg. 95, which can be used for determining conveyor chain type.

### Key Points in Determining Conveyor Chain Type

- Adopt a loading type conveyor to reduce the running resistance of the conveyor chain when conveying materials, which will lead to energy savings. Bearing Roller Conveyor Chain and CT Series are the most suitable for this application.
- Design layout so that powdery or liquid materials, or materials that will promote chain wear, are prevented from directly contacting the conveyor chain.
- Use a sealed conveyor, such as a flow conveyor, to prevent loose material from flying during conveyance.
- When using conveyor chains to convey very corrosive material, or in corrosive environments, select a conveyor chain with suitable specifications. (Pg. 108, Chart 13)

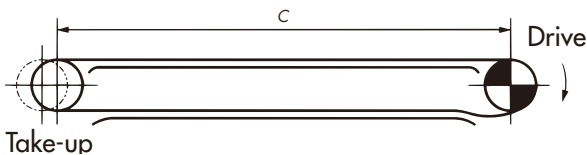
## 4. Deciding Roller Type

Refer to "Roller Types" in the pages concerning Large Conveyor Chain construction.  
See page 7.

## 5. Basic Conveyor Chain Layout

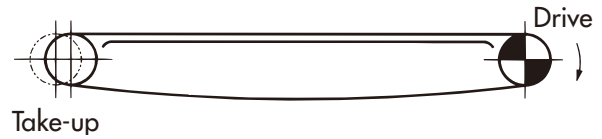
### 5.1 Horizontal Conveyor

#### 1) Making a catenary on the drive sprocket side



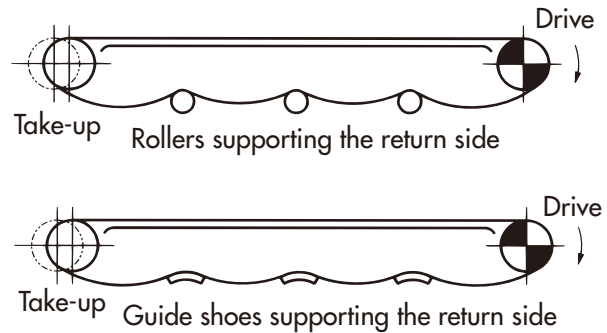
- ① Catenary tension makes chain-sprocket engagement smooth.
- ② Lubrication at the catenary is most effective.

#### 2) No guide on the return side



For short center distance and slow chain speed. The mass of the chain on the return side may cause vibration, affecting chain operation.

#### 3) Supporting the chain on the return side with guides or rollers



Contact between chain and guide or roller may hasten chain wear or damage chain as it articulates at the roller or guide. This may also cause vibration, affecting chain operation. With a long center distance, it is practical to divide the return side into several catenaries. Partial or full support by catenary on the return side (see diagrams above) can absorb chain elongation/shrinkage from heat or other factors. This arrangement can be used when chain speed is comparatively slow. Catenary sag should be about 10% of the free span. This is not recommended for reverse drives.

#### 4) Supporting the entire return side

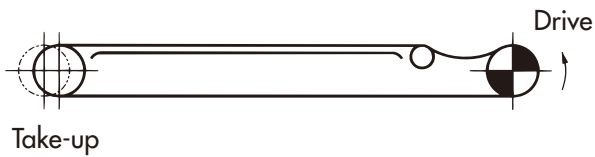


The return side is entirely supported by rails, which are fixed on the take-up of the driven sprocket. This method absorbs all chain sag, and can also be used in reverse operation. However, there is no catenary on the drive sprocket lower side, making it necessary to regularly adjust chain elongation through take-up.

Caution: Excessive tension from take-up will hasten chain wear.



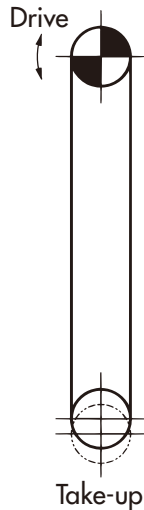
## 5) Return side on top



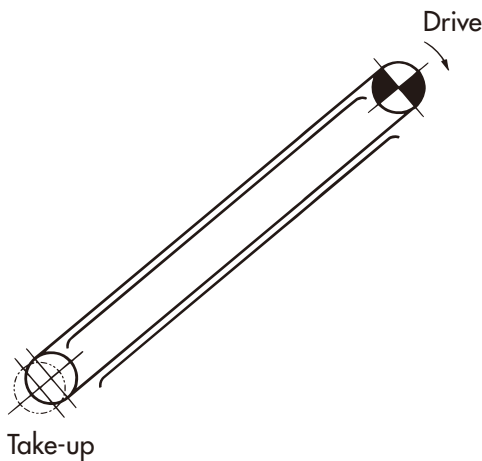
## 5.2 Vertical Conveyors

If the conveyor will be stopped while loaded, it will be necessary to install a brake or Tsubaki Back Stop Cam Clutch to prevent reverse operation.

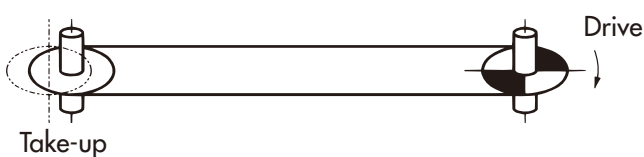
Caution: Excessive tension from take-up will hasten chain wear.



## 5.3 Inclined Conveyors



## 5.4 Vertical Shaft Conveyors



Installing a guide roller will help the chain run smoother.

### Key Points in Using Conveyor Chains

- Lubricate chain to prevent elongation during use. Use a lubricant with an equivalent viscosity of ISO VG100-150 (SAE30-40).  
Use a drip or brush method and ensure lubricant penetrates between pins, bushes, rollers, and other areas to prevent metal-on-metal contact. (See pg. 124 for the Tsubaki Automatic Conveyor Chain Lubricator.)
- Ensure that sprocket shafts are parallel.
- At least three sprocket teeth need to engage the chain.
- Use take-up to adjust chain elongation.
- When using chains in parallel, be sure that sprocket teeth on both sides are aligned when engaging.
- New chain will prematurely wear if connected to a sprocket whose teeth have severely worn.

# Selection and Handling

## 6. Choosing a Chain Series for Conveying Loose Materials

The following table lists the chain conveyor types and chain series used in conveying typical loose materials, as well as our recommendations.

Depending on the conveyed items, the same items listed in Table 1 may differ in condition or quality. Determine conveyor type and chain series based on consideration of past performance and careful investigation.

Table 1: Material and Chain Specifications

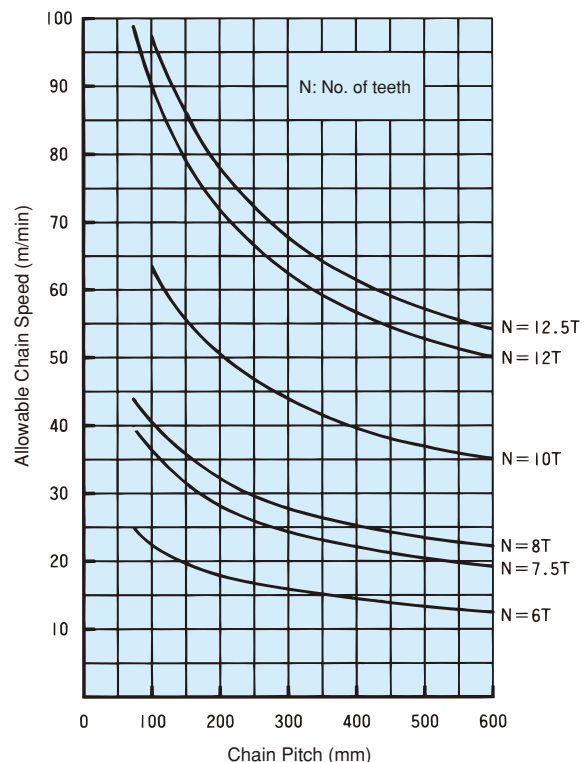
Material			Type of Conveyor				Recommended Chain Series	Notes
Name	Abrasiveness	Corrosiveness	Scraper	Flow	Apron	Bucket		
Activated Charcoal	B	C	○	△		△	DT	
Alumina	B	E		△		△	CT	
Bagasse	C	C	○				GT	
Barley	C	C	○	○		○	DT	
Carbide	B		○	○	○	○	∕	
Carbon	B	C	○	△		△	BT	
Cement Clinker	A	E	○	△	○	△	CT	
Cement Products	B	E		○		○	∕	
Clinker Dust	A	E		△			BT	
Coal	B	B	○		○		CT	
Coke	A	C			○	△	BT	
Coke Dust	A	C		△			∕	
Corn	C	C	○	○		○	DT	
Dolomite	B	D	○	△	○	△	DT	GT on Apron Conveyors
Dry Ammonium Chloride	B	B	○	△		△	∕	
Dry Ammonium Sulfate	C	C	○	△		△	∕	
Dry Clay	B	C		△		△	BT	
Dry Incinerated Garbage (Room Temperature)	C	D	○				GT	
Dry Limestone	B	D	○	△	○	△	DT	GT on Apron Conveyors
Dry Sawdust	C	D	○	△			∕	
Dry Slaked Lime	C	E	○	△		△	∕	
Dry Unslaked Lime	B	E	○	△		△	∕	
Dry Urea Powder	C	C	○	△		△	∕	
Dry Wood Chips	C	D	○	△			∕	
Foundry Sand	A	C	○		△		BT	
Garbage	B		△		○		RT	
Glauber's Salt	B	B		△			GS	
Mixed Feed	C	B	○	△		△	∕	
Polyethylene	B	C	○	△		△	∕	
Rice	C	C	○	○		○	∕	
Rock Salt	C	C	○	△		△	∕	
Scale	B	C	○	△		△	BT	
Soda Ash	B	E	○	△		△	DT	
Soybean	C	C	○	○		○	∕	
Starch	C	C	○	△		△	∕	
Sugar	C	C	○	○		○	SS	See 3.
Sugar Cane	C	C	○		○		GT	
Synthetic Detergent	B	C	○	△		△	DT	
Vinyl Chloride Powder	B			△		△	MT	
Wet Coal Dust	B	B		△			BT	
Wet Gypsum	B	A	○	○		○	GS, RT	
Wet Incinerated Garbage	C	D	○				RT	
Wet Urea Powder	B	E	○	△		△	DS	
Wheat	C	C	○	○		○	DT	
Wheat Flour	C	C	○	○		○	∕	

- Note 1. Abrasiveness: ABC  
 2. Corrosiveness: A (Strong acid), B (Moderate acid), C (Neutral), D (Moderate alkali), E (Strong alkali)  
 3. See pg. 143 for clean specifications.

## 7. Chain Pitch and Number of Sprocket Teeth

- 1) Smoother chain operation can be expected as the number of sprocket teeth increases. This means that for a sprocket with the same outer diameter, a shorter pitch chain can operate more smoothly due to a reduction in the polygonal speed fluctuation or less articulating angle of chain on the sprocket. This also results in less wear between pin and bush.
- 2) Longer pitch chain, though more expensive per link, would be cheaper for a unit length of chain in general. Chain pitch for Unit Conveyors is determined by unit size or attachment spacing.  
 (Example) Attachment spacing = 2m  
 \* Chain pitch = 100, 200, 250  
 \* Chain pitch can be selected by dividing attachment spacing by an even number.
- 3) The chain pitch for Bulk Conveyors is determined not only by material itself, but also by conveyor capacity. Conveyor capacity is determined by sizes of bucket, apron, scraper, etc. Chain pitch is in turn determined by these sizes.
- 4) Space limitation should also be kept in mind when selecting sprocket.
- 5) Chain pitch relates to the number of sprocket teeth and chain speed shown in Table 2.

Table 2: Chain Pitch and Allowable Chain Speed



## 8. Deciding Attachment Type

See pages 9-10.

## 9. Calculating Chain Tension

Maximum static tension to chain,  $T_{max}$ , during operation can be calculated using the formulae in Table 3. The formulae are based on mass  $M$  (weight  $W$ )  $\times$  coefficient of friction. Inertial forces are extremely large when suddenly starting or stopping high speed conveyors or when rapidly conveying items using push conveyors or other such systems. Bear these inertial forces in mind when calculating the tension and required kW.

### 9.1 Terms

	SI Units	Gravimetric Units
$T_{MAX}$ : Maximum static tension on chain	kN	{kgf}
$T$ : Static tension on chain	kN	{kgf}
$Q$ : Maximum conveying quantity	t/h	{tf/h}
$V$ : Chain speed	m/min	m/min
$H$ : Center distance between sprockets (vertical)	m	m
$L$ : Center distance between sprockets (horizontal)	m	m
$C$ : Center distance between sprockets (inclined)	m	m
$M$ : Mass (weight) of conveying device (Chain $\times$ strands, buckets, aprons, etc.)	kg/m	{kgf/m}

Note: SI Units and Gravimetric Units  
Calculations are listed in both SI Units and Gravimetric Units.  
When calculating tension  $T$  in gravimetric units, the mass value (kgf) is the same as the mass value for SI Units (kg).

- $f_1$  : Coefficient of friction between chain and guide rail (Tables 5 and 6)
- $f_2$  : Coefficient of friction between material conveyed and casing (Table 7)
- $f$  : Material loaded directly on chain:  $f=1$   
Material scraped:  $F = \frac{f_2}{f_1}$
- $g$  : Acceleration of gravity: 9.80665m/s<sup>2</sup>
- $W$  : Mass Conveyed Item {Weight} kg/m {kgf/m}

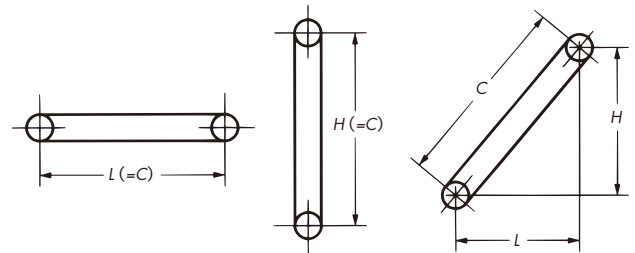
Loose

$$W = 16.7 \times \frac{Q}{V} \quad \{W = 16.7 \times \frac{Q}{V}\}$$

Item

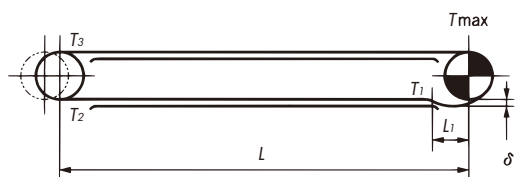
$$W = \frac{\text{Mass of Item (kg/each)}}{\text{Load Spacing (m)}} \quad \{W = \frac{\text{Mass of Item (kg/each)}}{\text{Load Spacing (m)}}\}$$

\* 1 : The coefficient for calculating the mass (weight) per meter of item conveyance is 16.7=1000/60.



### 9.2 Calculate Chain Tension (Table3)

#### Horizontal Conveyor



#### SI Units

$$T_1 = 1.35 * 1 \times M \times L_1 \times \frac{g}{1000} \dots\dots \text{kN}$$

$$T_2 = (L - L_1) \times M \times f_1 \times \frac{g}{1000} + T_1 \dots\dots \text{kN}$$

$$T_3 = 1.1 * 2 \times T_2 \dots\dots \text{kN}$$

$$T_{MAX} = (W \times f + M) \times L \times f_1 \times \frac{g}{1000} + T_3 \dots\dots \text{kN}$$

#### { Gravimetric Units }

$$T_1 = 1.35 \times M \times L_1 \dots\dots \{ \text{kgf} \}$$

$$T_2 = (L - L_1) \times M \times f_1 + T_1 \dots\dots \{ \text{kgf} \}$$

$$T_3 = 1.1 \times T_2 \dots\dots \{ \text{kgf} \}$$

$$T_{MAX} = (W \times f + M) \times L \times f_1 + T_3 \dots\dots \{ \text{kgf} \}$$

\* 1: Refer to Table 4, pg. 137.

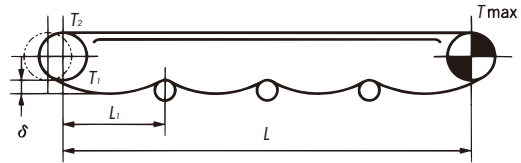
\* 2: 1.1 is for increased tension at the driven sprocket.

# Selection and Handling

SI Units

{ Gravimetric Units }

## Horizontal Conveyor



$$T_1 = 1.35 \times M \times L_1 \times \frac{g}{1000} + 0.1 \times M \times L \times \frac{g}{1000} \dots \text{kN}$$

$$T_1 = 1.35 \times M \times L_1 + 0.1 \times M \times L \dots \{\text{kgf}\}$$

$$T_2 = 1.1 \times T_1 \dots \text{kN}$$

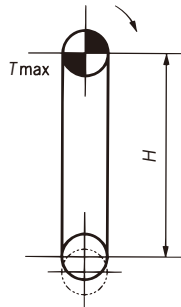
$$T_2 = 1.1 \times T_1 \dots \{\text{kgf}\}$$

$$T_{\text{MAX}} = (W \times f + M) \times L \times f_1 \times \frac{g}{1000} + T_2 \dots \text{kN}$$

$$T_{\text{MAX}} = (W \times f + M) \times L \times f_1 + T_2 \dots \{\text{kgf}\}$$

\* 0.1 is the coefficient of roller resistance at return side.

## Vertical Conveyor

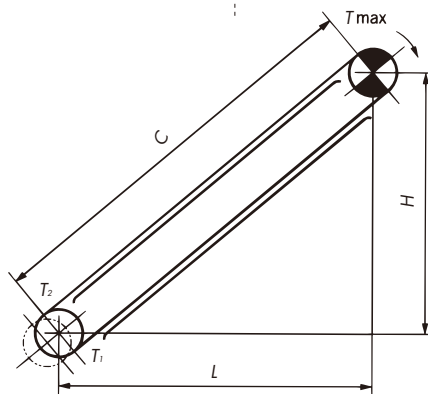


Note: In bucket elevators, 1m is added to center distance (H) to account for shock load when loading.

$$T_{\text{MAX}} = (W + M) \times H \times \frac{g}{1000} \dots \text{kN}$$

$$T_{\text{MAX}} = (W + M) \times H \dots \{\text{kgf}\}$$

## Inclined Conveyor



$$T_1 = M (L f_1 - H) \times \frac{g}{1000} \text{ (kN)}$$

$$T_1 = M (L f_1 - H) \{\text{kgf}\}$$

When  $T_1 < 0$ ,  $T_2 = 0$

When  $T_1 < 0$ ,  $T_2 = 0$

$$T_2 = 1.1 \times T_1 \text{ (kN)}$$

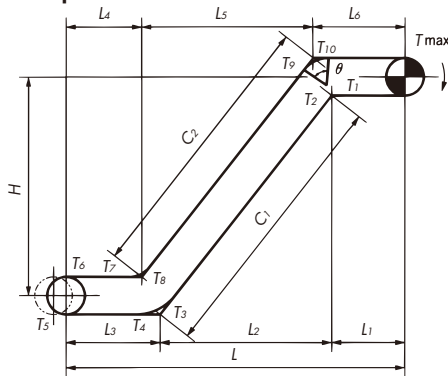
$$T_2 = 1.1 \times T_1 \{\text{kgf}\}$$

$$T_{\text{MAX}} = W (L f_1 \times f + H) \times \frac{g}{1000} + M (L f_1 + H) \times \frac{g}{1000} + T_2 \text{ (kN)}$$

$$T_{\text{MAX}} = W (L f_1 \times f + H) + M (L f_1 + H) + T_2 \{\text{kgf}\}$$

## SI Units

### Practical Example



$$T_1 = M \times L_1 \times f_1 \times \frac{g}{1000} \dots\dots \text{kN}$$

$$T_2 = T_1 \times Kc_1 \times \frac{g}{1000} \dots\dots \text{kN}$$

$$T_3 = M(L_2 f_1 - H) \times \frac{g}{1000} + T_2 \dots\dots \text{kN}$$

$$T_4 = T_3 \times Kc_2 \dots\dots \text{kN}$$

When \$T\_3 < 0, T\_4 = 0\$

$$T_5 = M \times L_3 \times f_1 \times \frac{g}{1000} + T_4 \dots\dots \text{kN}$$

$$T_6 = 1.1 \times T_5 \dots\dots \text{kN}$$

$$T_7 = (M + W \times f) \times L_4 \times f_1 \times \frac{g}{1000} + T_6 \dots\dots \text{kN}$$

$$T_8 = T_7 \times Kc_3 \dots\dots \text{kN}$$

$$T_9 = W(L_5 f_1 \times f + H) \times \frac{g}{1000} + M(L_5 f_1 + H) \times \frac{g}{1000} + T_8 \dots\dots \text{kN}$$

$$T_{10} = T_9 \times Kc_4 \dots\dots \text{kN}$$

$$T_{MAX} = (M + W \times f) \times L_6 \times f_1 \times \frac{g}{1000} + T_{10} \dots\dots \text{kN}$$

## { Gravimetric Units }

### Corner Factor (Kc)

Angle	30°	60°	90°	120°	180°
0.03	1.02	1.03	1.05	1.06	1.10
0.10	1.05	1.11	1.17	1.23	1.37
0.15	1.08	1.17	1.27	1.37	1.60
0.20	1.11	1.23	1.37	1.52	1.87
0.24	1.13	1.29	1.46	1.65	2.13
0.30	1.17	1.37	1.60	1.87	2.57
0.40	1.23	1.52	1.87	2.31	3.51

$$T_1 = M \times L_1 \times f_1 \text{ {kgf}}$$

$$T_2 = T_1 \times Kc_1 \text{ {kgf}}$$

$$T_3 = M(L_2 f_1 - H) + T_2 \text{ {kgf}}$$

$$T_4 = T_3 \times Kc_2 \text{ {kgf}}$$

When \$T\_3 < 0, T\_4 = 0\$

$$T_5 = M \times L_3 \times f_1 + T_4 \text{ {kgf}}$$

$$T_6 = 1.1 \times T_5 \text{ {kgf}}$$

$$T_7 = (M + W \times f) \times L_4 \times f_1 + T_6 \text{ {kgf}}$$

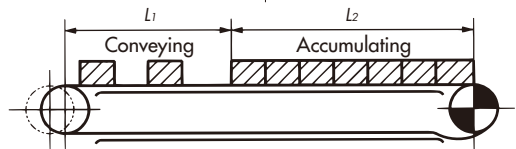
$$T_8 = T_7 \times Kc_3 \text{ {kgf}}$$

$$T_9 = W(L_5 f_1 \times f + H) + M(L_5 f_1 + H) + T_8 \text{ {kgf}}$$

$$T_{10} = T_9 \times Kc_4 \text{ {kgf}}$$

$$T_{MAX} = (M + W \times f) \times L_6 \times f_1 + T_{10} \text{ {kgf}}$$

### Example using Double Plus Chain



$$T_{MAX} = 2.1M(L_1 + L_2) f_1 \times \frac{g}{1000} + (W \times L_1 \times f_1) \times \frac{g}{1000} + (W_1 \times L_2 \times f_3 \times \frac{g}{1000}) \text{ (kN)}$$

$$T_{MAX} = 2.1M(L_1 + L_2) f_1 + (W \times L_1 \times f_1) + (W_1 \times L_2 \times f_3) \text{ {kgf}}$$

- \$L\_1\$ : Length of conveying section (m)
- \$L\_2\$ : Length of accumulating section
- \$W\_1\$ : Mass of conveyed items accumulating (kg/m) {mass kgf/m}
- \$f\_1\$ : Coefficient of friction between chain and rail at conveying material = 0.05
- \$f\_3\$ : Coefficient of friction during accumulation = 0.2

### Static tension to chain varies with layouts as follows:-

Horizontal \$T = T\_{MAX} - T\_1\$

Vertical \$T = T\_{MAX} - MH \times \frac{g}{1000}\$

Inclined \$T = T\_{MAX} - M(H - Lf\_1) \times \frac{g}{1000}\$

\$T = T\_{MAX} - MH\$

\$T = T\_{MAX} - M(H - Lf\_1)\$

When \$H - Lf\_1 < 0, T = T\_{MAX}\$

### ■ Calculating Required Power

$$1 \text{ kW} = 1 \text{ kN} \cdot \text{m/s}$$

$$\text{kW} = \frac{T \times V}{60}$$

$$1 \text{ kW} = 102 \text{ kgf} \cdot \text{m/s}$$

$$\text{kW} = \frac{T \times V}{102 \times 60}$$

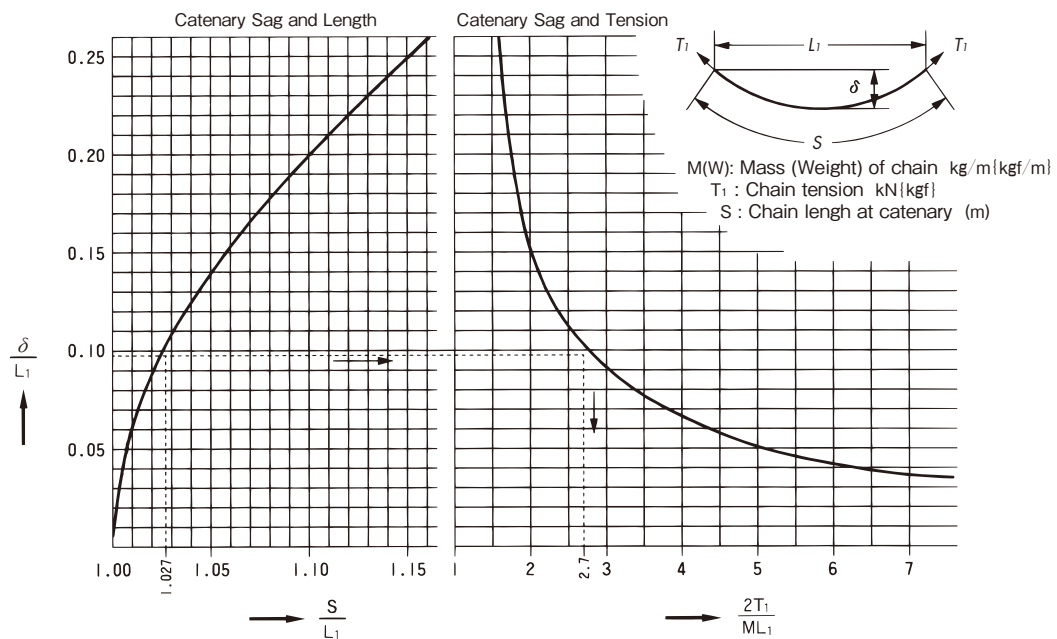
Assuming that the power loss from chain - sprocket engagement and sprocket rotational friction resistance to be 10% (1/0.9 = 1.1), When the power transmission ratio of the drive section is \$\eta\$,

$$\text{kW} = \frac{T \times V}{60} \times 1.1 \times \frac{1}{\eta}$$

$$\text{kW} = \frac{T \times V}{102 \times 60} \times 1.1 \times \frac{1}{\eta}$$

# Selection and Handling

Table 4: Catenary Tension Graph



■ Catenary Tension

$$T_1 = 1.35 \times M \times L_1 \times \frac{g}{1000} \dots\dots \text{kN}$$

1.35 factor in the above formula is worked out as follows:

When catenary sag is 10%,  $\delta = 0.10L_1$

Then from the graph

$$\frac{\delta}{L_1} = 0.10 \rightarrow \frac{2T_1}{ML_1} = 2.7 \quad T_1 = 1.35 \times M \times L_1 \times \frac{g}{1000}$$

■ Chain Length at Catenary

$$\frac{\delta}{L_1} = 0.10 \rightarrow \frac{S}{L_1} = 1.027$$

$$S = 1.027L_1$$

Table 5: Rolling Friction Factor  $f_1$  Between Chain and Rail

Roller Diameter (mm)	Lubricated		Dry	
	R, F	S, M, N	R, F	S, M, N
$D < 65$	0.08	0.16	0.15	0.24
$65 \leq D < 100$	0.08	0.15	0.14	0.23
$100 \leq D$	0.08	0.14	0.13	0.22
RF 214 (exception)	0.12	0.15	0.18	0.22

Note 1. Conditions: Clean and room temperature  
 2. Lubricant ISO VG100 (SAE30-40)  
 3. The friction factor  $f_1$  between top roller and material conveyed is the same as that of R roller in the above.

Series	$f_1$
Plastic Roller Series / Plastic Sleeve Series	0.08 (DRY)
Bearing Roller Series	0.03 (Lubricated)
Bearing Bush Series	0.14 (Lubricated) 0.21 (DRY)
EPC78	0.1 (Lubricated), 0.2 (Water-Lubricated), 0.25 (Dry)

Table 6: Sliding Coefficient of Friction  $f_1$  Between Chain and Rail

Temperature of Conveyed Material (°C)	Lubricated	Dry
Room temperature – 400	0.20	0.30
400 – 600	0.30	0.35
600 – 800	0.35	0.40
800 – 1000	–	0.45

Table 7: Coefficient of Friction  $f_2$  Between Material Conveyed and Casing

Material	$f_2$	Apparent Specific Gravity (g/cc)	Material	$f_2$	Apparent Specific Gravity (g/cc)
Alum	0.63	1.01	Phosphate rock	0.42	1.51
Alumina	0.55	0.83	Pitch	0.41	0.7
Ammonium chloride	0.79	0.67	Polyethylene	0.52	0.34
Asbestos	0.58	0.19	Pyrites	0.58	1.54
Barley	0.71	0.39	Quartz powder	0.55	1.24
Calcium carbonate	0.49	0.88	Quicklime	0.46	1.53
Calcium chloride	0.43	0.68	Red iron ore	0.47	2.99
Carbon	0.53	0.3	Rice	0.4	0.77
Cement	0.54	0.60–0.75	Rock salt	0.57	1.09
Cement clinker	0.46	1.3	Rubber powder	0.53	0.39
Charcoal	0.41	0.44	Scale	0.67	1.54
Chrome powder	0.51	1.14	Scrap	0.73	0.54
Clay	0.63	0.77	Slag	0.48	0.9
Coal		0.30–0.70	Slaked lime	0.63	0.69
Coke		0.35–0.70	Soap material	0.27	0.65
Corn	0.4	0.71	Soda ash	0.45	0.52
Dolomite	0.55	1.62	Soybean	0.41	0.68
Feldspar	0.55	1.36	Starch	0.57	0.71
Foundry sand	0.41	1.59	Sugar	0.47	0.68
Gypsum	0.64	0.77	Sulphurated calcium	0.64	1.01
Lead ore powder	0.77	3.26	Urea	0.63	0.64
Limestone	0.47	0.35–0.55	Wheat	0.43	0.73
Magnesia	0.84	1.48	Wood chips	0.74	0.36
Mixed feed	0.5	0.55			
Nickel ore powder	0.45	0.92			

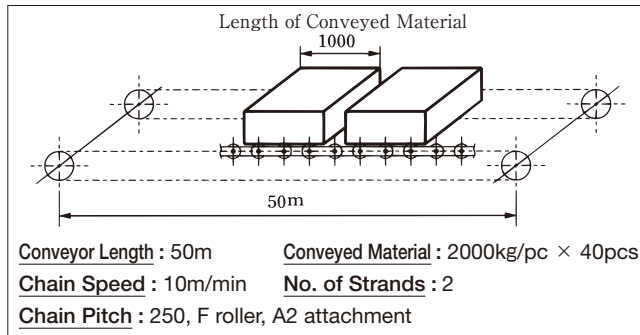
Note: The above values may change depending on dryness and humidity.



## 10. Chain Selection Examples

### 10.1 Bearing Roller Conveyor Chain

#### 1) Conditions



We will see selection examples for Bearing Roller Conveyor Chain and Standard DT Series Conveyor Chain.

#### 2) Conditions

##### ① Confirm roller load

$$\text{No. of rollers} = \frac{\text{Length of material}}{\text{Chain pitch}} = \frac{1000}{250} = 4$$

4 rollers × 2 strands = 8 rollers

However, as there is an uneven load only four rollers will receive the load.

$$\text{Roller load} = 2000 \times \frac{g}{1000} \times \frac{1}{4} = 4.9\text{kN}\{500\text{kgf}\}/\text{roller}$$

From Table 10, we can select the following Bearing Roller Conveyor Chain:

RF12250BF-1LA2, allowable load 5.49kN{560kgf}

or the following RF Conveyor Chain:

RF26250F-DT-1LA2, allowable load 5.30kN{540kgf}.

##### ② Check allowable loading mass on conveyor

Due to simplified selection, tension of conveyor weight and starting impact will not be considered in the following procedure.

$$2000\text{kg} \times 40\text{pcs}/2 \text{ strands} = 40,000/\text{strand}$$

From the table on the right, RF10 ton type Bearing Roller Conveyor Chain (53300kg) and RF17 ton type RF Conveyor Chain (44600kg) can be selected.

When comparing roller allowable load and allowable loading mass, roller allowable load should be the first consideration in selection. Thus,

Bearing Roller Conveyor Chain = RF12250BF-1LA2

RF Conveyor Chain = RF26250-DT-1LA2

##### ③ Select Motor Size

$$\text{Motor kW} = \frac{T \times V}{54.5} \times \frac{1}{\eta} = (\eta = 0.85)$$

Bearing Roller Conveyor Chain ( $f^1 = 0.03$ )

$$T = 2000\text{kg} \times \frac{g}{1000} \times 40 \times 0.03 = 23.5\text{kN} \{2400\text{kgf}\}$$

$$\text{kW} = \frac{23.5 \times 10}{54.5} \times \frac{1}{0.85} = 5.1\text{kW}$$

Standard Conveyor Chain ( $f^1 = 0.08$ )

$$T = 2000\text{kg} \times \frac{g}{1000} \times 40 \times 0.08 = 62.8\text{kN} \{6400\text{kgf}\}$$

$$\text{kW} = \frac{62.8 \times 10}{54.5} \times \frac{1}{0.85} = 13.6\text{kW}$$

#### ④ Simplified allowable loading mass chart

Values derived using a horizontal conveyor, safety factor 7, and a coefficient of friction (Conveyor chain: 0.08, Bearing roller: 0.03).

Unit: kg/per strand

Chain Size	DT Series Allowable Loading Mass kg	Bearing Roller DT Series Allowable Loading Mass kg
RF 03	5400	14000
RF 05	12500	33300
RF08, 450	14300	36700
RF 10	20500	53300
RF 12	33900	90000
RF 17	44600	116700
RF 26	57100	150000
RF 36	86600	230000
RF 60	91100	-
RF 90	143800	-
RF120	201800	-

### 10.2 Conveyor Type: Horizontal Slat Conveyor

Conveyed Material : Cardboard boxes	Slat Mass : 2kg/Slat Mass:
Conveyor Length : 30m	No. of Strands : 2
Loading Spacing : 1 box/m	
Sprocket : 12T	Box Mass : 40kg/box
Lubrication : None	Chain Speed : 15m/min
Chain: Pitch : 100, F Roller chain w/A2 attachment every link	

- 1) Required number of links
- 2) Chain size at safety factor 10
- 3) Drive sprocket torque
- 4) Required kW

#### 1) No. of links: n

$$n = \left( \frac{23.5 \times 10}{54.5} \times 2 + 12 \right) \times 2 = 612 \times 2 = 1224 \text{ links}$$

#### 2) Chain size at safety factor 10

30 cardboard boxes will be carried on the conveyor. Thus, conveyor total loading mass is  $40 \times 30 = 1200\text{kg}$ , and the coefficient of friction under non-lubed conditions from Table 5 is 0.15.

Required power  $T_1$  to convey the cardboard boxes only is

$$T_1 = 1200 \times \frac{g}{1000} \times 0.15 = 1.77\text{kN}$$

$$\{T_1 = 1200 \times 0.15 = 180\text{kgf}\}$$

Next, with each slat having a mass of 2kg, and the chain pitch at 100, slat mass =  $2 \times \frac{1000}{100} = 20\text{kg/m}$

Required power  $T_2$  to convey slats only

$$T_2 = 2.1 \times 20 \times 30 \times \frac{g}{1000} \times 0.15 = 1.85\text{kN}$$

$$\{T_2 = 2.1 \times 20 \times 30 \times 0.15 = 189\text{kgf}\}$$

$$T_1 + T_2 = 1.77 + 1.85 = 3.62\text{kN}$$

$$\{T_1 + T_2 = 180 + 189 = 369\text{kgf}\}$$

RF03100F - DT (2 strands) can be tentatively selected owing to its average tensile strength of  $29\text{kN} \times 2 = 58\text{kN}$  {6000g}.

With RF03100F-DT-1LA2, the required power  $T^3$  to move the chain only is

# Selection and Handling

$$T^3 = 2.1 \times \left( \underset{\substack{\text{Chain Mass Add.} \\ \text{2 Strands}}}{2.4 \times 2} + \underset{\substack{\text{Mass from Att.} \\ \text{Pitch 100}}}{\frac{0.06}{100/1000}} \times 2 \right) \times 30 \times \underset{\substack{\text{Convert to m}}}{\frac{g}{1000}} \times 0.15 = 0.56 \text{ kN}$$

$$\{T^3 = 2.1 \times (2.4 \times 2 + \frac{0.06}{100/1000} \times 2) \times 30 \times 0.15 = 56.7 \text{ kgf}\}$$

$$T = T^1 + T^2 + T^3 = 1.77 + 1.85 + 0.56 = 4.18 \text{ kN}$$

$$\{T = T^1 + T^2 + T^3 = 180 + 189 + 56.7 = 426 \text{ kgf}\}$$

Using RF03100F-1LA2 will give a safety factor of

$$Sf = \frac{29 \times 2}{4.18} = 14 \quad \{Sf = \frac{3000 \times 2}{426} = 14\}$$

Allowable roller and attachment loads are satisfied by RF03100F-DT-1LA2 as per Table 10.11.

3) Drive sprocket torque: Tr

The pitch diameter of a sprocket with pitch = 100,

$$N = 12T \text{ is } \phi 386.4$$

$$Tr = 4.18 \times 386.4 \times \frac{1}{2} \times \frac{1}{1000} = 0.81 \text{ kN} \cdot \text{m}$$

$$\{Tr = 426 \times 386.4 \times \frac{1}{2} \times \frac{1}{1000} = 82.3 \text{ kgf} \cdot \text{m}\}$$

4) Required kW

$$kW = \frac{4.18 \times 15}{54.5} \times \frac{1}{0.85} = 1.35 \text{ kW}$$

$$\{kW = \frac{426 \times 15}{5565} \times \frac{1}{0.85} = 1.35 \text{ kW}\}$$

## 10.3 Conveyor Type: Continuous Vertical Bucket Elevator

Lift Distance : 30m  
 Chain : Pitch = 250, GA4 att. every 2 links  
 (S roller bucket elevators)  
 Conveyor Capacity : 100t/h  
 Chain Speed : 28m/min  
 Bucket Mass : 25kg/pc  
 Sprocket : N = 12T

1) Required number of links 2) Chain size at safety factor 10

3) Drive sprocket torque 4) Required kW

1) Required number of links: n

$$n = \left( \frac{30000}{250} \times 2 + 12 \right) \times 2 = 252 \times 2 = 504 \text{ links}$$

2) Chain size at safety factor 10

① Tension T1 of conveyed material only

$$T^1 = 16.7 \times \frac{100}{28} \times (30+1) \times \frac{g}{1000} = 18.1 \text{ kN}$$

$$\{T^1 = 16.7 \times \frac{100}{28} \times (30+1) = 1849 \text{ kgf}\}$$

② Tension T<sub>2</sub> of bucket only

With a chain pitch of 250 and buckets attached every 2 links, bucket mass is 25kg × 2 = 50kg/m.

$$T^2 = 50 \times \frac{g}{1000} \times (30+1) = 15.2 \text{ kN}$$

$$\{T^2 = 50 \times (30+1) = 1550 \text{ kgf}\}$$

③ T<sup>1</sup> + T<sup>2</sup> = 18.1 + 15.2 = 33.3kN

$$\{T^1 + T^2 = 1849 + 1550 = 3399 \text{ kgf}\}$$

With two strands, 33.3 × 10 = 333kN {3399 × 10 =

33990kgf}. B17250 - S or greater chains have sufficient

strength. The mass of B17250 - S with a GA4

attachment every two links is 15kg/m.

$$T^3 = 15 \times 2 \times (30+1) \times \frac{g}{1000} = 9.12 \text{ kN}$$

$$\{T^3 = 15 \times 2 \times (30+1) = 930 \text{ kgf}\}$$

④ T = T<sup>1</sup> + T<sup>2</sup> + T<sup>3</sup> = 18.1 + 15.2 + 9.12 = 42.4kN

$$\{T = T^1 + T^2 + T^3 = 1849 + 1550 + 930 = 4329 \text{ kgf}\}$$

With B17250 - S with a GA4 att. every two links, chain strength is 245 × 2 = 490kN {25000 × 2 = 50000kgf}, so

$$\text{Safety Factor: } Sf = \frac{490}{42.4} = 11.6 \quad \{Sf = \frac{50000}{4329} = 11.6\}$$

Thus, B17250-S with a GA4 att. every two links can be selected.

3) Drive sprocket torque: Tr

With a vertical bucket elevator, the mass of the chain and bucket are counterbalanced. Thus, tension related to torque and kW is only tension T<sup>1</sup> from the conveyed material.

Pitch diameter when pitch = 250, N = 12T is φ 965.9, so

$$Tr = 18.1 \times 965.9 \times \frac{1}{2} \times \frac{1}{1000} = 8.74 \text{ kN} \cdot \text{m}$$

$$\{Tr = 1849 \times 965.9 \times \frac{1}{2} \times \frac{1}{1000} = 893 \text{ kgf} \cdot \text{m}\}$$

4) Required kW

$$kW = \frac{18.1 \times 28}{54.5} \times \frac{1}{0.85} = 10.9 \text{ kW}$$

$$\{kW = \frac{1849 \times 28}{5565} \times \frac{1}{0.85} = 10.9 \text{ kW}\}$$

## 11. Chain Size

Multiply tension  $T_{MAX}$  calculated with formulas in Table 3 by Safety Factors in Table 8 for required tensile strength, and then select a chain which satisfies the strength.

$$\boxed{\begin{array}{c} \text{Chain Tension} \\ T_{MAX}: \text{kN(kgf)} \end{array}} \times \boxed{\frac{1}{\text{No. of Strands}}} \times \boxed{\begin{array}{c} \text{Chain Speed-Temperature} \\ \text{Safety Factor (Kv) (Table8)} \end{array}} \times \boxed{\begin{array}{c} \text{Operation Time} \\ \text{Factor (Ks) (Table9)} \end{array}} \cong \boxed{\begin{array}{c} \text{Average Tensile} \\ \text{Strength kN(kgf)} \end{array}}$$

Notes:

- 1) When there are any regulations, guidelines, etc. effecting chain selection, select chain based on the regulations and the Safety Factor Selection explained below. Then take the larger or stronger chain.
- 2) When a conveyor consists of multiple strands of chain, correct the number of strands in the above formula to allow for uneven loading of the chain.
- 3) In the following applications, chain life is reduced to 1/2 to 1/10. Determine safety factor referring to clause P142.
 

Considerations for Special Environments

  1. Short distance conveyance of heavy loads
  2. Exposure of chain to abrasive, adhesive, and corrosive material
  3. High temperature environments
  4. High humidity
  5. No lubrication

**Table 8: Chain Speed-Temperature Safety Factor Kv conditions: Clean environment and well lubricated**

Chain Series Temperature °C	Standard Series		Reinforced Series				Stainless Steel 400 Series				Stainless Steel 300 Series			
	Under 100	100 to 200	Under 100	100 to 200	200 to 300	300 to 400	Under 100	100 to 200	200 to 300	300 to 400	Under 100	100 to 200	200 to 300	300 to 400
Over 50-Under 60 (incl.)	10		10				14				16			
Over 40-Under 50 (incl.)	9		9				13				15			
Over 30-Under 40 (incl.)	8	10	8	10			12	12			14	14		
Over 20-Under 30 (incl.)	7	9	7	9	10		11	11	12		13	13		
Under 20 (incl.)	7	8	7	8	9	10	10	10	10	10	12	12	12	12

**Table 9: Operation Time Factor Ks**

Operation Time h/day	Ks
Less than 10 hours	1.0
10 to 24 hours	1.2

**Tension  $T_{MAX}$  on Bearing Roller, Plastic Sleeve, and Bearing Bush Chains should be under the maximum allowable load.**

# Selection and Handling

## 12. Allowable Roller Load under Lubricated Conditions

Allowable load per roller under lubricated conditions in loading type conveyors is as per Table 10. Where A2 attachments are used, the smaller allowable load should be used. A tensile strength of 400N/mm<sup>2</sup> (41kgf/mm<sup>2</sup>) is the minimum requirement for guide rails. Allowable roller load should also be checked when corner rails are set up in a conveyor.

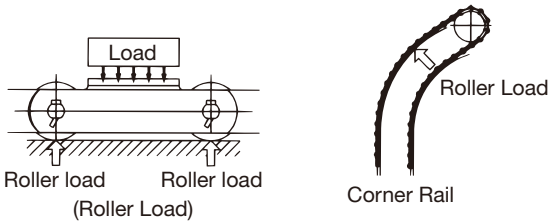
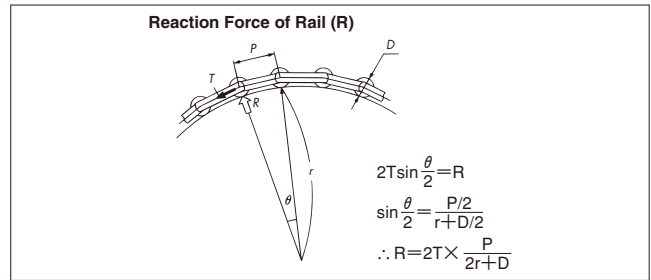


Table 10: Allowable Roller Load under Lubricated Conditions kN{kgf}/pc

Chain Size	R, F		S,M,N Roller (Heat Treated)	Bearing Roller Series		Bearing Bush Series
	Standard Series	Reinforced Series		R Roller	F Roller	
RF03075	0.54	0.88	0.54	1.96	1.27	0.54
RF03100	{55}	{90}	{55}	{200}	{130}	{55}
RF430	0.93{95}	1.57{160}	0.93{95}	-	-	-
RF05075						
RF05100	1.03	1.72	1.03	3.04	1.96	1.03
RF05125	{105}	{175}	{105}	{310}	{200}	{105}
RF05150						
RF204	-	-	1.27{130}	-	-	-
RF450	1.27{130}	2.11{215}	1.27{130}	4.12{420}	2.65{270}	-
RF08125	1.27	2.11	1.27	4.12	2.65	-
RF08150	{130}	{215}	{130}	{420}	{270}	-
RF650	1.42{145}	2.35{240}	1.42{145}	-	-	-
RF10100	1.77	2.94	1.77	5.49	3.43	1.77
RF10125	{180}	{300}	{180}	{560}	{350}	{180}
RF10150						
RF214	2.11{215}	3.58{365}	2.11{215}	-	-	-
RF205	-	-	2.50{255}	-	-	-
RF6205	2.50{255}	4.17{425}	2.50{255}	-	-	-
RF12200	2.50	4.17	2.50	8.34	5.49	2.50
RF12250	{255}	{425}	{255}	{850}	{560}	{255}
RF212	2.89{295}	4.85{495}	2.89{295}	-	-	-
RF17200	4.02	6.67	4.02	14.1	9.81	4.02
RF17250	{410}	{680}	{410}	{1440}	{1000}	{410}
RF17300						
RF26200						
RF26250	5.30	8.83	5.30	19.6	13.7	5.30
RF26300	{540}	{900}	{540}	{2000}	{1400}	{540}
RF26450						
RF36250						
RF36300	7.45	12.4	7.45	27.5	18.6	7.54
RF36450	{760}	{1260}	{760}	{2800}	{1900}	{760}
RF36600						
RF52300						
RF52450	9.81	16.6	9.81	-	-	-
RF52600	{1000}	{1690}	{1000}	-	-	-
RF60300						
RF60350	10.8	18.1	10.8	-	-	-
RF60400	{1100}	{1850}	{1100}	-	-	-
RF90350						
RF90400	15.2	25.5	15.2	-	-	-
RF90500	{1550}	{2600}	{1550}	-	-	-
RF120400						
RF120600	19.6	33.3	19.6	-	-	-
	{2000}	{3400}	{2000}	-	-	-



## 13. Allowable Load for Standard A Attachments

Allowable vertical load for A type attachments is as per Table 11. Where the load works with the roller, allowable roller load should be compared to that of the attachment, and the smaller value used.

Table 11: Allowable Load for A Attachments kN{kgf}/pc

Chain Size	Standard Series DT	Reinforced Series AT
RF03075	0.78{ 80}	1.18{ 120}
RF03100	0.93{ 95}	1.42{ 145}
RF430	1.57{ 160}	2.35{ 240}
RF05075	1.03{ 105}	1.57{ 160}
RF05100	1.32{ 135}	1.96{ 200}
RF05125	1.52{ 155}	2.26{ 230}
RF05150	1.72{ 175}	2.55{ 260}
RF204	1.08{ 110}	1.62{ 165}
RF450	2.16{ 220}	3.24{ 330}
RF08125	2.45{ 250}	3.68{ 375}
RF08150	2.79{ 285}	4.17{ 425}
RF650	2.35{ 240}	2.35{ 240}
RF10100	2.06{ 210}	3.09{ 315}
RF10125	2.30{ 235}	3.48{ 355}
RF10150	2.60{ 265}	3.92{ 400}
RF214	3.24{ 330}	4.81{ 490}
RF205	2.40{ 245}	3.63{ 370}
RF6205	3.68{ 375}	4.31{ 440}
RF12200	4.41{ 450}	5.30{ 540}
RF12250	5.30{ 540}	6.37{ 650}
RF212	4.95{ 505}	5.88{ 600}
RF17200	4.85{ 495}	5.74{ 585}
RF17250	6.72{ 685}	6.86{ 700}
RF17300	8.68{ 885}	9.8 {1000}
RF26200	4.41{ 450}	6.47{ 660}
RF26250	6.28{ 640}	9.12{ 930}
RF26300	8.14{ 830}	9.16{ 980}
RF26450	6.67{ 680}	6.67{ 680}
RF36300	3.33{ 340}	3.33{ 340}
RF36450	6.86{ 700}	6.86{ 700}
RF36600	8.63{ 880}	8.63{ 880}
RF52300	4.61{ 470}	4.61{ 470}
RF52450	9.71{ 990}	9.71{ 990}
RF52600	12.1 {1230}	12.1 {1230}
RF60300	5.49{ 560}	5.49{ 560}
RF60350	7.06{ 720}	7.06{ 720}
RF60400	8.34{ 850}	8.34{ 850}
RF90350	6.47{ 660}	6.47{ 660}
RF90400	8.29{ 845}	8.29{ 845}
RF90500	12.3 {1250}	12.3 {1250}
RF120400	6.33{ 645}	6.33{ 645}
RF120600	12.7 {1290}	12.7 {1290}

## 14. Considerations for Special Environments

Special environments mean the following conditions:

- high temperature
- low temperature
- high humidity
- high dust
- high chemical reactions

### 14.1 Low Temperatures

When chain is used at low temperatures, the following should be considered.

#### 1) Low temperature brittleness of material

In general, steel materials become brittle at low temperatures depending on chemical composition, etc. RF Conveyor Chain should not be used at temperatures lower than those specified in Table 12.

Table12: Applicable Lowest Temperature

RF Conveyor Chain	Lowest Temperature (°C)
Standard Series (DT)	-20
Reinforced Series (AT)	-60
400 Stainless Series (DS, GS)	-70
300 Stainless Series (SS)	-100

#### 2) Chain Freezing

Freezing between pin and bush, inner and outer link plates, or bush and roller will cause an excessive load on chain and drive unit. Freezing should be avoided by generally filling gaps between parts with lubricant that does not freeze at the temperature the chain is used in. For this purpose, silicon grease is recommended.

### 14.2 High Temperatures (Over 400°C)

The strength of the chain decreases as the temperature of the chain increases from the heat of the material conveyed or the environment. Usage limits for each chain are determined by the temperature of the chain and material. For the Safety Factor at temperatures up to 400°C, please refer to Table 8, and for over 400°C, please contact a Tsubaki representative.

#### 1) Points Concerning Hot Chain

- ① Friction factor increases more than usual.
- ② There is a possibility of heat fatigue when different materials have been welded, due to the difference in heat expansion coefficients.
- ③ In environments over 400°C, heat expansion and clearance must be considered.
- ④ Creep breakage
- ⑤ High temperature brittleness
- ⑥ Carbide precipitation brittleness
- ⑦ Effects of fluctuating temperature (cooling and expansion)

#### 2) Points Concerning Lubricant

Silicon, graphite and molybdenum disulphide oil have Superior heat resistance.

### 14.3 Abrasiveness

Points concerning abrasive conditions

- 1) Install a chain cover to avoid exposure to abrasive material.
- 2) Select the adequate conveyor type when exposing chain to abrasive material.
- 3) Slow down chain speed as much as possible.
- 4) Increase the chain size to reduce pin-bush bearing pressure
- 5) Lubricate using a grease nipple.

(Please contact a Tsubaki representative)

### 14.4 Corrosiveness

When chain is exposed to corrosive material:

- 1) Chain parts get thin, accelerating wear.
- 2) Rust affects roller rotation and chain articulation.
- 3) Special considerations should be made for stress corrosion and intergranular corrosion when chains are used in acidic or alkaline environments.

Please refer to Table 13 when selecting chain. It shows the corrosion resistance of chain material to various kinds of solvents. Chain parts made of SUS 400 stainless steel may rust depending upon conditions.

Specifications against stress corrosion are available.

(Please contact a Tsubaki representative.) Please inform your Tsubaki representative of the material used for accessories and related equipment. For example, when the chain is used in a tank, the material of the tank is important.

# Selection and Handling

**Table 13: Corrosion Resistance to Various Kinds of Solvent**

When selecting your chain, please check whether or not the material is fully corrosion resistant by referring to this table.

This table shows properties of material at 20°C and is only to be taken as a guide. To determine final specifications of the chain, please consider all conditions together.

○ : Resistant                      × : Not resistant  
 △ : Resistant depending upon conditions                      - : Unknown

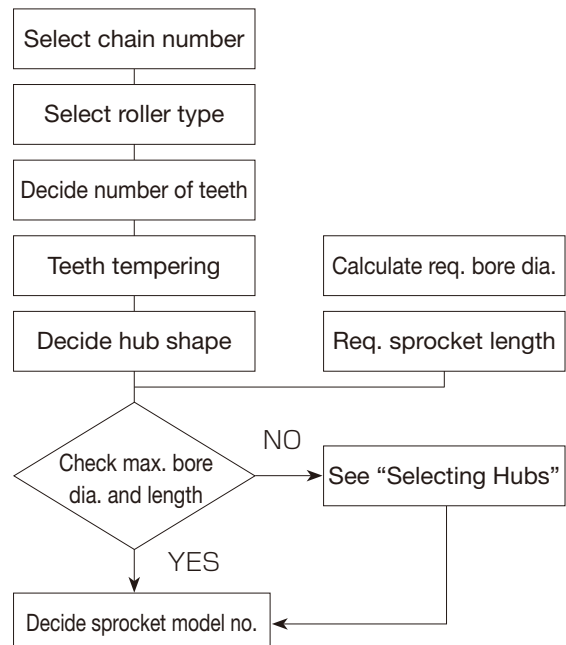
Solvent	Steel	SUS 400 Stainless Steel	SUS 300 Stainless Steel	Stainless Steel with Plastic Rollers
Acetic Acid 10%	×	○	○	○
Acetone	-	○	○	○
Alcohol (Methyl-, Ethyl-, Propyl-, Butyl)	○	○	○	○
Ammonia Gas (Cold)	-	-	-	-
Ammonia Gas (Hot)	-	-	-	-
Ammonia Water	△	○	○	○
Beer	×	○	○	○
Benzene	○	○	○	○
Boric Acid 5%	×	○	○	-
Butyric Acid 20°C	-	○	○	○
Calcium Hydroxide 20% Boil	-	○	○	○
Calcium Hypochlorite	×	×	○	×
Carbolic Acid 20°C	-	○	○	×
Carbon Tetrachloride (Dry) 20°C	×	○	○	○
Carbon Tetrachloride (Water Cont. 1%) Boil	-	-	-	-
Carbonated Water	×	○	○	-
Caustic Soda 25%	-	○	○	○
Chlorine Gas (Wet) 20°C	×	×	×	-
Citric Acid 50%	×	○	○	-
Formaldehyde	○	○	○	○
Formic Acid 50%	×	○	○	×
Gasoline	○	○	○	○
Glycerin 20°C	○	○	○	○
Hydrogen Peroxide 30%	-	△	○	×
Hydrochloric Acid (2%)	×	×	×	×
Iodine	-	-	-	-
Kerosene	○	○	○	-
Lactic Acid 10% 20°C	×	△	○	○
Milk	×	○	○	○
Nitric Acid 5%	×	△	○	×
Oil (Vegetable, Mineral)	○	○	○	○
Oxalic Acid 10% 20°C	×	△	○	-
Paraffin	○	○	○	○
Petroleum 20°C	○	○	○	○
Phosphoric Acid 10%	×	△	△	×
Potassium Permanganic Acid (Saturation) 20%	-	○	○	-
Sea Water	×	×	△	△
Soap Solution	×	○	○	○
Sodium Bicarbonate 20°C	-	○	○	○
Sodium Carbonate (Saturation) Boiling Point	-	○	○	-
Sodium Chloride	×	△	○	-
Sodium Hypochlorite 10%	×	×	×	×
Sodium Sulfate Saturation 20°C	-	○	○	-
Soft Drinks	×	○	○	○
Sulphuric Acid 5%	×	×	×	×
Sulphurous Acid Gas (Dry) 20°C	-	-	-	-
Sulphurous Acid Gas (Wet) 20°C	×	×	○	-
Tartaric Acid 10% 20°C	×	○	○	○
Vegetable Juice	×	○	○	○
Vinegar	×	×	△	△
Water	×	○	○	○
Whiskey	×	○	○	○
Wine	×	○	○	○

## 15. Clean Specifications

Class	For	Cleanliness	Application	Anti-rust Oil	Packaging
Class 1	All stainless steel parts (SUS300)	No extraneous matter (oil, grime, scale) or burrs, wiped with a clean cloth to remove dirt.	Pharmaceuticals or other materials come in direct contact with chain	No	Wrapped in a sheet, boxed in heavy duty paper and plastic
					Anti-atmospheric rust agent added to packaging. Boxed in heavy duty paper and plastic.
Class 2	All stainless steel parts (SUS 400 or US400/300 mix)	No extraneous matter (oil, grime, scale) or burrs.	Pharmaceuticals or other materials come in direct contact with chain	No	Anti-atmospheric rust agent added to packaging. Boxed in heavy duty paper and plastic.
Class 3	Some or all parts regular steel	After assembly, chain is wiped of oil and cleaned to remove oil and grime. Scale still remains.			

## 16. Sprocket Selection

Select a sprocket model using the following steps. The maximum bore diameter and length of standard sprockets strike the proper strength balance with AT Series chain, and are set to efficient dimensions. Please contact a Tsubaki representative should a larger or smaller hub be required.





## Handling Conveyor Chain

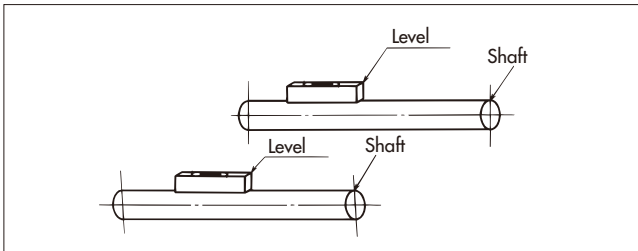
### 1. Installation

Proper attachment of the sprocket has a major influence on smooth conveyance, and will affect chain life as well. Follow the instructions below for proper sprocket attachment.

#### 1.1 Attaching the Sprocket

**1.1.1 Find the levelness of the shaft using a level.**  
Adjust precision to within  $\pm 1/300$ .

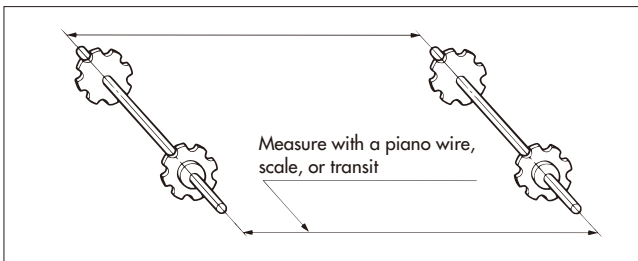
Dia. 1 Measuring shaft parallelism



**1.1.2 Find the levelness of the shaft.**

Use a scale to adjust the levelness of the shaft to  $\pm 1$ mm.

Dia. 2 Measuring shaft parallelism



**1.1.3 Correct the difference in sprockets.**

Distance between shafts

up to 1m:

$\pm 1$ mm

Distance between shafts

from 1m-10m:

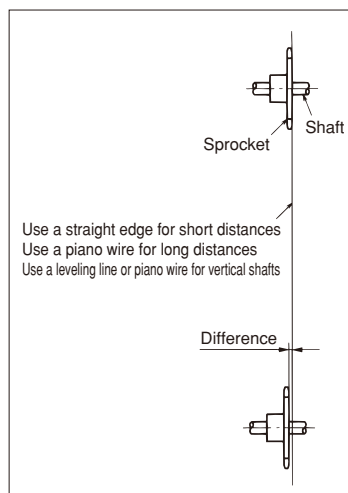
$$\pm \frac{\text{Distance between shafts (mm)}}{1000}$$

Distance between shafts

over 10m:

$\pm 10$ mm

Dia. 3 Measuring sprocket difference



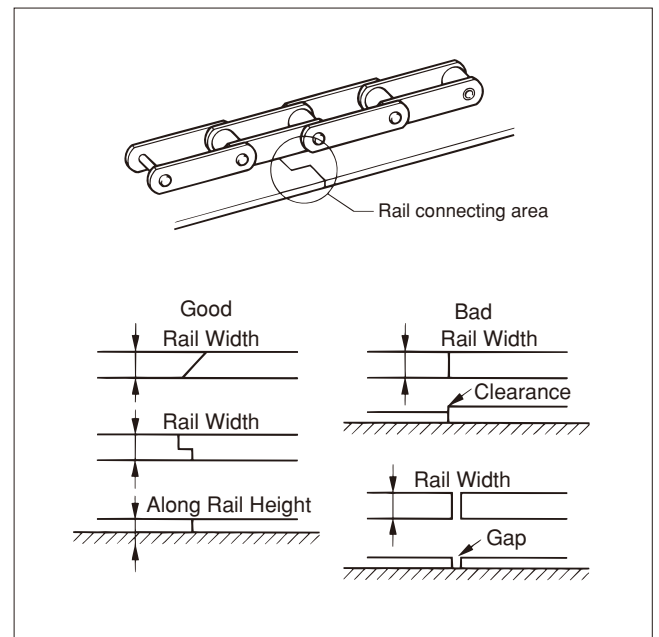
#### 1.1.4 Attaching sprockets

Attach the properly installed sprocket to the shaft with a key. Sprockets used in parallel strands should be fixed so that two teeth above the shaft center are in phase. Tsubaki can also supply keyless locking sprockets.

### 1.2 Rails for Conveyor Chains

- 1) Rail connecting areas should be smooth and free of any edges, clearances, or gaps. (See diagram below.)
- 2) Remove any welding spatter or scales.
- 3) Test operation with a lubed chain with no load, and check condition of chain and rail.

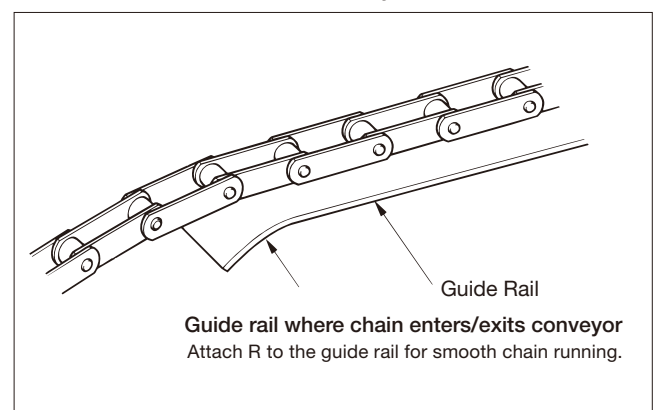
Rail connecting area



4) Chain enter/exit point

Ensure there is a curve to the guide rail for smooth chain running.

Guide rail where chain enters/exits conveyor



# Selection and Handling

## 2. Connecting and Disconnecting RF Conveyor Chain

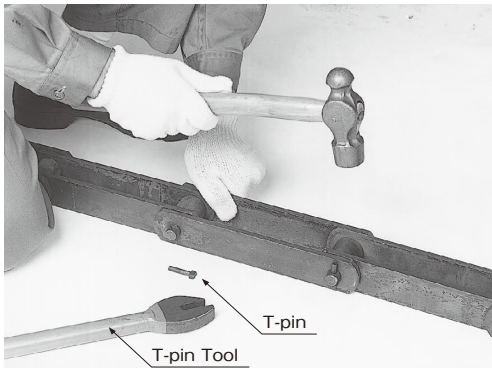
- (1) When connecting or disconnecting the chain, always begin by attaching or removing the outer plate on the T-pin side.
- (2) Loosen the take-up so that there is no tension on the chain.

**⚠ Caution on Handling**  
Whether the conveyor is parallel, slanted, or vertical, always attach a chain block or piano wire to the area to be connected/disconnected to ensure there is no tension on the chain.

### 2.1 Disconnecting Chain

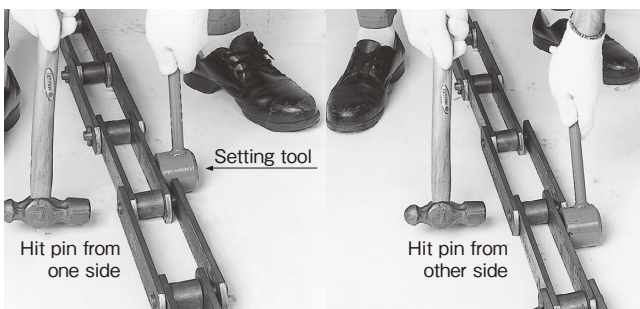
#### 1) Remove the T-pin

Use a T-pin tool or monkey wrench to bend the T-pin straight before removal. Always use a new T-pin—never reuse straightened T-pins.



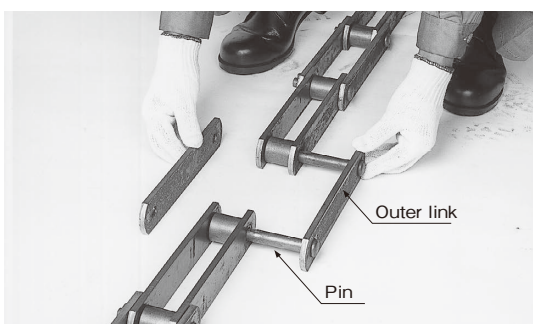
#### 2) Alternate Hitting Two Pins

Place a holding tool against the inner link and hit the pin with a hammer to remove as shown in the photo below.



#### 3) Remove the Outer Link

Remove the outer plate along with the two pins as shown in the photo below.



#### 4) Specialty Tools

Pins can be safely and quickly inserted and removed without affecting chain performance by using a chain breaker. The photos below show a chain being disconnected using specialty tools.

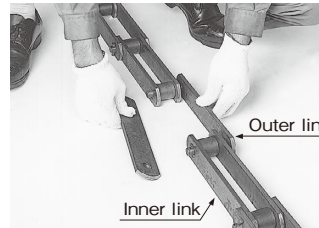


### 2.2 Connecting Chain

#### 1) Preparation

With a new chain, remove the outer plate on the outer link on the T-pin side. Refer to the previous section for pin removal.

**⚠ Caution:** Widening the plate holes or narrowing the pin diameter to make pin insertion or removal easier will lead to dramatic loss of chain performance and accidents.



#### 2) Connecting Two Strands of Chain

Draw the two ends together and connect with outer plates.

#### 3) Pin Insertion

Hold the concave portion of a pin tool against the pin on the T-pin side. Hit pin head with a hammer until the pin pokes out through the T-pin hole on the outer plate. The pin can be inserted easily by using a chain breaker. Check the chain at this point to ensure that it articulates smoothly.



#### 4) Bend the T-pin

Insert the T-pin into the pin and bend the tip 30 degrees or more with a T-pin tool or monkey wrench so that it will not come out.



Once a T-pin is used, bending it back will result in cracking. Do not reuse T-pins.

## 3. Test Operation

Perform a test operation after attaching the chain and before actual operation. Use the following checkpoints as a guide.

### 3.1 Before Beginning Test Operation

- 1) Is the T-pin on the connecting link properly attached?
- 2) Does the chain have the proper amount of catenary?
- 3) Does the chain have the proper amount of lubrication?
- 4) Does the chain hit the case or cover?

### 3.2 Test Operation

- 1) Are there any abnormal noises?
- 2) Does the chain vibrate?
- 3) Does the chain ride up on the sprocket?
- 4) Does the chain wind up on the sprocket?
- 5) Are the rail(s) and sprocket(s) properly installed?
- 6) Are the rollers rotating smoothly?
- 7) Does the entire chain articulate smoothly?

**Caution:** Test operation after installation should consist of repeatedly starting and stopping the conveyor with no load, followed by continuous operation with no load. Lubricate chain before test operation so that parts wear in.

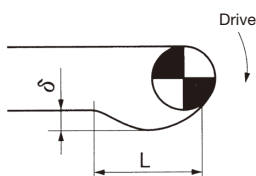
## 4. Adjusting Chain Tension

Take-up the chain to ensure proper operation of the conveyor. As a guide, chain should be adjusted 1.5–2 pitches.

The correct amount of slack is essential. Wear will advance on chains with too much tension, while chains with too much slack will ride up on the sprocket, causing accidents.

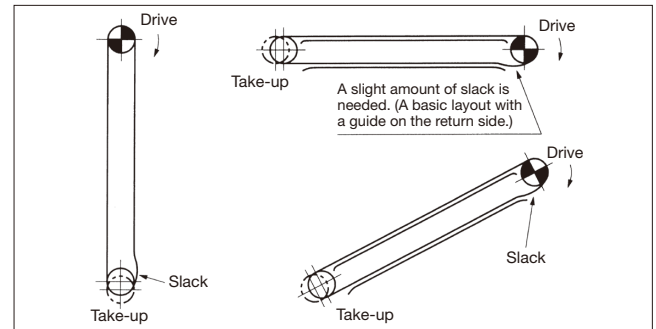
### 4.1 Chain Slack

In a basic layout, a small amount of slack ( $\delta$ ) is needed on the return side as shown in the diagram below. Too much tension will promote chain wear, and too much slack will cause the chain to ride up on the sprocket teeth and cause damage.



$$\text{Chain slack } (\delta) \doteq 0.1L$$

Chain slack



### 4.2 Frequency of Adjustment

The chain will undergo initial elongation when first used, as well as elongation resulting from wear between pin and bush after operation. Therefore, it is necessary to regularly adjust the chain through take-up to ensure proper chain tension. A chain operated for eight hours per day should be checked and adjusted as per the following chart. It becomes easier to neglect take-ups the longer the chain is used, which leads to chain catenary and accidents. Thus, performing regular checks is essential.

Within one week after initial operation	Once/day	Shorten interval between checks if chain speed is fast or chain operating time per day is over eight hours.
Within one month after initial operation	Twice/week	
Over one month after initial operation	Twice/month	

### 4.3 Adjustment Frequency

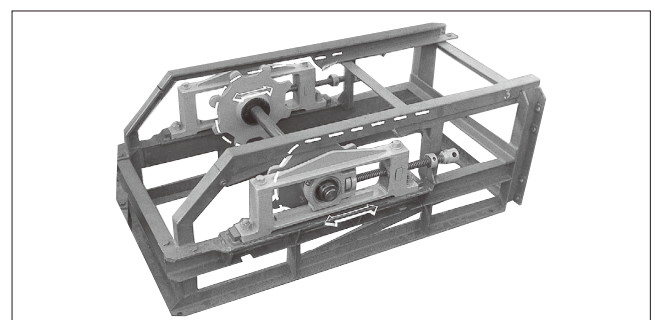
#### 4.3.1. When Chain Cannot Be Adjusted by Take-up Alone

If there is still some slack in the chain, despite taking up the chain as much as possible, remove two (2) links from the chain and shorten the overall length. See our guide to connecting and disconnecting chain.

#### 4.3.2 Even Adjustment of Take-up on Both Sides

When 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 sides. For this, we will assume that the length of the left and right chains is roughly equal. Therefore, it may be necessary to insert chain lengths at times to align the two lengths.

(This is unnecessary with continuous or balance take-up.) 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.



# Selection and Handling

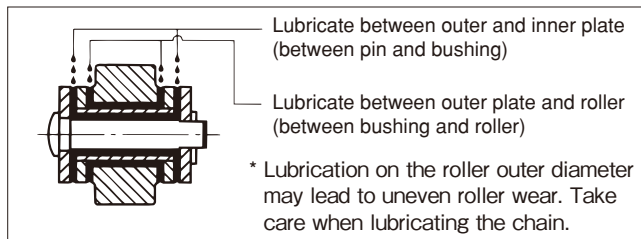
## 5. Lubrication

Lubrication is essential to ensure long life for your chain.

### 5.1 Lubricating

Lubricating your chain will reduce the wear on all chain parts as well as reduce required drive. Generally, lubricate once per week with ISO VG100 - VG150 (SAE30 - 40) oil by drip method or brush. Lubrication points are indicated by the diagram below. Ensure that chain is clean for maximum lubrication effectiveness.

#### Lubrication points



### 5.2 When to Avoid Lubrication

- When chain is buried within the items conveyed.
- When conveying powders in pan conveyors, apron conveyors, etc, or when powders may adhere to the chain and cause problems during lubrication.
- When the chain is used in high temperature environments.

### 5.3 Commercially Available Lubricants

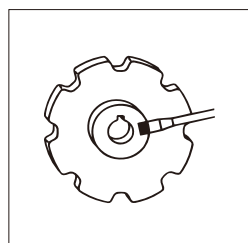
Lubricant	Lubricant		
	ISOVG100 (SAE30)	ISOVG150 (SAE40)	ISOVG220 (SAE50)
Idemitsu Kosan	Daphne Mechanics Oil 100	150	220
Exxon Mobile	Teresso 100	Teresso 150	—
	DTE Heavy Oil	DTE Extra Heavy Oil	DTE BB Oil
Showa Shell	Tellus Oil C100	150	220
ENEOS	FBK Oil RO100	RO150	RO220
	Diamond Lube RO100	RO150	RO220
Tonen General	Panol 100	150	220

Manufacturer names are listed in no particular order.

## 6. Storing Conveyor Chains and Sprockets

Do not store chains or sprockets in areas where they will be exposed to, or risk exposure to, dust or water. Carefully brush lubrication on the edge face of the boss and sprocket holes especially to prevent rusting. Chains are not treated with an anti-rust treatment when delivered. Apply an anti-rust treatment when storing and check periodically.

#### Sprocket anti-rust treatment



## 7. Limits of Conveyor Chain Use

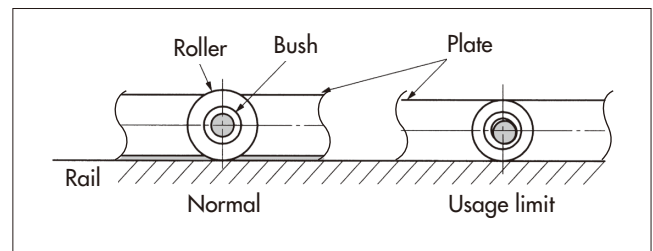
The following details the limits of conveyor chain parts. Check regularly for part wear.

### 7.1 Part Usage Limit

#### 7.1.1 R Roller, F Roller

The plate has reached its limit when the bottom of the plate begins to touch the rail due to wear on the contact surface or the sliding area with the bush.

#### R and F roller limits

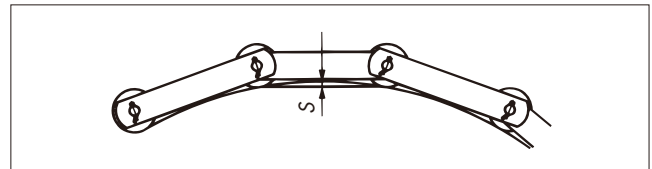


If there is a curve in the rail then there will be less wear allowance for the corresponding S dimension only as per the diagram below. Special care is needed in compared to flat conveyance.

#### 7.1.2 S·M·N Roller

When roller thickness wears to 40%.

#### Roller wear



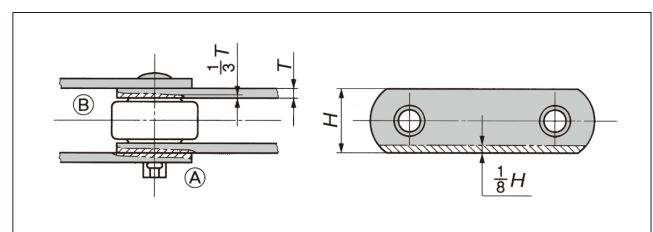
#### 7.1.3 Bush

When bush thickness wears to 40%.

#### 7.1.4 Measuring Plate Width or Height Wear

Wear will develop from abrasion between plates and roller and plate contact at (A) and (B) below. Chain strength will be insufficient when wear exceeds 1/3 of the plate's normal thickness. If items are conveyed directly on the plate as with flow conveyors, or if they slide on top of steel plates, then chain life will have been reached when plate height is worn by 1/8 as per the diagram below.

#### Plate wear



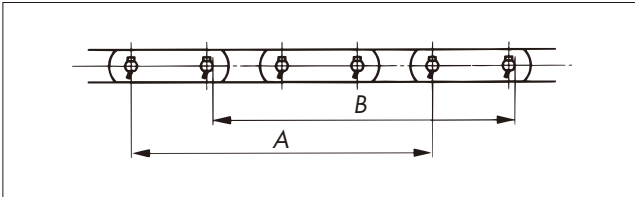


## 7.1.5 Measuring Chain Wear Elongation

A chain articulates when it engages the sprocket or along the curved portion of a rail, at which time a chain will elongate due to sliding wear between the bush and pin. The chain elongation limit is 2% (2mm of elongation on one link if pitch is 100mm) of a standard basic length (pitch × no. of links).

### 1) Measuring chain length (measured dimensions)

Measuring dimensions



Measure as many links as possible (at least four links) as per the diagram above. Measure from:

- (A) center of pin to center of pin
- (B) end of pin to end of pin

### 2) Chain elongation (%)

Measure chain using one of the above methods, compare to standard length, and determine chain elongation (%).

$$\text{Chain Elongation} = \frac{\text{Measuring method} - \text{Standard length}}{\text{Standard length}} \times 100(\%)$$

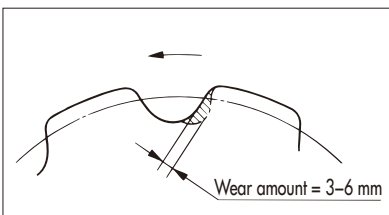
The photo bellows shows measurement from pin end to pin end using a Pitch Elongation Scale.

## 7.1.6 Wear on Sprocket Teeth Face or Sides

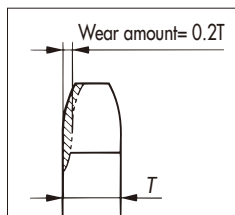
Worn sprocket teeth may accelerate chain wear during engagement. Regularly inspect both sprockets and chains.

- 2) Wear limits for sprocket teeth surfaces are roughly shown in the diagram below.

Tooth surface wear



Tooth side surface wear



- 2) Tsubaki recommends replacing the sprocket when teeth are worn. Avoid flipping the sprocket over and continuing to use sprockets with worn teeth bottoms. When performing welding repairs, use a tooth gauge to check the tooth profile.

## 8. Other Points

### 1) Conveyor Downtime

Always remove load from conveyors before stopping. Starting with load may cause overloading. Inspect chain before starting a conveyor that has been stopped for extended periods.

### 2) Lubrication

Always regularly lubricate the chain.

### 3) Fixing Parts

The nuts of buckets, aprons, slats, and other items that are bolted to the chain can come loose and fall off due to chain vibration during operation. Spot weld them or take other action to ensure they do not loosen.

### 4) Amount of Chain Slack

Regularly inspect and adjust chain slack.

### 5) Temperature and Freezing

Conveyors may freeze when there is a difference in temperature, such between day and night temperatures in winter. Lubricate chain and inspect often while paying attention to temperature changes when conveying liquid items. Condensation may form when conveying high temperature items in a case conveyor.

### 6) Storing Extra Chain

Tsubaki recommends having extra chain on hand in the event of chain failure. Store extra chain indoors where there is low humidity. Apply an anti-rust oil when storing for extended periods.

It may be convenient to attach a tag to the chain with the chain name, drawing number, date of purchase, equipment name, and other pertinent information.

### 7) Preventative Maintenance for the Conveyor

In addition to the above maintenance and inspection, create a conveyor history log and periodically record conveyor capacity, conveyor speed, main shaft rotation speed, current, voltage, power, actual operating time, actual conveyance load, inspection/lubrication days, accidents, etc. This can help prevent unexpected accidents and facilitate repairs.

### 8) Cleaning

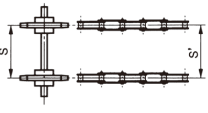
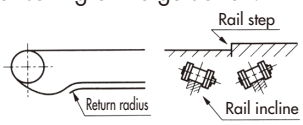

Periodically clean chain and rail if in contact with foreign matter or conveyed items.

# Selection and Handling





## 9. Troubleshooting

Refer to the table below if you experience problems with your conveyor chain or sprocket, which should be replaced with new products as necessary.



### 9.1 Chain and Sprocket Problems

Problem	Possible Cause	Solution
Chain rides up on sprocket 	Chain and sprocket do not match.	Replace chain or sprocket with the correct size.
	Total arc of contact with the chain on the sprocket is insufficient.	Have total arc of contact be at least three teeth on the sprocket.
	Excessive load.	Reduce the load (ex. install a shock absorber).
	Inadequate back tension.	Adjust the catenary of take-up idler, or install a tensioner.
	Excessive chain elongation due to wear.	Replace with a new chain.
	Distance between the center of the chain and sprocket do not match $S \neq S'$ .	Inspect and correct.
Chain winds on sprocket	Too much slack in chain.	Adjust the chain length or distance between axles, or install a tensioner.
	Excessively worn sprocket, or chain and sprocket do not match.	Replace chain and/or sprocket with the correct sized part.
Unusual noises	Inadequate lubrication to the contacting portions of the pin and bush.	Provide sufficient lubrication.
	Inadequate lubrication to the contacting portions of the bushing and roller.	Provide sufficient lubrication. Use a bearing roller or plastic roller.
	Winding or riding on the sprocket.	See above.
	Loose chain casing or axle bearing.	Tighten all nuts and bolts.
	Interference of the casing with the chain or other moving part.	Inspect and correct.
	Excessive wear in the chain or sprocket.	Replace the chain or sprocket (replace all connect chains).
	Improper setting of the guide rail.	Inspect and correct.
		
Excessive wear at the inside of the chain's link plates or the teeth surfaces 	Improper centering of the sprocket.	Remove the chain and correct the centering of the drive and driven sprockets.
	Chain is being pushed to the side.	Remove the cause of the push and/or install a guide roller.
	Vibration caused by the inaccurate finishing of the sprocket's shaft hole.	Check and correct the faulty locations and replace the sprocket with a new part.
Excessive wear of the sprocket teeth valleys and drive sides	Excessively worn chain.	Replace both the chain and the sprocket.
	Insufficient number of teeth.	Increase the number of teeth.
	BF Chain being used (no rollers).	Change to an RF Chain (w/rollers).
	Tooth hardness is insufficient with respect to the load and conveyed materials or foreign particles.	Use a sprocket with hardened or changeable teeth.
	Chain and sprocket do not match.	Replace chain or sprocket with correct sized parts.
Poor articulation	Rusting or corrosion.	<ul style="list-style-type: none"> <li>● Install a partition to protect the chain.</li> <li>● Select a suitable chain (MT series, etc.).</li> </ul>
	Particles of conveyed material have contaminated the pins, rollers, or bushes, or contamination from foreign particles.	<ul style="list-style-type: none"> <li>● Install a partition to protect the chain.</li> <li>● Select a chain with large clearance between pin, bush, and roller.</li> <li>● Use Chesterton #601 or #610.</li> </ul>
	Deformation of the chain from improper installation.	Inspect and correct installation of the sprockets and shafts.
	Inadequate lubrication.	Inspect the lubrication or look into wear resistant chain (CT/BT specifications, etc.).
	Operation in extremely high temperatures (over 400°C).	Provide adequate clearance.
	Seizure from excessive loads.	Lubricate regularly, reduce load.
	Pin bending due to excessively high loading.	Reduce load.

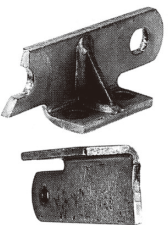
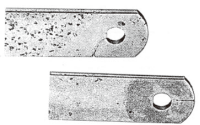


Problem	Possible Cause	Solution
The chain sticks and slips ( This can be caused by a combination of many problems; therefore, the listed remedies may not solve the problem. )	Change the rolling friction coefficient of the chain	<ul style="list-style-type: none"> <li>● Clean and lubricate moving parts with Tsubaki oil.</li> <li>● Replace sprocket.</li> <li>● Switch to Bearing Roller Chain.</li> </ul>
	The conveyor speed is too slow.	Increase conveyor speed.
	Insufficient rigidity in the frame. The conveyor chain is small compared to the device.	<ul style="list-style-type: none"> <li>● Increase the frame rigidity; increase the chain model number.</li> <li>● Decrease the slack in the drive roller chain.</li> </ul>
	The force of friction is excessively large.	<ul style="list-style-type: none"> <li>● Lubricate between the guide rail and chain.</li> <li>● Switch to Bearing Roller Chain.</li> </ul>
	The machine is too long.	Divide the conveyor system into sections to decrease the length.
	Inconsistent speeds due to movement along a polygonal path.	Use a 12 or more toothed drive sprocket, or reinforce the sprocket.
Excessive wear on the inside link and pin on one side of an NF Block Chain or BF Chain (no roller)	Increased internal tension when engaging the sprocket.	<ul style="list-style-type: none"> <li>● Attach a supporting block to the sprocket</li> <li>● Reduce load, and lubricate the chain and sprocket.</li> </ul> 
Chain is rusting	Inappropriate selection of material.	Select a more suitable chain material. Protect the chain from the environment. Apply a rust inhibitor.
	Condensation	Eliminate the temperature difference between the inside and outside of the conveyor (using insulation, etc.).
Excessive wear caused by the conveyed material 	The chain is contaminated with especially abrasive materials, such as mineral powders, etc., and the chain surface is being worn away.	<ul style="list-style-type: none"> <li>● Prevent material from falling onto the chain.</li> <li>● Use a wear-resistant chain.</li> </ul>
Excessive wear from corrosion 	The chain is exposed to acidic or alkaline substances and therefore becomes more susceptible to machine wear, which then progresses much faster.	<ul style="list-style-type: none"> <li>● Use a chemical-resistant material.</li> <li>● Use a wear-resistant material for the machine-worn parts.</li> </ul>
Excessive wear from electro-chemical corrosion 	When the chain is covered with water or passes through a solvent, the portions in contact suffer galvanic corrosion.	<ul style="list-style-type: none"> <li>● Use a chemical-resistant material.</li> <li>● Use a wear-resistant material for the machine-worn parts.</li> </ul>

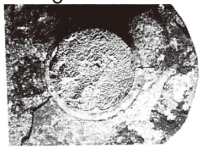
## 9.1 Plate

Problem	Possible Cause	Solution
Sudden fracture of link plate	Excessive load, too much tension on take-up.	<ul style="list-style-type: none"> <li>● Eliminate the cause of overloading.</li> <li>● Install a safety device (ex a Tsubaki Shock Relay).</li> <li>● Increase chain size.</li> </ul>
	Weakening of chain caused by excessive wear or corrosion.	<ul style="list-style-type: none"> <li>● Replace with a new part. Install a cover to protect the chain.</li> <li>● Lubricate regularly.</li> <li>● Select a chain with the proper specs for the application.</li> </ul>
	The link plates are pressed outward by the sprocket. 	<ul style="list-style-type: none"> <li>● Check and correct the installation</li> <li>● Excessively worn chain or sprocket.</li> <li>● Check if the chain and sprocket match, and correct as necessary.</li> </ul>
Deformed link plate holes and poor pin rotation (The pin is shifted from its normal position) 	Excessive load.	Eliminate the cause of overloading and replace chain with a larger size.
	Improper installation of the connecting link.	Replace connecting link with a new one.
	Excessive load and inadequate lubrication.	Replace with a new chain and improve the lubrication and loading conditions.
	Seizure of the pin and bush, poor articulation.	<ul style="list-style-type: none"> <li>● Increase the chain size.</li> <li>● Use a chain with a larger clearance between pin and bush.</li> </ul>

# Selection and Handling

Problem	Possible Cause	Solution
Crack in the link plate ① Fatigue breakage 	Excessive load, or excessive take-up tension. Excessively large repetitive load.	Eliminate overloading or large repetitive loads.
	Insufficient safety factor.	<ul style="list-style-type: none"> <li>● Increase the size or specs of the chain to increase the safety factor.</li> <li>● Replace with a new chain.</li> <li>● Eliminate overloading or large repetitive loads.</li> </ul>
	Repetitive load on attachment.	<ul style="list-style-type: none"> <li>● Increase the chain size to increase the allowable load of the attachment.</li> </ul>
② Corrosion stress crack  (Bow-shaped crack in heat treated metal plates)	The chain is being used in an acidic or alkaline environment. (Crack not caused by a repetitive load.)	<ul style="list-style-type: none"> <li>● Install a cover to protect the chain from the environment. Replace with a new part.</li> <li>● Use a chain with a high resistance to corrosion stress cracks.</li> </ul>

## 9.3 Pin

Problem	Possible Cause	Solution
① Pin fatigue fracture 	The factor of safety used for calculation of the peak load versus the breakage load was too small. The peak load acted like a repetitive load on the chain.	Recheck the size of the peak load and eliminate its cause. Replace the chain with a larger size (larger pin diameter).
② Pin corrosive fatigue	The pin was subjected to a tensile load at the side of the fracture origin, from whence the break then progresses. Chain is especially susceptible to this when the pin surface is corroded and weak against bending stresses.	<ul style="list-style-type: none"> <li>● Recheck the size of the peak load, and eliminate its cause. Replace the chain with a larger size (larger pin diameter).</li> <li>Use a cover to protect the chain.</li> <li>● Use a pin made of an anti-corrosion material.</li> </ul>
③ Pin brittle fracture	Poor environment.	Use an appropriate pin material.
④ Pin sudden fracture	Excessive load.	Eliminate the cause of overloading and replace the chain with a larger size.

## 9.4 Roller, Bush

Problem	Possible Cause	Solution
Improper roller rotation and uneven roller wear	Excessive load on roller.	Provide sufficient lubrication. Consider bearing roller or GT Series.
	Particles of conveyed material, or other foreign particles, have gotten between bush and roller.	Clean regularly, and install a partition to protect the chain.
	Particles of conveyed material, or other foreign particles, have built up on the rail.	Clean regularly, and install a partition to protect the chain.
	Lubricant is falling on the roller surface and rail without entering between the bush and roller or between roller and link plate.	Select an appropriate lubricant and lubrication method.
	Roller/bush rust.	Select an appropriate specification (RT, etc.).
	Inner plate is moving sideways.	Replace with a new chain. Re-inspect the installation and load conditions.
	Bush is cracked.	Reduce the load and lower the speed of rotation.
	The side surface of the roller is contacting the side of the link plate due to a thrust load.	Eliminate the cause of the thrust load.
	The chain and sprocket do not match, or excessively worn teeth.	Check for tooth deformation.
Roller is opening up	Excessive load.	Reduce the load, provide adequate lubrication, and remove any large steps in the rail.
Roller or bush is split (falling off)	Excessive load.	Reduce the load and provide adequate lubrication.
	Too few teeth with respect to conveyor speed.	Increase the number of teeth or decrease the speed.
The roller is becoming hourglass-shaped	Excessive load or inadequate lubrication.	Increase the lubrication, improve the loading conditions, and replace the chain with a new one.
	Excessively worn rail.	Correct or replace the rail.

## 10. Repair Parts

Indicate the following when inquiring about or ordering repair parts.

### 10.1 Conveyor Chains

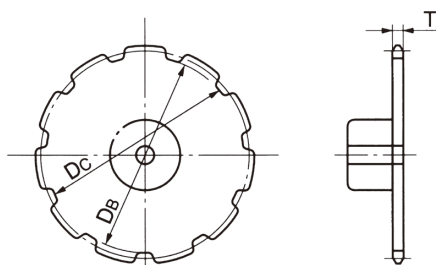
- 1) Chain size. (Ex: RF03075R)
- 2) Attachment type and spacing.  
(Ex: A2 att. every 2 links)
- 3) Total chain length. (Ex: 250 links)
- 4) Specification name (Standard, Heavy Duty, Corrosion Resistant).  
(Ex: AT Heavy Duty Conveyor Chain)
- 5) Once the above is known, it can be referred to as follows.  
RF03075R-AT-2LA2······250 links
- 6) Indicate differences from standard chain for special specifications.  
Provide the Tsubaki drawing number when known.
- 7) If chain size or chain drawing number are unknown, please provide the following information.
  - A. Chain pitch
  - B. Roller diameter and type
  - C. Inner link inner width
  - D. Plate width and height
  - E. Pin type
  - F. Attachment type and dimensions
  - G. Material and hardness if used in special applications

### 10.2 Sprockets

- 1) Chain size. (Ex: RF03075R)
- 2) Roller type and dimensions.  
(Ex: R roller,  $\phi$  31.8 diameter, 15.5 contact width)
- 3) Number of sprocket teeth. (Ex: 6)
- 4) Type. (BW, CW, BW1, CW1)
- 5) Tooth tip hardness. (Ex: Normal N specs, Wear Resistant H specs)
- 6) Shaft hole diameter and key dimensions. (Ex:  $\phi$  40H8, parallel key 12 × 8)
- 7) Parallel use.
- 8) Once the above is known, it can be referred to as follows.  
RF03075R6T-BWQ-TK  
Shaft hole =  $\phi$  40H8, Parallel key 12 × 8  
Parallel use.
- 9) Indicate differences from standard sprockets for special specifications.
- 10) Provide the Tsubaki drawing number when known.

When chain size is unknown

In addition to information 2) - 10) above, indicate tooth width (T), radius of tooth valley ( $D_B$ ), and distance between tooth valleys ( $D_C$ ) if there are an odd number of teeth.



# Large Size Conveyor Chain Inquiry Sheet

Specify the following when ordering Large Size Conveyor Chain.

Conveyor Name		Ave. Tensile Strength	kN{kgf}
Items Conveyed		Chain Pitch	mm
Corrosion Resistance		Attachment	every link
Wear Resistance		Conveyance Method	Pushed by Dog Direct Conveyance Other
Temp. of Items	Temp. °C	Operating Time	h/d
Dimensions of Items		Running Method	Continuous, Intermittent, Reverse (yes/no)
Mass of Items	MAX kg/each	Lubrication	Can/cannot use
Amt. Conveyed	MAX t/h (loose items) kg/conveyor (individual items)	Motor	AC/DC kW × r/min × motor(s)
		Sprocket No. of Teeth	NT (PCD mm)
Conveyor Length	m	Sprocket Shaft Hole Dia.	φ H8 · H7
Lifting Height	m	Hub	Type ( ) φ × L
No. of Strands	strands (spacing m)	Keyway	No ( ) JIS · b × t parallel
Chain Speed	m/min	Tooth Finishing	Precision fused Machine cut Induction hardened

Simple diagram of conveyor and chain: Include conveyor configuration, intake, discharge methods, rail configuration, return side uptake, etc.

Co. Name:	Division or Department:
Name:	Tel:
Date:	Fax:

## 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.

Note: The logos, brand names, or product names in this catalog are trademarks or registered trademarks of Tsubakimoto Chain Co. in Japan, the US, and other countries.



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