

# TSUBAKI LARGE SIZE CONVEYOR CHAINS







# ALL FOR THE GLOBAL USTOMER'S DELIGHT

# Tsubaki Chain 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, internal publication activities, etc.



Tsubaki-A Global Innovator Responding to Environmental 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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# Conveyor chain



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NEXT generation



# **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.

Read the Following Before Use

Values given in this catalog are both in SI International Units and {Gravimetric Units}.



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.



- 4. Excessive tension may cause chain failure. Including inertial forces and other forces when making the proper selection 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.
- 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.



### **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.



- 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.
- 5. Corrosion and other environmental factors can cause chain failure. Selecting material in light of usage conditions 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.
- 9. Widening plate holes or reducing the pin diameter to make pin insertion and removal easier will remarkably decrease the performance of your chain and lead to accidents.



### 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.

# Construction

### 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

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 bushing inner diameter when the chain articulates. The pin is an essential strength bearing part and requires high wear resistance.

### 2. Bushing

The bushing 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 bushing suffers wear from sliding against the roller inner diameter during roller rotation, while the bushing inner diameter suffers wear from sliding against the outer diameter of the pin when the chain articulates. Bushing inner diameter wear is directly expressible as pitch elongation.

### **3. Roller**

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

### 4. Plate

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. Tpin

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

Bend 30° or more, or so that the end of the T pin does not exceed the height of the plate.





# **Roller Types**

Tsubaki's most basic, versatile roller type. It has a

large allowable load and low frictional resistance.

Tsubaki Conveyor Chains use three basic roller types.

### **1. R Rollers**



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



### 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 outside 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)



# **Connecting Links**

# Connecting links require 1/3 the force to press fit compared to base chain connection, decreasing the time required to connect chains. Made to order item.

Effective for connection in ①narrow places, ②hanging applications, and ③areas with poor footing.

Applicable Sizes : RF12, RF17, RF26, RF36, RF214, RF205, RF212, B26N, B36N Applicable Specifications : DT, AT, GT, CT, BT Strength : Same as base chain.

Use the same selection method for selecting the connecting link as for selecting the base chain. \*Made to order item.



Overview

# **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.



# **Attachment Types**

Attachments can be attached at any link spacing.

### 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.

\* Tsubaki may send an A3 attachment for some A1 attachment orders. Contact a Tsubaki representative for more information.

### **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.

\* Tsubaki may send a K3 attachment for some K1 attachment orders. Contact a Tsubaki representative for more information.

### **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. K1 Attachment



K2 Attachment



A1 Attachment



GA2 Attachment



### Melding Additional Parts onto Chains

- Do not perform any additional welding, as it may result in:
- 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 elsewise.

- 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. 22.)
- 3) GA4 attachments will be attached on the T pin of opposing sides. (See pg. 23.)
- 4) Flanges for F rollers will be attached on the T pin side. (See pg. 22.)

### 2. Specialty Attachments

See other sections of this catalog for more information.



### **3. Special Attachments**

See the appropiate page for more information

SA Attachment		Stay Pin	stri	Attacher
Co Co Co	Straight attachment on one side	(Type: TN) Pg. 71		Attachment can be laid directly on stay pin, or mesh can be attached
* See Attachment section SK Attachment	Straight attachment on both sides	Top Plate (Type: TP)	Qa e e	Prevents damage to conveyed items
* See Attachment section CA2 Attachment		Pg. 72 Trolley Roller (Type: TRO)	CR I	Used in long
Serie Series and	Used to attach a mesh or slat with no spacing	Pg. 72		distance, horizontal applications
Pg. 69 AA3 Attachment	Stronger model -	Outboard Rol (Type: OR)	ller -	Provides support for heavy loads
Pg. 69	object attachment fits in between	Pg. 72 Guide Shoe (Type: GS)	~	Prevents lateral
A2R Attachment (w/reinforcing ribs)	Increases flexural	Pg. 73	Car Ja	Prevents lateral movement
Pg. 69 MG2 Attachment	attachment	Guide Roller (Type: GR)	S	Used in horizontal applications
Do 70 Core	Allows for one mounted jig to be used	Pg. 73 Fixed Dog (Type: KD)	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Conveys by
Pg. 70 AS2 Attachment		Pg. 74		pushing
Pg. 70	Uses scraper or flight attachment	Dog Roller (Type: RD)	( ) )	Conveys round items by pushing
AF2 Attachment	Uses deep scraper or flight attachment	Pg. 74 Tilting Dog (Type: CD)		Can accumulate items on top of the convevor
Pg. 70 V WS Attachment	Prevents conveyed items from	Pg. 75 Roller Tilting I (Type: RCD)	Dog	conveyor Can accumulate
Pg. 71	overspilling	– Pg. 75	8. 8. 0 8. 0	Can accumulate round items
Extended Pin (Type: EP)	Objects attach easily to pin end	Ducking Dog (Type: DD)	AS	Conveyed item will remain in fixed
Go >>>		Pg. 75	( )	position

# Large Size Conveyor Chain Line-up

Series	Product Name	Features/Application	Special Features	Ambient Temperature Range
General Use	DT Series	Economical, versatile	Heat treated pin and bushing	-20°C to 200°C
	GT Series	Increased wear life between roller - bushing	Higher roller load capacity than DT Series	-20°C to 200°C
Wear Resistant/Heavy Duty	AT Series	Compact design	Approximately two times the tensile strength of the DT Series with a higher roller load capacity	-60℃ to 400℃
	CT Series	Increased wear life between pin and bushing	Special heat treatment on pin and bushings	-20°C to 200°C
	BT Series	Optimal for conveying loose materials	Approximately two times the tensile strength of the CT Series	-20℃ to 200℃
	Standard Series (original series)	Perfect for direct conveyance of heavy items. Reduces necessary chain size, provides energy and space savings. Used for item conveyance.		
	Standard Series (anti-dust series)	Use in environments with dust or airborne particulates	Cylindrical bearings inside the roller	
Long Life Series Bearing Roller Conveyor Chain	Lube Free Series (standard series)	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.	lowers the coefficient of friction and increases roller load capacity	-20℃ to 80℃
	Lube Free Series (water-resistant series)	Perfect for environments where chain is exposed to water		
	Stainless Steel DS Series*1 (former NT Series)		All parts use SUS400	-70°C to 400°C
	Stainless Steel GS Series*1 (former PT Series)	Corrosive Resistant, Heat Resistant, Cold Resistant	1.6 times the tensile strength of DS Series	-70℃ to 400℃
	Stainless Steel SS Series*1 (former ST Series)		All parts use SUS300	-100°C to 400°C
Corrosion Resistant Series	MT Series		Pin and bushing are SUS400	-20°C to 200°C
	RT Series	Slightly water resistant	Pin, bushing, and roller are SUS400	-20°C to 200°C
	YT Series	Perfect for fly ash conveyance	Approximately two times the tensile strength of RT Series	-20°C to 400°C
	NEP Series Coated Chain	Treated with a corrosion resistant surface coating (hexavalent chromium-free)	All parts can be treated	-20°C to 200°C
	Needle Bushing Conveyor Chain	Used for high precision positioning in indexing operations and item conveyance	Uses needle bearings between pin and bushing, will not elongate	-10°C to 60°C
	Double Plus Conveyor Chain	Can convey as a free flow conveyor chain,	The combination of large and small diameter rollers allows items to be conveyed 2.3 times the chain speed	-20℃ to 200℃
	Top Roller Conveyor Chain	as well as accumulate	Direct conveyance of items on top rollers	* <sup>2</sup> -20°C to 200°C
	Outboard Roller Conveyor Chain		Sprocket engages the chain in the center of the S roller	* <sup>2</sup> -20°C to 200°C
	Deep Link Conveyor Chain	Items to be conveyed can be placed directly on the tall plates	Equipped with a R roller with little frictional resistance	*2-20°C to 200°C
	Lambda Plastic Roller Conveyor Chain	Perfect for use in clean environments	Uses a specially lubricated bushing (lube-free)	0°C to 50°C
Specialty Series	Bucket Elevator Conveyor Chain	Specialty chain emphasizing wear resistance and fatigue strength	Optimal material for abrasive environments	-20℃ to *3200℃
	Coil Transfer Conveyor Chain	Extremely high stiffness for conveying heavy loads	Uses Tsubaki⊐s unique cylindrical bearings in the rollers	-20℃ to 200℃
	Flow Conveyor Chain	Perfect for conveyance in hermetically sealed cases	Great wear resistance Wide variety of attachment types available	* <sup>2</sup> -20°C to 200°C
	Fly Ash Conveyor Chain	Perfect for conveying fly ash	Special surface treatment for increased wear resistance	*2-20°C to 200°C
	Conveyor Chain for Waste Treatment Plants	Perfect for conveying material from the waste treatment process	Increased wear/corrosion resistance thanks to the right combination of part materials	*2-20°C to 200°C
	Shoulder Bushing Conveyor Chain	Can convey heavier items than the RF Conveyor Chain	Large bushing outer diameter, increasing roller load capacity	*2-20°C to 200°C
	Block Chain	Superior structural stiffness and high tensile strength	Uses two outer plates and one or two inner plates and pin	-60°C to 400°C
		Block Chain for flow conveyors	Used for conveyance in extreme wear environments	-60℃ to 400℃

\*1. The specification codes for stainless steel Corrosion Resistant Conveyor Chain have been changed as follows: NT→DS, PT→GS, ST→SS.
\*2. Usage temperature will change depending on chain specification. The temperature shown is for DT Series.
\*3. Y Series is 400°C.

						м	eter Pi	tch		C	hain Si	20						Inch	Pitch			
RF03	RF05	RF08	RF10	RF12	RF17	RF26		RF52	RF60	RF90	RF120	RF280	RF360	RF440	RF430	RF204	RF450			RF205	RF6205	RF21
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# **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



### 2) If Product Code is Not Provided



### 2. Detailed Ordering Guidelines for Large Size Conveyor Chain

Large Size Conveyor Chain is not sold in unit lengths as with Drive Chain and Small Size Conveyor Chain, but rather by number of links.

### 2.1 Formation when Ordering by Total Number of Links

 Large Size Conveyor Chain is basically shipped in set lengths (approx. 3m) + fractional remainder, taken from the total number of links ordered. There will be occasions when set length (approx. 3m) will not be possible due to chain size, pitch, or attachment spacing. Contact a Tsubaki representative if you have special packaging requirements. Ex) For RF03100R-DT-1LA2 with 500 links

(Packaging) 30 links × 16 strands + 20 links × 1 strand Total: 500 links

2) One end of the set length (approx. 3m) of chain is an outer link, while the other end is an inner link. Normally, the chain is connected with a connecting link, which is shipped slightly press fit. (See photo below.)



### **2.2 Formed Products**

Formation refers to assembly of a chain based on instructions for chain length, specifications for both ends, attachment spacing, and so on. These products are referred to as formed products.

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

- 1) One end of the chain will be an outer link, while the other end will be an inner link.
- 2) Specify attachment positioning and spacing as per "3. Attachment Spacing"
- 3) Contact a Tsubaki representative regarding long length formation (Refer to 2.2.4).

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

- 1) Both ends inner link.
- 2) Both ends outer link
- 3) One end outer link, other end offset link.
  - \* For an odd number of links, specification for both ends are required.

### 2.2.3 When using parallel chains

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, <u>please specify half assembled in mirror image when ordering.</u>

Ordering strands in parallel does not mean they will be in mirror image. It is unnecessary to indicate mirror image in the following situations:

- 1 When using as a single strand.
- (2) When using in parallel, but not with right and left strands symmetrical.
- ③ When using in parallel with right and left strands parallel, but when chain direction is changed everything but the bending direction of the T pin is symmetrical.
- ④ When attachment positioning is symmetrical if chain direction is changed and connecting link position is moved.

### 2) Matched and tagged in pairs

Chain lengths will vary within standard tolerance. When it is desirable to minimize the relative difference in total chain length in a set of chains to be used as strands, the chain is matched and tagged in pairs. Indicate one of the following two methods when ordering. Contact a Tsubaki representative for details.

- ① When ordering "minimal matched tolerance differences"
- Some sets of standard length ( $\sim$ 3m) of the overall length are measured, and without performing the match and tag process we will assemble such a chain based on results of statistical and technical data.
- 2 When ordering "matched and tagged within XX mm"
  - Total length is measured in fixed intervals ( $\sim$ 3m) and matched and tagged.

<Delivery>

• Different colored tags are attached on 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. Please contact a Tsubaki representative for details.

### 2.2.4 Long chain lengths

Long chain lengths refer to chains with total lengths over a fixed length ( $\sim$ 3m). There are limits on long chain lengths due to transportation and handling problems depending on chain size. Consult 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. (A separate treatment fee will apply.)

## 3. Attachment Spacing

Numbering Example	Basic Attachment Coding	Connecting Link Type	Diagram
RF12200R-1LA2	OLA2	A2-PL	
RF12200R-2LA2 〇=2	OLA2	A2-PL	Connecting
RF12200R-2LA2RL )=2	⊖LA2RL	PL	Connecting $1L = 2L = 2L = 2L/A2$ repeat
RF12200R-3LA2	OLA2	A2-PL	Connecting
RF12200R-1L2LA2 ○=1, △=2	OLALA2	A2-PL	$\frac{C_{onnecting}}{link} = $
RF12200R-1L3LA2 ○=1, △=3	OLALA2	A2-PL	Connecting
RF12200R-2L4LA2 ○=2, △=4	OLALA2	A2-PL	Connecting Link 2L 2L 4L A 2 repeat
RF12200R-2L2L4LA2 ◯=2, △=2, □=4	OL∆L <b>∐LA2</b>	A2-PL	Connecting Link 2L 2L 4L 8L 2L, 2L, 4L/A2 repeat
RF12200R-2L3L5LA2 ○=2, △=3, □=5	OL∆L <b>∐LA2</b>	A2-PL	Connecting
RF12200R-2LEP	OLEP	EP-PL single side	Connecting
RF12200R-1L3LEP ○=1, △=3	OLALEP	EP-PL both sides	Connecting

Note: Connecting link here means "outer link" and should not be confused with a normal connecting link.

# Example Construction of the chain of the chain of the chain and sprocket (safety cover, etc.). When using a chain on suspension equipment, establish a safety perimeter, etc., and strictly prevent entry to the data strictly below the suspended object.

- If a substance that can cause embrittlement cracking (acid, strong alkali, battery fluid, etc.) adheres to the chain, stop using the chain immediately and replace it with a new one.
- During installation, removal, maintenance inspection and lubrication of the chain: Perform the operation according to the instruction manual or this catalog.
  - · Always turn off the power switch to the device and make sure that it cannot be turned on accidentally.
  - Anchor the chain and parts so that they cannot move freely.
  - · Perform cutting and connecting procedures properly using a press or other special tool.
  - Wear clothing and employ protective devices that are appropriate to the job (safety glasses, gloves, safety shoes, etc.). • Only allow experienced personnel to perform chain replacement procedures.
- In order to prevent hazards, damage, or injury when cutting a Leaf Chain, always install hazard protection devices (safety device, etc.) on the suspension equipment employing the Leaf Chain.

# **CAUTION** Obey the following points in order to prevent accidents.

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

# Warranty

### 1.LIMITED WARRANTY

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

### 2.NON-RELIANCE

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

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

### 3.CLAIMS

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

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

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

### 4.INDEMNIFICATION

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

### 5.ENTIRE AGREEMENT

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

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

# Large Size Conveyor Chain Strength Tables

### Average Tensile Strength

Unit: kN{kgf}

	Series	General Use Conveyor Chain	Wear Re	sistant/Heavy	/ Duty Convey	or Chain		Corr	osion Resistar	nt Conveyor (	Chain	
Chair	n Size	DT	AT	GT	СТ	BT	DS(formerly NT)	GS(formerly PT)	SS(formerly ST)	MT	RT	ΥT
	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}	29.4{3000}	69.6{7100}
1	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}	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}	78.5{8000}	142{14500}
F	RF10100 RF10125 RF10150	113{11 <i>5</i> 00}	226{23000}	123{12500}	123{12500}	226{23000}	113{11 <i>5</i> 00}	177{18000}	108{11000}	123{12500}	123{12500}	226{23000}
	RF12200 RF12250	186{19000}	279{28500}	186{19000}	186{19000}	279{28500}	167{17000}	265{27000}	132{13500}	186{19000}	186{19000}	279{28500}
I	RF17200 RF17250 RF17300	245{25000}	387{39500}	245{25000}	245{25000}	387{39500}	221{22500}	358{36500}	186{19000}	245{25000}	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}	314{32000}	520{53000}
Meter	RF36250 RF36300 RF36450 RF36600	476{48500}	682{69500}	476{48500}	476{48500}	682{69500}				476{48500}	476{48500}	682{69500]
I	RF52300 RF52450 RF52600	500{51000}	1030{105000}	500{51000}	500{51000}	1030{105000}				500{51000}	500{51000}	1030{105000
F	RF60300 RF60350 RF60400	500{51000}	1040{106000}	500{51000}	500{51000}	1040{106000}				500{51000}	500{51000}	1040{106000
F	RF90350 RF90400 RF90500	789{80500}	1630{166000}	789{80500}	789{80500}	1630{166000}				789{80500}	789{80500}	1630{166000
	RF120400 RF120600	1110{113000}	2210{225000}	1110{11300}	1110{11300}	2210{225000}				1110{113000}	1110{113000}	2210{225000
	RF280400 RF280600		3040{310000}									
	RF360400 RF360600		3630{370000}									
	RF440400 RF440600		4460{455000}									
I								83.4{8500}				
I	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}	78.5{8000}	142{14500
st I	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}	78.5{8000}	142{14500
Inch Lengths	RF650	78.5{8000}	142{14500}	113{11500}	113{11500}	98.1{10000}	78.5{8000}	142{14500}	68.6{7000}	113{11500}	113{11500}	142{14500
	RF214	127{13000}	240{25400}	127{13000}	127{13000}	240{24500}	118{12000}	186{19000}	123{12500}	127{13000}	127{13000}	240{24500
Ĕ	RF205	127{13000}	240{25400}	127{13000}	127{13000}	240{24500}	118{12000}	186{19000}	123{12500}	127{13000}	127{13000}	240{24500
F	RF6205	186{19000}	279{28500}	186{19000}	186{19000}	279{28500}	167{17000}	265{27000}	132{13500}	186{19000}	186{19000}	279{28500
1	RF212	245{25000}	387{39500}	245{25000}	245{25000}	387{39500}	221{22500}	358{36500}	186{19000}	245{25000}	245{25000}	387{39500

Note: 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

### Tsubaki Minimum Tensile Strength (Guaranteed Tensile Strength)

Serie Chain Size RF03075 RF03100 RF05075 RF05100 RF05125 RF05150	General Use Conveyor Chain	Wear Re	sistant/Heavy	/ Duty Convey	yor Chain		Corr	osion Resistar	nt Conveyor (	Chain	
hain Size	DT	AT	GT	СТ	BT	DS(formerly NT)	GS(formerly PT)	SS(formerly ST)	MT	RT	YT
	25.0{2500}	59.2{6000}	25.0{2500}	25.0{2500}	43.4{4400}	25.0{2500}	45.8{4700}	28.3{2900}	25.0{2500}	25.0{2500}	59.2{6000
RF05100 RF05125	58.3{5900}	121{12500}	58.3{5900}	58.3{5900}	83.4{8500}	58.3{5900}	91.8{9400}	58.3{5900}	58.3{5900}	58.3{5900}	121{12500
RF08125 RF08150	66.7{6800}	121{12500}	66.7{6800}	66.7{6800}	83.4{8500}	66.7{6800}	105{10500}	58.3{5900}	66.7{6800}	66.7{6800}	121{12500
RF10100 RF10125 RF10150	96.1{9800}	192{19500}	105{10500}	105{10500}	192{19500}	96.1{9800}	150{15000}	91.8{9400}	105{10500}	105{10500}	192{19500
RF12200 RF12250	158{16000}	237{24000}	158{16000}	158{16000}	237{24000}	142{14500}	225{23000}	112{11500}	158{16000}	158{16000}	237{24000
RF17200 RF17250 RF17300	208{21000}	329{33500}	208{21000}	208{21000}	329{33500}	188{19000}	304{31000}	158{16000}	208{21000}	208{21000}	329{33500
RF26200 RF26250 RF26300 RF26450	267{27000}	442{45000}	267{27000}	267{27000}	442{45000}	250{25500}	392{40000}	213{21500}	267{27000}	267{27000}	442{45000
RF36250 RF36300 RF36450 RF36600	405{41000}	580{59000}	405{41000}	405{41000}	580{59000}				405{41000}	405{41000}	580{59000
RF52300 RF52450 RF52600	425{43500}	876{89500}	425{43500}	425{43500}	876{89500}				425{43500}	425{43500}	876{89500
RF60300 RF60350 RF60400	425{43500}	884{90000}	425{43500}	425{43500}	884{90000}				425{43500}	425{43500}	884{90000
RF90350 RF90400 RF90500	671{68500}	1390{142000}	671{68500}	671{68500}	1390{142000}				671{68500}	671{68500}	1390{14200
RF120400 RF120600	944{96000}	1880{192000}	944{96000}	944{96000}	1880{192000}				944{96000}	944{96000}	1870{19100
RF280400 RF280600		2580{263000}									
RF360400 RF360600		3090{315000}									
RF440400 RF440600		3790{386000}									
RF430	45.8{4700}	83.4{8500}	45.8{4700}	45.8{4700}	59.2{6000}	44.2{4500}	70.9{7200}	40.9{4200}	45.8{4700}	45.8{4700}	83.4{8500
RF204	66.7{6800}	121{12500}	66.7{6800}	66.7{6800}	83.4{8500}	66.7{6800}	105{10500}	58.3{5900}	66.7{6800}	66.7{6800}	121{12500
RF450	66.7{6800}	121{12500}	66.7{6800}	66.7{6800}	83.4{8500}	66.7{6800}	105{10500}	58.3{5900}	66.7{6800}	66.7{6800}	121{1250
RF450 RF650	66.7{6800}	121{12500}	96.1{9800}	96.1{9800}	83.4{8500}	66.7{6800}	105{10500}	58.3{5900}	96.1{9800}	96.1{9800}	121{1250
RF214		204{21000}									
RF214 RF205		204{21000}									
RF6205		237{24000}									
RF212		329{33500}									

Note: Minimum tensile strength values are 85% of average tensile strength values.



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

**DT** Series (General Use Large Size Conveyor Chain)

# GT, CT, AT, and BT Series

(Wear Resistant/Heavy Duty Large Size Conveyor Chain)

# MT, RT, DS, YT, GS, SS, NEP Series

(Corrosion Resistant Large Size Conveyor Chain)

Ordering General Use, Wea and Corrosion Resista		
Chain Numbering Example		
Chain Size Roller Type	- ILA2	— Attachment Type — Attachment Spacing
Chain Size= RF03, Pitch= 75mm, Rolle Material Specification= AT Series Attachment Spacing/Type= A2 every lin Quantity= 400 links		
Chain Number RF03075R-AT-1LA2	Quantity 400	Unit 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) parts to satisfy any application.



# **NEP Coated Conveyor Chains**



Tsubaki coated conveyor chains are surface coated chains with increased resistance to corrosion and peeling.

In order to reduce our environmental load, our NEP Chain coating contains no hazardous chemicals, such as hexavalent chromium or lead. (Complies with RoHS Directive.)



### NEP Series

NEP Series features an optimal two-layer durable coating on each of its parts. (See below.) The special coating protects the base chain from corrosive environments, making it highly resistant to corrosion.



Parts Coated: Pin, Bushing, Plates

# Special Coating Chain

Parts Coated: Roller

Outdoor lines, cleaning lines, water cooling lines, and other environments where chain is subjected to

Wear dust may contaminate food products if they come in direct contact with the chain. Do not use in food

In non-food applications as well, if used in environments where flakes from peeling or wear dust will be a problem, cover the chain appropriately or consult a Tsubaki

representative about chain selection.

Refer to the "Selection" section for chain selection.

### Specifications

Available Sizes	Standard sizes, RF03-RF36 (It is possible to coat special products above this size.)
Chain Specifications	Regardless of chain material, any specification can be coated.
Ambient Temperature	-20°C to 200°C
Color	Silver

### Features

- · Chrome free-environmentally friendly
- · Superior rust resistance
- · Low temperature treatment for no loss of strength
- Deviation-free individual part treatment

### Saltwater Spray Test Results

### **NEP** Series

120 hours-No noticeable change



Nickel Plated Conveyor Chain 120 hours-Corroded

Applications

Selection

freshwater or seawater.

applications.



Zinc Plated Conveyor Chain 120 hours-Corroded



### **Meter Pitch (Dimensions)**

### RF03075 • RF03100







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GA2 Attachment







		Series	-	/	Attachmen		Attach	ment & Ro	ller Combi	nations	Арр	roximate l	Mass	A
TSUBAKI	Average I	Tensile Strength	Pitch	A, K, S	SA, SK	GA2						kg/m		Attachment
Chain Number	kN	{kgf}	Р	N	К	К	A1 K1	A2 K2	SA2 SK2	GA2	R Roller	F Roller	S Roller	Mass kg/each
RF03075	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
RF03100	27.4	{3000}	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. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole.

3. Consult a Tsubaki representative if using a guide on A or K attachment sides.

4. Attachments written in are standard attachments.

### **Meter Pitch (Dimensions)** RF05075 • RF05100

RF05125 • RF05150









### GA2 Attachment





SA2 Attachment <u>ل</u> \$R



### GA4 Attachment



Uses M8 Bolts

TSUBAKI		T Series Tensile Strength	Pitch	А, К, 3		hment GA2	GA4	Atta	chment &	& Roller (	Combina	tions	Appr	oximate kg/m	Mass	A Attachment Mass	GA4 Attachment Mass
Chain Number	kN	{kgf}	Ρ	N	К	К	К	A1 K1	A2 K2	SA2 SK2	GA2	GA4	R Roller	F Roller	S Roller	kg/each	kg/m
RF05075		{7000}	75	55	30	-	-	S	S	-	-	-	-	-	4.3	0.06	-
RF05100	68.6	{7000}	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
RF05125	00.0	{7000}	125	75	50	50	-	R, F, S	R, F, S	R, S	R, F, S	_	4.5	4.6	3.4	0.08	-
RF05150		{7000}	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.

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2. The mass of GA4 attachments is for one attachment ever two links.

3. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole.

Consult a Tsubaki representative if using a guide on A or K attachment sides.
 Attachments written in are standard attachments.

### **Meter Pitch (Dimensions)**

### RF08125 • RF08150











### C 64 50 ¥ ¥ Φ ±φ φ Ф Κ /12 Uses M10 Bolts L Ν

A2 Attachment





SK2 Attachment









or Inner Link: 31
90°
¢20

**\$**12

TSUBAKI		Series ensile Strength			Attachmen SA, SK	GA2	Attachr	nent & Rol	ller Combi	inations	Арр	proximate N kg/m	lass	A Attachment
Chain Number	kN	{kgf}	P	N	К	К	A1 K1	A2 K2	SA2 SK2	GA2	R Roller	F Roller	S Roller	Mass kg/each
RF08125	78.5	{8000}	125	80	50	-	R, F, S	R, F, S	R, S	-	5.9	6.2	4.2	0.19
RF08150	70.5	{8000}	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. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole.

4. Consult a Tsubaki representative if using a guide on A or K attachment sides.

5. Attachments written in are standard attachments.

### Meter Pitch (Dimensions) RF10100 • RF10125 RF10150



TSUBAKI Chain Number		OT Series Tensile Strength	Pitch	A, K,	Attacl SA, SK	hment GA2	GA4	Attac	chment 8	& Roller (	Combine	ations	А		nate Mas /m	55		GA4 Attachment
Chain Nomber	kΝ	{kgf}	Ρ	N	К	К	К	A1 K1	A2 K2	SA2 SK2	GA2	GA4	R Roller	F Roller	S Roller	M Roller	Mass kg/each	Mass kg/m
RF10100		{11500}	100	70	40	30	-	R, S, M	R, S, M	R, S, M	S, M	-	10	-	7	7.3	0.16	-
RF10125	113	{11500}	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		{11500}	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. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole.

5. Consult a Tsubaki representative if using a guide on A or K attachment sides.

6. Attachments written in \_\_\_\_are standard attachments.

arge Size Chair

### **Meter Pitch (Dimensions)**

### RF12200 • RF12250



TSUBAKI		DT Series Tensile Strength	Pitch	A, K,		hment GA2	GA4	Attac	chment 8	Roller (	Combine	itions	А		nate Ma: /m	55	A Attachment	
Chain Number	kN	{kgf}	Р	N	K	K	K	A1 K1	A2 K2	SA2 SK2	GA2	GA4	R Roller	F Roller	S Roller	M Roller	Mass kg/each	Mass kg/m
RF12200	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(10.6)
RF12250	100	{19000}	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. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole.

4. Consult a Tsubaki representative if using a guide on A or K attachment sides.

5. Attachments written in \_\_\_\_are standard attachments.

### **Meter Pitch (Dimensions)** RF17200 • RF17250 RF17300



A1 Attachment





GA2 Attachment



Uses M12 Bolt Maximum Length For Outer Link: 81 For Inner Link: 61









TSUBAKI		)T Series Tensile Strength	Pitch	A	K	Attac GA2	nment	GA4				achmer Combir			Ар	1	nate M /m	ass	A Attachment	GA4 Attachment
Chain Number	kN	{kg f}	Р	N	К	К	К	V	Y	A1 K1	A2 K2	A2 (Welded)	GA2	GA4	R Roller	F Roller	S Roller	M Roller	Mass kg/each	<sup>Mass</sup> kg/m
RF17200		{25000}	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)
RF17250	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)
RF17300		{25000}	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 ever two links (kg/m). ( ) indicates an M roller.

3. Numbers in < > are for when SUS300 stainless steel is used.

4. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole.

5. Consult a Tsubaki representative if using a guide on A or K attachment sides.

6. Attachments written in are standard attachments.

arge Size Chair

### Meter Pitch (Dimensions)

RF26200 • RF26250 RF26300 • RF26450



		DT Series				Attac	hment				Atte	achmer	nt &		Ap	proxin	nate M	ass	A	GA4
TSUBAKI Chain Numbe		ge Tensile Strength	Pitch	A	, K	GA2		GA4		]	Roller	Combi	nations			kg	/m		Attachment Mass	Attachment Mass
	kN	{kgf}		N	К	к	К	V	Y	A2 K2	A2 (Welded)	A3 (Welded)	GA2	GA4	R Roller	F Roller	S Roller	M Roller	kg/each	kg/m
RF26200		{32000}	200	120	80	-	100	120	80	S, M	-	-	-	S, M	-	-	16	17	0.74	19(20)
RF26250	314	{32000}	250	170	125	-	140	150	100	R, F, S, M	-	-	-	S, M	26	27	15	16	1.01	18(19)
RF26300		{32000}	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)
RF26450		{32000}	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.

2. The mass of GA4 attachments is for one attachment ever two links (kg/m). ( ) indicates an M roller.

3. Numbers in < > are for when SUS300 stainless steel is used.

4. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole.

5. Attachments written in are standard attachments.

### **Meter Pitch** (Chain Dimensions)

RF36250-RF440600





TSUBAKI Ch	ain Number		IT Series Tensile Strength	p: 1			1		Roller					Width between
		Average		Pitch	RR	oller			F Roller				MRoller	Inner Link Plates
Chain Size	Roller Type	kN	{kgf}	Р	Diameter R	Contact Width E	Diameter R	Flange Diameter F	Contact Width E	Off-center e	Ζ	Diameter R	Diameter <i>R</i>	W
RF36250 RF36300 RF36450 RF36600	S, M R, F, S, M R, F, S, M R, F, S, M	476	{48500}	250 300 450 600	- 125	- 56	- 125	- 150	- 42	- 7	- 14	50.8	57.2	66.7
RF52300 RF52450 RF52600	R, F, S R, F, S R, F, S	500	{51000}	300 450 600	140	65	140	170	49	8	16.5	57.2	-	77
RF60300 RF60350 RF60400	R, F, N R, F, N R, F, N	500	{51000}	300 350 400	140	65	140	170	49	8	16.5	-	70	77
RF90350	N			350	—	-	-	—	-	-	-			
RF90400 RF90500	R, F, N R, F, N	789	{80500}	400 500	170	76	170	205	56	10	18	_	85	88
RF120400	R, N R, F, N	1110	{113000}	400	200	87	-	-	-	-	-	_	100	100
RF120600	R, F, N	1110	113000	600	200	07	200	240	64	11.5	20.5		100	100
RF280400 RF280600	N R, N	3040	* {310000}	400 600	220	- 105	_	_	-	-	Ι	-	120	120
RF360400 RF360600	N R, N	3630	* {370000}	400 600	230	_ 115	-	-	-	-	-	-	130	130
RF440400 RF440600	N R, N	4460	* {455000}	400 600	_ 250	- 130	_	-	-	-	-	-	145	145

\* Denotes Wear Resistant/Heavy Duty Conveyor Chain items.

TSUBAKI	Plo	ate		P	in		Appr	roximat	e Mass	kg/m	Standar	d Attachment	& Roller Comb	inations
Chain Number	Height <i>H</i>	Thickness T	Diameter D	$L_1 + L_2$	L,	L <sub>2</sub>	R Roller	F Roller	S Roller	N Roller	A2 (Welded)	A3 (Welded)	GA2	GA4
RF36250 RF36300 RF36450 RF36600	76.2	12.7	25.4	146	78	68	- 40 32 28	- 42 33 29	25 23 21 19	26 24 21 20		R, F, S, M R, F, S, M	R, F, S, M R, F, S, M	S, M S, M
RF52300 RF52450 RF52600	76.2	16	31.8	172	90	82	55 43 37	58 45 38	30 26 25		R, F, S R, F, S R, F, S	R, F R, F	R, F, S R, F, S	
RF60300 RF60350 RF60400	90	12.7	35.0	160.5	83.5	77	54 49 45	57 51 47		32 30 28	R, F, N R, F, N R, F, N	R, F, N R, F, N		
RF90350 RF90400 RF90500	110	16	42.0	185	95.5	89.5	_ 74 65	- 78 68		49 46 42	N R, F, N R, F, N	R, F, N		
RF120400 RF120600	130	19	50.0	211.5	108	103.5	113 88	92	_	69 59	R , N R, F, N	R, F, N		
RF280400 RF280600	160 (135)	19	56.0	242	123.5	118.5	112	_	_	90 75				
RF360400 RF360600	170 (160)	22	61.0	258	131.5	126.5	135	_	_	112 92				
RF440400 RF440600	185 (170)	25	68.0	285	145	140	1 <b>7</b> 5	-	_	145 120				

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.

### **Meter Pitch** (Attachment Dimensions) RF36250-RF120600

### A2 Attachment (Welded)

TSUBAKI Cho	iin Number	Р	S	С	x	к	N	0	Angle Used	Bolt	Additional Mass/Each
Chain Size	Roller Type		U		~			0	, angle etter	Used	kg
RF36300 RF36450 RF36600	R, F, S, M R, F, S, M R, F, S, M	450	70	100	160	100 280 360	160 330 410	19	$L100 \times 100 \times 10$	M16	2.4 4.9 6.1
RF52300 RF52450 RF52600	R, F, S R, F, S R, F, S	300 450 600	80	120	172	100 280 360	160 330 410	24	L100×100×13	M20	3.1 6.3 7.8
RF60300 RF60350 RF60400	R, F, N R, F, N R, F, N	300 350 400	90	115	165	110 160 200	170 220 260	24	L100×100×13	M20	3.2 4.2 5.0
RF90350 RF90400 RF90500	N R, F, N R, F, N	350 400 500	100	140	210	100 150 260	180 230 340	28	L130×130×15	M24	5.2 6.6 9.8
RF120400 RF120600	R, N R, F, N	400 600	120	150	220	120 320	200 400	28	L130×130×15	M24	5.8 11.5

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

### A3 Attachment (Welded)

TSUBAKI Cho	iin Number	Р	s	с	x	к	N	0	Angle Used	Bolt	Additional Mass/Each
Chain Size	Roller Type	,	5	C	~	K		0	Aligie Osed	Used	kg
RF36450 RF36600	R, F, S, M R, F, S, M		70	100	160	140 180	330 410	19	L100×100×10	M16	4.9 6.1
RF52450 RF52600	R, F R, F	450 600	80	120	172	140 180	330 410	24	L100×100×13	M20	6.3 7.8
RF60350 RF60400	R, F, N R, F, N	350 400	90	115	165	80 100	220 260	24	L100×100×13	M20	4.2 5.0
RF90500	R, F, N	500	100	140	210	130	340	28	$L130\!\times\!130\!\times\!15$	M24	9.8
RF120600	R, F, N	600	220	150	220	160	400	28	$L130 \times 130 \times 15$	M24	11.5

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

### **GA2** Attachment

TSUBAKI Cho	ain Number	P	к т		Q.	Q,	А	0	Max, Le Attachm	ength of nent Bolt	Bolt
Chain Size	Roller Type	450	K				~		Outer Link	Inner Link	Used
RF36450 RF36600	R, F, S, M R, F, S, M		220 300	12.7	60	46	32	19	105	75	M16
RF52450 RF52600	R, F, S R, F, S	450 600	200 300	16	72	54.5	38	24	125	90	M20

### **GA4** Attachment

TSUB	TSUBAKI Chain Number		P	V	ĸ	v	т	Q	A	0	Bolt	Mass for Atta kg	achment/2 <i>1</i> /m
Chai	in Size	Roller Type	,		K	,	'	9			Used	S Roller	M Roller
	6250 6300	S, M S, M	250 300	150	140 180	100	12.7	60	32	19	M16	29 27	30 28



A3 Attachment (Welded) () c Ø  $\odot \odot^{\dagger}$  $\Phi \Phi \Phi$ 0 κ







## Inch Pitch (Chain Dimensions)





TSUBAKI Cho	ain Number		Series						Roller					Width between
		Average	Tensile Strength	Pitch P	R R	oller			F Roller				M Roller	Inner Link Plates
Chain Size	Roller Type	kΝ	{kgf}	Ρ	Diameter <i>R</i>	Contact Width E	Diameter <i>R</i>	Flange Diameter F	Contact Width E	Off-center e	Ζ	Diameter R	Diameter <i>R</i>	W
RF 430	R, S	53.9	{5500}	101.6	38.1	19	—	—	-	-	-	20.1	-	22.6
RF 204	S	78.5	{8000}	66.27	-	-	-	-	-	-	-	22.2	-	27
RF 450	R, F, S	78.5	{8000}	101.6	44.5	23	44.5	55	18	2.5	6.5	22.2	-	27
RF 650	R, F, S, M	78.5	{8000}	152.4	50.8	26	50.8	65	20	3	7	25.8	31.8	30.2
RF 214	R, S, M	127	{13000}	101.6	44.5	27	-	-	-	-	-	31.8	34.9	31.6
RF 205	S	127	{13000}	78.11	-	_	_	_	-	-	-	31.8	-	37.1
RF 6205	R, F, S, M	186	{19000}	152.4	57.2	32	57.2	70	25	3.5	9	34.9	38.1	37.1
RF 212	R, S, M	245	{25000}	152.4	69.9	32.5	-	-	-	I	I	40.1	44.4	37.1

TSUBAKI Chain		Plate		Pi	in		Ар	oroximate	e Mass k	g/m	Attachment & Roller Combinations				
Number	Height <i>H</i>	Thickness T	Diameter D	$L_{1} + L_{2}$	Γ,	L <sub>2</sub>	R Roller	F Roller	S Roller	M Roller	A1 K1	A2 K2	SA2 SK2	GA2	GA4
RF 430	25.4	4.8 (5.0)	9.7	55	29.5	25.5	4.4	-	3.0	-	R, S	R, S	R, S		
RF 204	28.6	6.3(6.0)	11.3	65.5	34.5	31	-	-	5.5	-	S	S			
RF 450	28.6	6.3(6.0)	11.3	65.5	34.5	31	6.9	7.2	4.6	4.8	R, F, S	R, F, S	R, S		
RF 650	38.1	6.3(6.0)	11.3	69	36.5	32.5	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
RF 214	38.1	7.9	15.9	77.5	40	37.5	10.5	-	8.7	9.1	R, S, M	R, S, M	R, S, M		
RF 205	38.1	7.9	15.9	83.5	43	40.5	-	-	10.3	-	S	S		-	
RF 6205	44.5	7.9	15.9	83.5	43	40.5	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
RF 212	50.8	9.5(10.0)	19.1	95.5	51	44.5	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.

### **Inch Pitch** (Attachment Dimensions)

### A1 (A3) Attachment

TSUBAKI Cł	nain Number	Р	s	с	x	N	т	0	Bolt	Additional Mass/Each
Chain Size	Roller Type		5	C	~		1	U	Used	kg
RF430	R, S	101.6	22	40	54	70	4.8 (5.0)	12	M10	0.11
RF204	S	66.27	24	45	60	35	6.3(6.0)	12	M10	0.07
RF450	R, F, S	101.6	28	50	64	70	6.3(6.0)	12	M10	0.18
RF650	R, F, S, M	152.4	32	50	64	90	6.3(6.0)	12	M10	0.23
RF214	R, S, M	101.6	35	55	73	80	7.9	15	M12	0.28
RF205	S	78.11	30	55	73	45	7.9	12	M10	0.13
RF6205	R, F, S, M	152.4	38	60	79	100	7.9	15	M12	0.37
RF212	R, S, M	152.4	45	65	83	100	9.5<10.0>	15	M12	0.47

### K1 (K3) Attachment

	ain Number	Р	S	2C	2X	N	Т	0	Bolt	Additional Mass/Each
Chain Size	Roller Type								Used	kg
RF430	R, S	101.6	22	80	108	70	4.8 (5.0)	12	M10	0.22
RF204	S	66.27	24	90	120	35	6.3(6.0)	12	M10	0.14
RF450	R, F, S	101.6	28	100	128	70	6.3(6.0)	12	M10	0.36
RF650	R, F, S, M	152.4	32	100	128	90	6.3(6.0)	12	M10	0.44
RF214	R, S, M	101.6	35	110	146	80	7.9	15	M12	0.56
RF205	S	78.11	30	110	146	45	7.9	12	M10	0.26
RF6205	R, F, S, M	152.4	38	120	158	100	7.9	15	M12	0.74
RF212	R, S, M	152.4	45	130	166	100	9.5(10.0)	15	M12	0.94

### A2 Attachment

TSUBAKI CH	nain Number	Р	s	С	x	к	N	т	0	Bolt	Additional Mass/Each
Chain Size	Roller Type		5	C	~	K		1	U	Used	kg
RF430	R, S	101.6	22	40	54	40	70	$4.8\langle 5.0 angle$	12	M10	0.11
RF204	S	66.27	24	45	60	35	55	$6.3\langle 6.0  angle$	12	M10	0.11
RF450	R, F, S	101.6	28	50	64	40	70	6.3(6.0)	12	M10	0.18
RF650	R, F, S, M	152.4	32	50	64	60	90	6.3(6.0)	12	M10	0.22
RF214	R, S, M	101.6	35	55	73	40	80	7.9	15	M12	0.28
RF205	S	78.11	35	60	75	30	65	7.9	12	M10	0.22
RF6205	R, F, S, M	152.4	38	60	79	60	100	7.9	15	M12	0.37
RF212	R, S, M	152.4	45	65	83	60	100	9.5 (10.0)	15	M12	0.47

### K2 Attachment

TSUBAKI CH	nain Number	Р	s	2C	2X	к	N	т	0	Bolt	Additional Mass/Each
Chain Size	Roller Type	'	5	20	27	K		1	U	Used	kg
RF430	R, S	101.6	22	80	108	40	70	$4.8\langle 5.0  angle$	12	M10	0.22
RF204	S	66.27	24	90	120	35	55	6.3(6.0)	12	M10	0.22
RF450	R, F, S	101.6	28	100	128	40	70	$6.3\langle 6.0  angle$	12	M10	0.36
RF650	R, F, S, M	152.4	32	100	128	60	90	6.3(6.0)	12	M10	0.44
RF214	R, S, M	101.6	35	110	146	40	80	7.9	15	M12	0.56
RF205	S	78.11	35	120	150	30	65	7.9	12	M10	0.44
RF6205	R, F, S, M	152.4	38	120	158	60	100	7.9	15	M12	0.74
RF212	R, S, M	152.4	45	130	166	60	100	9.5 (10.0)	15	M12	0.94











Note 1. Numbers in < > denote SUS300 Series stainless steel, while other numbers

are the same for all series.

2. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole.
3. X and 2X values for A and K attachments are approximate values. Consult a Tsubaki representative if using a guide on the A or K attachment sides.
4. Attachments written in are standard attachments.

SA2	Attach	ment
SA2	Attach	ment

TSUBAKI Ch	nain Number	Р	S.	S <sub>2</sub>	Q.	Q,	к	N	т	0	Bolt	Additional Mass/Each
Chain Size	Roller Type	'	0,	<b>U</b> <sub>2</sub>	α,		K	14	1	0	Used	kg
RF430	R, S	101.6	37.6	51.6	$22\left<22.5\right>$	16 (16.5)	40	70	$4.8\langle 5.0 angle$	12	M10	0.10
RF450	R, S	101.6	47.6	60.7	27 (26.5)	20 (19.5)	40	70	6.3(6.0)	12	M10	0.16
RF650	R, S, M	152.4	50	63	$28.5\langle 28  angle$	$21.5\left< 21\right>$	60	90	6.3(6.0)	12	M10	0.20
RF214	R, S, M	101.6	50	70	32.5	23.5	40	80	7.9	15	M12	0.25
RF6205	R, S, M	152.4	55	75.7	35.5	26.5	60	100	7.9	15	M12	0.33
RF212	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		Р	S.	S <sub>2</sub>	Q,	Q,	к	N	т		Bolt	Additional Mass/Each
Chain Size	Roller Type	'	0,		G,		K		1		Used	kg
RF430	R, S	101.6	37.6	51.6	$22\left<22.5\right>$	16 (16.5)	40	70	$4.8\langle 5.0 angle$	12	M10	0.20
RF450	R, S	101.6	47.6	60.7	$27\left<26.5\right>$	20 (19.5)	40	70	6.3(6.0)	12	M10	0.32
RF650	R, S, M	152.4	50	63	$28.5\left< 28\right>$	$21.5\left< 21 \right>$	60	90	6.3(6.0)	12	M10	0.40
RF214	R, S, M	101.6	50	70	32.5	23.5	40	80	7.9	15	M12	0.50
RF6205	R, S, M	152.4	55	75.7	35.5	26.5	60	100	7.9	15	M12	0.66
RF212	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	V	т	Q.	Q,			Max. Length of Attachment Bolt		Bolt
Chain Size	Roller Type			'			А		Outer Link	Inner Link	Used
RF650	R, F, S, M	152.4	60	6.3 (6)	$28.5\langle 28 \rangle$	21.5(21)	20	12	49	35	M10
RF6205	R, F, S, M	152.4	50	7.9	35.5	26.5	26	15	63	45	M12

### **GA4** Attachment

TSUBAKI Chain Number		Р	v	к	Y	т	Q	Δ	0	Bolt	Mass for Attachment/2 & kg/m		
Chain Size	Roller Type								Ĵ	Used	S Roller	M Roller	
RF650	S, M	152.4	110	75	70	6.3	28.5	20	12	M10	7.5	7.9	
RF6205	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.
 Attachments written in are standard attachments.







GA2 Attachment ŝ õ ÷ 90 Κ

### GA4 Attachment



# Wear Resistant/ Heavy Duty Conveyor Chain

вакі

NVEYER

AIN

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



# **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 stickslip phenomenon, and longer roller/rail life that existing chains cannot.

### Performance and Effects of Bearing Rollers



### earing Roller Features

- Reduces chain running resistance (1/3 of DT Series)
   Greatly increases roller allowable
- 2. Greatly increases roller allowable load

### **Bearing Roller Effects**

- 1. Reduces chain tension, required motor capacity
- 2. Prevents stick-slip phenomenon during long-length/low speed conveyance
- 3. Reduces rail wear and stops poor roller rotation
- 4. Increases wear life (bushing-roller)
- 5. Reduces CO2 output

### Bearing Roller Series and Specifications

**(Standard Series)** Standard Specifications BR Type BF Type





### **(Standard Series)** Anti-dust Specifications

DBR Type







**(Lube-Free Series)** Lube-free Specifications EBR Type EBF Type





(Lube-Free Series) Water Resistant Specifications WEBR Type WEBF Type




	Sp	ec	ific	at	ion De	tails								
	ę	Serie	s				Standar	d Series				Lube-Fre	ee Series	
	Spe	cific	ation			Standar	d Specs		Anti-Du	st Specs	Standar	d Specs	Water Res	istant Specs
		Туре	;		BR	BF	В	S	DBR	DBF	EBR	EBF	WEBR	WEBF
Ro	ller (	Cons	struct	tion	Bea	Bushing Roller uring	1 1 1 -	Bushing aoller Ja Bearing	Grease Nipple	Bushing aring	Be Spacer	Bushing Roller varing	- Contraction of the second se	ZZ Bushing Roller earing
		Roll	er (oute	r ring)	Alloy	Steel	Alloy	Steel	Alloy	Steel		Steel	SUS400 serie	s stainless steel
		E	Beari	ng	Case harde steel bearir	,	Case harde steel need		Case harde steel bearir		Case harde steel bearir plastic bear	ngs and		es stainless steel plastic bearings
	oller teria		ning (inn	er ring)	Case harden	ed alloy steel	Case harden	ed alloy steel	Case harden	ed alloy steel	Case harden	ed alloy steel	SUS400 serie	s stainless steel
IVIA	lena		Spac	er	Pla	stic	Pla	stic	Pla	istic	Pla	stic	Pla	astic
			Sea	.1	-	_		_	Rul	ober		_		—
		Si	de P	late	-		-	_	Carbo	n steel	-	_		
					DT Series	AT Series	Carba	n ata al	DT Series	AT Series	DT Series	AT Series	Carbo	un ete el
	Chain Specs		Plate	e		Alloy Steel	Carbo	n steel			Carbon steel		Carbo	on steel
Sh Sh			Pin		DT Series		Alloy	Steel		AT Series	DT Series			00 series ess steel
	Specs				Alloy Steel	Alloy Steel			Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel	Stalline	55 51661
Us	Jsage Environ			ent	Room tempe from wate	erature away r and dust		erature away r and dust	(Cannot be	be present used when buried in dust.)		erature away er and dust		mperature t with water
R	oller	Lub	ricati	on	Requires r	egular lube		shipped lubed ube necessary	Requires r	egular lube	Packaged and s no further lu	shipped lubed – be necessary	no further lu	shipped lubed – ube necessary a dusty environments)
Am	bient	t Terr	perat	ture	-20°C t (can manu withstand u		-20°C	to 50°C	-10°C	to 80°C	-20°C	to 50°C	0°C t	o 50°C
			RF	03	1.96kN	{ 200kgf}	_	_	_	—	1.96kN	{ 200kgf}	1.37kN	{ 140kgf}
	ler		RF		3.04kN	{ 310kgf}	_	_	_		3.04kN	{ 310kgf}	2.13kN	{ 220kgf}
	Roller		RF		4.12kN	{ 420kgf}	-		-		4.12kN	{ 420kgf}	2.88kN	{ 290kgf}
	ж, В		RF RF		5.49kN 8.34kN	{ 560kgf} { 850kgf}	2.00kN 3.00kN	{ 200kgf} { 310kgf}	5.49kN 8.34kN	{ 560kgf} { 850kgf}	5.49kN 8.34kN	{ 560kgf} { 850kgf}	3.84kN 5.84kN	{ 390kgf} { 600kgf}
ad	Roller,		RF		14.1kN	{1440kgf}	-	_	14.1kN	{1440kgf}	14.1kN	{1440kgf}	9.87kN	{1010kgf}
Roller Allowable Load	S	ø	RF		19.6kN	{2000kgf}	_	_	19.6kN	{2000kgf}	19.6kN	{2000kgf}	13.7kN	{1400kgf}
vabl		I Size	RF	36	27.5kN	{2800kgf}	_	_	27.5kN	{2800kgf}	27.5kN	{2800kgf}	19.3kN	{1970kgf}
Allov		Chain	RF	03	1.27kN	{ 130kgf}	_	_	_		1.27kN	{ 130kgf}	0.89kN	{ 90kgf}
ler /		Ö	RF		1.96kN	{ 200kgf}	_	_	_	-	1.96kN	{ 200kgf}	1.37kN	{ 140kgf}
Bol	٦.		RF		2.65kN	{ 270kgf}	_		_	—	2.65kN	{ 270kgf}	1.86kN	{ 190kgf}
	Roller		RF		3.43kN	{ 350kgf}	_	_	3.43kN	{ 350kgf}	3.43kN	{ 350kgf}	2.40kN	{ 240kgf}
	L L		RF		5.49kN	{ 560kgf}	_	_	5.49kN	{ 560kgf}	5.49kN	{ 560kgf}	3.84kN	{ 390kgf}
			RF RF		9.81kN 13.7kN	{1000kgf} {1400kgf}	_		9.81kN 13.7kN	{1000kgf} {1400kgf}	9.81kN 13.7kN	{1000kgf} {1400kgf}	6.87kN 9.59kN	{ 700kgf} { 980kgf}
			RF		18.6kN	{1400kgf}	_	_	18.6kN	{1400kgf}	18.6kN	{1400kgf}	13.0kN	{1330kgf}
Coeffi	cient of	I Roller F	lotation I		0.			: 03		).05		03		.03
,				6		/min		/min		/min	-			
	nain	Spro		8		/min		/min		/ n/min	15m	/min	15n	n/min
	vable eed		. of eth	10	30m	/min	20m	/min	30m	/min	20m	/min	20n	n/min
- 10				12	30m	/min	25m	/min	30m	ı/min	25m	/min	25n	n/min

## Specification Details

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

## Standard Series **BR/BF Type**



Features cylindrical bearings between rollers and bushings.

Same dimensions as standard R and F rollers on RF Conveyor Chains.

Roller-Bushing Wear Life Comparison with Standard Conveyor Chains



## Standard Series **BS Type**



Features a unique construction of needle bearings between the inner roller and outer bushing, kept in place by plastic side plates.
 Same dimensions as standard S roller on RF Conveyor Chains Roller-Bushing Wear Life Comparison with Standard Conveyor Chains



5x the wear life of DT Series without additional lubrication. \*Standard Conveyor Chain with S roller or R roller.

## New Anti-Dust Series DBR/DBF Type



 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. In-house Wear Comparison of Anti-dust Specs In-house testing (no add. lube)



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

#### Standard Series General Specifications

				Max	k. Allow	able Ten	sion			Ro	ller Allo	wable Lo	ad	
TS	SUBAKI Chain Numb	er		BR, BF	Туре		RS	Туре	R P	oller	FR	oller	SP	oller
			DT S	Series	AT S	Series	55						-	
BF Type	BF Type	BS Type	kN	{kgf}	kN	{kgf}	kN	{kgf}	kΝ	{kgf/each}	kΝ	{kgf/each}	kΝ	{kgf/each}
RF03075BR	RF03075BF	—	4.12	{420}	7.85	{800}	_	—	1.96	{200}	1.27	{130}	_	
RF03100BR	RF03100BF	—	4.12	{420}	7.05	10007	—	—	1.70	{200}	1.2/	{130}	—	—
RF05100BR	RF05100BF													
RF05125BR	RF05125BF	_	9.81	{1000}	14.7	{1500}	_	—	3.04	{310}	1.96	{200}	_	—
RF05150BR	RF05150BF	_												
RF08125BR	RF08125BF		10.0	(1100)	147	(1.500)			4.10	[400]	0 / 5	(070)		
RF08150BR	RF08150BF		10.8	{1100}	14.7	{1500}	_		4.12	{420}	2.65	{270}	_	
RF10100BR		RF10100BS												
RF10125BR	RF10125BF	RF10125BS	15.7	{1620}	23.5	{2400}	10.8	{1100}	5.49	{560}	3.43	{350}	2.00	{200}
RF10150BR	RF10150BF	RF10150BS												
RF12200BR	RF12200BF	RF12200BS	24.5	(0700)	24.2	(2700)	17.0	(1000)	0.04	(0.50)	E 40	(5(0)	2.00	(210)
RF12250BR	RF12250BF	RF12250BS	26.5	{2700}	36.3	{3700}	17.8	{1800}	8.34	{850}	5.49	{560}	3.00	{310}
RF17200BR	RF17200BF													
RF17250BR	RF17250BF	_	34.3	{3500}	54.9	{5600}	—	—	14.1	{1440}	9.81	{1000}	—	—
RF17300BR	RF17300BF													
RF26250BR	RF26250BF													
RF26300BR	RF26300BF	_	44.1	{4500}	72.6	{7400}	—	—	19.6	{2000}	13.7	{1400}	_	—
RF26450BR	RF26450BF													
RF36300BR	RF36300BF													
RF36450BR	RF36450BF	_	67.7	{6900}	97.1	{9900}	—		27.5	{2800}	18.6	{1900}	—	
RF36600BR	RF36600BF													

Note 1. DT specifications are standard for BS Type. As the max. allowable tension and roller allowable load for AT Series are determined by roller strength, they are the same as DT Series. 2. Consult a Tsubaki representative for inch pitch sizes.

#### Standard Series Anti-dust Specifications

		Ma	x. Allowo	able Ten	sion	Rc	oller Allov	vable La	ad
TSUBAKI Ch	ain Number		DBR, DE	BF Type		рр	oller	FD	oller
		DT S	Series	AT S	beries	KK	oliei	IN	oner
DBR Type	DBF Type	kN	{kgf}	kΝ	{kgf}	kΝ	{kgf/each}	kN	{kgf/each}
RF10100DBR									
RF10125DBR	RF10125DBF	15.7	{1620}	23.5	{2400}	5.49	{560}	3.43	{350}
rf10150dbr	rf10150dbF								
BRF12200DR	RF12200DBF	26.5	{2700}	36.3	{3700}	8.34	{850}	5.49	{560}
RF12250DBR	RF12250DBF	20.5	127003	50.5	13/001	0.54	10201	J.47	10001
RF17200DBR	RF17200DBF								
RF17250DBR	RF17250DBF	34.3	{3500}	54.9	{5600}	14.1	{1440}	9.81	{1000}
rf17300dbr	rf17300dbF								
RF26250DBR	RF26250DBF								
RF26300DBR	RF26300DBF	44.1	{4500}	72.6	{7400}	19.6	{2000}	13.7	{1400}
RF26450DBR	RF26450DBF								
RF36300DBR	RF36300DBF								
RF36450DBR	rf36450dbF	67.7	{6900}	97.1	{9900}	27.5	{2800}	18.6	{1900}
RF36600DBR									

Note:

\*DT Series: General Use Conveyor Chain AT Series: Wear Resistant/Heavy Duty Conveyor Chain.

2. Chain cannot be used for conveyance in environments where it will be fully covered in dust. (If using, a field test using a few links is essential.)
 3. Periodically lubricate the base chain using the grease nipple on the pin head. (The lubrication cycle will vary depending on the type and amount of dust. A field test using a few links is essential.)

Base chain is compatible with General Use Conveyor Chains and can use current sprockets.
 Do not use in corrosive environments. (Exposed to or submersed in water, etc.)

6. Can use any attachment.

## Standard Specs EBR/EBF Type



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

Roller-Bushing Wear Life Comparison with Standard Conveyor Chains In-house testing (w/o add. lube)



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 automatic lubricating functions between the bushing and roller. Can be used without lubricating the rollers.

Roller-Bushing Wear Life Comparison with Standard Conveyor Chains



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

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

#### Lube-Free/Standard Specifications

		Ma	x. Allowo	able Ten	sion	Rc	ller Allov	vable Lo	bad
TSUBAKI CH	ain Number	DT S	beries	AT S	beries	R R	oller	FR	oller
		kN	{kgf}	kΝ	{kgf}	kΝ	{kgf/each}	kΝ	{kgf/each}
RF03075EBR	RF03075EBF	2.88	{290}	5.50	{560}	1.96	{200}	1.27	{130}
RF03100EBR	RF03100EBF	2.00	{270}	5.50	12001	1.70	12005	1.2/	11307
RF05100EBR	RF05100EBF								
RF05125EBR	RF05125EBF	6.87	{700}	10.3	{1050}	3.04	{310}	1.96	{200}
RF05150EBR	RF05150EBF								
RF08125EBR	RF08125EBF	7.54	(770)	10.2	(1050)	410	(420)	245	(270)
RF08150EBR	RF08150EBF	7.56	{770}	10.3	{1050}	4.12	{420}	2.65	{270}
RF10100EBR									
RF10125EBR	RF10125EBF	11.0	{1120}	16.5	{1680}	5.49	{560}	3.43	{350}
RF10150EBR	RF10150EBF								
RF12200EBR	RF12200EBF	18.6	{1900}	25.4	(2500)	8.34	(050)	5.49	(540)
RF12250EBR	RF12250EBF	10.0	{1700}	25.4	{2590}	0.34	{850}	5.47	{560}
RF17200EBR	RF17200EBF								
RF17250EBR	RF17250EBF	24.0	{2450}	38.4	{3920}	14.1	{1440}	9.81	{1000}
RF17300EBR	RF17300EBF								
RF26250EBR	RF26250EBF	20.0	(21.50)	50.0	(5100)	10.4	(2000)	127	(1.400)
RF26300EBR	RF26300EBF	30.9	{3150}	50.8	{5180}	19.6	{2000}	13.7	{1400}
RF36300EBR	RF36300EBF	47.4	{4830}	68.0	{6930}	27.5	{2800}	18.6	{1900}

St	anda	rd B	R Se	ries,	BFT	ype (	ref.)
Max	. Allow	able Te	nsion	Roll	er Allov	wable L	oad
DT S	eries	AT S	eries	R Ro	oller	F Ro	oller
kΝ	{kgf}	kΝ	{kgf}	kΝ	{kgf/each}	kΝ	{kgf/each}
4.12	{420}	7.85	{800}	1.96	{200}	1.27	{130}
9.81	{1000}	14.7	{1500}	3.04	{310}	1.96	{200}
10.8	{1100}	14.7	{1500}	4.12	{420}	2.65	{270}
15.7	{1600}	23.5	{2400}	5.49	{560}	3.43	{350}
26.5	{2700}	36.3	{3700}	8.34	{850}	5.49	{560}
34.3	{3500}	54.9	{5600}	14.1	{1440}	9.81	{1000}
44.1	{4500}	72.6	{7400}	19.6	{2000}	13.7	{1400}
67.7	{6900}	97.1	{9900}	27.5	{2800}	18.6	{1900}

Note: Maximum allowable tension differs from Standard Series. (See chart on right for reference.) Keep this in mind when selecting. Roller allowable load is the same.

### Lube-Free Series, Water Resistant Specifications

				Rc	ller Allov	vable La	bad
TSUBAKI Ch	ain Number	Max. Allowe	able Tension	R R	oller	FR	oller
		kN	{kgf}	kN	{kgf/each}	kΝ	{kgf/each}
RF03075WEBR	RF03075WEBF	2.88	{290}	1.37	{140}	0.89	{90}
RF03100WEBR	RF03100WEBF	2.00	{270}	1.57	{140j	0.07	1203
RF05100WEBR	RF05100WEBF						
RF05125WEBR	RF05125WEBF	6.87	{700}	2.13	{220}	1.37	{140}
RF05150WEBR	RF05150WEBF						
RF08125WEBR	RF08125WEBF	7.56	{770}	2.88	{290}	1.86	{190}
RF08150WEBR	RF08150WEBF	7.50	{//0}	2.00	{270}	1.00	11705
RF10100WEBR							
RF10125WEBR	RF10125WEBF	11.0	{1120}	3.84	{390}	2.40	{240}
RF10150WEBR	RF10150WEBF						
RF12200WEBR	RF12200WEBF	18.6	{1900}	5.84	{600}	3.84	{390}
RF12250WEBR	RF12250WEBF	10.0	{1700}	5.04	10007	5.04	13705
RF17200WEBR	RF17200WEBF						
RF17250WEBR	RF17250WEBF	24.0	{2450}	9.87	{1010}	6.87	{700}
RF17300WEBR	RF17300WEBF						
RF26250WEBR	RF26250WEBF	30.9	{3150}	13.7	{1400}	9.59	{980}
RF26300WEBR	RF26300WEBF	30.7	{3130}	13.7	11400}	7.57	1700}
RF36300WEBR	RF36300WEBF	47.4	{4830}	19.3	{1970}	13.0	{1330}

### Chain Dimensional Chart

Standard Series, Standard Specifications (BR, BF), Anti-dust Specifications (DBR, DBF), Lube-Free Series, Lube-free Specifications (EBR, EBF)



		TSUBARICH	ain Number							Roller			
		130BARI CI				Pitch	R R	oller			F Roller		
	Standar	rd Series		Lube-fre	e Series	Р	Diameter	Contact Width	Diameter	Flange Diameter	Contact Width	Off-center	Ζ
Standard St	pecifications	Anti-dust Sp	pecifications	Lube-free S	pecifications		R	E	R	F	Е	е	Z
RF03075BR RF03100BR	RF03075BF RF03100BF			RF03075EBR RF03100EBR	RF03075EBF RF03100EBF	75 100	31.8	14	31.8	42	11	1.5	4.3
RF05100BR	RF05100BF	—	_	RF05100EBR	RF05100EBF	100					- /		
RF05125BR RF05150BR	RF05125BF RF05150BF	_	_	RF05125EBR RF05150EBR	RF05125EBF RF05150EBF	125 150	40	19	40	50	14	2.5	4.5
RF08125BR RF08150BR	RF08125BF RF08150BF			RF08125EBR RF08150EBR		125 150	44.5	23	44.5	55	18	2.5	6.5
RF10100BR		RF10100DBR	_	RF10100EBR	—	100			_	_	_	—	_
RF10125BR RF10150BR	RF10125BF RF10150BF	RF10125DBR RF10150DBR	RF10125DBF RF10150DBF	RF10125EBR RF10150EBR	RF10125EBF RF10150EBF	125 150	50.8	26	50.8	65	20	3	7
RF12200BR RF12250BR	RF12200BF RF12250BF	RF12200DBR	RF12200DBF RF12250DBF	RF12200EBR	RF12200EBF	200 250	65	32	65	80	24	4	8
RF17200BR RF17250BR RF17300BR	RF17200BF RF17250BF RF17300BF	RF17250DBR	RF17200DBF RF17250DBF RF17300DBF	RF17250EBR		200 250 300	80	44	80	100	34	5	12
RF26250BR RF26300BR RF26450BR	RF26250BF RF26300BF RF26450BF	RF26300DBR	RF26250DBF RF26300DBF RF26450DBF	RF26300EBR		250 300 450	100	50	100	125	38	6	13
RF36300BR RF36450BR RF36600BR	RF36300BF RF36450BF RF36600BF	RF36450DBR	RF36300DBF RF36450DBF RF36600DBF	RF36450EBR		300 450 600	125	56	125	150	42	7	14

		TSUBAKI CH	ain Number			Inner Link Inner Width	Plo	ate		Pi	'n		Approxim kg,	nate Mass /m
	Standa	rd Series		Lube-fre	e Series	W	Height	Thickness	Diameter	1.1	I	1	R Roller	F Roller
Standard Sp	pecifications	Anti-dust Sp	pecifications	Lube-free S	pecifications		Н	Т	D	$L_1 + L_2$	L <sub>1</sub>	L <sub>2</sub>	K Koller	r Koller
RF03075BR	RF03075BF	_			RF03075EBF	16.1	22	3.2	8.0	38	18	20	2.8	2.9
RF03100BR	RF03100BF				RF03100EBF	10.1	~~~	5.2	0.0	50	10	20	2.4	2.5
RF05100BR	RF05100BF		_		RF05100EBF								5.2	5.4
RF05125BR	RF05125BF	-	_	RF05125EBR		22	32	4.5	11.3	53.5	25	28.5	4.5	4.6
RF05150BR	RF05150BF	-		RF05150EBR									4.2	4.4
RF08125BR	RF08125BF	-	—	RF08125EBR		27	28.6	6.3	11.3	65.5	31	34.5	5.9	6.2
RF08150BR	RF08150BF			RF08150EBR	RF08150EBF			0.0				00	5.6	5.8
RF10100BR	—	RF10100DBR		RF10100EBR									10.0	_
RF10125BR	RF10125BF	RF10125DBR				30	38.1	6.3	14.5	69	33	36	8.7	9.0
RF10150BR	RF10150BF	RF10150DBR											8.0	8.3
RF12200BR	RF12200BF	RF12200DBR				37.1	44.5	7.9	15.9	83.5	40.5	43	11.6	12.1
RF12250BR	RF12250BF	RF12250DBR								00.0			10.4	10.8
RF17200BR	RF17200BF			RF17200EBR	RF17200EBF								20	21
RF17250BR	RF17250BF	RF17250DBR				51.4	50.8	9.5	19.1	109.5	51.5	58	17	18
RF17300BR	RF17300BF	RF17300DBR											16	16
RF26250BR	RF26250BF	RF26250DBR											26	27
RF26300BR		RF26300DBR				57.2	63.5	9.5	22.2	116.5	55.5	61	23	24
RF26450BR	RF26450BF	RF26450DBR											19	19
RF36300BR	RF36300BF	RF36300DBR											40	42
RF36450BR	RF36450BF	RF36450DBR				66.7	76.2	12.7	25.4	146	68	78	32	33
RF36600BR	RF36600BF	RF36600DBR	RF36600DBF	RF36600EBR	RF36600EBF								28	29

Note: See pgs. 43 and 44 for combining standard attachments with different roller types.

### Standard Series, BS Type



TSUBAKI Chain	Pitch	Roller	Inner Link	Plo	ate		Р	in		Approximate Mass
Number	Р	Diameter <i>R</i>	Inner Width W	Height <i>H</i>	Thickness T	Diameter D	L <sub>1</sub> +L <sub>2</sub>	Γ,	L <sub>2</sub>	kg/m
RF10100BS	100	29								6.8
RF10125BS	125		30	38.1	6.3	14.5	69	33	36	6.2
RF10150BS	150									5.8
RF12200BS	200	34.9	37.1	44.5	7.9	15.9	83.5	40.5	43	8.2
RF12250BS	250	34.9	37.1	44.5	/ .9	13.9	03.3	40.5	43	7.7

Note: See pgs. 43 and 44 for combining standard attachments with different roller types.

#### Lube-Free Series, Water Resistant Specifications (WEBR, WEBF)



		Pitch	D D.	oller		Roller	F Roller			Inner Link	Plo	ate		Pi	in			nate Mass / m
TSUBAKI Ch	ain Number	Plich	Diameter R	Contact Width	Diameter <i>R</i>	Flange Diameter F	Contact Width		Z	Inner Width W	Height H	Thickness T	Diameter D	L <sub>1</sub> +L <sub>2</sub>	L,	L <sub>2</sub>	R R Roller	F Roller
RF03075WEBR	RF03075WEBF	75	21.0	10.0	21.0	42	9.1	1 /	3	16.1	22	3.2	8.0	38	18	20	2.8	2.9
RF03100WEBR	RF03100WEBF	100	31.8	12.3	31.8	42	9.1	1.6	3	10.1	22	3.Z	8.0	30	10	20	2.4	2.5
RF05100WEBR	RF05100WEBF	100															5.2	5.4
RF05125WEBR	RF05125WEBF	125	40	17	40	50	13	2	4.5	22	32	4.5	11.3	53.5	25	28.5	4.5	4.6
RF05150WEBR	RF05150WEBF	150															4.2	4.4
RF08125WEBR	RF08125WEBF	125	44.5	21	44.5	55	17	2	6.5	27	28.6	6.3	11.3	65.5	31	34.5	5.9	6.2
RF08150WEBR	RF08150WEBF	150	44.5	21	44.5	55	17	2	0.5	27	20.0	0.5	11.5	05.5	51	54.5	5.6	5.8
RF10100WEBR	_	100			_	-	—	—	—								10.0	—
RF10125WEBR	RF10125WEBF	125	50.8	23	50.8	65	18.5	2.3	7	30	38.1	6.3	14.5	69	33	36	8.7	9.0
RF10150WEBR	RF10150WEBF	150			50.0	05	10.5	2.5	/								8.0	8.3
RF12200WEBR	RF12200WEBF	200	65	28	65	80	22	3	8	37.1	44.5	7.9	15.9	83.5	40.5	43	11.6	12.1
RF12250WEBR	RF12250WEBF	250	05	20	05	00	22	5	0	57.1	44.5	1.1	13.7	05.5	40.5	45	10.4	10.8
RF17200WEBR	RF17200WEBF	200															20	21
RF17250WEBR	RF17250WEBF	250	80	40	80	100	32	4	12	51.4	50.8	9.5	19.1	109.5	51.5	58	17	18
RF17300WEBR	RF17300WEBF	300															16	16
RF26250WEBR	RF26250WEBF	250	100	46	100	125	36	5	13	57.2	63.5	9.5	22.2	116.5	55.5	61	26	27
RF26300WEBR	RF26300WEBF	300	100	40	100	125	50	5	13	57.2	03.5	7.5	22.2	110.5	55.5		23	24
RF36300WEBR	RF36300WEBF	300	125	55	125	150	43	6	15.5	66.7	76.2	12.7	25.4	146	68	78	40	42

Note: See pgs. 43 and 44 for combining standard attachments with different roller types. Also, See pg. 39 for rail connection.

### Attachment Dimensional Chart

### A1/K1 Attachments

TSUBAKI Chain		Bearing oller Ty	0	Pitch	s	С	2C	x	2X	N	т	0	Bolt	Additional Mass/Each
Number	R Roller	F Roller	S Roller	Р	Ū		20	~	2/1			C	Used	kg
RF03075	0	0	-	75	20	30	60	46	92	55	3.2	10	M8	0.06
RF03100	0	0	-	100	20	00	00	40	12	65	0.2	10	1410	0.07
RF05100	0	0	-	100						65				0.07
RF05125	0	$\circ$	-	125	22	35	70	47	94	75	4.5	10	M8	0.08
RF05150	0	$\circ$	-	150						85				0.10
RF08125	0	0	-	125	28	50	100	64	128	80	6.3	12	м10	0.19
RF08150	0	0	-	150	20	50	100	04	120	90	0.5	12	14(10	0.23
RF10100	0	-	0	100						70				0.16
RF10125	0	0	0	125	28	50	100	67	134	80	6.3	12	M10	0.18
RF10150	0	0	0	150						90				0.20
RF12200	0	0	0	200	38	60	120	79	158	120	7.9	15	M12	0.44
RF12250	0	0	0	250	50	00	120	/ 7	150	170	1.7	15	INTZ	0.61
RF17200	0	0	-	200						120				0.64
RF17250	0	0	-	250	45	75	150	100	200	170	9.5	15	M12	0.88
RF17300	0	0	-	300						220				1.26
RF26250	0	0	-	250	55	80	160	108	216	170	9.5	15	M12	1.01
RF26300	0	0	-	300	55	00	130	108	210	220	7.5	15	INTZ	1.34

Note: Three-hole attachments may be sent for some attachment orders. If you receive a three-hole attachment, use the center hole.

### A2/K2 Attachments

TSUBAKI Chain		Bearing oller Ty		Pitch	S	С	2C	x	2X	N	к	т	0	Bolt	Additional Mass/Each
	R	F	S	Р	3		20		27		~	'	0	Used	
Number	Roller	Roller	Roller												kg
RF03075	0	0	-	75	20	30	60	46	92	55	30	3.2	10	M8	0.06
RF03100	0	0	-	100	20	50	00	40	12	65	40	5.2	10	1410	0.07
RF05100	0	0	-	100						65	40				0.07
RF05125	0	0	-	125	22	35	70	47	94	75	50	4.5	10	M8	0.08
RF05150	0	$\circ$	-	150						85	60				0.10
RF08125	0	0	-	125	28	50	100	64	128	80	50	6.3	12	м10	0.19
RF08150	0	0	-	150	20	50	100	04	120	90	60	0.5	12	/////0	0.23
RF10100	0	-	0	100						70	40				0.16
RF10125	0	0	0	125	28	50	100	67	134	80	50	6.3	12	M10	0.18
RF10150	0	$\circ$	0	150						90	60				0.20
RF12200	0	$\circ$	0	200	38	60	120	79	158	120	80	7.9	15	M12	0.44
RF12250	0	0	0	250	50	00	120	//	150	170	125	/./	15	////2	0.61
RF17200	0	0	-	200						120	80				0.64
RF17250	0	0	-	250	45	75	150	100	200	170	125	9.5	15	M12	0.88
RF17300	0	0	-	300						220	180				1.26
RF26250	0	0	-	250	55	80	160	108	216	170	125	9.5	15	M12	1.01
RF26300	0	0	-	300	55	00	130	108	210	220	180	7.5	15	10112	1.34

### A2 (Welded) Attachments

TSUBAKI Chain Number		Bearing oller Ty F Roller	0	Pitch P	S	С	2C	x	2X	N	к	0	Angle Used	Bolt Used	Additional Mass/Each kg
RF26450	0	0	-	450	55	80	160	123.5	247	320	280	15	L75×75×9	M12	3.19
RF36300	0	0	-	300						160	100		L100×100		2.4
RF36450	0	0	-	450	70	100	200	160	320	330	280	19	×10	M16	4.9
RF36600	0	0	-	600						410	360		~ 10		6.1





### SA2/SK2 Attachments

TSUBAKI Chain		Bearing oller Ty		Pitch	S,	<b>S</b> <sub>2</sub>	Q,	Q	N	к	Т	0	Bolt	Additional Mass/Each
Number	R Roller	F Roller	S Roller	P		<b>U</b> <sub>2</sub>		<b>G</b> <sub>2</sub>		~	1		Used	kg
RF03075				75					55	30				0.06
	<u> </u>				33	49	15.5	11.5			3.2	10	M8	
RF03100	0	-	-	100					65	40				0.07
RF05100	0	-	-	100					65	40				0.07
RF05125	0	-	-	125	33.4	50.7	21	15.5	75	50	4.5	10	M8	0.08
RF05150	0	-	-	150	1				85	60				0.10
RF08125	0	-	-	125	46.1	60.7	27	20	80	50	6.3	12	M10	0.19
RF08150	0	-	-	150	40.1	60.7	2/	20	90	60	0.3	12	MIU	0.23
RF10100	0	-	0	100					70	40				0.16
RF10125	0	-	0	125	46.1	63	28.5	21.5	80	50	6.3	12	M10	0.18
RF10150	0	-	0	150	1				90	60				0.20
RF12200	0	-	0	200	55	75.7	35.5	26.5	120	80	7.9	15	M12	0.44
RF12250	0	-	0	250	55	/3./	35.5	20.5	170	125	7.7	15	INTZ	0.61



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Duty

### **GA2** Attachments

TSUBAKI Chain		Bearing oller Ty		Pitch	к	т	QI	Q2	А	0		ength of ed Bolt	Bolt
Number	R Roller	F Roller	S Roller	Р	ĸ	1	QI	QZ	A	0	Outer Link	Inner Link	Used
RF03075	0	-	-	75	30		155	11.5	10.5	0	0/	10	
RF03100	0	-	-	100	50	3.2	15.5	11.5	13.5	8	26	19	M6
RF05100	0	-	-	100	40								
RF05125	0	0	-	125	50	4.5	21	15.5	15	10	36	26	M8
RF05150	0	0	-	150	60								
RF08150	0	0	-	150	60	6.3	27	20	20	12	45	31	M10
RF10100	-	-	0	100	30								
RF10125	0	-	0	125	40	6.3	28.5	21.5	20	12	49	35	M10
RF10150	0	0	0	150	60								
RF12200	0	0	0	200	80	7.9	35.5	26.5	26	15	63	45	M12
RF12250	0	0	0	250	125	/./	55.5	20.5	20	15	00	45	14(12
RF17200	0	0	-	200	70								
RF17250	0	0	-	250	110	9.5	45.5	35	26	15	81	61	M12
RF17300	0	0	-	300	150								
RF26300	0	0	-	300	140	9.5	48.5	38	26	15	88	67	M12
RF26450	0	0	-	450	220	7.5	40.0	50	20	.5			1112
RF36450	0	0	-	450	220	12.7	60	46	32	19	105	75	M16
RF36600	0	0	-	600	300	12.7	00	40	52	17	105	,5	14110



Note:

Note: 1. A attachment mass in the chart refers to additional mass per attachment. Multiply that number by two for K attachments. 2. GA2 attachment mass is the same as that of the base chain. 3. Three-hole attachments may be sent for A1 or K1 attachment orders. If you receive a three-hole attachment, use the center hole. 4. Consult a Tsubaki representative if using a guide on A/K attachment sides. 5. When using slats attached to two strands of chain, be sure that slats are attached to either outer link-outer link or inner link-inner link. 6. Inch sizes also available. (Consult a Tsubaki representative for further details.)



# **Specialty Conveyor Chain**

## **Specialty Conveyor Chains**

Application	Name	Features	Photo	Chain Number	Page
Indexing Conveyance	Needle Bushing Conveyor Chain	Features needle bearings between the pin and bushing. Reduces wear elongation to the absolute minimum possible. Suitable for index positioning and tact conveyance.	A Proposition	RF05100R-NB	46
	Double Plus Conveyor Chain	Conveyance speed is 2.3 times chain speed thanks to the size difference between its large and small diameter rollers.		RF05100VR	48
Free Flow Conveyance	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.	A CAR A CAR	Top Roller Material Code TRN(Untreated specifications) TRH(Hardened specifications)	49
	Outboard Roller Conveyor Chain	An outboard roller is attached to the S roller of any conveyor chain specification.		Outboard Roller Material Code SRN(Untreated specifications) SRH(Hardened specifications)	50
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.		RF12200R-DL-DT	51
Lube-free Conveyance	Lambda Plastic Roller Conveyor Chain	Over seven times the pin-bushing and bushing-roller wear life of DT Series without lubrication.	B. B. B. B. B.	RF03100RP-LMC	52
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.	(0 ··· · ···	СТ90300	53
Bucket Elevator Conveyance	Bucket Elevator Conveyor Chain	This specialty chain features high wear resistance and fatigue strength.		BI2200S-CT-2LGA4	54
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.	-	RF17250M-DT-1LKL45	56
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.	S	RF12250F-KG	63
Wear Resistance	Shoulder Bushing Conveyor Chain	The outer dimensions of this chain are the same as standard conveyor chain, but the bushing outer diameter is larger, which raises the roller allowable load.	S	RF12200F-DB	65
Special Applications	Block Chain	This strong chain features a simple construction with superior rigidity. It has high tensile strength for its mass.	(0)	NF56200	66

## **Needle Bushing Conveyor Chain**



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

tact conveyance.



Applic Chain







TSUBAKI Chain		m Allowable		Allowable	Pitch	Roller	Inner Link Inner		Pla	ate			Pin		Approximate
Number		ension		oad	P	Diameter R	Width W	Height	0	-	Thickness	Diameter	L,	L <sub>2</sub>	Mass kg/m
	kN	{kgf}	kN	{kgf}		ĸ	VV	h	H	$H_1$	Т	D	-1	-2	Kg/m
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	Pitch				Attachment					er Attachment g
Number	Р	S	С	X	К	N	Т	0	A2	К2
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.

### Needle Bushing Conveyor Chain Selection

- 1. R roller rotational coefficient of friction: 0.21
- 2. Chain speed: max. 30m/min
- 3. Operating temperature: -10℃ to 60℃
- 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 bushing 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 Needle Bushing Conveyor Chain

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



#### Sprocket Hole Processing

Elongation

Near

Tsubaki will process shaft holes and keyways upon request. Please include the following information in your request. Shaft hole diameter and clearance :

Wear Elongation Performance Comparison

Tsubaki

Needle Bushing Chain

Tsubaki Conveyor Chain

- 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 Needle Bushing 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.

	_		Pitch	Outer	Tooth	Shaft Di	ameter d	Hub	Hub	Center	Approximate	
TSUBAKI Sprocket Number	No. of Teeth	Series	Diameter Dp	Diameter Do	Width T	Pilot Hole	Maximum	Diameter	Length	Distance to Shaft I	Mass kg	Material
RF03075R-NB-8T RF03075R-NB-10T RF03075R-NB-12T	8 10 12	BW	196.0 242.7 289.8	209 259 308	11.9	18 18 18	55 60 60	83 93 93	62 67 67	56 61 61	4.8 7.1 9.0	Carbon steel for machinery use
RF05100R-NB-8T RF05100R-NB-10T RF05100R-NB-12T	8 10 12	BW	261.3 323.6 386.4	272 340 405	18.0	28 33 33	75 80 85	107 117 127	86 94 104	77 85 95	12.0 17.4 24.4	Carbon steel for machinery use
RF10150R-NB-8T RF10150R-NB-10T RF10150R-NB-12T	8 10 12	BW	392.0 485.4 579.6	408 506 601	22	38 38 38	100 110 115	147 157 167	123 133 144	112 122 133	33.2 47.6 65.2	Carbon steel for machinery use
RF12200R-NB-8T RF12200R-NB-10T RF12200R-NB-12T	8 10 12	BW1	522.6 647.2 772.7	551 682 810	28	60 65 75	120 130 145	177 187 207	1 <i>5</i> 0 1 <i>6</i> 0 180	125 135 155	67.4 96.6 136.9	Carbon steel for machinery use
RF17200R-NB-8T RF17200R-NB-10T RF17200R-NB-12T	8 10 12	BW1	522.6 647.2 772.7	562 691 821	40	75 75 80	145 145 160	207 207 227	180 180 200	148 148 168	98.1 134.0 190.1	Carbon steel for machinery use
RF26250R-NB-8T RF26250R-NB-10T RF26250R-NB-12T	8 10 12	BW1	653.3 809.0 965.9	703 864 1026	45	80 85 85	160 175 175	227 247 247	200 240 240	164 204 204	159.7 244.1 321.4	Carbon steel for machinery use
RF36300R-NB-8T RF36300R-NB-10T RF36300R-NB-12T	8 10 12	BW1	783.9 970.8 1159.1	853 1046 1234	55	95 95 100	190 190 210	267 267 297	240 270 260	198 228 218	276.2 398.9 550.8	Carbon steel for machinery use

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 suspension hole near the teeth.



Operating Time

## **Double Plus Conveyor Chain** (Free Flow Conveyance)



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	Pitch	Ro	ller		Height		Plo	ate		Pi	'n		В	G	Maximum Allowable Tension	Roller Allowable Load	Approximate Mass
Number	Р	R <sub>1</sub>	R	$W_1$	<i>W</i> <sub>2</sub>	W	Т	Н	D	$L_1 + L_2$	L	L <sub>2</sub>	D	0	kN{kgf}	kN{kgf/each}	
RF03075VR	75	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
RF03100VR	100	42.0	51.0	12	0.5	50	5.2	~~~	0.0	51.5	24.5	27	50.7	14.5	4.12(420)	1.27 [130]	4
RF05100VR	100																8
RF05125VR	125	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}	7
RF05150VR	150																6
RF10125VR	125	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
RF10150VR	150	07.0	50.0	20	14	54	0.5	30.1	14.5	75	45	40	50.7	25	13.7{1000}	3.43{330}	12
RF06205VR	152.4	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
RF12200VR	200	/ 5.5	57.2	~~~	10	02	1.7	44.5	13.7	100.5	55	55.5	00.5	20	20.3(2700)	4.70(300)	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



## Top Roller Conveyor Chain (Free Flow Conveyance)



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)

#### 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)
- Conveying and stopping can be performed simultaneously on top of the same chain. (Fig. 1)
  Alleviates shock impact during operation. (Fig. 2)

Sprocket teeth tips and top rollers will not touch with this chain. A specialty sprocket is required.





Fig. 3 Example of attachment to prevent toppling





TSUBAKI	Pitch	Ro	ller	Inner Link Inner	Plo	ate	P	in	-	Top F	Roller			Chain Approximate	Additional Mass per	Top Roller Al kN{kgf	lowable Load /each}
Chain Number	P	Diameter <i>R</i>	Contact Width E	Width	Height <i>H</i>	Thickness T	L	L <sub>2</sub>	S	R <sub>1</sub>	E,	В	Туре	Mass kg/m	Top Roller kg	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 1 <i>5</i> 0	40	19	22	32	4.5	25	28.5	30	40	19	70	Ι	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	Ι	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	Ι	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	Ι	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	Ι	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	Π	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.



## **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.

With Special Attachment (Fig. 1)

- 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)









[Outboard Roller F]



	Pitch	Roller	Inner Link	Plo	ate	Total	Out	board R	oller F R	oller	Outboo	ard Roller	R Roller	Additional Mass of		able Load kN{kgf}
TSUBAKI Chain Number	Р	Diameter R	Inner Width W	Height <i>H</i>	Thickness T	Width <i>K</i>	А	В	G	Z	A	G	Z	OR (both sides) kg	OR Untreated	OR 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 1 <i>5</i> 0	22.2	22	32	4.5	102	40	50	14	55	40	19	46.5	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 1 <i>5</i> 0	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. 2. Basic chain specifications are the same as RF Conveyor Chain.



## **Deep Link Conveyor Chain Direct Conveyance**



#### Applications

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

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.

- 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.



TSUBAKI	Pitch	Ro	ller	Inner Link	Chain		Plate		Р	in	Approximate		r Allowable :N{kgf}/eac			nsile Strength kg f}
Chain Number	Р	Diameter <i>R</i>	Contact Width E	Inner Width W	Height <i>H</i>	$H_1$	$H_2$	Thickness $_{\mathcal{T}}$	L	L <sub>2</sub>	Mass kg/m	DT Series	AT Series	Bearing Roller	DT Series	AT Series
RF03075R-DL RF03010R-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{3000}	70{7100}
RF05100R-DL RF05150R-DL	100 1 <i>5</i> 0	40	19	22	44	24	4	4.5	25	28.5	5.9 4.9	1.03{105}	1.72{175}	3.04{310}	69{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{8000}	142{14500}
RF10150R-DL RF10200R-DL	1 <i>5</i> 0 200	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: Roller diameters marked with \* are different from RF Conveyor chain diameters and require a special sprocket.



## Lambda Plastic Roller Conveyor Chain



#### 1. Lube-free, long life

Wear life between pin-bushing and bushing-roller is seven times that of DT specs while being lube-free. 2 Low noise

- 5-7db quieter than steel rollers. No grating sound when roller rotates.
- 3. Low running resistance

55% lower than steel rollers. (Unlubricated) Clean 4.

Suppresses generation of metal wear dust. 5. Lightweight

7

{kgf}

{190}

{200}

{340}

{480}

{530}

kΝ

1.86

1.96

3.33

4.71

5.20

- 30% lighter than steel rollers.
- Compatible 6.

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.)

8

{kgf}

{200}

{200}

{430}

{530}

{530}

kΝ

1.96

1.96

4.21

5.20

5.20

9

{kgf}

{200}

{200}

{530}

{530}

{530}

kΝ

1.96

1.96

5.20

5.20

5.20

#### Maximum Allowable Tension

kΝ

1.47

1.86

2.65

3.74

4.90

6

{kgf}

{150}

{190}

{270}

{380}

{500}

Sprocket Teeth

	Materi	al	Usage	Roller Rotational	Chain	Sprocket
Roller	Bushing	Other Parts	Temperature	Coefficient of Friction	Speed	эргоскег
Engineering Plastic	Special Oil Impregnated Bushing	Steel	0℃ to 50℃	0.07 (lube-free)	25m/min or less	RF Standard Sprocket

Note

Specifications

 Link plates are black-coated carbon steel.
 Roller coefficient of friction values assume a low dust, room temperature, indoor environment.

Note:

TSUBAKI

Chain Number

RF03075-LMC

RF03100-LMC

RF05100-LMC

RF05125-LMC

RF05150-LMC

R roller max. allowable tension values shown above are for chain speeds under 25m/min.

2. F rollers have 70% of the above values.

3. Refer to selection pages for chain tension calculations.





TSUBAKI	Pitch	RP R	oller		F	P Rolle	r		Inner Link Inner Width	Plo	-		Pi	'n			llowable (each)	Approximate Mass	Attachment
Chain Number	Ρ	Diameter <i>R</i>	Contact Width E	Diameter <i>R</i>	Flange Diameter F	Contact Width E	Off-center e	Ζ	W	Height <i>H</i>	Thickness T	Diameter D	$L_1 + L_2$	L	L <sub>2</sub>	kΝ	{kgf}	kg/m	Туре
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	Α
RF03100-LMC	100	31.0	15.5	31.0	42	IZ	1.0	4.3	10.1	22	3.Z	0.0	30	10	20	0.49	{30}	1.7	к
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 Ordering Example Chain Size: RF03, Pitch: 100mm RF03100RP-LMC-1LK2 Roller Type: Engineering Plastic R roller Quantity: 400 links Attachment Type Attachment Spacing Chain Size Chain Number Quantity Unit Roller Type Chain Type LMC: Lambda Plastic Roller RP: Engineering Plastic R Roller FP: Engineering Plastic F Roller 400 RF03100RP-LMC 1 Conveyor Chain

Unit : kN{kgf}

10

{kgf}

{200}

{200}

{530}

{530}

{530}

kΝ

1.96

1.96

5.20

5.20

5.20

## 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 bushing.
- 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	Pitch	Ro	ller	Inner Link	Plate		Chain	Height				Pin			Approximate	Maximum Allowable	Roller	Average
Chain Number	P	Diameter <i>R</i>	Contact Width E	Inner Width	Thickness T	Н	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	Diameter		$L_1 + L_2$	L <sub>1</sub>	L <sub>2</sub>	Mass (kg/m)	Tension kN{kgf}	Allowable Load kN{kgf/each}	Tensile Strength kN{kgf}
CT60300 CT60400 CT60500	300 400 500	125	60	65	12.7	171	42.5	108.5	20	D 28	D <sub>1</sub> 36	165	88	77	90 82 78	83.3 {8500}	29.4 {3000}	588 {60000}
СТ90300 СТ90400 СТ90500	300 400 500	135	65	79	12.7	182.5	54	115	13.5	30	36	179	95	84	99 91 87	126 {12800}	35.3 {3600}	883 {90000}
CT130300 CT130400 CT130500	300 400 500	1 <i>5</i> 0	70	84	16	195	61	120	14	38	46	197	104	93	123 112 105	181 {18500}	42.2 {4300}	1270 {130000}
CT160400 CT160500 CT160600	400 500 600	175	80	91	16	227	69	139.5	18.5	41	46	205	108	97	135 126 118	224 {22800}	55.9 {5700}	1 <i>5</i> 70 {160000}
CT200600	600	180	90	102.6	19	225	76	135	14	45	50	229	119	110	141	279 {28500}	64.7 {6600}	1960 {200000}

Note: Roller allowable load values are when rail tensile strength is 400N/mm<sup>2</sup>{41kgf/mm<sup>2</sup>}.

	Ordering Coil Transfer Conveyor Chain	
Chain Numbering Example	Ordering Example	ble
<u>CT90300</u>	Chain Size: CT90, Pit Quantity: 400 links	ch: 300mm
Chain Size Pitch	Chain Nu CT903	· · · · · · · · · · · · · · · · · · ·

ial Applic Chain

## **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	Pitch	Roller	Inner Link	Pla	ate		Pin				A	verage Ter	nsile St	rength		
Chain Number	P	Diameter	Inner Width	Height	Thickness	$L_1 + L_2$	L,	L <sub>2</sub>	CT	Series	BT	Series	RT	Series	Y	Series
		R	W	Ĥ	Т	L1+L2	L1	L <sub>2</sub>	kN	{kgf}	kN	{kgf}	kN	{kgf}	kN	{kg f}
B10150S	150	29	30	38.1	6.3	69	33	36	113	{11500}	226	{23000}	113	{11500}	191	{19500}
B12006S	152.4	24.0	37.1	44.5	7.9	83.5	40.5	43	10/	(10000)	279	(00,000)	10/	(10000)	070	(20,500)
B12200S	200	34.9	37.1	44.5	7.9	83.3	40.5	43	180	{19000}	2/9	{28500}	180	{19000}	2/9	{28500}
B17200S	200	(0.1	51.4	50.0	0.5	100.5	<b>51 5</b>	50	0.45	(0.5000)	0.07	(00500)	0.45	(0.5000)	070	(00.500)
B17250S	250	40.1	51.4	50.8	9.5	109.5	51.5	58	245	{25000}	387	{39500}	245	{25000}	378	{38500}
B26200N	200					117	57									
B26250N	250	50.8	57.2	63.5	9.5	117	56	61	299	{30500}	564	{57500}	299	{30500}	461	{47000}
B26300N	300					129.5*	68.5*									
B36250N	250					147	69									
B36300N	300	57.2	66.7	76.2	12.7	1.50		78	-	_	868	{88500}	-	-	765	{78000}
B36350N	350					159*	81*									
B60300N	300					170										
B60350N	350	70	77	90	12.7	172*	88*	84	-	_	1040	{106000}	_	-	843	{86000}
B60400N	400					177*	93*									
B90350N	350					197.5*	102*									
B90400N	400	85	88	100	16	201.5*	106*	95.5	-	—	1630	{166000}	-	-	1334	{136000}
B120400N	400	100	100	130	19	227.5*	119.5*	108	-	_	2210	{225000}	-	-	1814	{185000}

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



#### GA4 Attachment

TSUBAKI Chain Number	Р	v	к	Y	Т	Q	A	0	θ	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	7.9	35.5	20	15	90	M14	10
B17200S	200	120	100	80	9.5	45.5	26	15	90°	M14	14
B17250S	250	150	140	100	9.5	45.5	32	19	90	M16	15
B26200N	200	120	100	80	0.5	40	26	15	90°	M14	20
B26250N	250	150	140	100	9.5	48 32		19	90	M16	19
B36250N	250	150	140	100	12.7	60	32	19	90°	M16	30

#### GA4 Attachment (Double Plated)

TSUBAKI Chain Number	Р	V	к	Y	Т	Q	А	0	θ	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	16	81	50	35	60°	M30	46
B90350N	350	240	200	170	12	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 bushing is pressfitted into the pin hole of the connecting link plate, creating a slip-fit between pin and bushing.

TSUBAKI Chain Number	Pitch P	D	L <sub>1</sub>	L <sub>2</sub>	$L_1+L_2$	Т
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





## **Flow Conveyor Chain**

### Horizontal Flow Conveyor Chain



#### Standard Free Flow 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 Chain, 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 of corrosive coal dust.

Chair



	Old Chain	Case Inner	Pitch	Roller	Inner Link	Ple	ate	Average Tensile	Strength kN{kg f}
TSUBAKI Chain Number	Number	Width	P	Diameter <i>R</i>	Inner Width W	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	21.0	20	20.1	( )	112(11500)	224(22000)
RF10150M		270	150	31.8	30	38.1	6.3	113{11500}	226{23000}
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)	297(20500)
RF17250M		450	250	44.5	51.4	50.6	9.5	245{25000}	387{39500}
RF26200M	F8, FA8	410	200					314{32000}	520{53000}
RF26250N		450	250	50.8	57.2	63.5	9.5	299{30500}	564{57500}
RF26300N		580	300					299{30500}	564{57500}
RF36300M		500	200	67.0		74.0	10.7	476{48500}	682{69500}
RF36300N	F12, FA12	580	300	57.2	66.7	76.2	12.7	-	868{88500}

TSUBAKI Chain Number	Wing Width	L Atta	chment	KL Atto	achment	B Atta	chment		2V(U2V Attachmer	•	w	Attachm	ient
130DANI Chain Number	2X	Height S	Mass kg/m	Height S	Mass kg/m	Height S	Mass kg/m	Height S	С	Mass kg/m	Height S	С	Mass kg/m
RF450WM	135	28	6.5	28	6.5	55	7.4	80	60	9.1	80	80	8.1
RF08125WM	185	28	6.5	28	6.5	80	8.2	115	85	10.1	115	85	10.3
RF10125M	185	32	8.1	32	8.1	80	8.9	115	85	10.1	115	85	11.3
RF10150M	250		8.1	32	0.1	100	9.8	140	105	12	140	105	13.0
RF6205M	250	38	12	38	12	100	14.4	140	105	18.5	140	105	17.2
RF12200M	330	40	12	38	12	125	16.3	185	130	20	185	130	22.6
RF17200M	330	46	17	46	17	125	18.7	185	130	23	185	130	26.3
RF17250M	430	40	17	40	17	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	58	23	58	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	70	34	70	34	200	37	290	160	40	290	160	61.3
RF36300N	560	70		70	34	200	3/	270	100	40	290	100	01.3

### 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





### Flow Conveyor Chain for Grain

P

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	Case Inner	Pitch	Roller	Inner Link	Plo	ate	Attac	nment	Clee	aner	Approximate	Average Te	nsile Strength
Chain Number	Width	P	Diameter <i>R</i>	Inner Width W	Height <i>H</i>	Thickness T	Wing Width 2X	Height S	Width CX	Height <i>CS</i>	Mass kg/m	DT : kN	Series {kgf}
	110	75	15.9	16.1	22	3.2	95	20	105	28	2.1	29.4	{3000}
	150	101.6	20.1	22.6	25.4	4.8	135	22	145	32	3.4	53.9	{5500}
RF450S	150	101.6	22.2	27	28.6	6.3	135	25	145	34	5.0	78.5	{8000}
RF08125S	200	125	22.2	27	28.6	6.3	185	25	195	34	5.0	78.5	{8000}
RF10125S	200 240	125	29	30	38.1	6.3	185 225	32	195 235	47	6.8 7.3	113	{11500}
RF101 <i>5</i> 0S	270 320	1 <i>5</i> 0	29	30	38.1	6.3	250 300	32	265 315	47	6.9 7.2	113	{11500}
RF6205S	270	152.4	34.9	37.1	44.5	7.9	250	38	265	53	10.5	186	{19000}
RF12200S	350	200	34.9	37.1	44.5	7.9	330	38	345	53	10.3	186	{19000}
RF17200S	350 450	200	40.1	51.4	50.8	9.5	330 430	46	345 445	58	14.0 16.0	245	{25000}
RF26200S	450	200	44.5	57.2	63.5	9.5	430	58	445	68	21.0	314	{32000}



### Inclined Flow Conveyor Chain





UK (Square) Attachment (Wing span 2x: over 500)

UM (Round) Attachment (Wing span 2x: under 500)







U Attachment

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

### 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

TSUBAKI	( hain		Pitch		Inner Link	Plo	ate	Wing	-	Attachm	ient	U2(U2	2N) Attac	hment	Average Tensile S	itrength kN{kgf}
Chain Number	Chain Number	Width	Р	Diameter <i>R</i>	Inner Width	Height <i>H</i>	Thickness T	Width 2X	Height S	С	Mass kg/m	Height S	С	Mass kg/m	DT Series	AT Series
RF450WM	F4 FW4	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	F6 FW6	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	F8	410	200	50.8	57.2	63.5	9.5	390	220	100	30.9	220	100	33.3	314{32000}	520{53000}
RF26200N	FA8	410	200	50.8	57.2	03.5	9.5	390	220	100	30.9	220	100	33.3	299{30500}	564{57500}
RF36300M	F12	500	300	57.2	66.7	76.2	12.7	480	260	120	42.5	260	120	44.8	476{48500}	
KF30300/M	FIZ	600	300	57.2	00.7	70.2	12.7	580	305	140	47	305	140	48.1	470{40300}	_
RF36300N	FA12	500	300	57.2	66.7	76.2	12.7	480	260	120	42.5	260	120	44.8		868{88500}
KE30300IN	FAIZ	600	300	57.2	00.7	70.2	12.7	580	305	140	47	305	140	48.1	—	{000{00300}

### **Ordering Inclined Flow Conveyor Chain**

#### Chain Numbering Ordering Example Chain Size: RF6205, Pitch: 152.4mm, Roller Type: M Roller RF6205M-DT-1LUM32 Chain Specs: Standard DT Series Attachment Spacing/Type: U attachment every Link - Inner Case Width Inner Case Width: 320mm Attachment Type Quantity: 400 links Chain Size -Attachment Spacing Roller Type Chain Number Quantity Unit -Chain Specs RF6205M-DT-1LUM32 400 L

## Fly Ash Conveyor Chain FA Series



#### (Pat. No. 371948) 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 specifications and implemented a special hardening treatment that gives remarkable strength to the rollers' anti-wear properties, greatly increasing wear life.





**Operating Time** 

#### Applications

Wear

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.



**FA Series** 

#### Note:

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



BT Series (Wea

〈Wear Comparison〉

## Fly Ash Conveyor Chain FA Series (Horizontal Conveyance)



	Nominal	Case Inner	Pitch	Roller	Inner Link	Plo	ate	Average Ten	sile Strength
TSUBAKI Chain Number	Size	Width	P	Diameter	Inner Width	Height	Thicknes	FA S	
				R	W	Н	Т	kN	{kg f}
RF17200M	35	350	200	44.5	51.4	50.8	9.5	387	{39500}
RF17250M	45	450	250	44.5	51.4	50.8	7.5	567	{37300}
RF26200M	41	410	200					520	{53000}
RF26250N	45	450	250	50.8	57.2	63.5	9.5	564	{57500}
RF26300N	58	580	300					564	{57500}
RF36300N	58	580	300	57.2	66.7	76.2	12.7	868	{88500}
RF36350N	75	750	350	57.2	00.7	70.Z	12.7	000	{00003
RF60350N	75	750	350	70	77	90	12.7	1040	{106000}

TSUBAKI Chain Number	Wing Width	L Attachment		KL Atta	chment	B Atta	chment		2V(U2V Attachmer	•	w	Attachm	ent
130BARI Chain Number	2X	Height S	Mass kg/m	Height S	Mass kg/m	Height S	Mass kg/m	Height S	С	Mass kg/m	Height S	С	Mass kg/m
RF17200M	330	46	17	46	17	125	18.7	185	130	23	185	130	26.3
RF17250M	430	40	17	40	17	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	58	23	58	23	160	25	230	135	29	230	135	35.7
RF26300N	560		23		23	200	27	290	160	30.6	290	160	53.0
RF36300N	560	70	34	70	34	200	37	290	160	40	290	160	61.3
RF36350N	720	84	36	70	36	240	47	350	180	67	350	180	76.3
RF60350N	720	84	46	84	46	240	54	350	180	75	350	180	85

## Fly Ash Conveyor Chain FA Series (Inclined Conveyance)











U2 Attachment U2N Attachment

TSUBAKI	Nominal	Case Inner	Pitch	Roller	Inner Link	Plo		Wing	U A	Attachm	ient	U2(U2	N) Attac	hment	Average Ten	sile Strength
Chain Number	Size	Width	Р	Diameter		rieigin	Thickness	Width	Height	С		Height	С	Mass	FA S	
				R	W	Н	T	2X	S		kg/m	S		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															520	{53000}
RF26200N	41	410	200	50.8	57.2	63.5	9.5	390	220	100	30.9	220	100	33.3	564	{57500}
	50	500				7/0	107	480	260	120	42.5	260	120	44.8	0.40	(00,500)
RF36300N	60	600	300	57.2	66.7	76.2	12.7	580	305	140	47	305	140	48.1	868	{88500}

## **Waste Treatment Conveyor Chain**

Waste Treatment Conveyor Chain is a specialty chain used in waste treatment processes. It has been thoroughly checked for wear patterns in ever process to ensure safety.



### **Chain Dimensions**

TSUBAKI	Roller	D'L			R	oller Typ	e			Inner	PL	ate		P	'n	
Chain Number	Type	Pitch P	R Ro	oller			F Roller			Width	T K	lie				
Chain Nomber	1700		R	Е	R	F	Е	е	Ζ	W	Н	Т	D	L	L <sub>1</sub>	L <sub>2</sub>
RF03075	R, F	75	31.8	14.5	31.8	42	11	1.8	3.8	15.1	22	3.2	8.0	38	20	18
RF03100	R, F	100	31.0	14.5	31.0	42	11	1.0	5.0	15.1	22	3.2	0.0	30	20	10
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	28.5	25
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	11.3	69	36	33
RF10150	R, F	150														
RF12200	R, F	200	65	32	65	80	24	4	8	35.1	44.5	7.9	14.5	83.5	43	40.5
RF12250	R, F	250	65	32	05	80	24	4	0	35.1	44.5	7.7	14.5	63.5	43	40.5
RF17200	R, F	200	80	44	80	100	34	5	12	49.4	50.8	9.5	15.9	109.5	58	51.5
RF17250	R, F	250	50	44	50		54	5	12	47.4	50.8	7.5	13.7	109.5	50	51.5
RF26250	R, F	250	100	50	100	125	38	6	13	55.2	63.5	9.5	19.1	116.5	61	55.5
RF26300	R, F	300	100	50	100	125	50	5	15	55.2	05.5	7.5	17.1	110.5	01	55.5

#### **Specification Codes**

Name of Conveyor in Each	Waste	See	ries	F	Performance	e per Proces	s
Treatment Process		50	les	Wear	Corrosion	Poor Articulation	Poor R Roller Rotation
Receiving/Supplying Con	veyor	KG	KA	O		0	0
	Dry	AG	AA	0		0	0
Ash Conveyor	Wet	AM			0	0	0
	wer	A	νP		0	0	0
Els Ash Comercor	Normal	F	G	0		0	0
Fly Ash Conveyor	Corrosive	F	P		0	0	0
Molten Slag Conveyor	Molten Slag Conveyor		Έ	0	0	0	0

Performance: ◎ Optimal ○ Suitable \*Each specification has been optimized for the needs of that individual process. \*KA and AA specs are reinforced versions of KG, AG, and AM specs. (2x the tensile strength)

Chain



### **Attachment Dimensions**

TSUBAKI Chain Number	Roller Type		At	A2 tachment						A2 hment			A2 CA2	GA2	At	GA4 tachme	ent		GA2 GA4	
Chain Number	1700	С	X	К	N	S	С	X	К	N	S	Т	0	К	V	Y	К	А	0	Q
RF03075 RF03100	R, F R, F	30	46	30 40	55 65	20	35	46	30 40	55 65	0	3.2	10	30 50	_		_	13.5	8	15.5
RF05100	R, F			40	65				40	65				40			—			
RF05125	R, F	35	47	50	75	22	40	52	50	75	3	4.5	10	50	—		—	15	10	21
RF05150	R, F			60	85				60	85				60	—	—	—			
RF10100	R			40	70				40	70				30	_		—			
RF10125	R, F	50	67	50	80	28	50	65	50	80	4	6.3	12	40	_		—	20	12	28.5
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	00	/9	125	170	30	00	/9	125	165	5	7.9	15	125	—		—	20	15	35.5
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	/5	100	125	170	45	/5	70	125	165	0	7.5	15	110	150	100	140	20	15	45.5
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	00	100	180	220	55	00	105	180	220	0	/.5	13	140	150	100	180	20	13	40.5



## **Shoulder Bushing Conveyor Chain**



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







**F** Roller

	Roller								Inner Link	Plo	ate		Pi	'n		Roller Allowab	le Load kN{kgf}	Approxim	nate Mass	
TSUBAKI	Roller	Pitch	R R	oller			F Roller	-			Height	Thickness	Diameter				DT	GT · AT		
Chain Number	Туре	Ρ	Diameter	Contact Width	Diameter	Flange Diameter	Contact Width	Off-center	z	W	H	T	D	$L_1 + L_2$	L	$L_2$	Series	Series	R Roller	F Roller
			R	Ε	R	F	Е	е	2	VV	11	1	D				Series	Jeries		
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	3.38	10	-
RF10150-DB	R, F	150	50.0	2/	50.0	05	20	5	/	50	50.1	0.5	14.5	07	55	50	{210}	{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	5.00	12.2	12.6
KF0203-DD	К, Г	152.4	57.Z	32	57.Z	/0	25	3.5	7	37.1	44.5	1.7	15.7	03.5	40.5	43	{310}	{510}	12.2	12.0
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	5.00	11.6	12.1
RF12250-DB	R, F	250	05	32	05	00	24	4	0	37.1	44.5	1.7	15.7	03.5	40.5	43	{310}	{510}	10.4	10.8
RF17200-DB	R, F	200															4.00	0.04	20	21
RF17250-DB	R, F	250	80	44	80	100	34	5	12	51.4	50.8	9.5	19.1	109.5	51.5	58	4.09	8.04	17	18
RF17300-DB	R, F	300															{500}	{820}	16	16
RF26250-DB	R, F	250															( )7	10 (	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	10.6	23	24
RF26450-DB	R, F	450															{650}	{1080}	19	19
RF36300-DB	R, F	300															0.70	144	40	42
RF36450-DB	R, F	450	125	56	125	150	42	7	14	66.7	76.2	12.7	25.4	146	68	78	8.73	14.4	32	33
RF36600-DB	R, F	600															{890}	{1470}	28	29

Note

1. 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 Bushing Conveyor Chain**

Chain Numbering Example	Ordering Example
RF12200F-DB-AT-1LA2	Chain Size: RF12, Pitch: 200mm, Roller Type: F Roller Chain Specifications: Shoulder Bushing/AT Series Attachment Spacing/Type: A2 every Link Quantity: 400 links
Chain Size — Attachment Spacing — Chain Specifications	Chain Number Quantity Unit
Roller Type Chain Specifications Chain Specifications	RF12200F-DB-AT-1LA2 400 L

#### **Block Chain** Simple, Yet Tough



This chain, consisting of two outer plates, one or two inner plates, and pin, 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	Pitch	Link Height		Pin		Outer Plate Thickness	Outer Link Inner Width	Approximate Mass	Avero St	ge Tensile rength
Chain Number	Р	H	L	L <sub>2</sub>	L <sub>3</sub>	T	W	kg/m	kΝ	{kgf}
NF30150	150	38.1	24	32	49	7.9	23.3	7.0	309	{31500}
NF30200	200	30.1	24	32	47	7.7	23.3	6.6	307	{31300}
NF40150	150	44.5	25.5	33.5	52	7.9	26.5	9.0	397	{40500}
NF40200	200	44.5	23.5	55.5	52	7.7	20.5	8.5	377	1403007
NF56200	200	54	29.5	40.5	60	9.5	29.5	12.3	554	{56500}
NF56250	250	54	27.5	40.5	00	7.5	27.5	12.0	554	1000001
NF63200	200	57	30.5	41.5	62	9.5	31.5	13.7	618	{63000}
NF63250	250	57	50.5	41.5	02	7.5	51.5	13.0	010	(00000)
NF70200	200	63.5	31.5	42.5	64	9.5	33.5	16.2	721	{73500}
NF70250	250	05.5	51.5	42.5	04	7.5	55.5	15.5	/21	{/ 3300}
NF90200	200	72	34.5	45.5	70	10.5	38	21.0	907	{92500}
NF90250	250	/2	54.5	45.5	/0	10.5	- 50	20.0	/0/	{72300}
NF115250	250	76.2	38	49	77	12.7	40	25.0	1120	{114000}
NF115300	300	70.2	50	47	//	12.7	40	24.0	1120	[114000]
NF140250	250	85	44	54	88	14	47.5	32.0	1400	{143000}
NF140300	300	00		- 54		14	47.5	31.0	1400	[140000]
NF180300	300	95	48.5	58.5	97	16	52.5	39.0	1740	{177500}
NF180350	350	/5	40.5	50.5	//	10	52.5	37.8	1740	[177300]
NF210300	300	110	51.5	61.5	103	16	59	50.0	2150	{219500}
NF210350	350	110	51.5	01.5	105	10		48.3	2150	[217300]
NF250300	300	112	58.5	49 5	117	19	66	58.8	2440	{248500}
NF250350	350	112	112 58.5	68.5 1	117	17	00	56.7	2440	[240300]
NF280300	300	122	58.5	68.5	117	19	67	66.0	2720	{277500}
NF280350	350	122	50.5	50.5			0,	62.3	27 20	[277 300]

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

#### ①Fixed Dog

The inner or outer plate Skid Upper Surface 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. Skid Upper Surface Once the item has passed, the dog automatically returns to its former position



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#### ③Ducking Dog

Skid Upper Surface 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 Skid Upper Surface pass. When there is a break in the guide rail the conveyed item is lowered as is.





#### **Ordering Block Chain**



Ordering Example			
Chain Specs: Block Chain Chain Size: NF56 Pitch: 200mm Quantity: 400 links			
Chain Number	Quantity	Unit	
NF56200	400	L	

## **Block Chain for Flow Conveyors**

Block Chain for Flow Conveyors consists of two outer plates, one inner plate, and a pin, 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.



		Link H	leight	Pin L	ength	Outer Plate	Outer Plate	Approximate	Average Tensile	Wing	LA	Attachment	KL /	Attachment	M	/ Atta	chment	Case Inner
TSUBAKI Chain Number	Pitch P	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>2</sub>		Inner Width W		Strength kN{kgf}	Width 2X	Height S	Additional Mass/Each (kg)	Height S	Additional Mass/Each (kg)	Height S	С	Additional Mass/Each (kg)	Width
										135		0.18		0.18	80	60	0.33	150
NFX30150	150							7.9		185		0.26		0.26	115	85	0.68	200
NFX30200	200	44.5	38.1	23.5	32	7.9	23.3	7.6	309{31500}	250	34	0.36	34	0.36	140	105	1.12	270
141730200	200							7.0		330		0.74		0.74	185	130	2.94	350
										430		0.98		0.98	230	135	5.14	450
NFX56200	200							14.7		390		1.3		1.3	233	100	5.0	410
NFX56250	200	63.5	54.0	28.5	39.5	9.5	29.5	14.7	554{56500}	430	51	1.44	51	1.44	230	135	5.2	450
111720220	250							14.5		560		1.92		1.92	290	160	8.6	580

Ordering Block 0	Chain for Flow Conveyors
Chain Numbering Example	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 Size Attachment Spacing Pitch	Chain Number  Quantity  Unit    NFX30150-1LKL15  400  L

# Special Attachment Conveyor Chain

EYER

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#### **CA2** Attachment

This attachment is for mounting a wire mesh or other endless belt to an inelastic chain.

Consult Tsubaki about changes to the S dimension and diagonal attachments.





TSUBAKI Chain Number	Pitch P	С	X	N	К	Т	0	S
RF03075	75	35	46	55	30	3.2	10	0
RF03100	100	55	40	65	40	J.Z		0
RF05100	100	10	50	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	15	70	40	10	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	80	/7	165	125	1.7	15	5
RF17200	200	75	98	120	80	9.5	15	6
RF17250	250	/5	98	165	125	9.5	15	0
RF26200	200	80	105	120	80	9.5	15	6
RF26250	250	80	105	165	125	7.5	15	0
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.



### **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	С	Х	N	К	Т	0	Bolt Used
RF05100 RF05150	100 1 <i>5</i> 0	22	35	47	65 85	40 60	4.5	10	M 8
RF10100 RF10150	100 1 <i>5</i> 0	28	50	67	70 90	40 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

170

120

170

125

80

125

9.5

15

M12

Suitable Roller Types: R, F, S Chain Numbering Example: RF05100F-DT-2LA2R

45

75

100

250

200

250

#### TSUBAKI Pitch S С Х Ν Κ Т 0 Chain Number Р RF05100 100 40 65 22 35 52 4.5 10 150 85 60 RF05150 70 40 RF10100 100 28 50 6.3 12 65 90 RF10150 150 60 7.9 152.4 100 RF6205 38 60 79 60 15 RF12200 200 120 80 79 7.9 38 60 15

165

125

Suitable Roller Types: R, F, S

250

RF12250

Chain Numbering Example: RF05100F-DT-2LAA3

RF12250

RF17200

RF17250

### **MG2 Attachment**

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



TSUBAKI	Roller	Pitch	к	T			0	Max. Lengt	n of Att. Bolt	Bolt
Chain Number	Туре	Р	K	T	Q	A	0	Outer Link	Inner Link	Used
RF05100	R, S	100	40	9	21	15	10	31	26	M 8
RF05150	R, F, S	150	60	9	21	15	10	51	20	101 0
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	15.8	35.5	26	15	55	45	M12
RF12250	R, F, S	250	125	15.0	35.5	20	15	55	45	INIZ
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	19	48	26	15	78	67	M12
RF26450	R, F, S	450	220	17	40	20	15	/0	07	IVITZ
RF36450	R, F, S	450	220	25.4	59.5	32	19	92	75	м16
RF36600	R, F, S	600	300	23.4	57.5	JΖ	17	72	15	///10
Chain Number	ing Exa	mple:	RFC	)5100F	R-DT-	2LMG	2			

### **AS2 Attachment**

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

(KS2 type).



TSUBAKI Chain Number	Pitch P	C <sub>1</sub>	К	X	0	S	м	Т
RF03075	75	28.3	20	61	9	20	36	3.2
RF03100	100	20.0	20	01		20	00	0.2
RF05100	100	38.8	20	72	9	28	37	4.5
RF05150	150	50.0	20	/2		20	57	4.5
RF450	101.6	46.6	25	85	11	25	37	6
RF10100	100	54.6	30	100	11	34	47	6
RF10150	150	54.0	30	100		54	47	0
RF6205	152.4	63.9	50	132	14	40	57	6
RF12200	200	63.9	50	122	14	40	57	4
RF12250	250	03.9	50	132	14	40	57	6
RF17200	200							
RF17250	250	80.8	70	175	14	46	66	9
RF17300	300							
RF26200	200							
RF26250	250	01 7	100	015	14	50	75	9
RF26300	300	91.7	100	215	14	58	75	9
RF26450	450							
RF36300	300	110	100	2/0	10	70	0.4	10
RF36450	450	110	120	260	18	70	84	12
0.1.1.1. D.11.	-	•					•	

Suitable Roller Types: R, F, S

Chain Numbering Example: RF03075F-DT-2LAS2

#### **AF2 Attachment**

The perfect shape for mounting scrapers and other attachments.

Especially ideal for deep scrapers.



TSUBAKI Chain Number	Pitch P	С	Х	К	<i>S</i> <sub>1</sub>	Н	S	0	м	Т
RF03075	75	21.2	40	20	10	40	32	9	24	2.2
RF03100	100	31.3	48	20	10	40	32	9	36	3.2
RF05100	100	36.9	53	25	14	53	32	9	37	4.5
RF05150	150	30.9	53	25	14	53	32	9	3/	4.5
RF450	101.6	46.1	65	25	12.5	50	38	11	37	6
RF10100	100	47.6	67	30	17	64	38	11	47	6
RF10150	150	47.0	07	30	17	04	30	11	4/	0
RF6205	152.4	57.4	80	50	20	90	44	14	57	6
RF12200	200	57.4	80	50	20	90	44	14	57	6
RF12250	250	57.4	00	50	20	90	44	14	57	0
RF17200	200									
RF17250	250	70.8	96	70	23	116	50	14	70	9
RF17300	300									
RF26200	200									
RF26250	250	707	99	100	29	158	50	14	80	9
RF26300	300	73.7	99	100	29	100	50	14	80	9
RF26450	450									
RF36300	300	92.4	125	120	35	190	65	18	90	12
RF36450	450	72.4	123	120	35	170	65	10	70	12
Suitable Roller		5:	B	FS						·

Suitable Roller Types: R, F, S Chain Numbering Example: RF03075R-DT-2LAF2

### **WS Attachment**

One side of the plate is made taller to prevent conveyed items from spilling over.

Normally used with CA attachments. (See pg. 69.)



TSUBAKI Chain Number	Pitch P	Н	L	Т
RF03100	100	60	160	3.2
RF05100	100	70	170	4.5
RF10100	100	80	180	6.3
RF10150	1 <i>5</i> 0	00	230	0.5
RF6205	152.4	100	250	7.9
RF12200	200	100	300	7.9
RF12250	250	100	350	7.7
RF17200	200	120	320	9.5
RF17250	250	120	370	7.3
Suitable Roller	Types:	R, F, S		

Chain Numbering Example: RF03100F-DT-2LWS

#### **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.



TSUBAKI Chain Number	Pitch P	φd	A	B <sub>1</sub>	B <sub>2</sub>	0	м
RF03100	100	11	40	34	27	4	M10
RF05100	100	15	50	42	34	5	M12
RF05150	150	15	50	42	54	5	10112
RF450	101.6	15	50	42	34	5	M12
RF10100	100	18	60	51	40	6	M16
RF10150	150	10	00	51	40	0	MIO
RF6205	152.4	20	70	61	50	6	M16
RF12200	200	20	70	61	50	6	M16
RF12250	250	20		01	50	0	MIO
RF17200	200						
RF17250	250	22	80	71	56	6	M20
RF17300	300						
RF26250	250						
RF26300	300	28	90	78	61	8	M24
RF26450	450						
RF36300	300	30	100	85	71	10	M24
RF36450	450	30		60		10	11124

Suitable Roller Types: R, F, S

Chain Numbering Example: RF03100S-DT-2LEP1

#### 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	φd	A (MAX)	В
RF03100	100	11	500	A-31
RF05100	100	15	700	A-42
RF05150	150	15	700	A-42
RF450	101.6	15	800	A-55
RF10100	100	18	1000	A-58
RF10150	150	10	1000	A-36
RF6205	152.4	20	1100	A-71
RF12200	200	20	1100	A-71
RF12250	250	20	1100	A-71
RF17200	200			
RF17250	250	22	1300	A-92
RF17300	300			
RF26250	250			
RF26300	300	28	1500	A-98
RF26450	450			
RF36300	300	30	1500	A-120
RF36450	450		1500	A-120

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
# 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.)



# **Trolley Roller (TRO)**

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



TSUBAKI Chain Number	Pitch P	Roller Diameter R	G	J	В	н	H <sub>1</sub>	$\begin{array}{c} \text{cleavance} \\ H_2 \end{array}$	Т
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	40	145	5	05	50	30	4	0
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	05	245	5	90	02.5	50	10	7
RF17250R	250	00	240	10	125	102	()	144	10
RF17300R	300	80	290	10	123	102	62	14.6	12
RF26300R	300	85	290	10	125	107.5	65	10.7	12
RF36300R	300	100	290	10	1.50	100	70	11.0	17
RF36450R	450	100	440	10	150	128	78	11.9	16
Chain Numhar	in a Free		DE021		T 41 7				

Chain Numbering Example: RF03100R-DT-1LTP1

\*Consult 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	А	G	Ζ	К	Trolley Roller Allowable Load F (Total for both sides) kN{kgf}	
RF03075R	75	35	31.8	12	50	88	0.69{70}	
RF03100R	100	55	51.0	12	50	00	0.09{70}	
RF05100R	100	45	45	45 40	14	60	107	1.18{120}
RF05150R	150	45	40	14	00	107	1.10[120]	
RF10100R	100	60	50.8	20	75	138	1.96{200}	
RF10150R	150	00	50.0	20	/5	130	1.78(200)	
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		57.2	25	70	170	2.73{280}	
RF17200R	200	85	65	25	105	185	3.14{320}	
RF17250R	250	65	05	20	105	185	3.14[320]	

Chain Numbering Example: RF03075R-DT-2LTRO

# **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	A	В	G	Ζ	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	05	80	24	40	07	1.70[200]
RF17200S	200	80	100	34	60	116	2.26{230}
RF17250S	250		100	54	00	110	2.20[230]
RF26250S	250	100	125	38	65	125	3.53{360}
RF26300S	300		125	50	05	125	3.33{300}
RF36300S	300	100	125	38	76	137	5.00{510}
RF36450S	450		125	50	70	13/	3.00(310)

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

Chain Numbering Example: RF10150S-DT-2LOR

# **Guide Shoe (GS)**

Used to prevent chain meandering.

Consult 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	Т	С	
RF03075	75	50	9.5	25	
RF03100	100	50	9.5	25	
RF430	101.6	60	13	35	
RF05100	100	60	13	34	
RF05150	150	80	13	54	
RF450	101.6	60	13	40	
RF08150	150	60	13	40	
RF10100	100	60	16	45	
RF10150	150	80	10	45	
RF214	101.6	60	16	49	
RF6205	152.4	100	19	52	
RF12200	200	100	19	52	
RF12250	250	100	17	52	
RF17200	200				
RF17250	250	130	22	68	
RF17300	300				
RF26200	200				
RF26250	250	130	28	77	
RF26300	300	130	20	//	
RF26450	450				
RF36250	250				
RF36300	300	150	32	92	
RF36450	450	150	52	72	
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	В	N	L	Standard Guide Roller Allowable Load kN{kgf}
RF03075R	75	31.8	15.5	22.6	22	53	0.54{55}
RF03100R	100	51.0	15.5	22.0	22	55	0.34(33)
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	31.0	15.5	22.0	22	59	0.54{55}
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	40	17	51.0	52	/0	1.03(103)
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	40	17	51.0	52	05	1.03(103)
RF17200R	200						
RF17250R	250	44.5	23	39.6	28.6	100	1.27{130}
RF17300R	300						

Chain Numbering Example: RF03075R-DT-2LGR

# 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)



Butt Strip Attached (dual layer) No Butt Strip (single layer) TSUBAKI Pitch Chain Number Ρ Η, В  $H_1$  $H_2$ Α Т Α RF03075 75 70 50 20 24.5 4.5 40 50 RF03100 100 RF05100 100 100 75 25 6 50 70 31 150 RF05150 100 RF10100 130 100 30 9 65 90 39 RF10150 150 90 9 RF6205 152.4 150 110 40 100 49 200 RF12200 150 110 9 100 40 90 49 250 RF12250 200 RF17200 180 125 50 12 100 120 62 RF17250 250 RF26200 200 250 12 110 RF26250 210 150 60 \_ RF26300 300 RF36250 250 RF36300 300 240 170 70 16 150 \_ RF36450 450

Suitable Roller Types:

Chain Numbering Example: RF03075S-DT-30LKD1

R, S

# 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	Н	D	В	
RF03075	75	50	21.0	155	
RF03100	100	50	31.8	15.5	
RF05100	100	60	40	19	
RF05150	150	00	40	17	
RF10100	100	70	50.0	27	
RF10150	150	70	50.8	27	
RF6205	152.4	80	57.2	32	
RF12200	200	80	65	32	
RF12250	250	00	05	32	
RF17200	200	100	80	44	
RF17250	250	100	00	44	
RF26250	250	120	85	50	
RF26300	300	120	65	50	
RF36300	300	150	100	56	
RF36450	450	130	100	56	

Suitable Roller Types: R, S

Chain Numbering Example: RF03075R-DT-10LRD

# **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.



# **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.



# **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.



	D'I I							Dog Allowable Pus	h Strength kN{kgf}
TSUBAKI Chain Number	Pitch P	H,	$H_2$	H <sub>3</sub>	A	Т	В	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	90	20	/0	13	21	32	5.10{520}	2.16{220}
RF10100R	100	95	20	75	22	28	45	9.02{920}	2.26{230}
RF10150R	150	75	20	/5	22	20		9.02{920}	3.43{350}
RF6205R	152.4	130	30	100	30	35	55	14.2{1450}	3.63{370}
RF12200R	200	120	30 30	100	30	35	55	12.7{1300}	4.71{480}
RF12250R	250	130						9.81{1000}	5.88{600}
RF17200R	200	160	40	120	30	50	70	19.6{2000}	4.41{450}
RF17250R	250	100	40	120	30	50	/0	14.7{1500}	5.59{570}
RF26250R	250	195	50	145	30	55	75	24.5{2500}	7.16{730}
RF26300R	300	175	50	145	30	55	/5	20.6{2100}	8.63{880}
RF36300R	300	265	5 70	195	55	65	90	36.3{3700}	8.53{870}
RF36450R	450	205	70					25.5{2600}	12.8{1310}

Chain Numbering Example: RF03100R-DT-30LCD



TSUBAKI Chain Number	Pitch P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	A	D	t	В	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	22	75	4.90{500}
RF17250R	250	200	50	150	60	70	33	150	8.83{900}

Chain Numbering Example: RF10150R-DT-30LRCD



TSUBAKI Chain Number	Pitch P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	А	В	L	Т	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	(0	40	60	20	40	82	40	110	12	8.83{900}
RF10150R	150	00	20 40	02	40	110	12	0.03(700)			
RF6205R	152.4	85	30	55	103	70	134	16	10.8{1100}		
RF12200R	200	05	30	55	103	70	134	16	10 0(1100)		
RF12250R	250	85	30	55	103	70		10	10.8{1100}		
RF17200R	200	100	40	60	131	100	168	19	15.7{1600}		
RF17250R	250	100	40	80	131	100	108	19	13.7{1000}		

Chain Numbering Example: RF03100R-DT-30LDD





# 

# **Related Products**

Toughroller · · · · · · · · · · · · · · · 77



Bearings, Bearing Rollers for Attachments •••••83



# 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 functionnlity over the basic features of steel rollers. And Tsubaki's Plastic Toughroller Jr. is an economical, lightweight, simple design for easy use.

# Selection

# Steel Rollers/Steel Double Rollers

 Toughroller working load

 Rail coefficient × Frequency coefficient

# Rail Coefficient Chart

Rail Material	Rail Coefficient				
SS400 {SS41}	1.0				
780N {80kgf} class high tensile rail	1.5				
Use plastic rollers with concrete.					

Note: Do not use a 780N {80kgf} class high tensile rail with TUF-J.

# Rail Frequency Coefficient Chart

Usage Conditions	Frequency Coefficient
A) When travel amount is 1-2 times/day and rail can be replaced	1.0
B) Between A and C	0.5
C) When travel amount is around 10 times/day and rail needs to be protected, or rail cannot be replaced	0.2

Coefficient of Friction: 0.03 (on rail)

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

# Loading Position

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

# Operational Load

Calculate operational load per Toughroller by considering variable load from inconsistencies between center positioning and the rail face.

# Plastic Jr., Plastic Roller, Plastic Double Roller

Toughroller working load	Control and Allowerses
Rail coefficient	$\leq$ Basic Load Allowance

# Rail Coefficient Chart

Rail Material	Rail Coefficient
Steel	1.0
Concrete	0.2
Plastic Floor Tile	0.3

Coefficient of Friction: 0.04

■Allowable Temperature: -10°C to 80°C

# Loading Position

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

# Operational Load

Calculate operational load per Toughroller by considering variable load from inconsistencies between center positioning and the rail face.

# Dimensional Chart

Steel Roller Type



Note: The holes marked \* are not for attaching a handle. Handle attachments are restricted to extended side plate types.

	Basic Load	Capacity			Fro	ime				Тор	Plate			Ro	ller		Approximate
Model Number	kΝ	{Tons}	Width X	Length N	Height <i>H</i>	Side Plate Width W	Center Plate Width A	Space B	С	К	n- <i>φ</i> O	Т	D	E,	E <sub>2</sub>	Roller Contacting Ground	Mass kg
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	185	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

Note: Models in bold in the table above are stock items, while models in regular font are made-to-order.

# Steel Double Roller Type (Multi-directional Type)



34.3 Note 1. Extended side plates with a turntable attachment is standard for Steel Double Roller Types. 2. All models made-to-order.

TUF 4WP

Plastic roller

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3.5

# Plastic Roller Type



	Basic Load	Capacity			Fro	ime				Тор	Plate			Roller		Approximate
Model Number	kΝ	{Tons}	Width X	Length N	Height <i>H</i>	Side Plate Width W	Center Plate Width A	Space B	С	К	n- <i>φ</i> O	Т	D	E,	Roller Contacting Ground	Mass kg
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

# ● Plastic Toughroller Jr.



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



# Attachment Dimensions Dimensions no

# Dimensions not listed below are the same as the main frame.

# 1. Extended Side Plate Type



Applicable Models	L	Ζ	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

# 2. Handle

# Handles can only be attached to Extended Side Plate types.





3. Turntable



Applicable Models	φ P	φd	Q	t	Attachment Bolt	Mass kg
TUF-J	90	7	10	6	M 8	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 by bolts to the top plate of the Toughroller.



#### 4. Side Guide Roller

Side guide rollers can be attached to one or both sides. (See diagram below.)



# 5. Spike



Applicable Models	R	S
TUF-J	12	7
TUF6	14	8
TUF12	19	10.5

L<sub>R</sub>

#### 6. Skirt

Skirts can be attached to one or both sides. (See diagram below.) Skirts are generally attached to one side.



Applicable Models	U	V	Y	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

# Notes on Handling

- 1. Standard Toughrollers cannot take thrust loads along the roller axis. If a thrust load is present, use the optional side guide rollers and a skirt.
- 2. Except for double roller types, do not change direction while Toughroller is in motion. This will cause a thrust load as described in 1. above. Use a jack or other such device when it is necessary to change direction.
- 3. Ensure a gradient of 1.0 2.0mm when there is a gap in rail connections. Make sure the rail connection is smooth.
- 4. The Toughroller does not have a stopping mechanism. When leaving a Toughroller in a stopped position, insert chocks between the side plates and rail.

Ordering Toughroller	<sup>®</sup> (Endless Bollers)					
erdering redginener						
Model Numbering Example     Ordering Example						
TUF       -         Frame       Attachment         Size (Junior Roller Type       Handle: HDL         is denoted       Steel Rollers: No code         Turrtable: TTB       Both sides: SKT-2)         TuF-J)       Plastic Rollers: P         Side Guide Roller: SGR       Rubber Pad: (GPD)	Size: TUF4 Roller Type: Plastic Roller Attachment: Turntable Quantity: 1					
Double Rollers: W (One side: SGR-1, Scraper: (SCR) Both side: SGR-2)	Frame Number Quantity Unit					
Note1:Refer to individual Toughroller sections for possible model (size, roller type)	TUF4P 1 K					
and attachment assemblies. 2:Please contact a Tsubaki representative to verify if attachments (optional) are to be installed before (by Tsubakimoto) or after (by the customer) shipping.						





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# **Bearings and Bearing Roller Attachments**

# Series Overview

$\leq$		Lubed Specifications	Non-lubed Specifications	Water Resistant Specifications	Heat Resistant Specifications
Ro	Bearing Specification	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 1.50°C 3.Heat resistant lube (Includes grease nipple)
	JBR	Roller Dia:	Roller Dia:	Roller Dia:	Roller Dia:
Axle Bearing Roller Series	JBF	Roller Dia:	Roller Dia:	Roller Dia:	Roller Dia:
	JBFF	Roller Dia:	Roller Dia: φ 31.8 - φ 80 Allowable Load: 1.27 - 6.86kN	Roller Dia:	Roller Dia:
	JBTF	Roller Dia:	Roller Dia:	Roller Dia:	Roller Dia:
	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		
	ABR	Roller Dia:	Roller Dia:	Roller Dia:	Roller Dia:
ig Roller Series	ABF	Roller Dia:	Roller Dia:	Roller Dia:	Roller Dia:
Attachment Bearing Roller Series	ABFF	Roller Dia:	Roller Dia:	Roller Dia:	Roller Dia:
	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.



# Ordering

Designate code (product code and model number) when ordering. Order by piece (pc). (Consult a Tsubaki representative regarding water or heat resistant

specifications.)

# Model Numbering Example



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

# JBR-2







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

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Rol	ler Specific	ation,	Size,		vable ad	Allowable No. of	Max. Tightenir	Screw ng torque		Outer Diameter		н	Screw Diameter	E	T <sub>2</sub>	т	L,	,	,	,	Approxim k		Attac	hment	Plate
	Axle Ty	уре		kΝ	{kgf}	Rotations r/min	N∙m	{kgf∙m}	1	Diuliteiei	F		M	L	2	3	-1	L <sub>2</sub>	L <sub>3</sub>	L	Type 1	Type 2	A	Т	W
	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)
Ŀ	JBR10	Type 1	Type 2	5.49	560	190 (120)	78.4	8	16	50.8	-	32 (24)	M16	26	3 (6)	-	$\underset{\left(41.5\right)}{35}$	40	75 (81.5)	112 (118)	0.59	0.69	16.2	17-21	32 (38)
R Roller	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)
2	JBR17	Type 1	Type 2	9.81 (14.1)	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)
	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)
ц.	JBF10	Type 1	Type 2	3.43	350	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)	0.66	0.76	16.2	17-21	32 (38)
Roller	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)
ш	JBF17	Type 1	Type 2	6.86 (9.81)	700 (1000)	120 (80)	162	16.5	24	80	100	48 (30)	M24	34	4 (10.5)	$\underset{\left(20.5\right)}{\overset{14}{}}$	56.5 (70)	62.5	119 (132.5)	177 (190)	2.72	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)	$\underset{\left(22.5\right)}{\overset{16}{}}$	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)	$\underset{\left(26.5\right)}{19.5}$	73.5 (90)	86.5	160 (176.5)	240 (254)	7.0	7.20	30.2	39 - 47	67 (84)

Note:

1. Allowable loads shown in ( ) are for Type 2. No ( ) indicate the same values for both Type 1 and 2.

2. Values for allowable no. of rotations shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicate no difference between specifications. 3. 03 and 05 sizes for Type 2 heat resistant specifications are unavailable.

◎ Lubed Specifications: Type 1 JBR03 – 17, JBF03 – 17 5. Stock Items Non-lubed Specifications: Type 1 JBR03N - 12N, JBF03N - 12N

All other models are made-to-order.

<sup>4.</sup> The allowable load values above for JBR water resistant specifications are multiplied by a coefficient of 0.7.



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.



Note

Non-lubed

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.
 3. 03 and 05 sizes for Type 2 heat resistant specifications are unavailable.

4. Made-to-order item

# Urethane-lined Roller Axle Bearing Roller



[Available Specifications]

# Ordering

Designate code (product code and model number) when orderina. Order by piece (pc).

# Model Numbering Example



Axle Type (1:Type 1, 2:Type 2) Lubed Specs: No code Non-lubed Specs: N

Dimensions/Specifications

# JBUR-1

Attachment Plate

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



Lubed

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



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

Roll	er Specifica	tion, S	Size,		vable ad	Allowable No. of		Screw ig torque	Axle Diameter	Outer Diameter	н	Screw Diameter	Е	т	I	1	I	I	Approxim k	nate Mass B	Atta	chment P	late
	Axle Ty	ре		kΝ	{kgf}	Rotations r/min	N∙m	{kgf∙m}		Diumeier		M	L	2	-1	-2	-3	-4	Type 1	Type 2	А	Т	W
	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
Ŀ	JBUR05	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
Roller	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
R	JBUR12	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. 2. Made-to-order item.



#### Note

Allowable running speeds shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicate no difference between specifications. 1

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 OLubed Specifications: ABR03-17 ON-lubed Specifications: ABR03N-012N 3

4 All other models are made-to-order

\*Heat resistant grease nipple protrusion 8.5

# Dual Flange Roller Attachment Bearing Roller





# Ordering

Designate code (product code and model number) when ordering.

Order by piece (pc). (Consult a Tsubaki representative regarding water or heat resistant specifications.)

# Model Numbering Example



Lubed: No code Non-lubed: N Water Resistant: W

Heat Resistant: H

Roller Specification, Size	Allował kN	ole Load {kgf}	Allowable Running Speed m/min	R	Ε	L	h	S	Т	2C	2X	N	0	W	Fo	Approximate Mass kg
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 ( ) indicate no difference between specifications. 03 size for heat resistant specifications are unavailable.

3. Made-to-order item.

# Urethane-lined Roller Attachment Bearing Roller



Dimensions/

**Specifications** 

[Available Specifications]



# Ordering

Designate code (product code and model number) when ordering. Order by piece (pc).

# Model Numbering Example



Dell	er Specification, Size	Allował	ole Load	Allowable	R	E	,	L	s	τ	2C	2X	N	0	w	Approximate Mass
KOI	er specification, size	kΝ	{kgf}	Running Speed m/min	K	L	L	h	5	1	20	27			~~	kg
	ABUR03	0.29	30	18 (12)	40	14	28	44.1	24.1	3.2	50	70	32	10	17.2	0.15
Ŀ	ABUR05	0.59	60	23 (15)	50	19	36.8	55	30	4.5	60	84	40	10	23	0.33
Roller	ABUR10	0.98	100	30 (20)	60	26	48.8	68.6	38.6	6.3	80	110	52	12	31	0.74
R	ABUR12	1.47	150	30 (20)	80	32	58.4	87.5	47.6	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:

Allowable running speeds shown in ( ) are for non-lubed and water resistant specifications. No ( ) indicate no difference between specifications.
 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 $5^{\circ}$ 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

- 1) 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.
- 2) 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.
- 3) Be aware that precision is much coarser than with cam followers.
- Do not use in acidic or alkali environments. Water resistant specifications (SUS400 Series parts) may rust in certain usage environments.
- 5) 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.
- 6) Do not allow roller to come into contact with severe shock
- 7) This product does not come equipped with a brake. Consider installing one on the equipment side.
- 8) 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.
  - $\cdot$  When resin spacer has worn away.
- 10) All parts are coated with an anti-rust agent before shipment.



# **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 issue forth 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

Product Numbering Ex

Туре	TCL4	TCL2					
Nozzle	4 ports	2 ports					
Number of Operations	Max. 3 times/sec. Refer to the chart below for allowable chain 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	o 120℃					

\*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.



<b>Ordering Autom</b>	atic Conveyor Chain Lubricator	
xample	Ordering Example	



Type: TCL4 Chain Direction of Travel: R Quantity: 1 Product Number Quantity Unit **TCL4-R** 1 S

# Allowable Chain Pitch and Speed

Chain Speed m/min Chain Pitch mm	5	10	15	20	25	30
75	0	×	×	×	×	×
100	0	0	*S	×	×	×
150	0	0	0	0	0	*S
200	0	0	0	0	0	*S
250-600	0	0	0	0	0	0

Note:

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

Pump TCL -L







#### Pump

Туре	TCL4-R TCL4-L	TCL2-R TCL2-L
Nozzle	4 nozzles	2 nozzles
Discharge Amount	0.05cc/sł	not/nozzle
Number of Operations	Max. 3 t	imes/sec
Discharge Pressure	0.196Pa	{2kg/cm²}
Color	Cre	eam
Mass	5.3	3kg
Fittings	Attachment bolts (M	10 × 35L), nuts (2)

# Pipe (Nuts fitted at both ends)

Pipe	Discharge Pipe	Inlet Pipe
Material	Steel	Rubber hose (black)
Diameter	Outer dia. $\phi$ 5	Outer dia. $\phi$ 16
Diameier	Inner dia. $\phi$ 3	Inner dia. $\phi$ 8.5
Length	2000mm	2000mm

# Lubricant

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

Note: Lubricants with additives such as  $MoS_2$  (molybdenum dioxide) may clog nozzles. Do not use.





Pump TCL -R







Accessories

# 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.

# <u>8</u> <u>26</u><u>26</u><u>110</u><u>16</u><u>178</u><u>0</u>

# Nozzle



# Oil Tank

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

# Oil Tank



# Notes on Usage

- It is necessary to switch the checker arm ON to operate. Ensure a safe working area for this purpose.
- •Attach pump so that it is minimally affected by chain side vibration or up/down movement. Ensure a working area where it can be attached easily.
- •Attach pump (nozzle) on the chain's return side (slack side) near the sprocket to ensure maximum penetration of lubricant between pin and bushing and bushing and roller. (See diagram below.)
- Install oil tank 300mm or higher than the pump.
- Ensure that discharge pipes (steel pipes) are each less than 3m long. (Pipes provided by Tsubaki are 2m long.)
- 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.)



and inner plate (pin-bushing)
Lubricate between inner plate
and roller (bushing-roller)

Lubricate between outer plate

# **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
$\phi {\rm 3(2.6)} \times {\rm 15} \ell$	RF03
$\phi4(3.6)\times20\mathbf{\ell}$	RF05, RF08, RF430, RF204, RF450, RF650
$\phi4(3.6)\times25\mathbf{\ell}$	RF10, RF12, RF205, RF6205, RF214
$\phi {\rm 6(5.6)\times 30} {\rm l}$	RF17, RF212
$\phi {\rm 6(5.6)\times 35} {\rm l}$	RF26, RF26N
$\phi \mathbf{8.5(8.1)}\times 45 \mathbf{\ell}$	RF36
$\phi \mathbf{8.5(8.1)\times 50} \mathbf{\ell}$	RF36N, RF52
$\phi 8.5(8.1) \times 55 \ell$	RF60N
$\phi10(9.7)\times65\ell$	RF90N
$\phi {\rm 10(9.7)} \times {\rm 70} \ell$	RF120N



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**Pitch Elongation Scale

Scale Range: Under 2000mm

**3**Holding Tool

Contact Tsubaki with chain size.

# **4**Hydraulic Pin Extractor

Contact a Tsubaki representative for details.

# (5)Chain Vice

Product Applicable Chain		Dimensions			
Number		L	Н	В	
CV-4	RF03-RF17	300	135	120 -180	









# **Selection and Handling**

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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.



Selection and Handling **Determining Conveyor Chain Conveyance Conditions** Machine ÷ **Conveyed Material** : Corrosion : Wear • Temp. of Material °C : Room Temp. Conveyed Dimensions of : **Conveyed Items** Mass of Material : MAX kg/each Conveyed t/h **Conveyed Amount** : MAX (Loose Materials) • MAX kg/conveyor **Conveyed Amount** (Item) 2 m **Conveyor Length** Lift • m Number of Chain Strands 1 (spaced m apart) **Chain Speed** m/min : Average Tensile Strength : kN{kgf} Chain Pitch : mm

	D
c	
2	and
С Ш	Ĭ
Se	and

link

unit(s)

mm)

Length

Parallel/beveled

Sprocket Tooth Finishing : Precision Welded, Machine Cut, Induction Hardened

: Unnecessary, JIS b

: AC/DC kW,

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.

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Attachment Type and Spacing

**Conveyance Method** 

**Operating Time** 

Number of Sprocket Teeth

Sprocket Bore Diameter

Lubrication

Motor

Boss

Keyway

:

5

5

: NT

: *\phi* 

: Type

att.

everv

: Pushed by dog, direct conveyance, other

h/d

Yes / No

(PCD

H8 / H7

Dia

r/min,

×t

# 2. Deciding Conveyor Type

Basic Conveyor			Convey	red Items		
Types	Item Conveyance	Chain Type	See Pg.	Loose Material	Chain Type	See Po
	●Slat Conveyor	RF-BR	34	●Apron/Pan Conveyor	RF	19
		RF-NB	46			
		RF	19	a contra		
		(CT)	53	A CONTRACTOR OF THE OWNER		
	and the second sec					
				A A A A A A A A A A A A A A A A A A A		
a	<ul> <li>Push Conveyor, Tow Conveyor,</li> </ul>	RF	19			
ŭ	Roller Coaster	RF-NB	46			
Хa		NF	66			
< e		RF-SR	50			
uo						
Top Loading Conveyance		55.45	(0			
Ľ	●Free Flow Conveyor	RF-VR	48			
ad	and the	RF-TR	49			
Ĕ		RF-SR	50			
d	Man and a start of the start					
Ĕ	1					
	Standard Chain Conveyor	RF	19	1		
		NF	66			
	the and the an	EPC	131			
		RF-NB	46			
	<ul> <li>Trolley Conveyor</li> </ul>	RF	19	Bucket Elevator	RF	19
	Trolley Conveyor	ΚΓ	17		B Class Chain	54
						04
	●Tray Elevator	RF-NB	46			
0		RF	19			
ŭ		NF	66			
e Xe				Bucket Type	Special Chain	
ž				Continuous Unloader		
ပိ	₩ ∏					
oension Conveyance						
isio.	●Vertical Parking Structure	RF	19			
e		Specialty				
dsr		Chain				
Susp						
	●Push Conveyor	RF	19	<ul> <li>Scraper/Flight Conveyor</li> </ul>	RF	19
		NF	66	-		
		RF-NB	46		*	
, e				and the second second		
an						
Push Conveyance, Frictional Conveyance				5000		
vey	Horizontal Revolving Conveyor	RF	19	●Flow Conveyor	RF	19
ίŬ	~	rf-NB	46		NFX	67
ğ Ŭ	- States					
ior sh						
PC Ict						
Ľ				<ul> <li>Drag Chain Conveyor</li> </ul>	Special Chain	
		1 1			opecial chall	

Note: See pg. 98, Table 1 regarding item wear and corrosion properties.

# 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 Chain 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.

# 5. Basic Conveyor Chain Layout

#### 5.1 Horizontal Conveyor

1) Making a catenary on the drive sprocket side



- ①Catenary tension makes chain-sprocket engagement smooth.
- <sup>(2)</sup>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.

 Supporting the chain on the return side with guides or rollers





Take-up Guide shoes supporting the return side

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.





# 5.4 Vertical Shaft Conveyors



Installing a guide roller will help the chain run smoother.

# 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**



# — 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 pin, bushing, roller, and other areas to prevent metal-on-metal contact. (See pg. 89 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.

# 6. Choosing a chain specification for conveying loose materials

The following table lists the chain conveyor types and chain specifications used in conveying typical loose items, 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 specifications based on consideration of past performance and careful investigation.

	Abrasive-	Corrosive-	Type of Conveyor				Recommended	
Material	ness	ness	Scraper	Flow	Apron	Bucket	Chain Series	Notes
Rice	С	С	0	0		0	DT	
Barley	С	С	0	0		0	DT	
Wheat	С	С	0	0		0	DT	
Soybean	С	С	$\circ$	0		0	DT	
Maize	С	С	0	0		0	DT	
Wheat Flour	С	С	0	0		0	DT	
Starch	С	С	0				DT	
Suger Cane	С	С	0		0		GT	
Bagasse	С	С	0				GT	
Sugar	С	С	0	0		0	SS	See 4.
Rock Salt	С	С	0				DT	
Mixed Feed	С	В	0				DT	
Soda Ash	В	E	0				DT	
Carbide	В		0	0	0	0	DT	
Glauber's Salt	В	В					GS	
Dry Unslaked Lime	В	E	0				DT	
Dry Slaked Lime	С	E	0				DT	
Polyethylene	В	С	0				DT	
Vinyl Chloride Powder	В						MT	
Carbon	В	С	0				BT	
Activated Charcoal	В	С	$\circ$				DT	
Dry Ammonium Sulfate	С	С	0				DT	
Dry Ammonium Chloride	В	В	0				DT	
Dry Urea Powder	С	С	0				DT	
Wet Urea Powder	В	Е	$\circ$				DS	
Synthetic Detergent	В	С	0				DT	
Wet Gypsum	В	А	0	0		0	GS, RT	
Dolomite	В	D	0		0		DT	GT on Apron Conveyors
Dry Limestone	В	D	$\circ$		0		DT	GT on Apron Conveyors
Dry Clay	В	С					BT	, ,
Cement Clinker	A	E	0		0		СТ	
Cement Products	В	E		0		0	СТ	
Dry Wood Chips	С	D	$\bigcirc$				DT	
Dry Sawdust	С	D	$\bigcirc$				DT	
Coal	В	В	0		0		СТ	
Coke	A	С			0		BT	
Alumina	В	E					СТ	
Foundry Sand	A	С	$\bigcirc$				BT	
Scale	В	С	0				BT	
Coke Dust	A	С					BT	
Wet Coal Dust	В	В					RT	
Clinker Dust	A	E					BT	
Garbage	В				0		RT	
Dry Incinerated Garbage (Room Temperature)	С	D	0				GT	
Wet Incinerated Garbage	С	D	0				RT	

Table 1.	Material	and	Chain	Specifications
----------	----------	-----	-------	----------------

Note 1. Abrasiveness:ABC

2. Corrosiveness: A (Strong acid), B (Moderate acid),

C (Neutral), D (Moderate alkali), E (Strong alkali) 3. Type of Conveyor:  $\bigcirc$  (Common),  $\bigtriangleup$  (Sometimes), Blank (Seldom)

4. See pg. 108 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 bushing.
- 2) Longer pitch chain, though more expensive per link, would be cheaper for a unit length of chain in general. Chain pitch for Unit Conveyor 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 Conveyor 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.
- Chain pitch relates to the number of sprocket teeth 5) 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, Tmax, 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 16	anns	SI Units Gr	avimetric Units
T	: Maximum static tension on chain	kN	{kgf}
т	: Static tension on chain	kN	{kgf}
Q	: Maximum conveying quantity	t/h	{tf/h}
v	: Chain speed	m/min	m/min
н	: Center distance between sprockets (vertical)	m	m
L	: Center distance between sprockets (horizontal)	m	m
С	: Center distance between sprockets (inclined)	m	m
М	: Mass {weight} of conveying device (Chain $\times$ strands, but	ckets, aprons, e	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).

# 9.2 Calculate Chain Tension (Table3)

# Horizontal Conveyor



f<sub>2</sub>

f

W

SI Units

$$\begin{split} T_{1} &= 1.35^{*1} \times M \times L_{1} \times \frac{g}{1000} \ (kN) \\ T_{2} &= (L - L_{1}) \times M \times f_{1} \times \frac{g}{1000} + T_{1} \ (kN) \\ T_{3} &= 1.1^{*2} \times T_{2} \ (kN) \\ T_{MAX} &= (W \times f + M) \times L \times f_{1} \times \frac{g}{1000} + T_{3} \ (kN) \end{split}$$

 $f_1$  : Coefficient of friction between chain and guide rail (Tables 5 and 6)

- : Coefficient of friction between material conveyed and casing (Table 7)
- : Material loaded directly on chain: f=1 Material scraped: F= $\frac{f_2}{f_1}$

: Mass Conveyed Item {Weight} kg/m{kgf/m}

 $W = 16.7 \times \frac{Q}{V} \qquad \{W = 16.7 \times \frac{Q}{V}\}$ Item
Mass of Item (kg/each) Automation Mass of Item (kg/each)

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

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



**Gravimetric Units** 

$$\begin{split} T_1 &= 1.35 \times M \times L_1 \; \{ kgf \} \\ T_2 &= (L - L_1) \times M \times f_1 + T_1 \; \{ kgf \} \\ T_3 &= 1.1 \times T_2 \; \{ kgf \} \end{split}$$

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

\* 1: Refer to Table 4, pg. 102.

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



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



100



Calculating Required Power	
1kW=1kN⋅m/s	1kW = 102kgf·m/s
$kW = \frac{T \times V}{60}$	$kW = \frac{T \times V}{102 \times 60}$
Assuming that the power loss from chain – sprocket en $10\%$ (1/0.9 = 1.1), When the power transmission ratio of	gagement and sprocket rotational friction resistance to be the drive section is $\eta$ ,
$kW = \frac{T \times V}{60} \times 1.1 \times \frac{1}{\eta}$	$kW = \frac{T \times V}{102 \times 60} \times 1.1 \times \frac{1}{\eta}$

#### Table 4: Catenary Tension Graph



# Table 5: Rolling Friction Factor f1 Between Chain And Rail

Roller diameter	Lubri	cated	Dry		
(mm)	R, F	S, M, N	R, F	S, M, N	
D<65	0.08	0.16	0.15	0.24	
65≦D<100	0.08	0.15	0.14	0.23	
100≦D	0.08	0.14	0.13	0.22	
$\text{RF 214} \; (\text{exception})$	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 f1 between top roller and material conveyed is the same as that of R roller in the above.

Series	f <sub>1</sub>
Plastic Roller Series / Plastic Sleeve Series	0.08 (DRY)
Bearing Roller Series	O.O3 (Lubricated)
Bearing Bush Series	0.14 (Lubricated) 0.21 (DRY)
EPC78	0.1 (Lubricated) , 0.2 (Water-Lubricated) , 0.25 (Dry)

# Table 6: Sliding Friction Factor f, Between Chain And Rail

	1	
Temperature of conveyed material ( ${}^{\circ}\!\!\!{\rm C}$ )	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

Catenary Tension

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

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

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

Chain Length at Catenary  $\frac{\delta}{\mathsf{L}}$ S 1 027 0 10

$$L_1 = 0.10 \longrightarrow L_1 = 1.02$$

S = 1.027L<sub>1</sub>

#### Table 7: Friction Factor f<sub>2</sub> Between Material Conveyed And Casing

Material	Material f <sub>2</sub>	
Scale	0.67	1.54
Red iron ore	0.47	2.99
Pyrites	0.58	1.54
Slag	0.48	0.90
Scrap	0.73	0.54
Lead ore powder	0.77	3.26
Zinc ore powder	0.79	1.93
Nickel ore powder	0.45	0.92
Chrome powder	0.51	1.14
Alumina	0.55	0.83
Magnesium	0.84	1.48
Gypsum	0.64	0.77
Quartz powder	0.55	1.24
Feldspar	0.55	1.36
Dolomite	0.54	1.62
Clay	0.63	0.77
Molding sand	0.41	1.59
Phosphate rock	0.42	1.51
Quicklime	0.46	1.53
Slaked lime	0.63	0.69
Asbestos	0.58	0.19
Limestone	0.47	0.35-0.55
Cement	0.54	0.60-0.75
Cement clinker	0.46	1.30
Charcoal	0.41	0.44
Carbon	0.53	0.30
Pitch	0.41	0.70
Soda ash	0.45	0.52
Alum	0.63	1.01
Polyethylene	0.52	0.34
Rubber powder	0.53	0.39
Soap material	0.27	0.65
Urea	0.63	0.64
Ammonium chloride	0.79	0.67
Calcium chloride	0.43	0.68
Surphurated calcium	0.64	1.01
Calcium carbonate	0.49	0.88
Wood chips	0.74	0.36
Rice	0.74	0.30
Barley	0.71	0.39
Wheat	0.43	0.73
	0.43	0.73
Soybean		0.08
Corn	0.40	
Starch	0.57	0.71
Sugar	0.47	
Rock salt	0.57	0.55
Mixed feed Coal	0.50	
		0.30-0.70

# **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) Selection

1 Confirm roller load

No. of rollers  $=\frac{\text{Length of material}}{\text{Chain pitch}} = \frac{1000}{250} = 4$ 

4 rollers  $\times$  2 strands = 8 rollers

However, as there is an uneven load only four rollers will receive the load.

Roller load =  $2000 \times \frac{9}{1000} \times \frac{1}{4} = 4.9 \text{kN} |500 \text{kgf}| /\text{roller}$ 

From Table 10, the following chains can be selected: Bearing Roller Chain = RF12250BF-1LA2 RF Standard Chain = RF26250F-1LA2

#### ② Check allowable loading mass on conveyor

Due to simplified selection, tension of conveyor weight and starting impact will not 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

Motor kW =  $\frac{T \times V}{54.5} \times \frac{1}{\eta}$  = ( $\eta$  = 0.85)

Bearing Roller Conveyor Chain (f<sub>1</sub> = 0.03) T = 2000kg  $\times \frac{g}{1000} \times 40 \times 0.03 = 23.5 kN{2400kgf}$ 

 $kW = \frac{23.5 \times 10}{54.5} \times \frac{1}{0.85} = 5.1 kW$ 

 $\begin{array}{l} \mbox{Standard Conveyor Chain (f_1 = 0.08)} \\ T = 2000 \mbox{kg} \times \frac{g}{1000} \times 40 \times 0.08 = 62.8 \mbox{kN} \{ 6400 \mbox{kgf} \} \\ \mbox{kW} = \frac{62.8 \times 10}{54.5} \times \frac{1}{0.85} = 13.6 \mbox{kW} \end{array}$ 

# (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	r chain w/A2 attachment
every link	

Required number of links
 Chain size at safety factor
 3) Drive sprocket torque
 Required kW

# 1) No. of links: n

 $n = (\frac{30000}{100} \times 2 + 12) \times 2 = 612 \times 2 = 1224$  links

# 2) Chain size at safety factor 10

30 cardboard boxes will be carried on the conveyor. Thus, conveyor total loading mass is  $40 \times 30 = 1200$ kg, and the coefficient of friction under non-lubed conditions from Table 5 is 0.15.

#### Required power T1 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  $= 2 \times \frac{1000}{100} = 20$ kg/m

#### Required power T<sub>2</sub> to convey slats only

$$T_2 = 2.1 \times 20 \times 30 \times \frac{9}{1000} \times 0.15 = 1.85 \text{kN}$$

 $\{T_2 = 2.1 \times 20 \times 30 \times 0.15 = 189 kgf\}$ 

 $T_1 + T_2 = 1.77 + 1.85 = 3.62$ 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  $29kN \times 2 = 58kN$  {6000kgf}.

With RF03100F-DT-1LA2, the required power  $T_3$  to move the chain only is

(continued on next page)

Chain Mass Add. Mass from Att.

$$T_{3} = 2.1 \times (2.4 \times 2 + \frac{0.06}{100/1000} \times 2) \times 30 \times \frac{9}{1000} \times 0.15 = 0.56 \text{kN}$$
2 Strands Pitch 100 Convert to m

2 Strands

$$\{T_3 = 2.1 \times (2.4 \times 2 + \frac{0.06}{100/1000} \times 2) \times 30 \times 0.15 = 56.7 \text{kgf}\}$$

$$\begin{split} T = T_1 + T_2 + T_3 &= 1.77 + 1.85 + 0.56 = 4.18 kN \\ \{T = T_1 + T_2 + T_3 = 180 + 189 + 56.7 = 426 kgf\} \\ Using RF03100F - 1LA2 will give a safety factor of \end{split}$$

Sf = 
$$\frac{29 \times 2}{4.18}$$
 = 14 {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 × 386.4 × 
$$\frac{1}{2}$$
 ×  $\frac{1}{1000}$  = 0.81kN·m  
{Tr = 426 × 386.4 ×  $\frac{1}{2}$  ×  $\frac{1}{1000}$  = 82.3kgf·m}

#### 4) Required kW

 $kW = \frac{4.18 \times 15}{54.5} \times \frac{1}{0.85} = 1.35 kW$ 

$$\{kW = \frac{426 \times 15}{5565} \times \frac{1}{0.85} = 1.35kW\}$$

## 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)

 $n = (\frac{30000}{250} \times 2 + 12) \times 2 = 252 \times 2 = 504 links$ 

# 2) Chain size at safety factor 10

1 Tension  $T_{\scriptscriptstyle 1}$  of conveyed material only

$$T_{1} = 16.7 \times \frac{100}{28} \times (30+1) \times \frac{9}{1000} = 18.1 \text{kN}$$
$$\{T_{1} = 16.7 \times \frac{100}{28} \times (30+1) = 1849 \text{kgf}\}$$

(2) Tension  $T_2$  of bucket only

With a chain pitch of 250 and buckets attached every 2 links, bucket mass is 25kg  $\times 2 = 50$ kg/m.

$$T_2 = 50 \times \frac{9}{1000} \times (30+1) = 15.2$$
kN

$${T_2 = 50 \times (30+1) = 1550 \text{kgf}}$$

(3) T<sub>1</sub> + T<sub>2</sub> = 18.1 + 15.2 = 33.3kN

 $\{T_1 + T_2 = 1849 + 1550 = 3399 \text{kgf}\}$ 

With two strands,  $33.3 \times 10=333$ kN { $3399 \times 10=33990$ kgf}. 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)  $T = T_1 + T_2 + T_3 = 18.1 + 15.2 + 9.12 = 42.4$ kN

{T =  $T_1 + T_2 + T_3 = 1849 + 1550 + 930 = 4329$ kgf} With B17250 - S with a GA4 att. every two links, chain strength is  $245 \times 2 = 490$ kN { $25000 \times 2 = 50000$ kgf}, so

Safety Factor: Sf =  $\frac{490}{42.4}$  = 11.6 {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  $T_1$  from the conveyed material. Pitch diameter when pitch = 250, N=12T is  $\phi$  965.9, so

Tr = 
$$18.1 \times 965.9 \times \frac{1}{2} \times \frac{1}{1000} = 8.74$$
kN·m  
{Tr =  $1849 \times 965.9 \times \frac{1}{2} \times \frac{1}{1000} = 893$ kgf·m}

#### 4) Required kW

$$kW = \frac{18.1 \times 28}{54.5} \times \frac{1}{0.85} = 10.9 kW$$

$$\{kW = \frac{1849 \times 28}{5565} \times \frac{1}{0.85} = 10.9kW\}$$

# **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 chain which satisfies the strength.



Notes:

- 1) When there are any regulations, guidelines, etc. effecting chain selection, select chain based on the regulation and the Safety Factor Selection explained in this page. 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 load to the chain.
- 3) In the following applications, chain life is reduced to 1/2 to 1/10. Determine safety factor referring to clause 14. CONSIDERATIONS FOR SPECIAL ENVIRONMENTS
  - 1. Short distance transportation of heavy load
  - 2. Exposure of chain to abrasive, 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	Standar	d Series	Reinforced Series			Stainless Steel 400 Series			Stainless Steel 300 Series					
<i>Temperature</i> °C Chain Speed m/min	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<sub>MAX</sub> on Bearing Roller, Plastic Sleeve, and Bearing Bush Chains Should be under the maximum allowable load.

# **12.** ALLOWABLE ROLLER LOAD UNDER LUBRICATED CONDITIONS

Allowable load per roller under luricated condition in loading type conveyor is as per Table 10. Where A2 attachment is used, its allowable load should be taken. Tensile strength 400N/mm<sup>2</sup>(41kgf/mm<sup>2</sup>) is minimum requirement for guide rail. Allowable roller load should also be checked when corner rail is set up in a conveyor.



# Table 10: Allowable Rooler Load Under Luricated Conditions

Table 10: Allowable Rooler Load Under Luricated Conditions         kN{kgf}/pc							
	R, F		S,M,N,R	Bearing Ro			
Chain Size	Standard Series	Reinforced Series	oller (Heat Treated)	R 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							
RF10150	{180}	{300}	{180}	{560}	{350}	{180}	
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	1.17	4.02	141	0.01	4.02	
RF17250		6.67		14.1	9.81	4.02	
RF17300	{410}	{680}	{410}	{1440}	{1000}	{410}	
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	9.81	16.6	9.81				
RF52450				-	-	-	
RF52600	{1000}	{1690}	{1000}				
RF60300	10.8	10 1	10.8				
RF60350		18.1		-	-	-	
RF60400	{1100}	{1850}	{1100}				
RF90350	15.0	25.5	15.0				
RF90400	15.2		15.2	-	-	-	
RF90500	{1550}	{2600}	{1550}				
RF120400	19.6	33.3	19.6	_	_	_	
RF120600	{2000}	{3400}	{2000}				





# **13. ALLOWABLE LOAD FOR STANDARD A ATTACHMENTS**

Allowable vertical load for A type attachment is a as per Table 11.Where the load works with roller, allowable roller load should be compared to that of attachment, and smaller value to be taken.

e 11: Allowable Loa		kN{kg
Chain Size	Standard Series	Reinforced Serie
	DT	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}

Note: Please multiply A by two for K attachments.

# 14. CONSIDERATIONS FOR SPECIAL ENVIRONMENTS

Special environments mean the following conditions:-• high temperature

- ·low temperature
- ·high humidity
- ∙high dust
- ·high chemical reactions

Combinations of the above conditions often exist where chain is used. Therefore, to achieve satisfactory chain life, it is important thet to select adequate material.

# 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

Note: Please consult a Tsubaki representative about the safety factor.

#### 2) Chain Freezing

Freezing between pin and bushing, inner and outer linkplates, or bushing and roller will cause an excessive load on chain and drive unit. Freezing should be avoided by generally filling gaps between parts with lubricant which dose not freeze at the temperature the chain is used in. For this purpose, silicon grease is recommended.

# 14.2 High Temperature Over 400°C

Strength of chain decreases as temperature of chain increases by being heated up by the heat of material conveyed or environment. Limits to use of each chain are determined by temperature of chain and material. For Safety Factor at temperature up to 400°C, please refer to Table 8, and for over 400°C, please consult a Tsubaki representative.

# 1) Points Concerning Heated Chain.

)Friction factor gets larger than usual.

- ②There is a possibility to cause heat fatigue when different materials have been welded, due to the difference of heat expansion coefficient.
- ③In environments at temperature over 400°C, heat expansion and clearance are to be considered.
- ④Creep breakage
- (5)High temperature brittleness

#### 6 Carbide precipitation brittleness

⑦Effect of fluctuating temperature

(cooling and expansion)

2) Points Concerning Lubricant

Heat resistance of silicon, graphite and molybedenum disulphide oil are superior.

# 14.3 Abrasiveness

Points Concerning Abrasive Conditions

- 1) Install chain cover to avoid exposure to abrasive material.
- Select adequate conveyor type when exposing chain to abrasive material.
- 3) Slow down chain speed as much as possible.
- 4) Make chain size larger to reduce bearing
- 5) Lubricate through grease fitting.(Please consult a Tsubaki representative)

#### 14.4 Corrosiveness

When chain is exposed to corrosive material:

- 1) Chain parts get thin. Wear is accelerated.
- 2) Rust affects rotation of roller and articulation of chain.
- Special considerations to be taken for stress corrosiveness and intergranular corrosiveness when chain is use under acid or alkaline environments.

Please refer to Table 13 when selecting chain. It shoes anticorrosiveness of chain material to various kinds of solvent. Chain parts made of 400 stainless steel may rust depending upon conditions.

Specifications for antistress corrosiveness are available. (Please consult a Tsubaki representative.) With regard to corrosiveness, Please inform a Tsubaki representative of materials of accessories and related equipment. For example, when chain is used in a tank, the material of the tank is important information. In this case, it may be possible to pervent electric corrosion beforehand.
## Table13: Anticorrosiveness to Various Kinds of Solvent

When selecting chain, please check whether or not material is fully anticorrosive 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 specificacations of chain, please consider all conditions together.

 $\bigcirc$  : Resistant × : Not resistant

 $\bigtriangleup$  : Resistant depending upon conditions

- : Unknown

Solvent	Steel	400 Stainless steel	300 Stainless steel	EPC78 STP
Acetone	-	0	0	0
Oil (Vegetable, Mineral)	0	0	0	0
Sulphurous Acid Gas (Wet) 20°C	×	×	0	
Sulphurous Acid Gas (Dry) 20°C	_	_		
Alcohol				
(Methyl-, Ethyl-, Propyl-, Butyl	0	0	0	0
Ammonia water	$\bigtriangleup$	0	0	0
Ammonia Gas (Cold)	-	-	-	
Ammonia Gas (Hot)	_	_	_	
Whisky	×	0	0	0
Sodium Chloride	×		0	
Hydrochloric Acid (2%)	×	×	×	×
Chlorine Gas (Wet) 20°C	×	×	×	-
Sea Water	×	×	$\bigtriangleup$	$\bigtriangleup$
Hydorogen Peroxide 30%	-	Δ	0	×
Caustic soda 25%	-	0	0	0
Gasoline	0	Õ	Õ	0
Potassium Permanganic Acid (Saturation) 20%	_	0	0	_
Formic Acid	×	0	0	×
Formaldehyde	0	0	0	0
Milk	 	0	0	
Citric Acid	×	0	0	
		-	-	-
Glycerin 20°C	0	0	0	0
Acetic Acid 10%	×	0	0	0
Carbon Tetrachloride (Water Cont. 1%) Boil	-	-	-	-
Carbon Tetrachloride (Dry) 20°C	0	0	0	0
Tartaric Acid 10% 20°C	×	0	0	0
Oxalic Acid	×	$\triangle$	0	_
Vitric Acid 5%	×	Δ	0	×
Vinegar	×	×	$\triangle$	$\triangle$
Sodium Hypochlorite 10%	×	×	×	×
Calcium Hypochlorite	×	×	0	×
Sodium Bicarbonate 20°C	_	0	0	0
Soft Drinks	×	0		
			0	0
Water	×	0	0	0
Calcium Hydroxide 20% Boil	-	0	0	0
Carbolic Acid 20°C	-	0	0	×
Petroleum 20°C	0	0	0	0
Soap Solution	×	0	0	0
Carbonated Water	×	0	0	-
Sodium Carbonate (Saturation) Boiling Point	-	0	0	-
Kerosene	0	0	0	-
Lactic Acid 10% 20°C	×		0	0
Paraffin	0	0	0	$\overline{)}$
Beer	×	0	0	$\vdash \tilde{0}$
Benzene	Ô	0	0	$\vdash$
		-	-	
Boric Acid 5%	×	0	0	
Vegetable Juice	×	0	0	0
Lodine	-	-	-	-
Butyric Acid 20°C	-	0	0	0
Sulphuric Acid 5%	×	×	×	×
Phosphoric Acid 10%	×	$\triangle$	$\triangle$	×
Sodium Sulfate Saturation 20°C	-	0	0	-
Wine	×	0	0	0

## **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.	ontact with chain		Wrapped in a sheet, boxed in heavy duty paper and plastic
Class 2	All stainless steel parts (SUS 400 or SUS400/300 mix)	No extraneous matter (oil, grime, scale) or burrs.	Pharmaceuticals or other materials come in direct contact with chain	No	ent added to packaging. r 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.	Pharmaceuticals		Anti-atmospheric rust agent added to packaging Boxed in heavy duty paper and plastic.

## Handling Conveyor Chain

## 1. Installation

### 1.1 Attaching the Sprocket

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) Find the levelness of the shaft using a level.



Adjust precision to within  $\pm 1/300$ .

2) Find the levelness of the shaft.

Use a scale to adjust the levelness of the shaft to  $\pm 1$ mm.



3) Correct the difference in sprockets.

Distance between shafts up to 1m:



4) 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.
- Test operation with a lubed chain with no load, and check condition of chain and rail.







Guide rail where chain enters/exits conveyor Attach R to the guide rail for smooth chain operation.

## 2. Connecting and Disconnecting RF Conveyor Chain

- When connecting or disconnecting the chain, always begin by attaching or removing the outer plate on the T pin side.
- · 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.

 $\triangle$  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 Frequency of Adjustment

The chain will undergo initial elongation when first used, as well as elongation resulting from wear between pin and bushing 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
Within one month after initial operation	Twice/week
Over one month after initial operation	Twice/month

Shorten interval between checks if chain speed is fast or chain operating time per day is over eight hours.

### 4.2 When Adjustment by Take-up Is Impossible

When there is still sag in the chain even after maximum take-up, remove two links from the length to shorten the chain. Refer to pg. 110 for details.



#### 4.3 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.



## 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. (See pg. 89 for Automatic Conveyor Chain Lubricator)



Lubricate between outer and inner plate (between pin and bushing)

Lubricate between outer plate and roller (between bushing and roller)

### 5.2 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 no treated with an anti-rust treatment when delivered. Apply an anti-rust treatment when storing and check periodically.



### 5.3 When to Avoid Lubrication

- 1) When chain is buried within the items conveyed.
- 2) When conveying powders in pan conveyors, apron conveyors, etc, or when powders may adhere to the chain and cause problems during lubrication.
- 3) When the chain is used in high temperature environments.

### 5.4 Commercially Available Lubricants

Lubricant	Lubricant		
LUDRICARI	ISOVG100(SAE30)	ISOVG150(SAE40)	ISOVG220(SAE50)
Idemitsu Kosan	Daphne Mechanics Oil 100	, 1 <i>5</i> 0	220
Exxon Mobile	Teresso 100	Teresso 150	_
Exxon Mobile	DTE Heavy Oil	DTE Extra Heavy Oil	DTE BB Oil
JOMO	Lathus 100	َ 1 <i>5</i> 0	<i>*</i> 220
Showa Shell	Tellus Oil C100	С1 <i>5</i> 0	, С220
ENEOS	FBK Oil RO100	RO150	, RO220
LINEUS	Diamond Lube RO100	<i>x</i> RO1 <i>5</i> 0	, RO220
Tonen General	Panol 100	َ 1 <i>5</i> 0	220

Manufacturer names are listed in no particular order.

## 6. Limits of Conveyor Chain Use

The following details the limits of conveyor chain parts. Check regularly for part wear.

### 6.1 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 bushing.



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 comparison to flat conveyance.



#### 6.2 S Roller

When roller thickness wears to 40%.

#### 6.3 Bushing

When bushing thickness wears to 40%.

#### 6.4 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.



## 6.5 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 bushing and pin. The chain elongation limit is 2% (2mm of elongation on one link if pitch is 100mm) of a standard basic length (pitch  $\times$ no. of links).

#### Measuring chain length (measured 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

Measure chain using one of the above methods, compare to standard length, and determine chain elongation (%).

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.



#### 6.6 Wear on Sprocket Teeth Face or Sides

The following diagram is a guide in determining sprocket tooth face wear limits.



As per the diagram on the right, wear on the tooth side means that shaft centering is incorrect. Check and adjust.

## 7. Other Points

### 7.1 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.

#### 7.2 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.

#### 7.3 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.

### 7.4 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.

#### 7.5 Preventative Maintenance of 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.

### 7.6 Cleaning

Periodically clean chain and rail if in contact with foreign particles or conveyed items.

## 8. 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.

## 8.1 Chain and Sprocket Problems

Problem	Possible Cause	Solution
	Chain and sprocket do not match.	Replace chain or sprocket with the correct size.
Chain rides up on sprocket	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).
ró	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≠S'.	Inspect and correct.
Chain winds on	Too much slack in chain.	Adjust the chain length or distance between axles, or install a tensioner.
sprocket	Excessively worn sprocket, or chain and sprocket do not match.	Replace chain and/or sprocket with the correct sized part.
	Inadequate lubrication to the contacting portions of the pin and bushing.	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.
Unusual noises	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. Rail step Return radius Rail incline	Inspect and correct.
Excessive wear at the	Improper centering of the sprocket.	Remove the chain and correct the centering of the drive and driven sprockets.
inside of the chain's link	Chain is being pushed to the side.	Remove the cause of the push and/or install a guide roller.
plates or the teeth surfaces	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.
	Excessively worn chain.	Replace both the chain and the sprocket.
Б	Insufficient number of teeth.	Increase the number of teeth.
Excessive wear of the sprocket teeth valleys	BF Chain being used (no rollers).	Change to an RF Chain (w/rollers).
and drive sides	Tooth hardness is insufficient with respect to the	Use a sprocket with hardened or changeable teeth.
und unve sides	load and conveyed materials or foreign particles.	
	Chain and sprocket do not match.	Replace chain or sprocket with correct sized parts.
	Rusting or corrosion.	<ul> <li>Install a partition to protect the chain.</li> </ul>
		<ul> <li>Select a suitable chain (MT series, etc.).</li> </ul>
	Particles of conveyed material have	<ul> <li>Install a partition to protect the chain.</li> </ul>
	contaminated the pins, rollers, or bushings, or	• Select a chain with large clearance between pin, bushing, and roller.
Poor articulation	contamination from foreign particles.	●Use Chesterton #601 or #610.
	Deformation of the chain from improper	Inspect and correct installation of the sprockets and shafts.
	installation 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
	Change the rolling friction coefficient of the chain	• Clean and lubricate moving parts with Tsubaki oil.
		• Replace sprocket.
The chain sticks and slips		• Switch to Bearing Roller Chain.
	The conveyor speed is too slow.	Increase conveyor speed.
This can be caused by a combination of	Insufficient rigidity in the frame.	• Increase the frame rigidity; increase the chain model number.
many problems;	The conveyor chain is small compared to the device.	• Decrease the slack in the drive roller chain.
therefore, the listed	The force of friction is excessively large.	• Lubricate between the guide rail and chain.
remedies may not solve the problem.		• Switch to Bearing Roller Chain.
	The machine is too long.	Divide the conveyor system into sections to decrease the length.
	Inconsistent speeds due to movement along	Use a 12 or more toothed drive sprocket, or reinforce the sprocket.
	a polygonal path.	
Excessive wear on the inside	Increased internal tension when engaging the sprocket.	Attach a supporting block to the sprocket
link and pin on one side of an NF Block Chain or BF Chain (no roller)		Reduce load, and lubricate the chain and sprocket.
	Inappropriate selection of material.	Select a more suitable chain material. Protect the chain from
Chain is rusting		the environment. Apply a rust inhibitor.
chain is rosning	Condensation	Eliminate the temperature difference between the inside and
		outside of the conveyor (using insulation, etc.).
Excessive wear caused	The chain is contaminated with especially abrasive	• Prevent material from falling onto the chain.
by the	materials, such as mineral powders, etc., and the chain	• Use a wear-resistant chain.
conveyed www.	surface is being worn away.	
Excessive wear	The chain is exposed to acidic or alkaline substances	• Use a chemical-resistant material.
trom corrosion	and therefore becomes more susceptible to machine	• Use a wear-resistant material for the machine-worn parts.
0.00	wear, which then progresses much faster.	
Excessive wear	When the chain is covered with water or passes	• Use a chemical-resistant material.
trom electro-chemical	through a solvent, the portions in contact suffer	• Use a wear-resistant material for the machine-worn parts.
corrosion	galvanic corrosion.	

## 8.2 Plate

Problem	Possible Cause	Solution
	Excessive load, too much tension on take-up.	• Eliminate the cause of overloading.
		● Install a safety device (ex., a Tsubaki Shock Relay).
		● Increase chain size.
	Weakening of chain caused by excessive	<ul> <li>Replace with a new part. Install a cover to protect the chain.</li> </ul>
	wear or corrosion.	● Lubricate regularly.
Sudden fracture of link plate		<ul> <li>Select a chain with the proper specs for the application.</li> </ul>
	The link plates are pressed outward	<ul> <li>Check and correct the installation</li> </ul>
	by the sprocket.	• Excessively worn chain or sprocket.
	P-P	<ul> <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	Excessive load.	Eliminate the cause of overloading and replace chain with a larger size.
its normal position)	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.
I Della Sol	Seizure of the pin and bushing, poor	● Increase the chain size.
	articulation.	• Use a chain with a larger clearance between pin and bushing.

## Selection and Handling

Problem	Possible Cause	Solution
Crack in the link plate	Excessive load, or excessive take-up tension.	Eliminate overloading or large repetitive loads.
①Fatigue breakage	Excessively large repetitive load.	
	Insufficient safety factor.	<ul> <li>Increase the size or specs of the chain to increase the safety factor.</li> </ul>
1 9		<ul> <li>Replace with a new chain.</li> </ul>
		<ul> <li>Eliminate overloading or large repetitive loads.</li> </ul>
	Repetitive load on attachment.	• Increase the chain size to increase the allowable load of the attachment.
(*		
②Corrosion stress crack	The chain is being used in an acidic or	● Install a cover to protect the chain from the environment.
And all S	alkaline environment.	Replace with a new part.
1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -	(Crack not caused by a repetitive load.)	<ul> <li>Use a chain with a high resistance to corrosion stress cracks.</li> </ul>
(Bow-shaped crack in		
heat treated metal plates)		

## 8.3 Pin

Problem	Possible Cause	Solution
①Pin 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).
②Pin 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> <li>Recheck the size of the peak load, and eliminate its cause.</li> <li>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>
③Pin brittle fracture	Poor environment.	Use an appropriate pin material.
④Pin sudden fracture	Excessive load.	Eliminate the cause of overloading and replace the chain with a larger size.

## 8.4 Roller, Bushing

Problem	Possible Cause	Solution
	Excessive load on roller.	Provide sufficient lubrication. Consider bearing roller or GT Chain.
	Particles of conveyed material, or other foreign	Clean regularly, and install a partition to protect the chain.
	particles, have gotten between bushing and roller.	
	Particles of conveyed material, or other foreign	Clean regularly, and install a partition to protect the chain.
	particles, have built up on the rail.	
	Lubricant is falling on the roller surface and	Select an appropriate lubricant and lubrication method.
Improper roller rotation	rail without entering between the bushing	
and uneven roller wear	and roller or between roller and link plate.	
	Roller/bushing rust.	Select an appropriate specification (RT, etc.).
	Inner plate is moving sidewards.	Replace with a new chain. Re-inspect the installation and load conditions.
	Bushing is cracked.	Reduce the load and lower the speed of rotation.
	The side surface of the roller is contacting	Eliminate the cause of the thrust load.
	the side of the link plate due to a thrust load.	
	The chain and sprocket do not match,	Check for tooth deformation.
	or excessively worn teeth.	
Roller is opening up	Excessive load.	Reduce the load, provide adequate lubrication, and remove any large steps in the rail.
Roller or bushing is split	Excessive load.	Reduce the load and provide adequate lubrication.
(falling off)	Too few teeth with respect to conveyor speed.	Increase the number of teeth or decrease the speed.
The roller is becoming	Excessive load or inadequate lubrication.	Increase the lubrication, improve the loading conditions, and replace the chain with a new one.
hourglass-shaped	Excessively worn rail.	Correct or replace the rail.

## 9. Repair Parts

Indicate the following when inquiring about or ordering repair parts.

- 9.1 Conveyor Chains
- 1) Chain size. (Ex: RF03075R)
- 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
- 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

## 9.2 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, BW1, CW1)
- 5) Boss type (Ex : D1, D2, D3 boss size) and dimensions.
- 6) Tooth tip hardness. (Ex: Normal N specs, Wear Resistant H specs)
- 7) Shaft hole diameter and key dimensions. (Ex:  $\phi$  40H8, parallel key 12×8)
- 8) Parallel use.
- 9) Once the above is known, it can be referred to as follows. RF03075R6T-BW1-D3HG Shaft hole =  $\phi$  40H8, Parallel key 12×8 Parallel use.
- 10) Indicate differences from standard sprockets for special specifications.
- 11) 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<sub>B</sub>), and distance between tooth valleys (D<sub>C</sub>) if there are an odd number of teeth.



# Chains and Sprockets for Water Treatment Facilities

## **Ordering Water Treatment Chain**

			Ex:	
Line 1	Tsubaki Chain No. (Main chain)	No. of links	ACR15152W	376 links
Line 2	Tsubaki Chain No. (Attachment area)	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	e link w/SF4),
Other	Special specifications (Coating, etc.)		2 strands $ imes$ 18 links (one link w/SF4) ,	
			extra OL (2 strands $ imes$ 1 lin	nk), Epoxy resin, black

Note: 1. If offset links are not needed, please provide formation and specification information starting from line 4.

2. Please indicate JWWA 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 Line 2 Other	Tsubaki Chain No. (Main chain), type (code), no. of teeth, amount Specifications (material, hub diameter $\times$ hub length $\times$ shaft hole diameter Indicate pilot holes by $\bigtriangledown$ , prepared holes by code)	Ex. 1: ACS15152W-C-11T One strand SCS2 $\phi$ 200×140L× $\phi$ 100 Oiles #500, w/seal Zinc rich primer, single Epoxy plastic	Ex. 2: JAC10152F-PJWH-C-11T FCD600 $\phi$ 200 × 140L × $\phi$ 110H7 New JIS keyway, w/tap
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.

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## Water Treatment Chains and Sprockets

## Chains

Application	Specification	Туре	Series	Material	Chain Size			
					ACR810			
	With rollers			SUIS 400 miles	ACR815			
	With rollers	ACR		SUS 400 series	ACR816			
Collector					ACR819			
					ACP04152			
	Non-Metallic Chain	ACP	_	Engineering plastic	ACP04152P			
	Stainless steel	ACR		SUS 300 series	ACR810SS			
					AC\$13078W			
					AC\$13103W			
					AC\$13152W			
ollector	Standard material	ACS		SUS 400 series	AC\$13152W			
Olieciol	(bushed type)	700			AC\$15152W			
					AC\$15152W			
					ACS35152W			
					JAC08152 -PJ			
	Standard material				JAC10152 -PJ			
					JAC10152 - PJ-H			
	(bushed type)		PJ	SUS 400 series	JAC6205 - PJ			
	S, F rollers				JAC6205 - PJ-H			
					JAC21152PJ			
					JAC26152 -PJ			
					JAC10152F-PJW			
	Alternation Fuellers		DIM	SUS 400 series	JAC10152F-PJW-H			
	Alternating F rollers		PJW	303 400 series	JAC6205F-PJW			
Vater Screen		14.6			JAC6205F-PJW-H			
Vater Screen		JAC			JAC08152 -SJ			
					JAC10152SJ			
	SUS S, F rollers		SJ	SUS 300 series	JAC6205 -SJ			
					JAC21152 - SJ			
					JAC26152 -SJ			
					JAC10152F-SJW			
′ater Screen	Alternating F rollers		SJW	SUS 300 series	JAC6205F-SJW			
	Allerhalling Frollers		5544	505 500 series	JAC02031-557W			
	Plastic F rollers			F roller: Plastic	JAC10152FP-SJW			
	(Low noise type)			Pin, bushing, link plate: SUS 300 series	JAC6205FP-SJW			
					JAC21152FP-SJW			
					ACRD08			
	With roller	ACRD		SUS 400 series	ACRD10			
					ACRD12			
					ACRD17			
					BF120			
					BF140			
					BF140-TK			
rive Chains	Standard material				BF160			
		BF	_	SUS 400 series	BF160-TK			
	(bushed type)				BF200			
					BF200-TK			
					BF240			
					ACS4124			
					FPC78D			
	Plastic	EPCD		Engineering plastic	EPC90D			

## Sprockets

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

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

	Strength kN{kgf} icture Strength)		Strength  kN{kgf} Fracture Strength)	Features	Attachment Type	Page
	1 {10000} {15000}		{ 9000} {13500}	Roller contact is made possible through roller waste treatment chains with rollers	SF4 * Dimensions of	
1 <i>5</i> 7 186	{16000} {19000}		{14500} {17500}	and tooth block sprockets, increasing wear resistance. Lightening the chain will also result in cost savings through by reducing the necessary drive power.	attachment holes can be changed.	121
	2{ 4000} 4{ 3000}		{ 3600} { 2500}	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.		
58.8	8{ 6000}	52.9	{ 5400}	A total SUS chain with rollers is stronger than plastic chains and has increased reusability.		
132	{13500}		{12500}	This chain was the first to use tempered stainless steel for increased wear and corrosion resistance	SF4 LA1 Extended pin	
147	{15000}	137	{14000}		*LA1 uses hardened tensile steel	123
186	{19000}		{17500}			
245	{25000}		{23000}			
343	{35000}		{32000}			
142	{14500}		{13500}	The right combination of material will give you the right chain for any	Y	
167	. ,		{15500}	application.	A2 (1) A2 (2)	
186	<u> </u>		{17500}		*Attachments can be	
235	{24000}		{22000}	PJ Series: Provides excellent wear resistance	hardened tensile steel	
265	{27000}	245	{25000}	SJ Series: Provides superb corrosion resistance	or SUS 400/300 series.	
353	{36000}		{33000}	PJW Series: Same as PJ Series but with alternating flanges	*Y attachments can be	
490	{50000}		{46000}		hardened tensile steel or	
167	{17000}	152	{15500}	SJW Series: Same as SJ Series but with alternating flanges	SUS 300/400series.	
186	{19000}	172	{17500}	* The inner link plate width on heavy duty specifications is wider.		
235	{24000}	216	{22000}	* PJW/SJW Series are wider than standard material chains.		
265	{27000}	245	{25000}	Low Noise Series: Less running noise due to plastic F roller.		125
68.6	6{ 7000}	58.8	{ 6000}	* The rollers on attachment links are steel.		125
108	{11000}	93.2	{ 9500}	*Uses special sprockets. Be sure to indicate chain specifications.		
132	{13500}	113	{11500}			
186	{19000}	157	{16000}	∗Insert roller type code in the 🗆 area.		
250	{25500}	211	{21500}			
108	{11000}	93.2	{ 9500}			
132	{13500}	113	{11500}			
186	{19000}	157	{16000}			
108	{11000}	93.2	{ 9500}			
132	{13500}		{11500}			
	{19000}		{16000}			
142	{14500}	132	{13500}	Roller contact is made possible through roller waste treatment chains with		
186	{19000}		{17500}	rollers and tooth block sprockets, increasing wear resistance.		
235	{24000}		{22000}			
353	{36000}		{33000}			
108	{11000}	99.0	{10100}	Uses SUS material for increased wear resistance.		
137	. ,		{13000}	* Can also be made from SUS 300 series stainless steel.		
147	{15000}		{13500}			
181	. ,		{17000}			131
233	· /		{20000}			
309	{31500}		{29000}			
353	{36000}		{33000}			
392	. ,		{37000}			
	{19000}		{17000}			
	6{ 2000}		·{ 1800}	This plastic drive chain for collector combines engineering plastic and SUS		
37.3	3{ 3800}	32.4	{ 3300}	300 pins.		

## Tsubaki Emerson Products

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

## **ACR Collector Chain**

## SF4 Attachment



Tsubaki Chain	Ave. Tensile Strength	Min. Tensile Strength	Pitch	Roller Dig	Inner Link Inner Width		Pin		Inner	Plate	Outer	· Plate	Mass
Number	kN{kgf}	kN{kgf}	Р	R	W	D	Lı	L2	Т	Н	Т	Н	kg/m
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				Atta	chment Dimen	sions				Mass
Number	2C	2X	J	S	S1	<b>S</b> 2	S3	0	Т	kg/each
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	100	140	70	157	05		22	14	0	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.







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



P: Plastic Center Pin No Code: SUS Center Pin

ACP Chain





## **ACS Heavy Duty Collector Chains**

## Main Chain





Tsubaki Chain	Ave. Tensile Strength	Min. Tensile Strength	Pitch	Bushing Dia.	Inner Link Inner Width		Pin		Outer	r Plate	Inner	Plate	Approximate Mass
Number	kN{kgf}	kN{kgf}	Р	B	W	Dia. D	Lı	L2	Thickness TP	Height HP	Thickness TB	Height HP	
AC\$13078W			78.11										5.2
AC\$13103W	132{13500}	123{12500}	103.2	23	26	12.7	28	32	5	33	5	36	4.6
AC\$13152W			152.4										3.6
AC\$15152W	147{15000}	137{14000}	152.4	24	26	13.5	29	33	5	36	6	38	4.8
AC\$19152W	186{19000}	172{17500}	152.4	26(※30)	30	14.5	32	39.5	6	38	6	44	5.8(%6.8)
AC\$25152W	245{25000}	226{23000}	152.4	29	30	15.8	35	41	6	44	7	54	7.9
AC\$35152W	343{35000}	314{32000}	152.4	35	38	19.0	41	46	7	54	7	60	10.9

Note: Offset links available

## SF4 Attachment

Flight attachment for sediment conveyors and collectors



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



Tsubaki Chain Num	hor				Attac	hment Dimer	nsions				Additional Mass per Set
ISODARI CHAIN NOM	Del	2C	2X	J	S	Sı	<b>S</b> 2	S3	0	Т	kg
AC\$13078W-SF4	78.11			38							0.6
AC\$13103W-SF4	103.2	90	131.5	52	110	35	55	28	14	5	0.7
ACS13152W-SF4	152.4			76							1.0
AC\$15152W-\$F4	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
AC\$25152W-\$F4	152.4	100	143.5	76	154	65	70	38	14	6	1.4
AC\$35152W-\$F4	152.4	110	152.0	76	160	65	75	40	14	7	1.6

## **LA1 Attachment** Bucket attachment for sediment collector. Buckets attach easily.





Taubaki Chain Num	Tsubaki Chain Number				Attac	hment Dimer	nsions				Additional Mass per Set
ISODARI CHAIII NOIII	Del	do	<b>l</b> 1	<b>l</b> 2	С	x	N	0	TA	Τι	kg
AC\$13078W-LA1	78.11	M10	29.5	41.5	55	77	40	19	16	12	0.4
AC\$13103W-LA1	103.2	MIO	27.5	41.5	55		56	17	10	12	0.6
AC\$15152W-LA1	152.4	M12	30.5	44.5	55	77	68	19	16	12	0.8
AC\$19152W-LA1	152.4	M12	33.5	51.5	65	90	80	24	20	16	1.2
AC\$25152W-LA1	152.4	M14	36.5	53.5	65	90	80	24	20	16	1.4
AC\$35152W-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
TSUBURI CHUIII HUIIIDEI	Р	P'	d	do	l 1	<b>l</b> 2	Q	То	kg
AC\$13078W-LONGPIN	78.11	77.7	12	M10	28	49	24	12	0.06
AC\$13103W-LONGPIN	103.2	102.8		MIU	20	49	24	12	0.06
AC\$15152W-LONGPIN	152.4	152.0	13	M12	29	51	25	12	0.10
AC\$19152W-LONGPIN	152.4	151.9	14	M12	32	59	28	16	0.11
AC\$25152W-LONGPIN	152.4	151.9	15.5	M14	35	62	29	16	0.14
AC\$35152W-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

PJ Series
SJ Series
PJW Series
SJW Series
FP-SJW Series (Low Noise Series) Offers superb wear and corrosion resistance.

Our most corrosion resistant chain.

A PJ Series chain with alternating flanges, preventing chain from falling off of guide rail.

An SJ Series chain with alternating flanges, preventing chain from falling off of guide rail. Reduced running noise thanks to engineering plastic F rollers.



% The following will need to be determined when using FP-SJW Series (Low Noise Series).

Calculate rail reactive force R generated by chain tension B along the rail corner using the formula below.



Calculate Hertz stress (contact stress) Q from rail reactive forces using the formula below.

 $Q=10.164\sqrt{R(r-d)/(L\cdot r\cdot d)[N/mm^2]}$ 

If  $Q \leq 49 [N/mm^2]$ , then it can be used.

d : Roller radius (D/2) [mm] L : Rail width [mm]

		Tsubaki	Ave.	Min.		Inner Link	S Roller	R Ro	oller		F	Rolle	er			Pin			Plate		Appro	x. Mass	kg/m
Series	Material	Chain Number	Tensile Strength kN{kgf}	Tensile Strength kN{kgf}	Roller Type	Inner Width W	Dia. R1	Dia. R2	Contact Width E	Dia. R2	Flange Dia. <i>F</i>	Contact Width E	Off- center e	Ζ	Dia. D	Lı	L2	н	НВ	Т	S Roller	F Roller	<i>R</i> Roller
		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	20.0	00.0	50.0	0/ 0	50.0	15.0	00.0		7.0	145	00.0	0/ 0	38.0	-	6.0	5.6	7.9	7.5
		JAC10152 □-PJ-H	186 {19000}	172 {17500}	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	38.0	44.0	6.0	6.0	8.3	7.9
PJ	SUS 400 Series	JAC6205 □-PJ	235 {24000}	216 {22000}	SRF	27.1	24.0	(5.0	22.0	(5.0	05.0	24.0	4.0	0.0	15.0	20.5	40.0	44.5	_	7.0	8.2	13.3	12.3
		JAC6205 □-PJ-H	265 {27000}	245 {25000}	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	44.5	54.0	7.0	8.9	14.0	13.0
		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	18.1	19.0
		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	28.7	30.0
		JAC10152 F-PJW	167 {17000}	152 {15500}	F			_	_	50.0				10.0		o / F	00 F		38.0		_	8.3	_
<b>DB</b> 4 (	SUS 400	JAC10152 F-PJW-H	186 {19000}	172 {17500}	F	36.2	_	_	_	50.8	65.0	20.0	26.0	10.0	14.5	36.5	39.5	38.0	44.0	6.0	_	8.7	-
PJW	Series	JAC6205 F-PJW	235 {24000}	216 {22000}	F		.5	_	_				10.0	15.0	(0.0			44.5		-	14.4	_	
		JAC6205 F-PJW-H	265 {27000}	245 {25000}	F	44.5		_	_	65.0	65.0 85.0	24.0	32.0	12.0	15.9	43.0	45.5	44.5	54.0	7.0	_	15.1	_
		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
SJ	SUS 300 Series	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}	1 <i>57</i> {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
		JAC10152F -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	_
SJW	SUS 300 Series	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	-
		JAC21152F -SJW	186 {19000}	1 <i>57</i> {16000}	F	44.5	-	-	-	70.0	90.0	24.0	-	12.0	19.1	49.0	55.5	50.8	-	10.0	-	19.1	-
	F roller: Engineering plastic	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	-
SIW	Pin, bushing,	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	-
_	link plate: SUS 300 Series	JAC21152 FP-SJW	186 {19000}	1 <i>57</i> {16000}	F	44.5	_	_	_	70.0	90.0	24.0	_	12.0	19.0	49.0	55.5	50.8	_	10.0	_	12.2	-

## Water Screen Chain Dimensional Chart

Note 1. Offset links available.
2. Run once every 2-3 weeks when using around shells or seaweed.
3. Insert roller type in the □.
4. Rollers on attachments on engineering plastic F roller chains (low noise chains) are stainless steel.

## Attachment Dimensions Y Attachment

For rotating-rake Water Screens





Series	Tsubaki Chain Number	Roller Type	d	do	D	<b>l</b> 2	<b>l</b> 3	Q	То	Add. Mass per Set kg/set
	JAC08152	S	25	M10	M20	38	120	60	30	1.1
	JAC10152	R, S	35	M12	M27	42	148.5	70	40	1.9
PJ	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	<b>l</b> 2	С	X	К	N	S	0	TL	Add. Mass per Set kg/set
		JAC10152	R, F	M12	42	60	80	65	110	19.0	15	9.5	0.6
_	PJ, SJ	JAC6205	R, F	M12	49	70	95	70	120	22.2	18	12	0.9

## A2 Attachment (Type 2)

For sediment conveyors





						L. L.		- -		-1	
Series	Tsubaki Chain	Roller	C	x	K	N	s	0		Т	Add. Mass per Set
Series	Number	Туре	0	~	N N		5		PJ Series	SJ Series	kg/set
PJ, SJ	JAC10152	R, F	50	65	60	90	32	12	6	6	0.20
FJ, SJ	JAC6205	R, F	60	79	60	100	38	15	7	8	0.37

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

For fixed rake Water Screens. Special sprockets are required.





## **PJW Series**

Tsubaki Chain				Atta	chment Dimen	sions				Add. Mass per Set
Number	do	<b>l</b> 2	С	X	К	N	S	0	TL	kg/set
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				Atta	chment Dimen	sions				Add. Mass per Set
Number	do	<b>l</b> 2	С	X	К	N	S	0	TL	kg/set
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	Chain	No. of	Outer	Pitch	Tooth	Hub	Dim.	Pilot Bore Dia.	Max.	Type/Material	Approx. Mass
Number	Pitch	Teeth	Dia.	Diameter	Width	Dia. DH	Length L	d	Shaft Dia	rype/ Maleria	kg
ACR810		11	565	540.9	18	210	140	90	130	C Block: SS400	47
ACR815		11	567	540.9	22	210	140	90	130	(Arm, hub: welded)	53
ACR816	152.4	11	566	540.9	22	210	140	90	130	C: SCS2 or SCS13	53
ACR819		11	570	540.9	25	210	140	90	130	C. 3C32 01 3C313	53
ACR810SS		11	565	540.9	18	200	130	80	125	C: SCS13	55
ACP04152	152.4	11	575	540.9	28	320	145	-	_	<ul> <li>C: (Square boss solid ass'y)</li> <li>D-split: (Plastic teeth)</li> </ul>	_
ACP04152P	152.4	11	575	540.9	28	210	145	90	130		64

## Collector Tank, Sediment Collector Tank Chains

Tsubaki Chain	Chain	No. of	Outer	Pitch	Tooth	Hub	Dim.	Pilot Bore Dia.	Max.	Type/Material	Approx. Mass
Number	Pitch	Teeth	Dia.	Diameter	Width	Dia. DH	Length L	d	Shaft Dia		kg
AC\$13078W	78.11	11	300	277.3	22	140	110	60	85		15
AC\$13103W	103.2	11	390	366.3	22	150	110	50	90	C, C-split: FCD600 or SCS2	22
AC\$13152W	152.4	11	565	540.9	22	150	130	60	90	D-split: FCD600 (Hub, arm) SCS2 (teeth)	36
AC\$15152W	152.4	11	565	540.9	22	170	130	60	105	C-block: SS400 or FCD600	44
AC\$19152W	152.4	11	565	540.9	25	210	140	80	130	(Hub, arm)	51
AC\$25152W	152.4	11	570	540.9	25	210	140	80	130	SCS2 (teeth)	51
AC\$35152W	152.4	11	575	540.9	30	210	140	80	130		62

## Water Screen Chains

Tsubaki Chain	Chain	No. of	Outer	Pitch	Tooth	Boss	Dim.	Pilot Bore Dia.	Max.	Type/Material	Approx. Mass
Number	Pitch	Teeth	Dia.	Diameter	Width	Dia. DH	Length L	d	Shaft Dia		kg
JAC08152S	152.4	11	556	540.9	22	180	130	90	110		51
JAC10152S	152.4	10	517	493.2	24	180	130	90	110		47
JACTUT525	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
JACTOTJZI	132.4	11	576	540.9	16	180	130	90	110		46
JAC6205S	152.4	10	527	493.2	30	180	130	90	110		47
JAC02033	132.4	11	574	540.9	30	220	170	110	135		80
JAC6205F	152.4	10	539	493.2	21	180	130	90	110		47
JACOZUJI	132.4	11	586	540.9	21	220	160	110	135		65
JAC21152S	152.4	10	521	493.2	30	220	160	100	135		68
JACZTIJZJ	132.4	11	569	540.9	30	230	170	110	140		78
JAC21152F	152.4	10	542	493.2	21	170	120	80	105	C, C-split: FCD600 or SCS2	41
JACZIIJZI	132.4	11	590	540.9	21	230	170	110	140		68
JAC26152S	152.4	10	524	493.2	48	230	170	110	140	*Indicate when ordering	86
JAC201323	132.4	11	572	540.9	48	260	190	120	160	sprockets for plastic	110
JAC26152F	152.4	10	549	493.2	26	230	170	110	140	rollers.	68
JACZOTJZI	132.4	11	597	540.9	26	260	190	120	160		98
JAC10152F-PJW	152.4	10	528	493.2	16	170	120	80	105		35
JACTUTJZI-FJW	132.4	11	576	540.9	16	180	130	90	110		42
JAC6205F-PJW	152.4	10	539	493.2	21	180	130	90	110		43
JACOZUJI-FJVV	132.4	11	586	540.9	21	220	160	110	135		62
JAC10152F-SJW	152.4	10	528	493.2	16	170	120	80	105		35
JAC10152FP-SJW (Plastic roller)	132.4	11	576	540.9	16	180	130	90	110		42
JAC6205F-SJW	152.4	10	539	493.2	21	180	130	90	110		43
JAC6205FP-SJW (Plastic roller)	132.4	11	586	540.9	21	220	160	110	135		62
JAC21152F-SJW	152.4	10	542	493.2	21	180	120	80	110		41
JAC21152FP-SJW (Plastic roller)	152.4	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. Consult a Tsubaki representative for more details.

## ACR Sprockets



Note: Teeth:SCS2 Hub,arm:SS400

## ACS, JAC Sprockets

PH A

C Type (Solid)

00



D-split (Ring tooth)



ACP Sprockets (For ACP04152 Chain)

C Type (Compound type)



Note: All bolts except assembly bolts are plastic

#### Note:

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

D-split (Teeth: Plastic Hub: FCD600)



<u>Nater</u> Treatment Facilities

## **Drive Chains**

## BF, ACS 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.





2 pitch offset link (BF120)

All other BF Chains use a 1 pitch offset link.



Tsubaki Chain	Ave. Tensile Strength	Min. Tensile Strength	Pitch	Bushing Dia.	Inner Link Inner Width	Plo	ate		Pin		Approx. Mass
Number	kN{kgf}	kN{kgf}	Р	B	W	Thickness T	Height H	Dia D	Lı	L2	kg/m
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}	44.45	25.40	23.4	0	44.0	14.45	27.5	37.0	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}	50.80	20.30	31.7	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}	03.50	37.07	30.1	7	54.0	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
AC\$4124	186 {19000}	167{17000}	103.20	43.70	37.0	6	44.0	15.80	37.0	39.5	10.5

## ACRD Chain



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



Tsubaki Chain Number	Pitch	Ave. Tensile Strength	Min. Tensile Strength	Inner Width	Roller Dia.		Pin		Plo	ate	Approx. Mass
Inumber	P	kN{kgf}	kN{kgf}	W	K /	Dia D	Li	L2		Н	kg/m
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
ACRD TU	127	188 [19000]	172 {17500}	30.0	27	14.5	33	30	6	44	0.4
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:  $6t \times 38$ , inner plate:  $6t \times 44$ 

## EPCD Chain Plastic Drive Chain





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

Note: Chain should be selected by the Allowable Teusile Strength

## **Drive Chain Sprockets**

Tsubaki Chain Number	Chain Pitch	No. of Teeth	Outer Dia.	Pitch Diameter	Tooth Width	Hub		Pilot Bore Dia.	Max. Shaft Dia.	Type/Material	Approx. Mass
Indition	ПСП	Teeni		Diumeiei	wium	Dia. DH	Length L	u	Shun Diu.		kg
ACRD08	101.6	12	419	392.6	22	140	115	50	85		26
ACKDUO	101.0	24	803	778.4	22	160	135	60	95		77
ACRD10	127	10	433	411	25	150	125	50	90	]	29
ACRUTU	127	18	751	731.4	25	180	150	70	110	SS400 (Hub)	74
ACRD12	152.4	9	480	445.6	30	160	135	60	95	SCS2 (Teeth)	40
ACKD12	152.4	15	765	733	30	190	160	80	115	]	90
ACRD17	152.4	9	476	445.6	30	180	150	70	110	1	45
ACRUTZ	152.4	15	760	733	30	230	200	100	140	1	110

subaki Chain	Chain Pitch	No. of Teeth	Outer Dia.	Pitch	Tooth	Hub Dim.		Pilot Bore Dia.	Max.	Type/Material	Approx. Mas
Number				Diameter	Width	Dia. DH	Length L	d	Shaft Dia.	rype/ Maleria	kg
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	507	485.6	24	170	130	80	105		49
		45	568	546.19	24	170	130	75	105		50
BF140		11	178	157.78	24	100	100	40	60		8
		23	350	326.44	24	120	100	55	70		21
	44.45	35	521	495.88	24	150	100	50	90		45
	44.45	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	65	80		18
		23	400	373.07	30	130	120	55	80		29
		25	433	405.32	30	190	170	80	115		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
		50	838	809.04	30	200	130	70	125		142
	63.50	11	254	225.39	36	145	120	50	85		21
		24	520	486.49	36	160	110	70	95		61
BF200		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
	76.20	11	305	270.47	45	150	120	50	90		29
BF240		37	941	898.52	45	250	150	125	155		250
		40	1014	971.21	45	250	160	125	155		293

Note 1. Standard number of teeth is listed. Tsubaki can manufacture sprockets with teeth numbers other than listed above. Consult a Tsubaki representative for more details. 2. Contact a Tsubaki representative for ACS4124 sprockets

## C-split (Split solid)



## D-split (Ring teeth)



Note: Teeth: SCS2 Hub:FCD600

## 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 pin, bushing, and roller 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	Ave. Tensile Strength	Min. Tensile Strength	Roller		Inner P Width		ate	Pin					Distance Spacer			Approx. Mass
Number	kN{kgf}	kN{kgf}	Dia. R	Ε	W	Т	Н	Dia. D	Lı	L2	Th	Dh	do	d	l	kg/m
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





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 (single collar)



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



## Shoe (dual collars)

Specific Gravity: 1.14 Material: Polyurethane

Mass: 260g Color: Black



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

## 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.	Ĵ	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)	Motor	AC·DC kW× r/min× motor(s)			
		kg/conveyor (individual items)	Sprocket No. of Teeth	NT (PCD mm)			
Conveyor Length		m	Sprocket Shaft Hole Dia.	φ H8 · H7			
Lifting Height		m	Hub	Type( ) $\phi$ × 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:	T E L:
Date:	FAX:

## MEMO


MEMO

# **T**SUBAKI

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