

TSUBAKI Bearing Roller Conveyor Chain



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Bearing Roller Conveyor Chain

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Bearing Roller Conveyor Chain

General Use
Dust Resistant
Lube Free
Completely Lube Free
Water Resistant

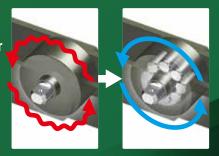
Tough, Eco-Friendly—Tsubaki Bearing Roller Conveyor Chain

Reduces Chain Running Resistance

Chain running resistance reduced by

Minimizes poor roller rotation and decreases rail wear

Cylindrical bearings ensure smooth roller rotation and reduce rail wear. Roller wear life is also dramatically increased.



Cylindrical bearings

3

Reduces Required Drive

Reduces motor capacity

2.5

With New Installations

Less power consumed means

less CO₂ emissions

Smaller motor means

30% cost savir

Reduces chain replacement labor by

When Replacing Existing Chain

Bearing Roller Conveyor Chain Standard RF Conveyor Chain Chain load RF 12250BF RF26250F 2 sizes down 1/3 the 0.03 0.08 coefficient of fricton 1/3 the 31.4kN {3200kgf} 11.8kN {1200kgf} chain load 1/2.5 the 13.5kW 5.1kW required kW Can help make your conveyor more compact and reduce energy costs

Standard RF Conveyor Ch	ain Beari	ng Roller Conveyor Chain
	Chain load	
RF26250F	Same size	RF26250BF
0.08 (When lubed)	1/3 the coefficient of friction	0.03
31.4kN {3200kgf}	1/3 the chain load	11.8kN {1200kgf}
	1/2.5 the required kW	5.1kW
	3x the wear life	Over 3x
Offers superior cha conveyor ma	ain service life iintenance lab	

has a line-up of s to suit your needs.

Longer Wear Life

Over 3xthe wear life

Note: Water resistant series has twice the wear life of RF Series

Chain load and required drive are only 1/3 of standard conveyor chains. This allows users to choose a smaller size chain, as well as reduce the size of their conveyor and necessary drive power, for greater cost savings.



TSUBAKI

Selection

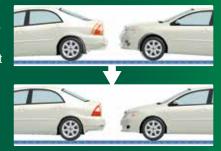
- 1. Refer to the Tsubaki Large Size Conveyor Chains & Sprockets catalog for selection.
- 2. Requirements for selection:
- Roller rotation coefficient of friction See pg. 19.
- Operating temperature range See pg. 19.
- Sprocket All series/specifications can use sprockets for RF Conveyor Chains. See pg. 19 for sprocket number of teeth.
- Roller allowable load Roller allowable load is the allowable load for one roller on a load-type conveyor. Roller allowable load assumes a guide rail tensile strength of 400N/m²{41kgf/m²}. When using A attachments, compare attachment allowable loads and use the lower of the values.

Stable Conveyance

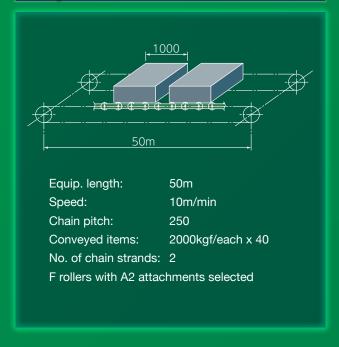
Better productivity

Prevents stick-slip phenomenon at low speeds

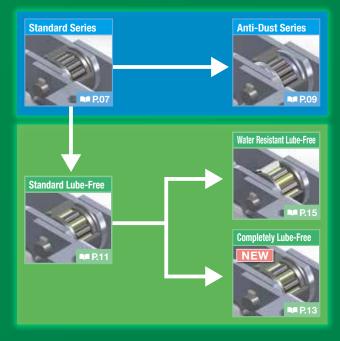
Preventing stick-slip and providing smooth movement ensures stable conveyance and eliminates motion sickness on assembly lines for higher productivity.



Sample Selection Conditions



Line-Up to Suit Any Application



Application Examples





Anti-Dust Series

Casting conveyance (in contact with molding sand)

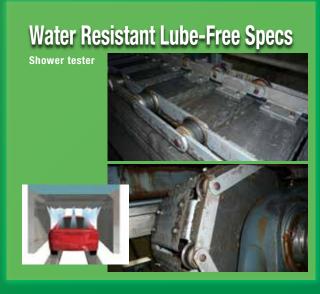


Lube-Free Series Coating line pallet conveyance

Anti-Dust Series

Waste conveyance (scrap iron, rocks, etc.)



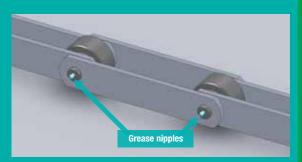


Sample Customizations

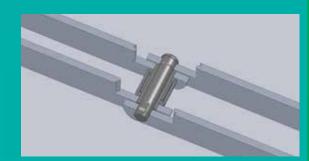
Bearing Outboard Rollers Easy roller replacement



With Grease Nipples Easy Indication

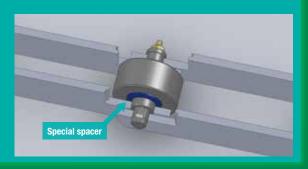


BS Bearing Rollers Same size as S Rollers on Standard Series

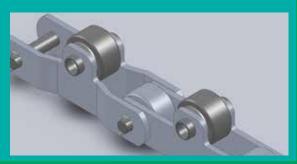


Heat Resistant

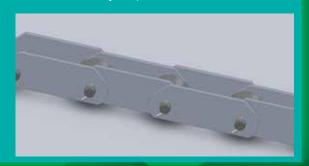
Max. operating temp.: 150°C



Bearing Top Rollers Reduces load during accumulation

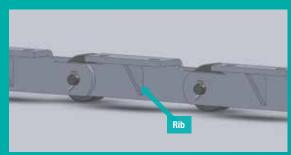


Deep Link
Allows direct conveyance, even with BR rollers

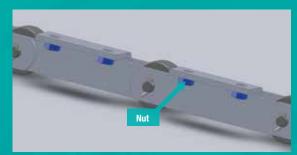


With Ribbed Attachments

Higher attachment allowable load

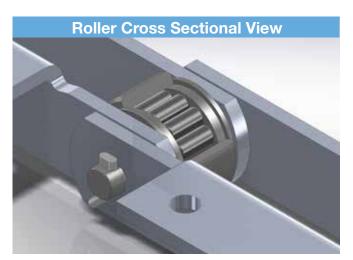


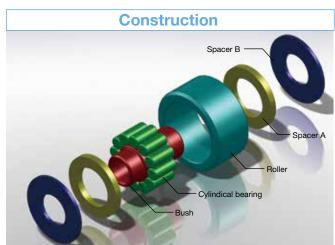
Attachments with Nuts Easy attachment



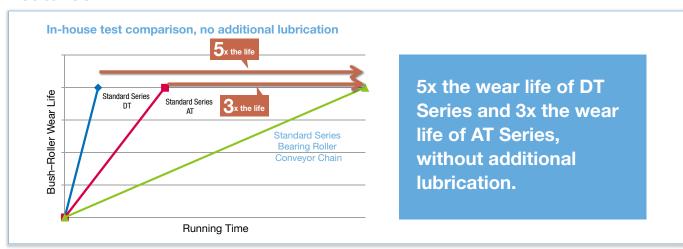
Standard Series

Standard Series Bearing Roller Conveyor Chain features a unique construction of cylindrical bearings between rollers and bushes. (Patented) These rollers have the same dimensions as R and F Rollers on standard RF Conveyor Chain.

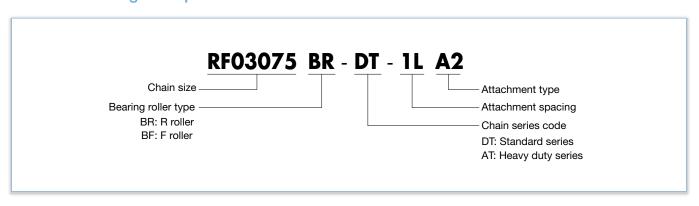


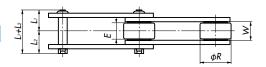


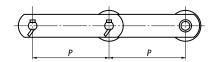
Features



Chain Numbering Example



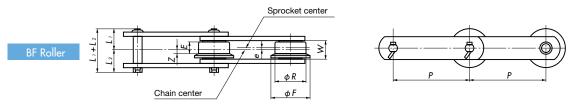




Chain Size	Pitch	Inner Link		Pin		R Ro	oller	Roller Allowable	Approx. Mass	Max. Allow	able Load
Chain Size	P	W	L ₁ +L ₂	L,	L ₂	Diameter R	Contact Width E	Load kN{kgf}/pc	kg/m	DT Series kN{kgf}	AT Series kN{kgf}
RF03075	75	16.1	38.0	18.0	20.0	31.8	14.0	1.04(200)	2.8	4.20{430}	7.85{800}
RF03100	100	10.1	36.0	16.0	20.0	31.0	14.0	1.96{200}	2.4	4.20{430}	7.63{600}
RF05100	100								5.2		
RF05125	125	22.0	53.5	25.0	28.5	40.0	19.0	3.04{310}	4.5	9.80{1000}	14.7{1500}
RF05150	150								4.2		
RF08125	125	27.0	65.5	31.0	34.5	44.5	24.0	4.12{420}	5.9	11.2{1140}	14.7{1500}
RF08150	150	27.0	05.5	31.0	34.3	44.5	24.0	4.12(420)	5.6	11.2(1140)	14.7(1300)
RF10100	100								10.0		
RF10125	125	30.0	69.0	33.0	36.0	50.8	26.0	5.49{560}	8.7	16.1{1650}	23.5{2400}
RF10150	150								8.0		
RF12200	200	37.1	83.5	40.5	43.0	65.0	32.0	8.34{850}	11.6	26.6{2710}	36.3{3700}
RF12250	250	37.1	65.5	40.5	45.0	05.0	32.0	0.34(630)	10.4	20.0(2710)	30.3(3700)
RF17200	200								20.0		
RF17250	250	51.4	109.5	51.5	58.0	80.0	44.0	14.1{1440}	17.0	35.0{3570}	54.9{5600}
RF17300	300								16.0		
RF26250	250								26.0		
RF26300	300	57.2	116.5	55.5	61.0	100.0	50.0	19.6{2000}	23.0	44.9{4570}	72.6{7400}
RF26450	450								19.0		
RF36300	300								40.0		
RF36450	450	66.7	146.0	68.0	78.0	125.0	56.0	27.5{2800}	32.0	68.0{6930}	97.1{9900}
RF36600	600								28.0		

Note: 1. Contact a Tsubaki representative for imperial sizes.

2. The above dimensions are nominal dimensions and may differ from actual dimensions.



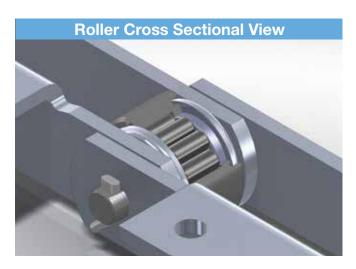
Chain Size	Pitch	Inner Link		Pin				F Roller			Roller Allowable	Approx.	Max. Allov	vable Load
Chain Size	Р	Inner Width W	L ₁ +L ₂	L,	L ₂	Diameter R	Flange Diameter F	Contact Width E	Off- Center e	Z	Load kN{kgf}/pc	kg/m	DT Series kN{kgf}	AT Series kN{kgf}
RF03075	75	16.1	38.0	18.0	20.0	31.8	42.0	11.0	1.5	4.3	1.27{130}	2.9	4.20{430}	7.85{800}
RF03100	100	10.1				01.0	-2.0		1.0	7.0	1.27 (100)	2.5	4.20(400)	, .oo(ooo)
RF05100	100											5.4		
RF05125	125	22.0	53.5	25.0	28.5	40.0	50.0	14.0	2.5	4.5	1.96{200}	4.6	9.80{1000}	14.7{1500}
RF05150	150											4.4		
RF08125	125	27.0	65.5	31.0	34.5	44.5	55.0	18.0	2.5	6.5	2.65{270}	6.2	11.2{1140}	14.7{1500}
RF08150	1 <i>5</i> 0	27.0	05.5	31.0	34.3	44.5	33.0	16.0	2.5	0.5	2.03(2/0)	5.8	11.2(1140)	14./{1300}
RF10125	125	30.0	69.0	33.0	36.0	50.8	65.0	20.0	3.0	7.0	3.43{350}	9.0	16.1{1650}	23.5{2400}
RF10150	150	30.0	7.0	33.0	30.0	30.0	05.0	20.0	3.0	7.0	3.43(330)	8.3	10.1(1000)	25.5(2400)
RF12200	200	37.1	83.5	40.5	43.0	65.0	80.0	24.0	4.0	8.0	5.49{560}	12.1	24 4(2710)	36.3{3700}
RF12250	250	3/.1	03.5	40.5	43.0	65.0	80.0	24.0	4.0	8.0	3.49{300}	10.8	26.6{2710}	36.3{3/00}
RF17200	200											21.0		
RF17250	250	51.4	109.5	51.5	58.0	80.0	100.0	34.0	5.0	12.0	9.81{1000}	18.0	35.0{3570}	54.9{5600}
RF17300	300											16.0		
RF26250	250											27.0		
RF26300	300	57.2	116.5	55.5	61.0	100.0	125.0	38.0	6.0	13.0	13.7{1400}	24.0	44.9{4570}	72.6{7400}
RF26450	450											19.0		
RF36300	300											42.0		
RF36450	450	66.7	146.0	68.0	78.0	125.0	150.0	42.0	7.0	14.0	18.6{1900}	33.0	68.0{6930}	97.1{9900}
RF36600	600											29.0		

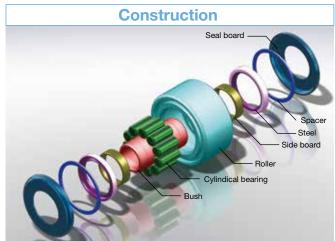
Note: 1. Contact a Tsubaki representative for imperial sizes.

2. The above dimensions are nominal dimensions and may differ from actual dimensions.

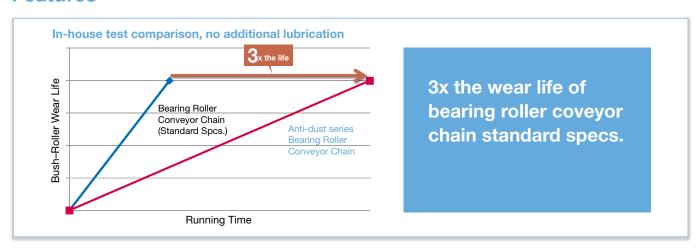
Anti-Dust Series

Anti-Dust Series Bearing Roller Conveyor Chain uses a labyrinth construction and seal to make it harder for dust and debris to infiltrate compared to our Standard Series. (Patented) These rollers have the same dimensions as R and F Rollers on standard RF Conveyor Chain.

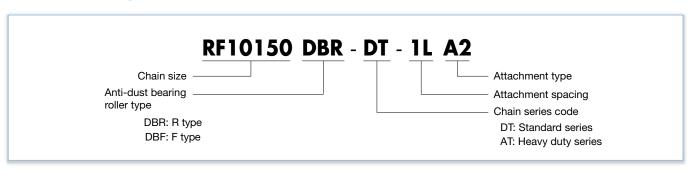




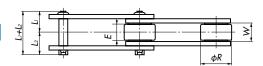
Features

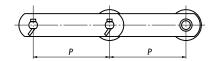


Chain Numbering Example



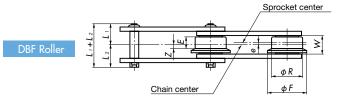


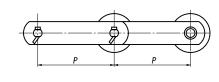




Chain Size	Pitch	Inner Link Inner Width -		Pin		R R	oller	Roller Allowable	Approx. Mass	Max. Allowable Load	
Chain Size	P	W	L ₁ +L ₂	L,	L ₂	Diameter R	Contact Width E	Load kN{kgf}/pc	kg/m	DT Series kN{kgf}	AT Series kN{kgf}
RF10100	100								10.0		
RF10125	125	30.0	69.0	33.0	36.0	50.8	26.0	5.49{560}	8.7	16.1{1650}	23.5{2400}
RF10150	150								8.0		
RF12200	200	37.1	83.5	40.5	43.0	65.0	32.0	8.34{850}	11.6	26.6{2710}	36.3{3700}
RF12250	250	37.1	65.5	40.5	45.0	05.0	32.0	0.54(050)	10.4	20.0(2710)	30.3(3700)
RF17200	200								20.0		
RF17250	250	51.4	109.5	51.5	58.0	80.0	44.0	14.1{1440}	17.0	35.0{3570}	54.9{5600}
RF17300	300								16.0		
RF26250	250								26.0		
RF26300	300	57.2	116.5	55.5	61.0	100.0	50.0	19.6{2000}	23.0	44.9{4570}	72.6{7400}
RF26450	450								19.0		
RF36300	300								40.0		
RF36450	450	66.7	146.0	68.0	78.0	125.0	56.0	27.5{2800}	32.0	68.0{6930}	97.1{9900}
RF36600	600								28.0		

Note: 1. Chain cannot be used for conveyance in environments where it will be fully covered in dust.
2. Periodically lubricate the base chain using the grease nipple on the pin head.
3. Base chain is compatible with General Use Conveyor Chains and can use current sprockets.
4. Do not use in corrosive environments. (Exposed to or submersed in water, etc.)
5. The above dimensions are nominal dimensions and may differ from actual dimensions.





Chain Sizo	Chain Size Pitch Inner Inner I			Pin				F Roller			Roller Appro		Max. Allowable Load	
Citalii oize	Р	W	L ₁ +L ₂	L ₁	L ₂	Diameter R	Flange Diameter <i>F</i>	Contact Width E	Off- Center e	Z	Load kN{kgf}/pc	kg/m	DT Series kN{kgf}	AT Series kN{kgf}
RF10125	125	20.0	40.0	20.0	010	50.0	45.0	20.0		7.0	0. (0(0.50)	9.0	1 (1(1 (50)	00.5(0.400)
RF10150	150	30.0	69.0	33.0	36.0	50.8	65.0	20.0	3.0	7.0	3.43{350}	8.3	16.1{1650}	23.5{2400}
RF12200	200	37.1	83.5	40.5	43.0	65.0	80.0	24.0	4.0	8.0	5.49{560}	12.1	26.6{2710}	36.3{3700}
RF12250	250	3/.1	63.5	40.5	43.0	65.0	80.0	24.0	4.0	8.0	3.49(300)	10.8	20.0{2/10}	30.3{3/00}
RF17200	200											21.0		
RF17250	250	51.4	109.5	51.5	58.0	80.0	100.0	34.0	5.0	12.0	9.81{1000}	18.0	35.0{3570}	54.9{5600}
RF17300	300											16.0		
RF26250	250											27.0		
RF26300	300	57.2	116.5	55.5	61.0	100.0	125.0	38.0	6.0	13.0	13.7{1400}	24.0	44.9{4570}	72.6{7400}
RF26450	450											19.0		
RF36300	300											42.0		
RF36450	450	66.7	146.0	68.0	78.0	125.0	150.0	42.0	7.0	14.0	18.6{1900}	33.0	68.0{6930}	97.1{9900}
RF36600	600											29.0		

Note: 1. Chain cannot be used for conveyance in environments where it will be fully covered in dust.

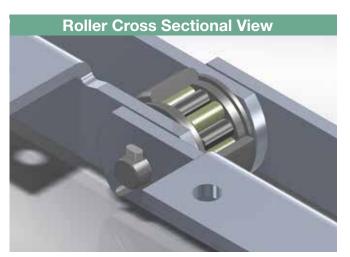
Periodically lubricate the base chain using the grease nipple on the pin head.
 Base chain is compatible with General Use Conveyor Chains and can use current sprockets.

Do not use in corrosive environments. (Exposed to or submersed in water, etc.)
 The above dimensions are nominal dimensions and may differ from actual dimensions.

Lube-Free Series (Standard Specs)

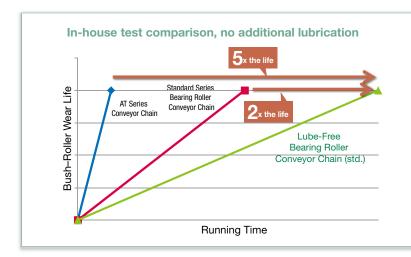
Lube-Free Series Bearing Roller Conveyor Chain uses special cylindrical bearings with self-lubricating functions between the bushes and rollers. The rollers can be used without additional lubrication. (Patented)

These rollers have the same dimensions as R and F Rollers on standard RF Conveyor Chain.



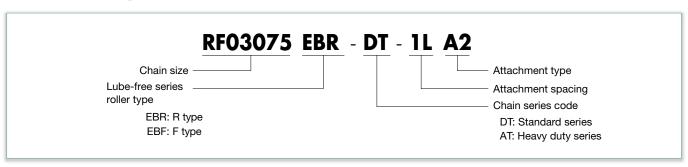


Features

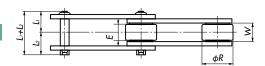


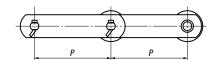
Has 5x the wear life of Standard Conveyor Chain DT Series and 2x the wear life of Bearing Roller Conveyor Chain Standard Specs without additional lubrication.

Chain Numbering Example





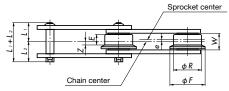


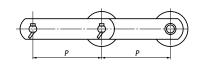


Pitch Chain Size		Inner Link		Pin		R Ro		Roller Allowable	Approx. Mass	Max. Allov	wable Load
Chain Size	Р	W	L1+L2	L,	L ₂	Diameter R	Flange Diameter E	Load kN{kgf}/pc	kg/m	DT Series kN{kgf}	AT Series kN{kgf}
RF03075 RF03100	75 100	16.1	38.0	18.0	20.0	31.8	14.0	1.96{200}	2.8 2.4	2.94{300}	5.50{560}
RF05100 RF05125 RF05150	100 125 150	22.0	53.5	25.0	28.5	40.0	19.0	3.04{310}	5.2 4.5 4.2	6.86{700}	10.3{1050}
RF08125 RF08150	125 150	27.0	65.5	31.0	34.5	44.5	24.0	4.12{420}	5.9 5.6	7.84{800}	10.3{1050}
RF10100 RF10125 RF10150	100 125 150	30.0	69.0	33.0	36.0	50.8	26.0	5.49{560}	10.0 8.7 8.0	11.3{1150}	16.5{1680}
RF12200 RF12250	200 250	37.1	83.5	40.5	43.0	65.0	32.0	8.34{850}	11.6 10.4	18.6{1900}	25.4{2590}
RF17200 RF17250 RF17300	200 250 300	51.4	109.5	51.5	58.0	80.0	44.0	14.1{1440}	20.0 17.0 16.0	24.5{2500}	38.4{3920}
RF26250 RF26300 RF26450	250 300 450	57.2	116.5	55.5	61.0	100.0	50.0	19.6{2000}	26.0 23.0 19.0	31.4{3200}	50.8{5180}
RF36300 RF36450 RF36600	300 450 600	66.7	146.0	68.0	78.0	125.0	56.0	27.5{2800}	40.0 32.0 28.0	47.6{4850}	68.0{6930}

Note: 1. Contact a Tsubaki representative for imperial sizes.

2. The above dimensions are nominal dimensions and may differ from actual dimensions.





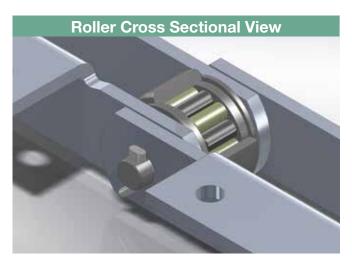
	in Size Pitch Inner Link		Pin				F Roller			Roller Allowable	Approx.	Max. Allow	vable Load	
Chain Size	Р	Inner Width W	L ₁ +L ₂	L,	L ₂	Diameter R	Flange Diameter F	Contact Width E	Off- Center e	Z	Load kN{kgf}/pc	Mass kg/m	DT Series kN{kgf}	AT Series kN{kgf}
RF03075 RF03100	<i>7</i> 5 100	16.1	38.0	18.0	20.0	31.8	42.0	11.0	1.5	4.3	1.27{130}	2.9 2.5	29.4{300}	5.50{560}
RF05100 RF05125 RF05150	100 125 150	22.0	53.5	25.0	28.5	40.0	50.0	14.0	2.5	4.5	1.96{200}	5.4 4.6 4.4	6.86{700}	10.3{1050}
RF08125 RF08150	125 150	27.0	65.5	31.0	34.5	44.5	55.0	18.0	2.5	6.5	2.65{270}	6.2 5.8	7.84{800}	10.3{1050}
RF10125 RF10150	125 150	30.0	69.0	33.0	36.0	50.8	65.0	20.0	3.0	7.0	3.43{350}	9.0 8.3	11.3{1150}	16.5{1680}
RF12200 RF12250	200 250	37.1	83.5	40.5	43.0	65.0	80.0	24.0	4.0	8.0	5.49{560}	12.1 10.8	18.6{1900}	25.4{2590}
RF17200 RF17250 RF17300	200 250 300	51.4	109.5	51.5	58.0	80.0	100.0	34.0	5.0	12.0	9.81{1000}	21.0 18.0 16.0	24.5{2500}	38.4{3920}
RF26250 RF26300 RF26450	250 300 450	57.2	116.5	55.5	61.0	100.0	125.0	38.0	6.0	13.0	13.7{1400}	27.0 24.0 19.0	31.4{3200}	50.8{5180}
RF36300 RF36450 RF36600	300 450 600	66.7	146.0	68.0	78.0	125.0	150.0	42.0	7.0	14.0	18.6{1900}	42.0 33.0 29.0	47.6{4850}	68.0{6930}

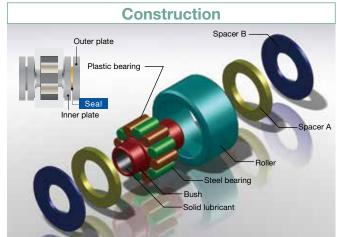
Note: 1. Contact a Tsubaki representative for imperial sizes.

2. The above dimensions are nominal dimensions and may differ from actual dimensions.

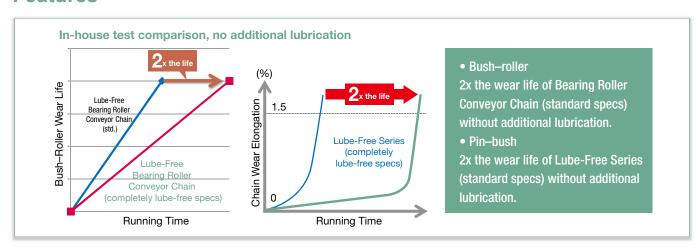
Lube-Free Series (Completely Lube-Free Specs)

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

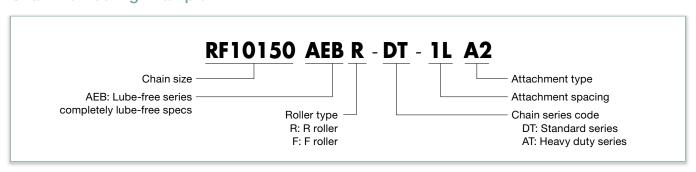


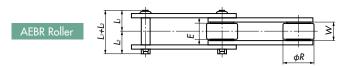


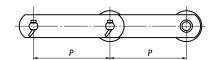
Features



Chain Numbering Example

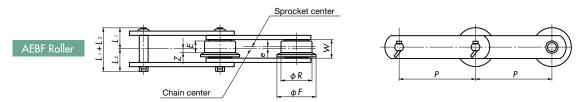






Chain Size Pitch		Inner Link Inner Width		Pin		R Ro	oller	Roller Allowable	Approx. Mass	Max. Allov	vable Load
Chain Size	Р	W	L ₁ +L ₂	L,	L ₂	Diameter R	Contact Width E	Load kN{kgf}/pc	kg/m	DT Series kN{kgf}	AT Series kN{kgf}
RF05100	100								5.2		
RF05125	125	23.0	58.0	27.0	31.0	40.0	19.0	3.04{310}	4.5	6.86{700}	10.3{1050}
RF05150	150								4.2		
RF08125	125	28.5	70.5	33.5	37.0	44.5	24.0	4 10(400)	5.9	7.84{800}	10.3{1050}
RF08150	150	28.3	70.5	33.5	37.0	44.5	24.0	4.12{420}	5.6	7.84{800}	10.3{1030}
RF10100	100								10.0		
RF10125	125	31.5	74.0	35.5	38.5	50.8	26.0	5.49{560}	8.7	11.3{1150}	16.5{1680}
RF10150	150								8.0		
RF12200	200	37.5	87.0	42.0	45.0	65.0	32.0	0.24(050)	11.6	10 ((1000)	25 4(2500)
RF12250	250	37.5	87.0	42.0	45.0	65.0	32.0	8.34{850}	10.4	18.6{1900}	25.4{2590}
RF17200	200								20.0		
RF17250	250	51.5	113.0	53.5	59.5	80.0	44.0	14.1{1440}	17.0	24.5{2500}	38.4{3920}
RF17300	300								16.0		
RF26250	250	57.5	120.0	57.5	62.5	100.0	50.0	10.4(2000)	26.0	21 4(2200)	EO 0[E100]
RF26300	300	57.5	120.0	5/.5	02.5	100.0	50.0	19.6{2000}	23.0	31.4{3200}	50.8{5180}

Note: 1. This chain is interchangeable with standard large size conveyor chain and can use the existing sprocket. However, the L1 + L2 dimension is different. 2. The above dimensions are nominal dimensions and may differ from actual dimensions.



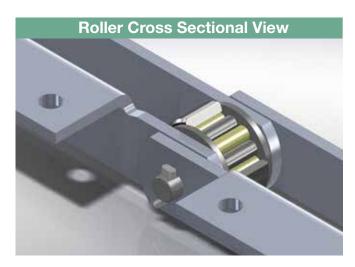
Chain Siza	Chain Size Pitch	Inner Link		Pin				F Roller			Roller Allowable	Approx. Mass	Max. Allow	vable Load
Chain Size	Р	Inner Width W	L ₁ +L ₂	L,	L ₂	Diameter R	Flange Diameter <i>F</i>	Contact Width E	Off- Center e	Z	Load kN{kgf}/pc	kg/m	DT Series kN{kgf}	AT Series kN{kgf}
RF05100	100											5.4		
RF05125	125	23.0	58.0	27.0	31.0	40.0	50.0	14.0	2.5	4.5	1.96{200}	4.6	6.86{700}	10.3{1050}
RF05150	150											4.4		
RF08125	125	28.5	70.5	33.5	37.0	44.5	55.0	18.0	2.5	6.5	2.65{270}	6.2	7.84{800}	10.3{1050}
RF08150	150	20.5	70.5	33.3	37.0	44.5	33.0	10.0	2.5	0.5	2.03(270)	5.8	7.04(000)	10.5(1050)
RF10125	125	31.5	74.0	35.5	38.5	50.8	65.0	20.0	3.0	7.0	3.43{350}	9.0	11.3{1150}	16.5{1680}
RF101 <i>5</i> 0	150	31.3	74.0	33.3	30.3	50.6	65.0	20.0	3.0	7.0	3.43{330}	8.3	11.3{1130}	10.5{1000}
RF12200	200	37.5	87.0	42.0	45.0	65.0	80.0	24.0	4.0	8.0	5.49{560}	12.1	18.6{1900}	25.4{2590}
RF12250	250	37.3	67.0	42.0	45.0	05.0	00.0	24.0	4.0	0.0	3.47(300)	10.8	18.0(1700)	23.4(2370)
RF17200	200											21.0		
RF17250	250	51.5	113.0	53.5	59.5	80.0	100.0	34.0	5.0	12.0	9.81{1000}	18.0	24.5{2500}	38.4{3920}
RF17300	300											16.0		
RF26250	250	57.5	120.0	57.5	62.5	100.0	125.0	38.0	6.0	13.0	13.7{1400}	27.0	31.4{3200}	50.8{5180}
RF26300	300	57.5	120.0	37.3	02.5	100.0	123.0	30.0	6.0	13.0	13.7 (1400)	24.0	31.4(3200)	30.0(3160)

Note: 1. This chain is interchangeable with standard large size conveyor chain and can use the existing sprocket. However, the L1 + L2 dimension is different.

2. The above dimensions are nominal dimensions and may differ from actual dimensions.

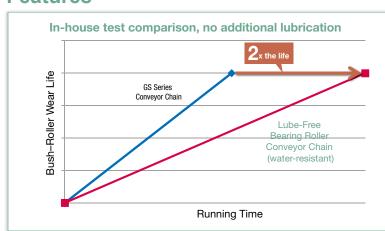
Lube-Free Series (Water Resistant Specs)

Lube-Free Series Water Resistant Bearing Roller Conveyor Chain features stainless steel cylindrical bearings and special cylindrical bearings with self-lubricating functions between bushes and rollers. The rollers can be used without additional lubrication, even in contact with water. (Patented)



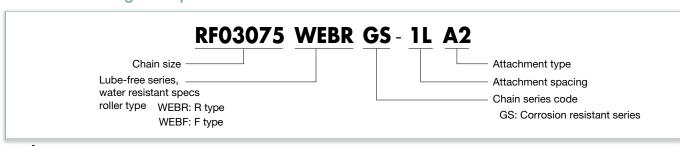


Features



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

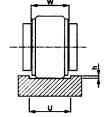
Chain Numbering Example



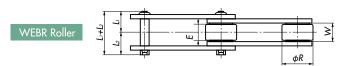


Rail mounting

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



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

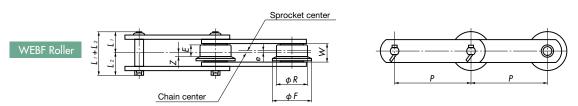




	Pitch	Inner Link Inner Width		Pin		R Ro	oller	Roller Allowable	Approx. Mass	Max. Allowable
Chain Size	Р	W	L ₁ +L ₂	L,	L ₂	Diameter R	Contact Width E	Load kN{kgf}/pc	kg/m	Load kN{kgf}
RF03075	75	16.1	38.0	18.0	20.0	31.8	12.3	1.37{140}	2.8	2.94{300}
RF03100	100	10.1	30.0	10.0	20.0	31.0	12.5	1.37 (140)	2.4	2.74(300)
RF05100	100								5.2	
RF05125	125	22.0	53.5	25.0	28.5	40.0	17.0	2.13{220}	4.5	6.86{700}
RF05150	150								4.2	
RF08125	125	27.0	65.5	31.0	34.5	44.5	21.0	2.88{290}	5.9	7.0.4(000)
RF08150	150	27.0	65.5	31.0	34.3	44.5	21.0	2.88{290}	5.6	7.84{800}
RF10100	100								10.0	
RF10125	125	30.0	69.0	33.0	36.0	50.8	23.0	3.84{390}	8.7	11.3{1150}
RF10150	150								8.0	
RF12200	200	27.1	83.5	40.5	43.0	45.0	28.0	F 0.4[(,00)	11.6	10 ((1000)
RF12250	250	37.1	83.3	40.5	43.0	65.0	28.0	5.84{600}	10.4	18.6{1900}
RF17200	200								20.0	
RF17250	250	51.4	109.5	51.5	58.0	80.0	40.0	9.87{1010}	17.0	24.5{2500}
RF17300	300								16.0	
RF26250	250	57.2	116.5	55.5	61.0	100.0	46.0	13.7{1400}	26.0	31.4{3200}
RF26300	300	37.2	110.3	33.3	01.0	100.0	40.0	13.7(1400)	23.0	J1.4(JZUU)
RF36300	300	66.7	146.0	68.0	78.0	125.0	55.0	19.3{1970}	40.0	47.6{4850}

Note: 1. Contact a Tsubaki representative for imperial sizes.

2. The above dimensions are nominal dimensions and may differ from actual dimensions.



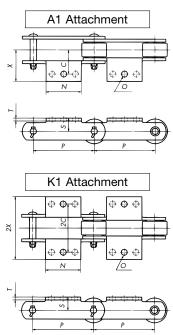
al	Pitch	Inner Link Inner Width	Pin					F Roller			Roller Allowable	Approx.	Max. Allowable
Chain Size	P	W	L1+L2	L,	L ₂	Diameter R	Flange Diameter F	Contact Width E	Off- Center e	Z	Load kN{kgf}/pc	Mass kg/m	Load kN{kgf}
RF03075	75	1/1	20.0	10.0	00.0	21.0	40.0	0.1		2.0	0.00(00)	2.9	0.04(200)
RF03100	100	16.1	38.0	18.0	20.0	31.8	42.0	9.1	1.6	3.0	0.89{90}	2.5	2.94{300}
RF05100	100											5.4	
RF05125	125	22.0	53.5	25.0	28.5	40.0	50.0	13.0	2.0	4.5	1.37{140}	4.6	6.86{700}
RF05150	150											4.4	
RF08125	125	27.0	65.5	31.0	34.5	44.5	55.0	17.0	2.0	6.5	1.86{190}	6.2	7.84{800}
RF08150	150	27.0	65.5	31.0	34.5	44.5	33.0	17.0	2.0	0.5	1.00{170}	5.8	7.04{000}
RF10125	125	30.0	69.0	33.0	36.0	50.8	65.0	18.5	2.3	7.0	2.40{240}	9.0	11.3{1150}
RF10150	150	30.0	07.0	33.0	30.0	30.0	05.0	10.5	2.5	7.0	2.40(240)	8.3	11.5(1150)
RF12200	200	37.1	83.5	40.5	43.0	65.0	80.0	22.0	3.0	8.0	3.84{390}	12.1	18.6{1900}
RF12250	250	37.1	63.5	40.5	43.0	65.0	60.0	22.0	3.0	0.0	3.04{370}	10.8	10.0{1900}
RF17200	200											21.0	
RF17250	250	51.4	109.5	51.5	58.0	80.0	100.0	32.0	4.0	12.0	6.87{700}	18.0	24.5{2500}
RF17300	300											16.0	
RF26250	250	57.2	116.5	55.5	61.0	100.0	125.0	36.0	5.0	13.0	9.59{980}	27.0	31.4{3200}
RF26300	300	57.2	110.5	33.3	01.0	100.0	123.0	30.0	3.0	13.0	7.57{700}	24.0	31.4(3200)
RF36300	300	66.7	146.0	68.0	78.0	125.0	150.0	43.0	6.0	15.5	13.0{1330}	42.0	47.6{4850}

Note: 1. Contact a Tsubaki representative for imperial sizes.
2. The above dimensions are nominal dimensions and may differ from actual dimensions.

Attachment Dimensional Chart

A1/K1 Attachments

Chain Size	Bea Roller	ring Type	Pitch	s	С	2C	X	2X	N	Т	0	Bolt	Additional Mass/Each
Chain oize	R	F	P			20		2/	. ,	,		Used	kg
	Roller	Roller											1,0
RF03075	0	0	75	20	30	60	46	92	55	3.2	10	M8	0.06
RF03100	0	0	100	20	30	80	40	72	65	3.2	10	1410	0.07
RF05100	0	0	100						65				0.07
RF05125	0	0	125	22	35	70	47	94	75	4.5	10	M8	0.08
RF05150	0	0	150						85				0.10
RF08125	0	0	125	28	50	100	64	128	80	6.3	12	M10	0.19
RF08150	0	0	150	20	30	100	04	120	90	0.3	12	MIO	0.23
RF10100	0	-	100						70				0.16
RF10125	0	0	125	28	50	100	67	134	80	6.3	12	M10	0.18
RF10150	0	0	150						90				0.20
RF12200	0	0	200	38	60	120	79	158	120	7.9	15	M12	0.44
RF12250	0	0	250	36	60	120	/9	156	170	7.9	15	MIZ	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	30	130	108	210	220	7.5	13	//// 2	1.34



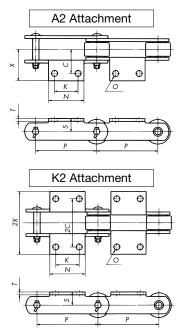
- Note: 1. The weight of the A attachment in the table is the additional weight per attachment. This value should be double for K attachments.

 2. Please contact a Tsubaki representative if the A or K attachment side face requires a guide.

 - 3. When attaching a slat or the like between two strands of chain, the slats should be attached to either outer link-outer link or inner link-inner link.
 - 4. Imperial sizes available upon request. 5. The above dimensions are nominal dimensions and may differ from actual dimensions.

A2/K2 Attachments

Chain Size		ring · Type	Pitch	S	С	2C	Х	2X	N	К	Т	0	Bolt	Additional Mass/Each
Chain Size	R	F	P					2/	, ,	K	'		Used	
	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	30	00	40	72	65	40	3.2	10	1410	0.07
RF05100	0	0	100						65	40				0.07
RF05125	0	0	125	22	35	70	47	94	<i>7</i> 5	50	4.5	10	M8	0.08
RF05150	0	0	150						85	60				0.10
RF08125	0	0	125	28	50	100	64	128	80	50	6.3	12	M10	0.19
RF08150	0	0	150	20	30	100	04	120	90	60	0.3	12	<i>M</i> 10	0.23
RF10100	0	-	100						70	40				0.16
RF10125	0	0	125	28	50	100	67	134	80	50	6.3	12	M10	0.18
RF10150	0	0	150						90	60				0.20
RF12200	0	0	200	38	60	120	79	158	120	80	7.9	15	M12	0.44
RF12250	0	0	250	36	80	120	/ 7	136	170	125	7.7	13	14(12	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	80	100	108	210	220	180	7.3	13	14112	1.34



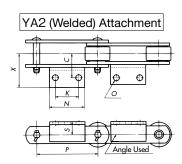
- Note: 1. The weight of the A attachment in the table is the additional weight per attachment. This value should be double for K attachments.

 2. Please contact a Tsubaki representative if the A or K attachment side face requires a guide.

 3. When attaching a slat or the like between two strands of chain, the slats should be attached to either outer link—outer link or inner link—inner link.
 - 4. Imperial sizes available upon request. 5. The above dimensions are nominal dimensions and may differ from actual dimensions.

YA2 (Welded) Attachments

Chain Size	Bearing Roller Type R F Roller Roller		Pitch	s	С	2C	х	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		2.40
RF36450	0	0	450	70	100	200	160	320	330	280	19	× 10	M16	4.90
RF36600	0	0	600	1					410	360		× 10		6.10



- Note: 1. When attaching a slat or the like between two strands of chain, the slats should be attached to either outer link-outer link or inner link-inner link.
 - 2. Imperial sizes available upon request. 3. The above dimensions are nominal dimensions and may differ from actual dimensions.

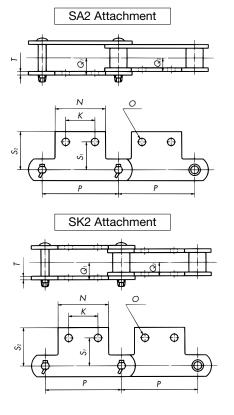
SA2/SK2 Attachments

Chain Size	Bea Roller	ring Type	Pitch	S ₁	S ₂	Q,	Q ₂	N	К	Т	0	Bolt	Additional Mass/Each
Chain Size	R	F	P	31	J ₂	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Q_2	'	K	'		Used	kg
	Roller	Roller											~5
RF03075	0	_	75	33	49	15.5	11.5	55	30	3.2	10	M8	0.06
RF03100	0	_	100	33	47	13.3	11.5	65	40	3.2	10	1410	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					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	80.7	2/	20	90	60	0.3	12	MIO	0.23
RF10100	0	_	100					70	40				0.16
RF10125	0	_	125	46.1	63	28.5	21.5	80	50	6.3	12	M10	0.18
RF10150	0	_	150					90	60				0.20
RF12200	0	-	200	55	75.7	35.5	26.5	120	80	7.9	15	M12	0.44
RF12250	0	_	250	33	/ 3./	33.3	20.5	1 <i>7</i> 0	125	7.7	13	19112	0.61

Note: 1. When attaching a slat or the like between two strands of chain, the slats should be attached to either outer link-outer link or inner link-inner link.

2. Imperial sizes available upon request.

3. The above dimensions are nominal dimensions and may differ from actual dimensions.



GA2 Attachments

GAZ Allac	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,											
Chain Size		ring Type	Pitch	K	т	Q,	ည	A	0		ength of ed Bolt	Bolt
Chain bize	Size $\begin{array}{ c c c c c c c c c c c c c c c c c c c$, ,		Outer	Inner	Used					
	Roller	Roller								Link	Link	
RF03075	0	_	75	30	3.2	15.5	11.5	13.5	8	26	19	M6
RF03100	0	_	100	50	3.2	13.3	11.5	13.5	0	20	17	7410
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	-	_	100	30								
RF10125	0	-	125	40	6.3	28.5	21.5	20	12	49	35	M10
RF101 <i>5</i> 0	0	0	150	60								
RF12200	0	0	200	80	7.9	35.5	26.5	26	15	63	45	M12
RF12250	0	0	250	125	7.9	33.3	20.5	20	13	63	45	MIZ
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	40.5	30	20	13	66	07	14/17
RF36450	0	0	450	220	12.7	60	46	32	19	105	75	M16
RF36600	0	0	600	300	12.7	00	40	32	17	103	/5	/////

GA2 Attachment

Note: 1. The weight of a GA2 attachment is the same as the weight of the base chain.

2. When attaching a slat or the like between two strands of chain, the slats should be attached to either outer link-outer link or inner link-inner link.

3. Imperial sizes available upon request.
4. The above dimensions are nominal dimensions and may differ from actual dimensions.

List of Series

•	Series Specification Standard Series									Lube-Fre	ee Series			
Se	ries S	pecit	icatic	n	Stando	ard Specs	Anti-Dus	st Specs	Stando	rd Specs	Completely L	ube-Free Specs	Water Resi	stant Specs
	1	Гуре			BF	R BF	DBR	DBF	EBF	EBF	AEBR	AEBF	WEBR WEBF	
		eratir ronm	•		away fr	nperature, om water I dust	Dust may (cannot be chain will be		away fr	mperature, om water d dust	away fr	nperature, om water I dust		nperature, with water
R	Roller Lubrication		1	Requires r	egular lube	Requires re	egular lube		ed without g the roller	lubed, no fu	and shipped urther lubing essary	Packaged and shipped lube no further lubing necessary (cannot be used in dust environments)		
	Operating Temperature Range			-20°C to 80°C (can be manufactured to withstand up to 150°C)		-10°C to 80°C		–20°C	to 50°C	−20°C to 50°C		0°C to 50°C		
			RF(03	1.96kN	{ 200kgf}	_		1.96kN	{ 200kgf}	_	_	1.37kN	{ 140kgf}
			RF()5	3.04kN	{ 310kgf}	_		3.04kN	{ 310kgf}	3.04kN	{ 310kgf}	2.13kN	{ 220kgf}
	_		RF(80	4.12kN	{ 420kgf}	_	_	4.12kN	{ 420kgf}	4.12kN	{ 420kgf}	2.88kN	{ 290kgf}
	Roller		RF	10	5.49kN	{ 560kgf}	5.49kN	{ 560kgf}	5.49kN	{ 560kgf}	5.49kN	{ 560kgf}	3.84kN	{ 390kgf}
	R		RF	12	8.34kN	{ 850kgf}	8.34kN	{ 850kgf}	8.34kN	{ 850kgf}	8.34kN	{ 850kgf}	5.84kN	{ 600kgf}
gg		RF17		17	14.1kN	{1440kgf}	14.1kN	{1440kgf}	14.1kN	{1440kgf}	14.1kN	{1440kgf}	9.87kN	{1010kgf}
Roller Allowable Load		မှု	RF2	26	19.6kN	{2000kgf}	19.6kN	{2000kgf}	19.6kN	{2000kgf}	19.6kN	{2000kgf}	13.7kN	{1400kgf}
d b		Size	RF:		27.5kN	{2800kgf}	27.5kN	{2800kgf}	27.5kN	{2800kgf}	27.5kN	{2800kgf}	19.3kN	{1970kgf}
- Section 1		Chain	RF()3	1.27kN	{ 130kgf}	_	<u> </u>	1.27kN	{ 130kgf}	_	<u> </u>	0.89kN	{ 90kgf}
er/			RF()5	1.96kN	{ 200kgf}	_		1.96kN	{ 200kgf}	1.96kN	{ 200kgf}	1.37kN	{ 140kgf}
2			RF(28	2.65kN	{ 270kgf}	_		2.65kN	{ 270kgf}	2.65kN	{ 270kgf}	1.86kN	{ 190kgf}
	Roller		RF		3.43kN	{ 350kgf}	3.43kN	{ 350kgf}	3.43kN	{ 350kgf}	3.43kN	{ 350kgf}	2.40kN	{ 240kgf}
	FR		RF		5.49kN	{ 560kgf}	5.49kN	{ 560kgf}	5.49kN	{ 560kgf}	5.49kN	{ 560kgf}	3.84kN	{ 390kgf}
		RF17			9.81kN	{1000kgf}	9.81kN	{1000kgf}	9.81kN	{1000kgf}	9.81kN	{1000kgf}	6.87kN	{ 700kgf}
	RF26			13.7kN	{1400kgf}	13.7kN	{1400kgf}	13.7kN	{1400kgf}	13.7kN	{1400kgf}	9.59kN	{ 980kgf}	
	RF36		36	18.6kN	{1900kgf}	18.6kN	{1900kgf}	18.6kN	{1900kgf}	18.6kN	{1900kgf}	13.0kN	{1330kgf}	
	Coefficient of Roller Rotation Friction			0	.03	C	0.05*	0	.03	0.03		0.03		
				6	15n	n/min	15m	n/min				_	-	
	nain wable	Spro No.		8	25n	n/min	25m	n/min	15n	n/min	15m/min		15m	/min
	wable	Tee		10	30n	n/min	30m	n/min	20m/min		20m/min		20m/min	
				12	30n	n/min	30m	n/min	25r	n/min	25m	n/min	25m/min	

^{*}As Anti-Dust Series chain is designed for use in dusty environments, its coefficient of friction is slightly higher.

• See the Tsubaki Large Size Conveyor Chains & Sprockets catalog for selection.

1 What is the difference between Tsubaki Bearing Roller Conveyor Chain and competitor bearing roller conveyor chain?

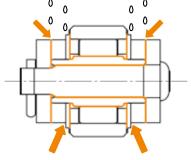
Tsubaki Bearing Roller Conveyor Chain uses a unique construction with cylindrical bearings inside the roller. Competitor chains just use two standard ball bearings.

Although bush–roller life is roughly the same with both types of construction, ball bearings receive load on their point contact and so generally have a lower allowable load than cylindrical bearings and their linear contact. Cylindrical bearings are also tough against impacts—impacts will damage the retainer of ball bearings, which easily leads to poor rotation.

2 Should I lubricate Bearing Roller Conveyor Chain?

We apply grease to inside the bearing rollers before we ship your chain from our plant. Although lubrication frequency will vary with the operating conditions, you should lubricate between pins—bushes and bushes—rollers once every 1–3 months (before you start hearing abnormal noises). (See the diagram below.)

Lubricate between pins and bushes, and inner and outer plates



Lubricate between bushes and rollers, and inner plates and spacers

Grease nipples are also available upon request. (See pg. 6.) Consider Tsubaki's Lube-Free Bearing Roller Conveyor Chain when you wish to avoid additional lubrication or when you wish to avoid contaminating conveyed items with lube.

3 Setting the allowable speed and sprocket number of teeth (pg. 19)

Bearing Roller Conveyor Chain's allowable speed is established by the strength of the rollers (cylindrical bearings) when engaging the sprocket. The less teeth a sprocket has, the higher the force acting on the roller during engagement, and the rollers (cylindrical bearings) will not be able to handle the load.

4 What is stick-slip?

Stick-slip, also called "surging," is a type of self-induced oscillation where the chain repeatedly starts and stops, despite there being continuous drive from the drive source. Stick-slip generally happens on conveyors over 10m long and with chain speeds less than 15m/min. The causes of stick-slip include a fluctuating coefficient of friction between bushes and rollers, insufficient chain strength, or even insufficient rail or conveyor strength. In situations where it is caused by a fluctuating coefficient of friction, then using Bearing Roller Conveyor Chain can minimize this surging.

5 Are the benefits of Bearing Roller Conveyor Chain worth the price?

When replacing existing chain, the initial costs will be higher but you will be able to reduce overall costs. (See table below.)

	AT Series Conveyor Chain	Standard Bearing Roller Conveyor Chain					
Initial costs	60	100					
Wear life	1	3					
Replacement costs	5000 yen/hour x 4 people x 12 hours (half day) x 3 times = JPY 720,000	5000 yen/hour x 4 people x 12 hours (half day) x 1 time = JPY 240,000					
Chain cost	60 x 3 replacements = 180	100 x 1 replacement = 100					
Total costs	180 + JPY 720,000 = 252 HAL	F 100 + JPY 240,000 = 124					

Note: Simulation with Bearing Roller Conveyor Chain costs as our benchmark of 100 and AT Series as 60.

Bearing Roller Conveyor Chain has half the total costs of standard conveyor chain.

Users can additionally reduce their electric bill thanks to the lower required motor kW and prevent production losses arising from stopping the line during replacement. (See the charts at the bottom of pg. 3.) And even with new installations, since Bearing Roller Conveyor Chain has a higher roller allowable load than standard conveyor chain users can go a chain size down. A smaller chain size means more compact equipment, which can lead to lower overall costs.

Notes on Use

- 1) Allowable loads are determined by roller-rail contact surface wheel load and bearing bending 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 the chain may come into contact with water.
- 3) Do not use in acidic or alkaline environments. Water resistant specifications (SUS400 Series parts) may rust in certain usage environments.
- 4) Poor rail installation, sprocket misalignment, or other equipment side operating conditions will cause an excessive thrust load to act on the chain in the direction of roller rotation. Adjust rails and sprockets to avoid this issue.

For Safe Use



Warning

Observe the following points to prevent hazardous situations.

- Do not use chains or accessories (peripheral devices and parts) for anything other than their original purpose.
- Never perform additional work on the chain.
- · Do not anneal the various parts of the chain.
- · Do not clean the chain with acids or alkalis, as they may cause cracking.
- · Never electroplate the chain or its parts, as this may cause cracking due to hydrogen embrittlement.
- · Do not weld the chain, as the heat may cause cracking or a reduction in strength.
- · When heating or cutting the chain with a torch, remove the links immediately adjacent and do not use them again.
- When there is a need to replace a damaged (fractured) portion of a chain, always replace the whole chain with a new product rather than replacing only the damaged or fractured portion.
- When using a chain and sprocket on suspension equipment, establish a safety fence and strictly prevent entry to the area directly below the suspended object.
- Always install hazard protection devices (safety covers, etc.) for the chain and sprocket.
- Immediately stop using the chain if it comes into contact with a substance that can cause embrittlement cracking (acid, strong alkali, battery fluid, etc.) and replace with a new chain.
- When installing, removing, inspecting, maintaining, and lubricating the chain:
 - · Perform the work according to the instruction manual or this catalog.
 - · Always turn off the power switch to the equipment beforehand and make sure that it cannot be turned on accidentally.
 - · Secure the chain and sprocket so that they cannot move freely.
 - · Use a press or other special tool to cut and connect chain, and cut and connect using the proper procedures.
 - · Wear clothing and protective gear (safety glasses, gloves, safety shoes, etc.) that are appropriate for the work.
 - · Only experienced personnel should replace chains and sprockets.
- Install hazard protection devices (safety equipment, etc.) on suspension equipment using Leaf Chain to prevent hazard or injury in the event of chain failure.
- Install protection equipment for safety on the equipment side when using chain on personnel transport devices or lifting equipment.



Caution

Observe the following points to prevent accidents.

- Only handle chains and sprockets after thoroughly understanding their structure and specifications.
- When installing chains and sprockets, inspect them in advance to confirm that they have not been damaged in transport.
- Always regularly inspect and maintain your chains and sprockets.
- 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 a load is applied to the chain once and does not refer to the allowable operational load.
- Lubricate connecting links (CL/OL) before assembling onto the base chain.
- Always ensure that the final customer receives the instruction manual.
- · If you do not have the instruction manual, contact a Tsubaki representative with the product name, series name, and chain/model number to receive the appropriate manual.
- The product information given in this catalog is mainly for selection purposes. Thoroughly read the instruction manual before actually using this product, and use the product properly.

Warranty

1. Warranty Period

Products manufactured by Tsubakimoto Chain Co. ("Products") are warranted against defects in materials and workmanship for eighteen (18) months from the date of shipment from the factory or twelve (12) months from the date the Products are first placed into operation (calculated from the date the Products have been installed on the customer's equipment), whichever comes first.

2. Scope of Warranty

During the warranty period, if defects arise in the Products when installed, used, and maintained correctly in accordance to Tsubakimoto Chain's catalogs, installation manuals (including any documents specially prepared and provided to the customer) and the like, Tsubakimoto Chain will repair or replace such defective Products thereof free of charge upon confirmation of said defect by Tsubakimoto Chain. This warranty shall only apply to Products received, and Tsubakimoto Chain shall not be liable for the following costs and/or damages (including installation manuals or other documents specially prepared and provided to the customer):

- Costs required for removing the defective Products from or re-installing the replacement Products on the customer's equipment for replacement or repair of the defective Product, as well as any associated installation costs.
- (2) Costs required to transport the customer's equipment, if needed, to a repair shop or the like.
- (3) Any consequential or indirect damages or loss of profits or benefits the customer may incur due to the defects or repair of the Products.

3. Out of Warranty Service and Repair

Regardless of the warranty period, Tsubakimoto Chain will provide investigation, repair, and/or manufacture of the Products for a fee should the Products experience problems or anomalies under the following situations.

- (1) Placement, installation (including connecting and disconnecting), lubrication, or maintenance of the Products not in accordance with Tsubakimoto Chain's catalogs, installation manuals (including documents specially prepared and provided to the customer), or the like.
- (2) Use of the Products (including operating conditions, environment, and allowances) not in accordance with Tsubakimoto Chain's catalogs, installation manuals (including documents specially prepared and provided to the customer), or the like.
- (3) Inappropriate disassembly, modification, or processing of the Products by the customer.
- (4) Use of the Products with damaged or worn products. (Example: Use of the Products with a worn sprocket, drum, rail, or the like.)
- (5) When the operating conditions exceed the performance of the Products as selected using the Tsubakimoto Chain selection method.
- (6) Use of the Products in conditions other than what have been discussed.
- (7) When consumables such as bearings, oil seals, and lubricant in the Products deplete, wear, or degrade.
- (8) When secondary damage occurs to the Products due to initial or primary damage or failure to the customer's equipment.
- (9) Damage or failure of the Products due to forces majeure such as natural disasters.
- (10) Damage or failure of the Products due to unlawful conduct by third parties.
- (11) Damage or failure of the Products due to causes not attributable to Tsubakimoto Chain

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