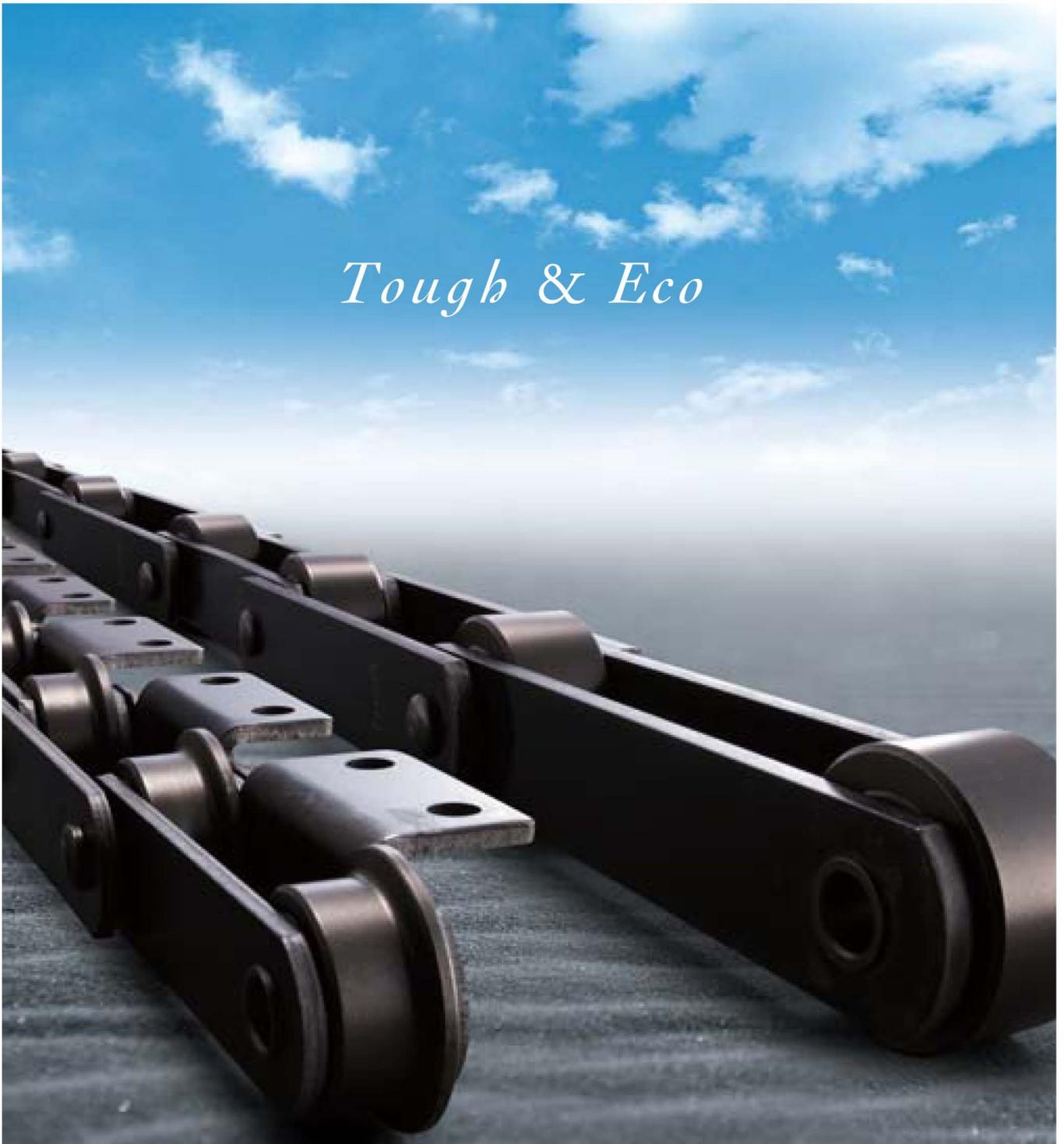


TSUBAKI Conveyor Chain For Waste Treatment Facilities

PAT.

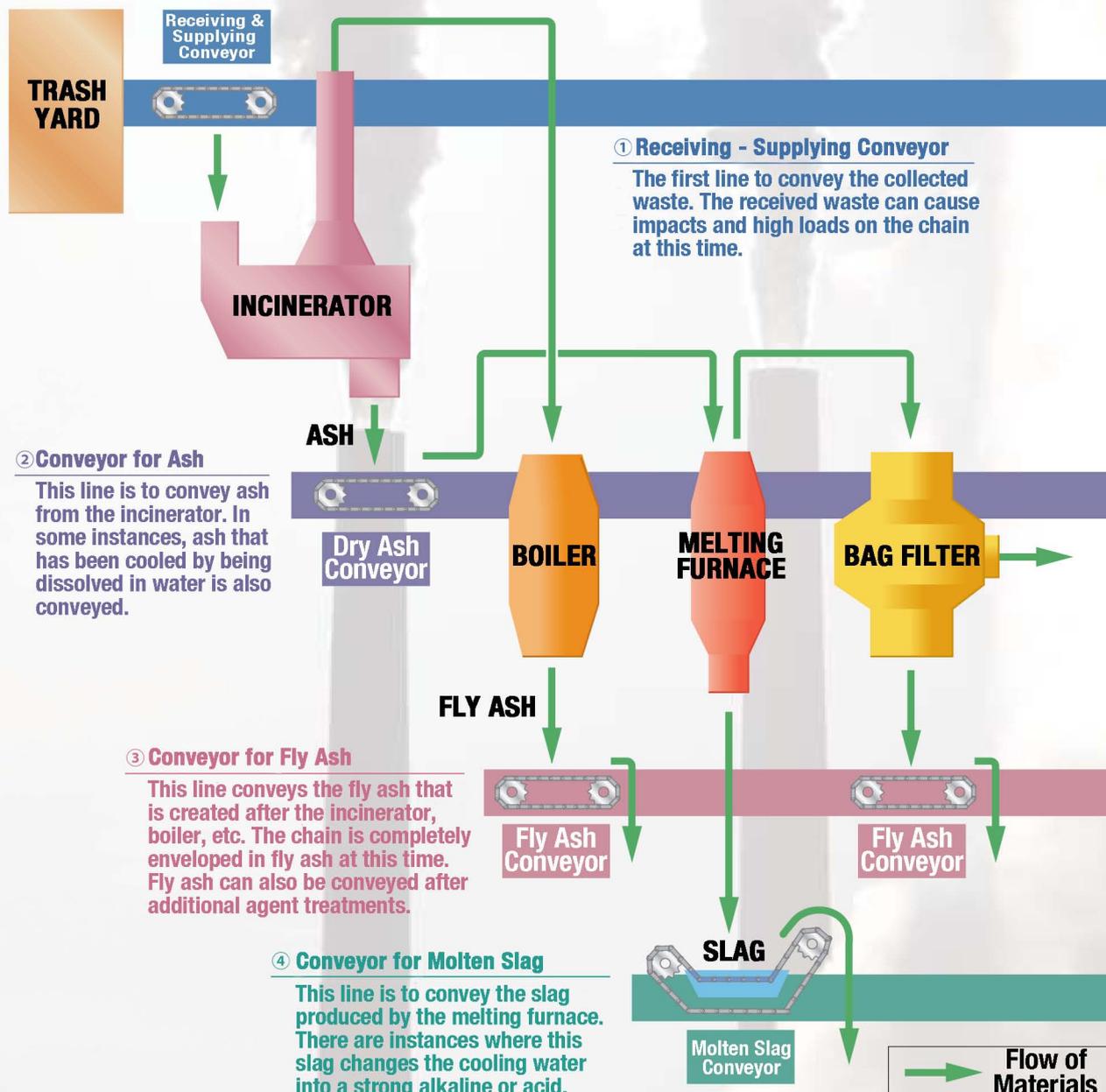
Tough & Eco



Introducing a Highly Adaptable Conveyor Chain Perfectly Suited for a Variety of Rigorous Conditions

In recent years concern for environmental issues and becoming more “eco” has greatly increased, spawning diversification in waste treatment facilities and waste treatment methods. Tsubaki has consequently gathered detailed results on the actual chains utilized in the various equipment in waste treatment facilities, and has developed a line of distinctly designed and specialized conveyor chain adaptable for the wide range of harsh applications. This is the “**Tsubaki Conveyor Chain for Waste Treatment Facilities**”. Tsubaki is committed to increasing the life of conveyor chain for waste treatment facilities and assisting you to become more “eco.”

◎ Layout of a Waste Treatment Facility (example)



the “Environment of Use”

& *Eco*

● Specification Codes

Name of Conveyor in Each Waste Treatment Process	Series		Performance per Process			
			Wear	Corrosion	Poor Articulation	Poor R Roller Rotation
Receiving & Supplying Conveyor	KG	KA	◎		○	○
Ash Conveyor	Dry	AG	○		○	○
	Wet	AM		○	○	○
		AP		◎	○	○
Fly Ash Conveyor	Normal	FG	○		◎	○
	Corrosive	FP		◎	◎	○
Molten Slag Conveyor		YP	◎	◎	○	○

Performance: ◎ Optimal ○ Suitable

* Each specification has been optimized for the needs of that individual process.

* KA, AA, AP specs are reinforced versions of KG, AG, and AM specs. (2x the tensile strength)



◎ Receiving - Supplying Conveyor **KG-KA Series**

- Conveyed Items: Collected Waste
- Roller Rotation + Step Bush + Countermeasure for Poor Articulation



◎ Conveyor for Ash (Dry) **AG-AA Series**

- Conveyed Goods: Incinerator Ash
- Countermeasure for Poor Articulation/Roller Rotation



◎ Conveyor for Ash (Wet) **AM-AP Series**

- Conveyed Goods: Incinerator Ash (mixed with water)
- Dry Ash Countermeasures + Corrosion Resistance



◎ Conveyor for Fly Ash **FG Series**

- Conveyed Goods: Post-Incineration Fly Ash
- Countermeasures for Poor Articulation/Roller Rotation + Pin ~ Bush Wear



◎ Conveyor for Fly Ash (Corrosive) **FP Series**

- Conveyed Goods: Fly Ash (fly ash produced after additional agent treatment in cooling tower, etc.)
- Conveyor for Fly Ash Countermeasures + Corrosion Resistance



◎ Conveyor for Molten Slag **YP Series**

- Conveyed Goods: Molten Slag
- Countermeasures for Chain Wear + Corrosion Resistance + Step Bush

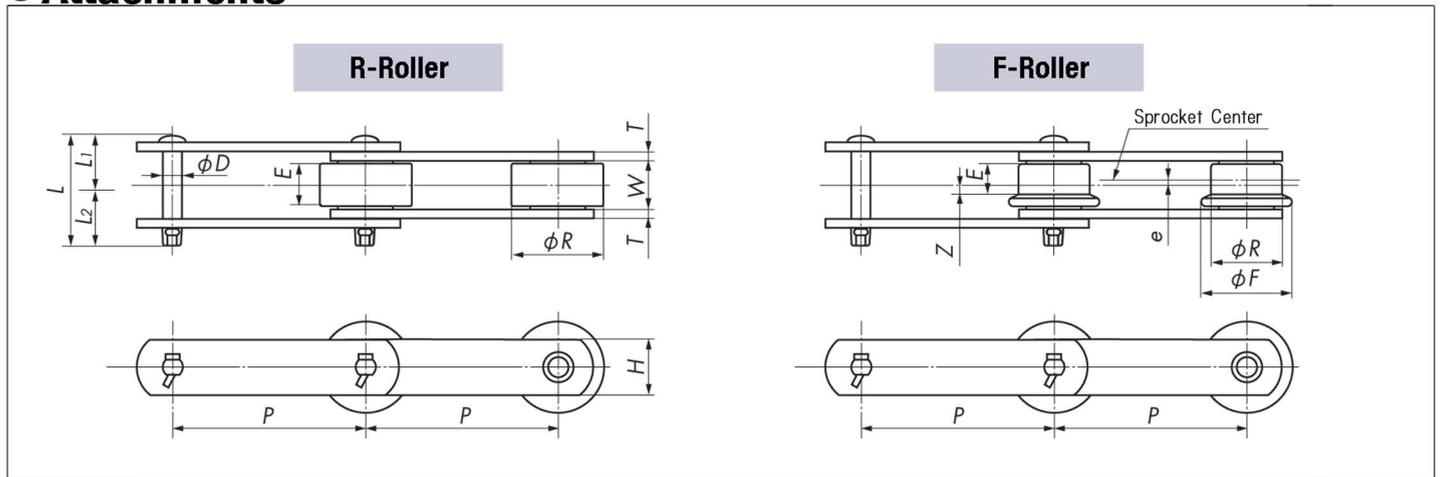
The Tsubaki Conveyor Chain for Waste Treatment Facilities

● Chain Numbering Example

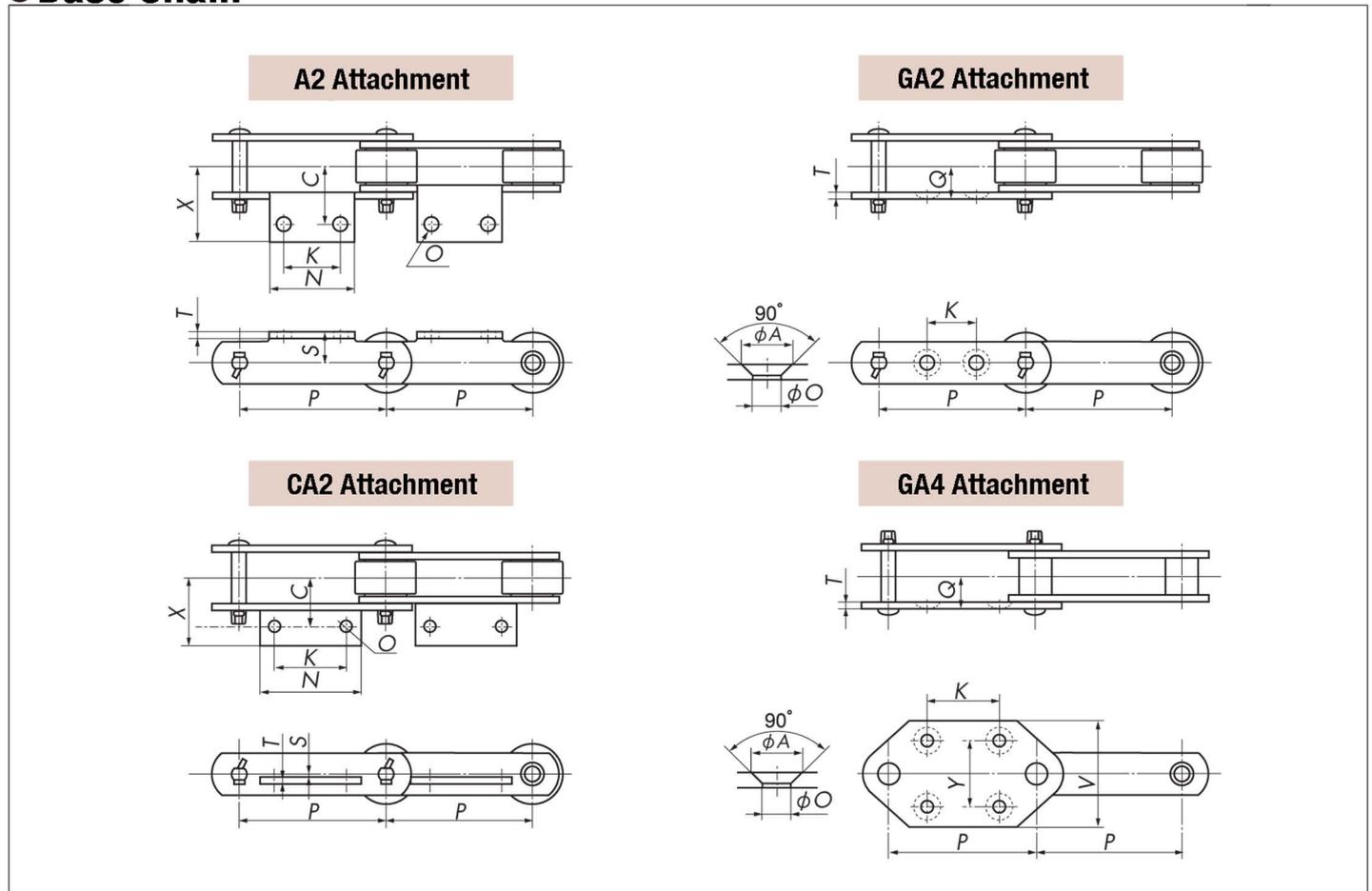
RF1 2200 F-KG-1 LA2



● Attachments



● Base Chain



Specifically Designed for the Waste Treatment Process

※ Please refer to “TSUBAKI Large Size Conveyor Chains” for selection methods, etc.

● Chain Strength

TSUBAKI Chain Number	Average Tensile Strength kN [kgf]			Roller Allowable Load kN [kgf]					
	KG, AG AM, FG	KA AA	FP, YP AP	KG KA	AG AA	AM AP	FG	FP	YP
RF03	29.4 {3000}	69.6 {7100}	53.9 {5500}	—	—	—	0.78 {80}	0.49 {50}	—
RF05	68.6 {7000}	142 {14500}	108 {11000}	—	—	—	1.57 {160}	0.88 {90}	—
RF10	123 {12500}	226 {23000}	177 {18000}	3.33 {340}	2.65 {270}	1.57 {160}	2.65 {270}	1.57 {160}	2.06 {210}
RF12	186 {19000}	279 {28500}	265 {27000}	4.90 {500}	3.82 {390}	2.26 {230}	3.82 {390}	2.26 {230}	2.94 {300}
RF17	245 {25000}	387 {39500}	358 {36500}	8.43 {860}	6.37 {650}	3.82 {390}	—	—	5.10 {520}
RF26	314 {32000}	520 {53000}	461 {47000}	11.0 {1120}	8.33 {850}	5.00 {510}	—	—	6.57 {670}

● Chain Dimensions

TSUBAKI Chain Number	Roller Type	Pitch P	Roller Type							Inner Width W	Plate		Pin			
			R Roller		F Roller						H	T	D	L	L ₁	L ₂
			R	E	R	F	E	e	Z							
RF03075	R · F	75	31.8	14.5	31.8	42	11	1.8	3.8	15.1	22	3.2	8.0	38	18	20
RF03100	R · F	100														
RF05100	R · F	100	40	19	40	50	14	2.5	4.5	21	32	4.5	11.3	53.5	25	28.5
RF05125	R · F	125														
RF05150	R · F	150														
RF10100	R	100	50.8	25	50.8	65	19	3	6.5	28	38.1	6.3	14.5	69	31	34.5
RF10125	R · F	125														
RF10150	R · F	150														
RF12200	R · F	200	65	32	65	80	24	4	8	35.1	44.5	7.9	15.9	83.5	33	36
RF12250	R · F	250														
RF17200	R · F	200	80	44	80	100	34	5	12	49.4	50.8	9.5	19.1	109.5	40.5	43
RF17250	R · F	250														
RF26250	R · F	250	100	50	100	125	38	6	13	55.2	63.5	9.5	22.2	116.5	51.5	58
RF26300	R · F	300														

● Attachment Dimensions

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

Results of Waste Treatment Conveyor Chain Testing

Wear Life Comparison

Molten Slag Conveyor:

Previously, the AT Series Heavy Duty Conveyor Chain that was widely used for molten slag conveyance would suffer wear between the bushes and rollers and meet its wear life after only 1 year of use. But by introducing the YP Series Conveyor Chain for molten slag conveyance, the wear between the bushes and rollers dropped to 1/10th, which demonstrates its extremely high level of durability.



Tsubaki Heavt Duty: AT Series
Bush~Roller: Wear life met



Molten Slag Conveyor: YP Series
Bush~Roller: Only slight wear
(1/10th of AT Series)

Corrosion Resistance Comparison

Molten Slag Conveyor:

To cool slag it is conveyed while submerged in water, but the slag causes this water to become either highly acidic or highly alkaline. Water from this treatment was used in an immersion test (80°C for 1.5 months), with the results showing harsh rust and pitting on the AT Series Heavy Duty Conveyor Chain; however, no remarkable rust or pitting was noticeable on the YP Series Conveyor Chain for Molten Slag Conveyance.



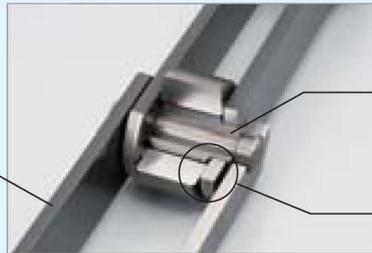
Tsubaki Heavy Duty: AT Series
Harsh rust and pitting occured



Molten Slag Conveyor: YP Series
No visible rust or pitting

Characteristics of Conveyor Chain for Waste Treatment

Corrosive Resistant: Superior Materials



Wear Resistant: Step Bush

Reliable Articulation: Proper Clearance

Highly Effective for a Wide Variety of Applications



Conveyor for Bulk Waste/Recycling Facility



Conveyor for Raw Garbage



Conveyor for Manufactured Goods at Treatment Facility



Inclinator+Melting Furnace Mixed Ash Conveyor



Fly Ash Conveyor: Dust Conveyor Under Boiler



Fly Ash Conveyor: Dust Conveyor Under Boiler

For Your Safety When Using the Chain



Warning To avoid danger, observe the following rules.

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

- 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.



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