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**C-C-007-018**

**2014.6**



# BANDO CONVEYOR BELTS

## Product guide

# BANDO CONVEYOR BELTS





# BANDO CONVEYOR BELT

Bando Chemical Industries, Ltd. produced the first conveyor belts made in Japan in 1921. Since that time, Bando has been a pioneer in conveyor belt production, and has developed the latest facilities and technologies, which have contributed to conveyor belt production in Japan at world-class levels. Our efforts are now directed at environment-friendly production and technological development, along with systems rationalization and labor savings to offer environment-friendly and safe products.

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# Standard Conveyor Belts

**G-CARRY™**

**G-CARRY™**


**EP-400/3**

Core body (polyester)    Belt strength N/mm    Number of plies

■ Belt elongation guide

Belt type	Initial elongation (%)	Total elongation (%)	Time to reach relative elongation stability
<b>G-CARRY™</b>	0.3	0.7	0.5–1 year
Monoply Belt™ Rock Belt™ Sun conveyor belt	0.9	1.7	1–2 years

\* Add extra length of 0.4% to the value in the table above as take-up stroke.



## Monoply Belts™

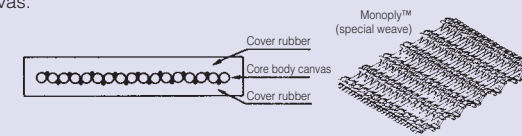
**Monoply Belts™ - 400/1**



### Applications and features

Suitable for applications exposed to small-to-medium-scale impact, such as crushed stone, ore and lumber.

1. Superior impact resistance and gripping resistance due to specially woven nylon canvas.
2. Superior flexibility due to monoply construction.
3. Reduced scratches on the canvas.
4. Superior slide-wear resistance.



### Applications and features

Applications include transportation of bulk materials, such as coal, ore, limestone, cement, wood chips, crushed rock, packaged materials, powder, aggregate, earth and sand. Also suitable to transport bulk materials in large industrial facilities.

1. Standard belt with CO<sub>2</sub> reduction specification.
2. Reduced electrical use.
3. Superior flexibility with fewer plies.
4. Superior impact resistance, gripping resistance, and tear resistance.
5. Belt strength values of 630N/mm and 800N/mm are standard specifications.

## Colored Conveyor Belts (White, Green)

Suitable to transport goods which may be adversely affected by exposure to black belts, as well as for use in assembly lines and packaging operations.

1. Sharp colors.
  2. Reduces contamination to goods being transported.
  3. Green Belts reduce eye fatigue.
- (Not suitable for transport of unpackaged food.)



Colored Conveyor Belts

## Rock Belts™ 0, 1 and 2

**Rock Belt™ -500/2**

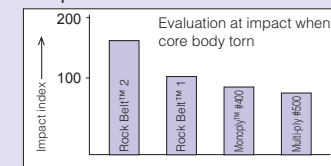


### Applications and features

Suitable for large impact applications, such as transport of rocks and debris from crushers, and transport of timber, rock, debris, earth and sand.

1. Superior impact resistance and gripping resistance result in reduced core body damage.
2. Superior cut resistance and wear resistance lead to long service life.
3. Non-standard Rock Belt™ 8 has strength value of 1500 N/mm. (Refer to page 15.)

#### ● Impact test



## Vinyl 300 Conveyor Belts

Light-duty white and green belts suitable for oily or oil-treated products.

1. Highly resistant to oil.
  2. One surface is white and the other is green. Odorless, with superior non-contamination properties.
  3. Surface cleanliness as transported items are less likely to adhere to the belt surface.
  4. Superior wear resistance compared with general colored belts.
- (Not suitable for transport of unpackaged food.)



Vinyl 300 Conveyor Belts

## Package Belts (for inclined conveyance)

Package Belts are used to transport goods on inclines. A mesh pattern is inscribed into the top cover rubber to prevent the collapse or spilling of items conveyed. The special pattern also cushions impact and alleviates vibration, so the belt is suitable to convey breakable items.

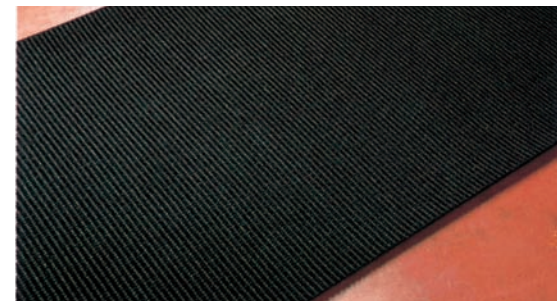
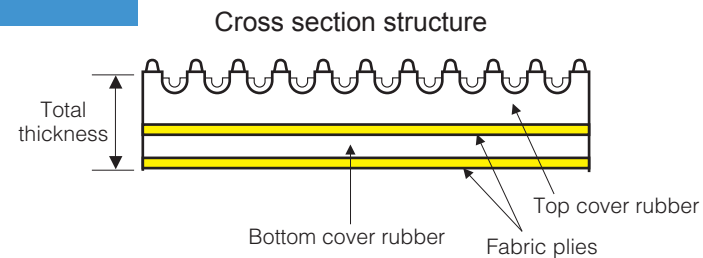
### Applications

- Inclined conveyance of lightweight goods and packages.
- Conveyance of breakable items (bottles, etc.) and items that might easily slide on an incline.  
Note 1: Unsuitable for oily goods.  
Note 2: Not for use with powders.

### Features

- There is no bottom cover rubber on the belt so the coefficient of friction is less, and it is suitable for use on table runs.
- The mesh pattern of the top cover rubber cushions impact, alleviates vibration and prevents slippage.
- Inclined conveyance up to 30° is possible, depending on the items transported.

### Standard structure



▲ Package Conveyor Belt

### Standard specifications

Belt strength (N/mm)	Belt width (mm)	Number of plies	Cover rubber thickness (mm)	Belt thickness (mm)	Reference weight (kg/m <sup>2</sup> )	Color
160	300	2	2.5×0	5.3	5.5	Black
160	350	2	2.5×0	5.3	5.5	Black
160	400	2	2.5×0	5.3	5.5	Black
160	450	2	2.5×0	5.3	5.5	Black
160	500	2	2.5×0	5.3	5.5	Black
160	600	2	2.5×0	5.3	5.5	Black
160	700	2	2.5×0	5.3	5.5	Black
160	750	2	2.5×0	5.3	5.5	Black
160	800	2	2.5×0	5.3	5.5	Black
160	900	2	2.5×0	5.3	5.5	Black
160	1000	2	2.5×0	5.3	5.5	Black
160	1050	2	2.5×0	5.3	5.5	Black
160	1200	2	2.5×0	5.3	5.5	Black

## V-Cleat Conveyor Belts (for inclined conveyance)

V-Cleat Conveyor Belts are designed for inclined conveyance. The unique shape of the cleats on the top cover rubber stabilizes the goods being transported and prevents spillage. V-Cleat Belts are effective in preventing load spillage and drops in inclined conveyance, as well as for the transport of granular materials.

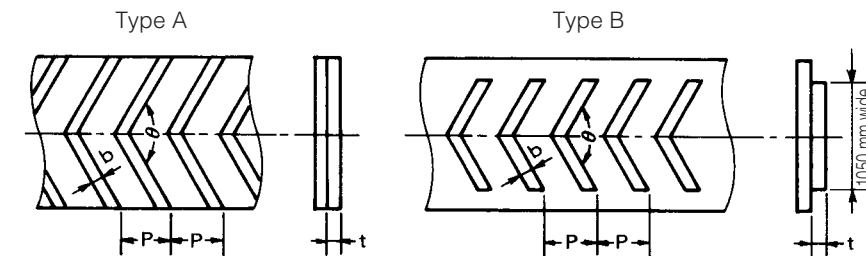
### Applications

- Inclined conveyance of granular materials up to 50mm diameter, with large coefficient of friction on the top surface.
- Inclined conveyance of low-load goods, such as soft packaged goods.  
Note: Not suitable to convey sticky substances as the recessed structure is difficult to clean. (Unable to directly apply cleanser due to the belt surface shape.)

### Features

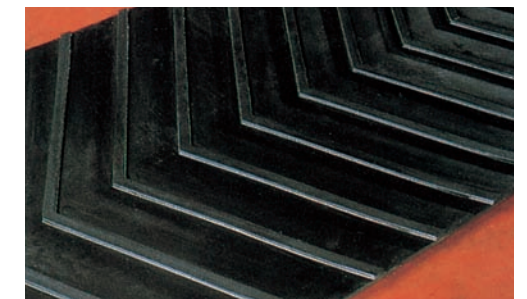
- Inclined conveyance  
Inclines up to 30 degrees, depending on the goods being conveyed. Suitable for the conveyance of unbagged gravel and sand, bulky goods and bagged goods.
- Safe, with few drops  
Goods being conveyed naturally gather at the belt center due to the cleat shape, which prevent goods from falling.
- The cleats are vulcanized, and cure at the same time as the belt, so there is no cleat separation.
- Noise due to vibration is reduced because the cleat angle pitch is designed so that the cleats wrap onto the return roller.

### Structure



### V-Cleat Belt Dimensions

Belt width (mm)	Cleat height t (mm)	Cleat width b (mm)	Cleat pitch p (mm)	Cleat angle θ	Type
300	5.0	12	80	120°	A
350	5.0	12	80	120°	A
400	5.0	12	80	120°	A
450	5.0	12	80	120°	A
500	5.0	12	80	120°	A
600	5.0	12	80	120°	A
700	5.0	12	80	120°	A
750	5.0	12	80	120°	A
800	5.0	12	80	120°	A
900	5.0	12	80	120°	A
1000	5.0	12	80	120°	A
1050	5.0	12	80	120°	A
1200-1600	5.0	11	150	120°	B



▲ V-Cleat Conveyor Belt



# Flexowell® Conveyor Belts (for steep-incline conveyance)



Special horizontal cleats and wave-shaped sidewalls enable Flexowell® Belts to convey at angles up to 90° (vertical). Capital investment savings due to substantially reduced facility space, with high efficiency. The simple structure allows for easy maintenance and contributes to reduced running costs.

Flexowell® is a registered trademark of ContiTech Transportbandsysteme GmbH; used by permission.

## Types and applications

Types of rubber	Applications	Major transferred goods
Standard products	Transportation of loose materials and powders	Sand, gravel, crushed stone, iron ore, sintered steel, steelmaking auxiliary materials, granulated slag, steel shot, wood chips, pulp, used paper, clay, cement, bricks, tile raw materials, cullet, glass raw materials, grain, fertilizers, coal, and coal ash
Heat-resistant products	Transportation of high-temperature goods (Intermediate heat-resistant transportation with the temperature of transferred goods not higher than 100°C and the belt surface temperature not higher than 70°C)	Coke, molding sand, mesalite ore, sulfur, pellets, cement clinker, sintered steel, glass raw materials, and cement
Oil-resistant products	Transportation of oily goods (highly oil resistant)	Settled sand, dewatered sludge, scum, municipal refuse, paper making sludge, punched steel sheets, animal skin, grain, and animal feeding stuff
Flame-retardant products	Coal-fired power stations, etc.	Coal and others
Flame-retardant and oil-resistant products*	Bulk waste disposal sites, etc. (waste crushing facilities)	Coarse refuse, etc.

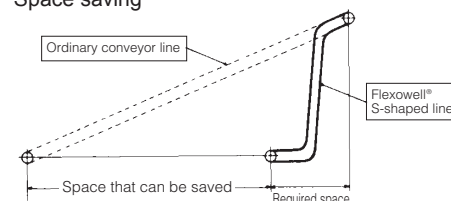
\* Fire prevention measure at bulk waste disposal sites. Used in steep-incline crusher lines. (Flame resistance performance equivalent to products passing JIS flame resistance test.)

## Features

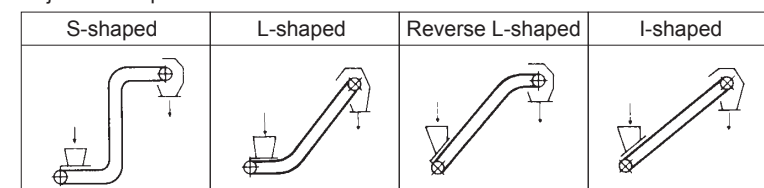
- Space saving**  
Vertical conveyance substantially saves space compared with conventional conveyor facilities.
- Freely design conveyor line angles**  
Easy to design the required conveyor angle, from flat to steep incline, depending on the facility layout.
- High capacity conveyance**  
Significantly improved cross-section area, with dramatically increased load capacity compared with trough conveyors.
- Reduced facility costs**  
Small pulley diameters may be used, without the need for skirt boards. Facility costs are reduced with flat rollers.



### Space saving

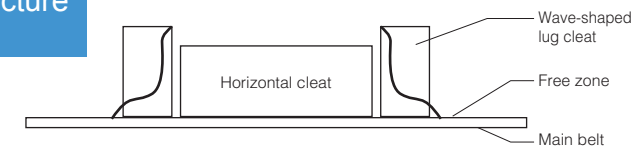


### Major line shapes



## Structure

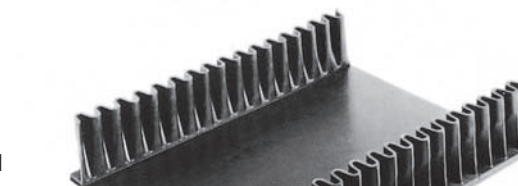
### Belt cross section



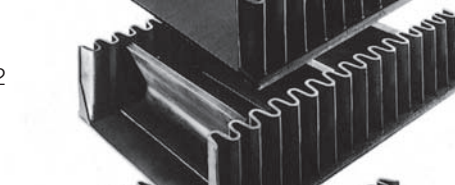
## Components

Flexowell® Belts are made up of the main body belt, wave-shaped sidewalls and horizontal cleats. The three components are rigidly cold-bonded by mechanical means. Please consult with us, as various combinations are available, depending on the items conveyed, volume and the angle of inclination.

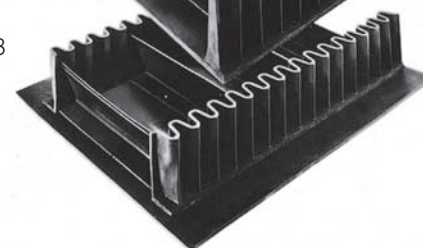
### Type 1



### Type 2



### Type 3



## Combination types (Types 1, 2 and 3 are standard)

### Type 1: No free zone, no horizontal cleats

For lines with 0-16° inclinations, without angle change in conveyance.

### Type 2: No free zone, with horizontal cleats

For sharp inclines, without angle change in conveyance.

### Type 3: With free zone and horizontal cleats

For sharp inclines, with angle change(s) in conveyance.

### Type 4: With free zone, without horizontal cleats

For lines with 0-16° inclinations, with angle change(s) in conveyance.

## Standard combination

Belt width	Sidewall height	Horizontal cleat height	In mm	
			Effective width	Free zone width
300	60N	55	120	40
	80N	75	200	0
350	60N	55	150	50
	80N	75	250	0
400	60N	55	200	50
	80N	75		
	100N	90	300	0
	120N	110		
450	60N	55	230	60
	80N	75		
	100N	90	350	0
	120N	110		
500	120S	110	180	60
			300	0
	80N	75	280	60
	100N	90	400	0
500	120N	110	260	70
			400	0
	120S	110	210	70
			350	0
600	80N	75	360	70
	100N	90	500	0
	120N	110	340	80
			500	0
600	120S	110	290	80
			450	0
	100N	90	390	80
	120N	110	550	0
650	120S	110	340	80
			500	0
	160S	140	320	90
			500	0
700	100N	90	440	80
	120N	110	600	0
	120S	110	420	90
	160S	140	600	0
750	100N	90	470	90
	120N	110	650	0
	120S	110	420	90
	160S	140	600	0
800	200S	180	400	100
			600	0
	120S	110	450	100
	160S	140	650	0
900	200S	180	530	110
	240S	220	750	0
	120S	110	510	120
	160S	140	750	0
1000	200S	180	610	120
	240S	220	850	0
	160S	140	590	130
	200S	180	850	0
1050	120S	110	660	120
	160S	140	900	0
	200S	180	640	130
	240S	220	900	0
1200	280S	260	770	140
	300S	280	1050	0
	400ES	360	750	150
	240S	220	1050	0
1400	300ES	280	700	150
	400ES	360	700	150
	200S	180	930	160
	240S	220	910	170
1600	280S	260	850	200
	300S	280	800	200
	300ES	280	1050	200
	400ES	360	1000	200

\* Standard effective widths of ES types are available in multiples of 100mm.

\* We can design and manufacture large-capacity non-standard belts, with various widths and strengths. Please contact us.

# Bando Eco-Carry™ (energy-saving conveyor belts)

Global efforts are now being made to conserve energy and reduce CO<sub>2</sub> emissions to protect the world's environment. These efforts are very important to us at Bando. Bando Eco-Carry™ was developed to meet customer needs for reduced costs for electricity associated with conveyor operations. Bando Eco-Carry™ conserves energy and contributes to reduced CO<sub>2</sub> emissions. Bando develops environment-friendly belts, and consistently remains at the forefront of global conveyor technology.

**Applications** Steelworks, cement, limestone mines, paper mills, electric power, etc.

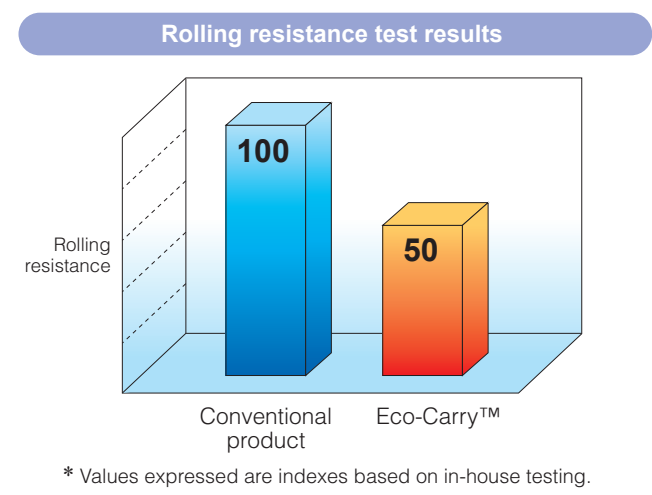
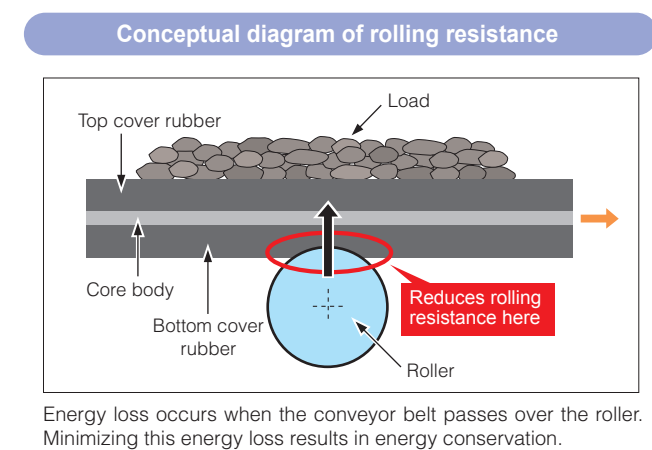
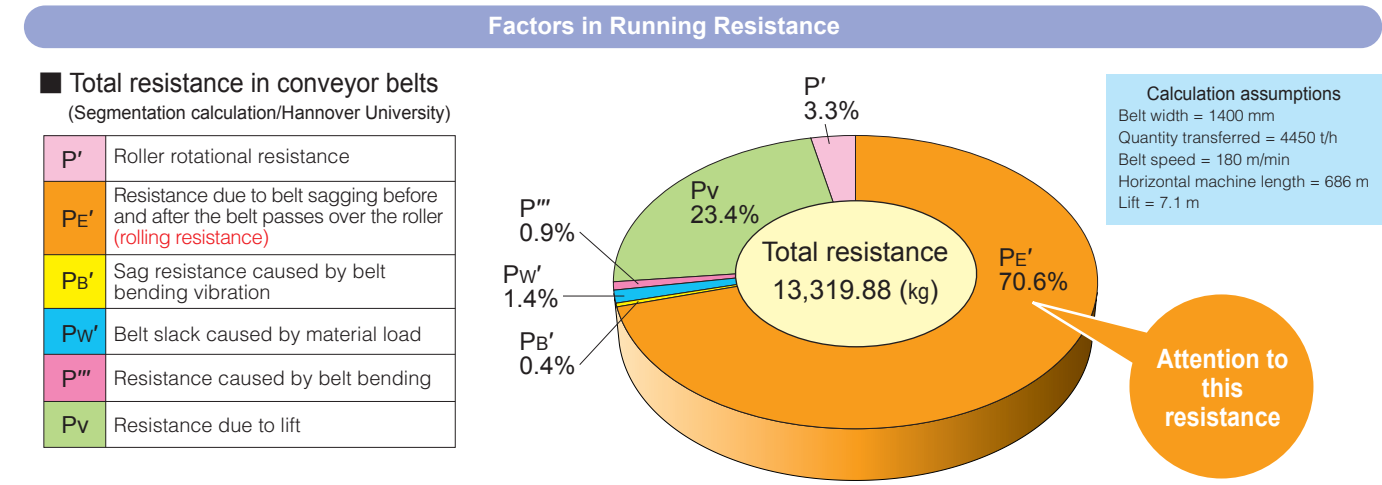
- Features**
- 1. Energy-savings (reduced electricity), contribution to reduced CO<sub>2</sub> emissions**  
Effective energy savings in the drive motor due to reduced rolling resistance.
  - 2. No modifications to existing facilities**  
Existing facilities do not require modification when switching to Eco-Carry™ belts.
  - 3. Secure operations**  
The safety factor is increased with Eco-Carry™, as it has the same strength as conventional belts, with reduced power requirements.

**Types** Canvas conveyor belts are used for short runs and steel cord conveyor belts are used for long runs. (Please contact Bando for details.)

**We provide energy conservation analyses.** We would be happy to conduct a simulation based on your usage conditions to calculate expected energy savings.

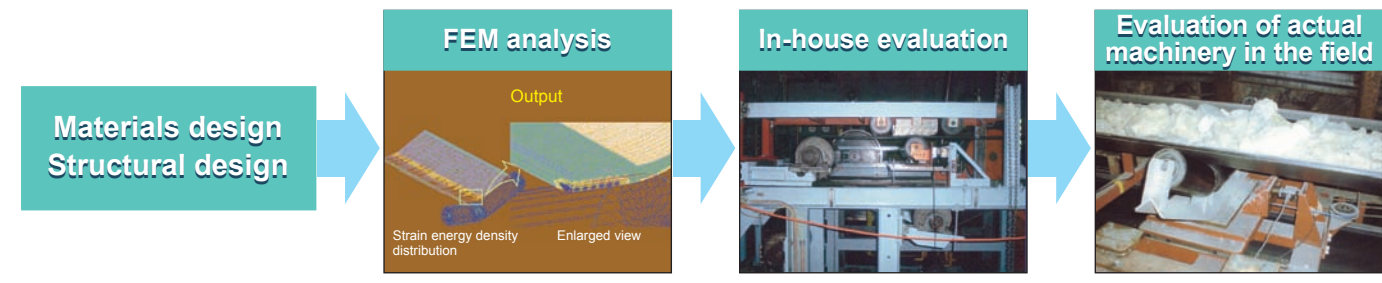
## How are energy savings achieved?

Among the various resistances encountered by the belt as it runs, **resistance over the rollers** is the greatest. Reducing rolling resistance was our key point in developing Bando Eco-Carry™. Our research into belt materials and construction resulted in reducing rolling resistance by 50%.  
 Reduced rolling resistance → reduced power required by the conveyor → reduced power consumption by the motor → contribution to reduced CO<sub>2</sub> emissions



## Verification of Energy Savings

A theoretical analysis of energy savings is conducted using FEM, along with in-house testing and an actual field evaluation of the equipment in use.



## Energy Saving Performance

- Energy conservation (reduced power consumption) is in the following ranges compared with conventional belts:
- Canvas conveyor belt: 3–10%
  - Steel cord conveyor belt: 7–30%
- \* Energy savings vary depending on individual conveyor belt line requirements (machinery length, incline, line shape, etc.)

# Flame Resistant Conveyor Belts

Flame resistant conveyor belts use special self-extinguishing compounds and chemicals in the rubber. These belts comply with JIS K 6324-1994, grades 2 and 3.

- Wear-resistant grade (equivalent to JIS S).....FR300J
- Ultra wear-resistant grade (equivalent to JIS A).....FR300T  
(Please contact us for information regarding JIS K 6324 grade 1 compliance and non-Japanese standard compliance.)

## Applications

Mines, steel mills (blast furnace), coal, people-movers, grain and petroleum terminals, and hazardous (flammable) materials conveyance



## Flame resistance testing method

(In compliance with JIS K 6324)

### ●Burn duration test

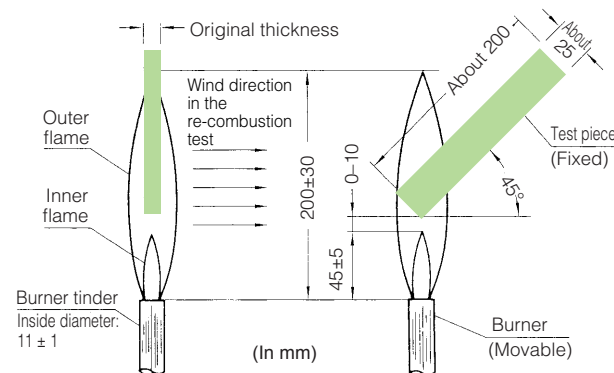
Adjust the burner to obtain an inner flame length of 45 ± 5mm and an outer flame length of 200 ± 30mm. Tilt the test piece at 45 degrees, and set it so that the lowermost end of the test piece comes to a position 0 – 10mm from the uppermost end of the inner flame. After exposing the test piece to the flame for 45 seconds, remove the flame, and measure the time the test piece continues to burn.

### ●Re-combustion test

After removing the flame in the burn duration test, wait 60 ± 10 seconds, and use a blower to expose the test piece to a wind speed of 1.5m/second in the direction shown at right to examine the re-combustibility of the fire.

Note: Adjust wind speed in advance using a portable anemometer.

\* Use LP gas (Type 1, No. 1) for the flame, as specified in JIS K 2240.



## Flame resistance grade

(JIS K 6324)

Item	Flame resistance grade	
	Grade 2	Grade 3
Burn duration	The total burn duration of six test pieces of cover rubber <u>not to exceed 45 seconds</u> and the burn duration for any one of the six test pieces not to exceed <u>15 seconds</u> .	Average burn duration for three test pieces of cover rubber <u>not to exceed 60 seconds</u> .
Re-combustion	No re-combustion on any of the test pieces.	
Types of rubber conveyor belts (Reference)	Fabric conveyor belts, steel cord conveyor belts	

# Oil Resistant Conveyor Belts

If ordinary belts are used to convey goods containing oil (mineral, animal or vegetable oil), the oil causes swelling in the cover rubber, offset, meandering or reverse warping may occur. The belt may become disabled or service life may be shortened. We recommend oil-resistant conveyor belts even if only a small amount of oil is present in the goods being conveyed.

## Types and applications

Type	Kind of rubber	Major features and applications
Oil-resistant 110 black Oil-resistant 130 white	CR (Chloroprene)	Well-balanced mechanical properties with light resistance to oil. Used in applications where these features are required or where light resistance to oil and moderately high heat resistance are required.
Oil-resistant 210 black Oil-resistant 230 white Oil-resistant 240 green	NBR (Nitrile)	Highly resistant to aromatic solvents (benzole, toluene, etc.), halogenated hydrocarbons, ketones, vegetable and mineral oils, except esters. Used in applications where large amounts of oil are present.
Oil-resistant 220 black	NR+NBR (Natural rubber plus nitrile)	Greater cold resistance than other belts, with mild oil resistance. Suitable for the conveyance of wood chips, frozen fish and grains.
Oil-resistant 300	PVC+NBR (Vinyl chloride plus nitrile)	Used in applications where high oil resistance is required, or in the light-duty conveyance of not-ready-to-eat foods that directly contact the belt. Standard belts have one side white and the other side green.
Oil-resistant 310 black Oil-resistant 330 white Oil-resistant 340 green	PVC+NBR (Vinyl chloride plus nitrile)	Oil-resistant 300 belts in made-to-order colors.

Note: For problematic applications, such as those involving mixed oils, the proper belt will be determined after examining the previous belt(s) test samples, and oil resistance testing.

## Oil resistance test examples

Volume change rate (%)  
Condition: Immersion at 70°C for a week

	JIS-G	Oil-resistant 110	Oil-resistant 210	Oil-resistant 220	Oil-resistant 300
Soybean oil	70	41	2	50	-3
Anti-corrosive oil	60	40	1	48	-5
Whale oil	175	51	22	66	10
Volatile oil	142	65	25	98	6

Volume change rate (%) JIS K 6258-1993

$$\frac{(\text{Weight in the air after immersion} - \text{weight in the water after immersion}) - (\text{weight in the air before immersion} - \text{weight of the water before immersion})}{\text{Weight in the air before immersion} - \text{weight of the water before immersion}} \times 100$$

## Conveyor belts for grains

\* Grain-oil-resistant SBR-base belts are most suitable to convey grains (wheat, soybeans, corn, etc.). However, we recommend Oil-resistant 210 for the conveyance of crushed or granulated grains. Please contact us for additional information.



# FR-450M – Flame Resistant and Highly Oil Resistant Conveyor Belts

We developed a cover rubber for FR-450M that adds the feature of high oil resistance to conventional flame resistant belts. These belts are a fire prevention measure used in oil-contaminated conveyance in mines, refuse disposal facilities and sewage treatment plants. Additionally, longer belt service life can be expected due to measures taken to counter swelling in the cover rubber.

## Applications

1. Treatment facilities for household waste containing oil, such as garbage and sewage.
2. Oily-coke and oily-coal conveyor lines at thermal power plants and steel mills.
3. Fire prevention belts in underground pits and refineries.

## Features

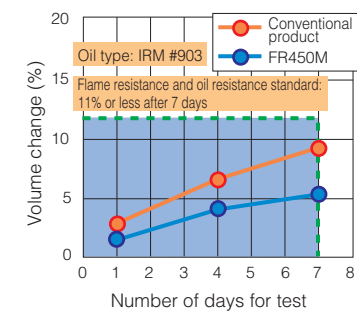
1. Meets JIS flame resistance standards.
2. Highly oil resistant specification (oil and wear resistance are twice those of conventional belts).

## Performance

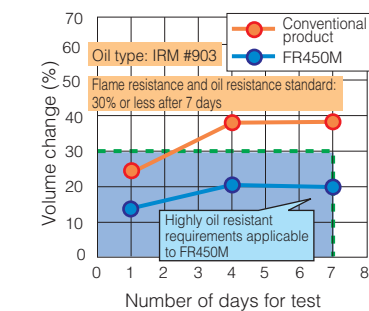
### Evaluation data

#### 1. Oil immersion resistance tests (JIS-K6258-2003)

● Result of oil-immersion resistance test at 23°C

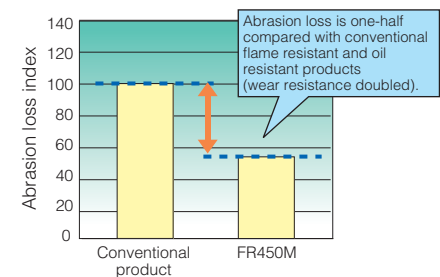


● Result of oil-immersion resistance test at 70°C

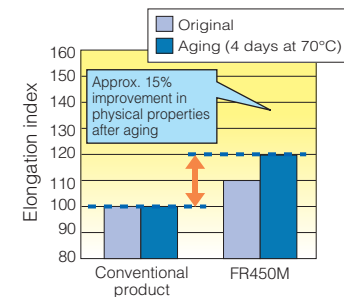


#### 2. Cover rubber wear resistance, tensile strength

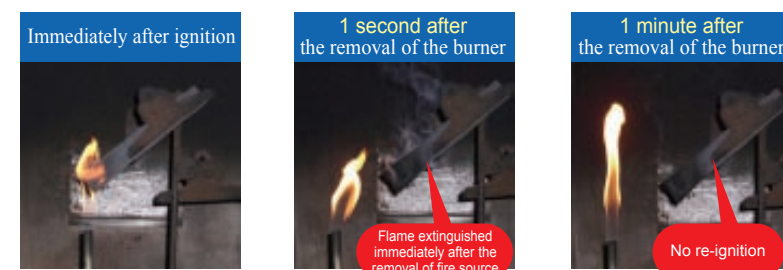
● Wear resistance test results: DIN abrasion loss



● Tensile strength test results: Elongation



#### 3. JIS Flame resistance test (JIS-K6324-2013)



# Impact Resistant Rock Belts™

Rock Belts™ were developed for conveyor runs exposed to large impact. A special woven structure is used in the core body canvas, designed in consideration of impact to the cover rubber and core body. Rock Belts™ are ideal for lines with high impact force that shortened the service life of traditional belts.

## Applications

Quarries, steel mills, paper manufacturers, mining, barges, civil engineering, other  
(Ideal for ore, rock crusher and timber applications)

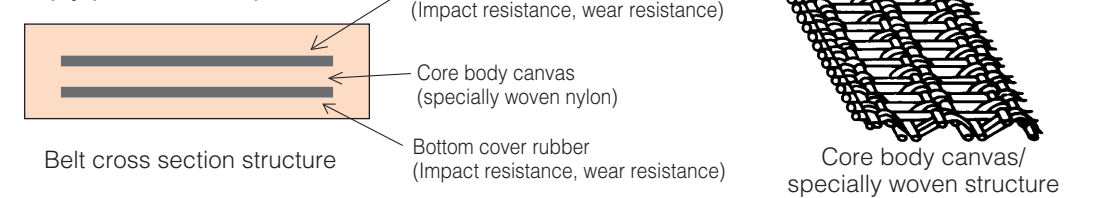


## Structure

### [Features of core body canvas]

Binding yarns are interwoven into the warp and weft of the canvas. The canvas excels in impact resistance and gripping resistance as it is rich in flexibility, with the warp and weft separately receiving belt stress and absorbing it.

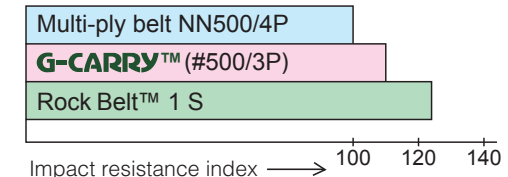
### 2-ply product example



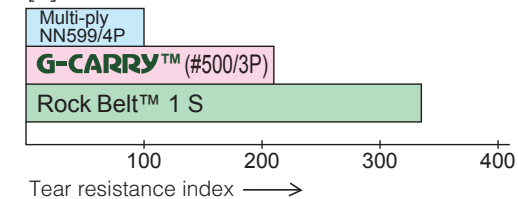
## Performance

Comparison of physical properties by belt type

### [1] Impact resistance

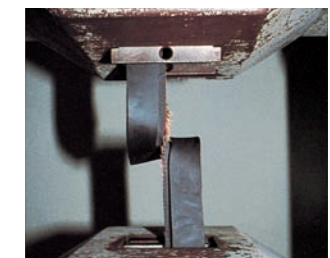


### [2] Tear resistance



### Tear resistance

● Tear resistance test without the center cover according to ISO505



## Standard specifications

Standard specification	Grade	Belt strength (N/mm)	Number of plies	Cover rubber thickness (mm)	Belt width (mm)	Minimum pulley diameter (mm)		
						A	B	C
Non-standard	Rock Belt™ 0	400	2	6.0×3.0	Up to 1400	400	350	300
	Rock Belt™ 1	500	2		Up to 1400	400	350	300
	Rock Belt™ 2	630	2		Up to 1800	550	450	400
	Rock Belt™ 3	720	3	Made to order	Up to 3000	600	500	450
	Rock Belt™ 4	800	2		Up to 1800	650	550	450
	Rock Belt™ 5	1000	3		Up to 3000	800	650	550
	Rock Belt™ 6	1000	2		Up to 1800	800	650	550
	Rock Belt™ 7	1250	3		Up to 3000	950	800	650
Rock Belt™ 8	1500	3	Up to 3000	1150	1000	800		

A: Drive, head, drive snap, stacker bend, tripper, tripper bend, and stacker ( $\theta > 90^\circ$ )

B: Tail and take-up bend ( $\theta > 90^\circ$ )

C: Head snap, tail snap, take-up snap, and take-up bend ( $\theta \leq 90^\circ$ )

\* Refer to pages 4 – 5 for standard Rock Belts™ 0, 1 and 2.



# Heat Carry™ – Heat Resistant Conveyor Belts

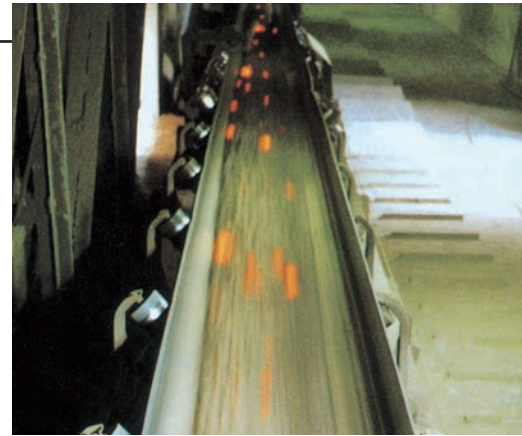
Heat Carry™ belts are a lineup of high-heat-resistant and wear-resistant belts, designed to convey high-temperature items.

## Applications

Steel mills (sintered ore, coke, pellets, slag, etc.), cement plants (clinker, cement products, compound raw materials, dry clay, etc.), other (foundry sand, etc.)

## Features

1. Superior resistance to wear and heat aging when exposed to heat.
2. The core body is designed to minimize performance variation under heat.
3. Superior adhesion between the cover rubber and core body when exposed to heat.



## Heat Carry™ 1500 (HC-1500)

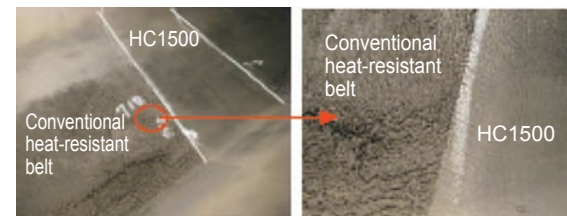
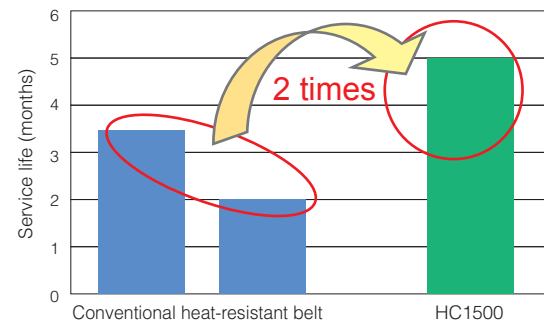
## Features

Heat Carry™-1500 has superior crack and heat resistance when belt surface temperatures are in the range of 100–200°C, so you can expect service life more than twice as long as conventional high-heat resistance belts. (Not suitable for lines where belt surface temperature are less than 100°C.)

## Performance

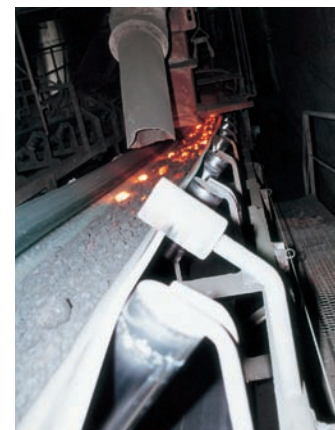
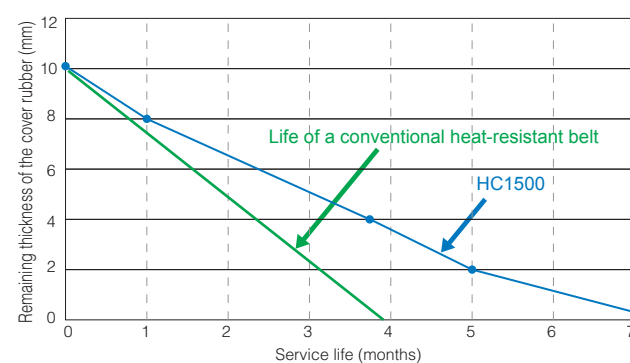
### Evaluation data [1]: Crack life evaluation

- Service life comparison on a foundry sand conveyor line (Belt surface temperature 260°C max.)



### Evaluation data [2]: Wear life evaluation

- Remaining cover rubber thickness on a sintered ore conveyor line



## Types and features of Heat Carry™ products

Temperature range	Type	Features	Temperature of the objects being transported (°C)	Allowable belt surface temperature (°C)	Major applications (Belts can be used in applications other than those listed below.)
Medium temperature range applications	HC-513	General purpose heat-resistant belt for use in medium temperature ranges. The SBR feature in the belt minimizes hardening due to heat (heat crack generation). Suitable for conveying powders.	Powder: up to 150 Bulk: up to 200	Up to 100	<ul style="list-style-type: none"> <li>• Sintered ore products: Belt surface temperature 100°C or less</li> <li>• Coke: Belt surface temperature 100°C or less</li> <li>• Clinker: Belt surface temperature 100°C or less</li> </ul>
	HC-515	Special heat resistant belt, with significantly improved wear resistance, including resistance to gouging due to impact.	Powder: up to 150 Bulk: up to 200	Up to 100	<ul style="list-style-type: none"> <li>• Sintered ore products: Belt surface temperature 100°C or less</li> <li>• Coke: Belt surface temperature 100°C or less</li> <li>• Clinker: Belt surface temperature 100°C or less</li> </ul>
High temperature range applications	HC-710	High temperature heat resistant belt, designed so that it is difficult for cracks to appear.	Powder: up to 180 Bulk: up to 400	Up to 180	<ul style="list-style-type: none"> <li>• Sintered ore products: Belt surface temperature 180°C or less</li> <li>• Coke: Belt surface temperature 180°C or less</li> <li>• Clinker: Belt surface temperature 180°C or less</li> </ul>
	HC-770	Superior wear resistance and heat aging resistance at high temperatures.	Powder: up to 180 Bulk: up to 450	Up to 180	<ul style="list-style-type: none"> <li>• Clinker (best-suited): Belt surface temperature 180°C or lower</li> <li>• Dried clay, dried lime: Belt surface temperature 180°C or lower</li> </ul>
	HC-1500	Superior wear resistance and heat aging resistance at high temperatures.	Powder: up to 200 Bulk: up to 450	Up to 200	<ul style="list-style-type: none"> <li>• Sintered steel pellets: Surface temperature 200°C or lower</li> <li>• Coke: Surface temperature 200°C or lower</li> <li>• Clinker: Surface temperature 200°C or lower</li> </ul>
Specific applications	HC-530	White belt for use on lines averse to contamination of the items conveyed.	Powder: up to 150 Bulk: up to 200	Up to 100	<ul style="list-style-type: none"> <li>• White cement, chemical fertilizers, and titanium: Belt surface temperature 100°C or less</li> </ul>
	HC-795	Improved wear resistance at high temperatures. Ideal for lines with short service life due to wear.	Powder: up to 180 Bulk: up to 450	Up to 180	<ul style="list-style-type: none"> <li>• Sintered steel, coke, clinker, and the like: Lines with a service life of less than 2 years that have short machine lengths and cycle times</li> <li>Belt surface temperature 180°C or lower</li> </ul>
	HC-730	White belt for use on lines averse to contamination of the items conveyed.	60–150	Up to 120	<ul style="list-style-type: none"> <li>• White cement, chemical agents, fertilizers, resin raw materials, and the like: Belt surface temperature 120°C or lower</li> </ul>
	HC-719	Almost no belt hardening or softening, even at high temperatures. Ideal for use in cylindrical conveyors.	Powder: up to 180 Bulk: up to 300	Up to 180	<ul style="list-style-type: none"> <li>• Cylindrical conveyors, etc.</li> </ul>

### Heat resistant belt selection

The temperature of the items being conveyed and belt surface temperatures are important considerations, as well as atmospheric temperatures. Powder affects belt performance differently than bulk in terms of temperature. Please contact us to select the best belt for your needs.



# Aramid Conveyor Belts

The core body canvas in aramid conveyor belts is characterized by high strength and high elasticity, which enables aramid belts to replace steel cord conveyor belts.


- Cord type
- Woven type

**Applications**

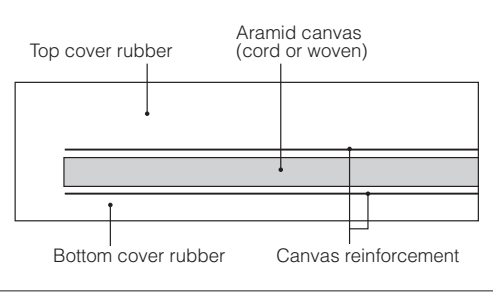
1. Long distance conveyor belts – for conveyor runs exceeding about 300m.
2. High strength conveyor belts – 630N/mm to 2200N/mm.
3. Ultra-low elongation conveyor belts.

**Features**

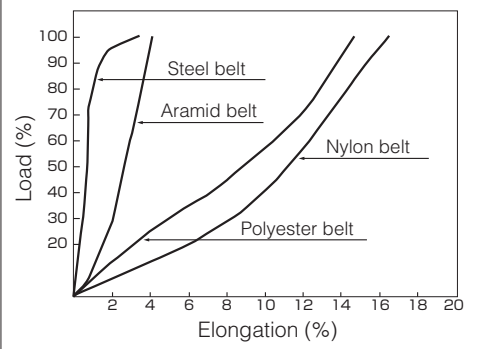
1. Extended service life as the core body remains rust-free.
2. Reduced belt weight.
3. Little belt elongation.
4. Improved gripping resistance and impact resistance.
5. Improved longitudinal tear resistance.



**Structure**

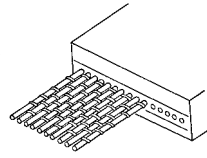


**Performance** Elasticity performance of aramid canvas



**Belt strength, belt widths and safety factors**

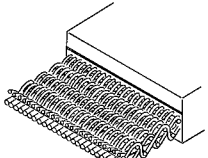
● Cord type aramid canvas



Belt strength N/mm	Belt width mm	Standard safety factor
630	400 – 1500	8
800	400 – 1500	8
1000	400 – 1500	8
1250	400 – 1300	8
1600	400 – 1300	8
2200	400 – 1200	8

Applicable cover rubber type  
Ordinary JIS (S, G, A, L, D, H), flame-retardant, heat-resistant, oil-resistant, ultra wear-resistant

● Woven type aramid canvas



Belt strength N/mm	Belt width mm	Standard safety factor
630	800 – 1400	8
800	800 – 1400	8
1000	800 – 1400	8
1250	800 – 1200	8
1500	800 – 1200	8

Applicable cover rubber type  
Ordinary JIS, ultra wear-resistant

# Cable Conveyor Belts

In a cable conveyor system, the belt “rides” on two wire cables on either side of the belt. The cable and belt move together at the same time, driven by carrier and return pulleys. Suitable for long distance conveyance.

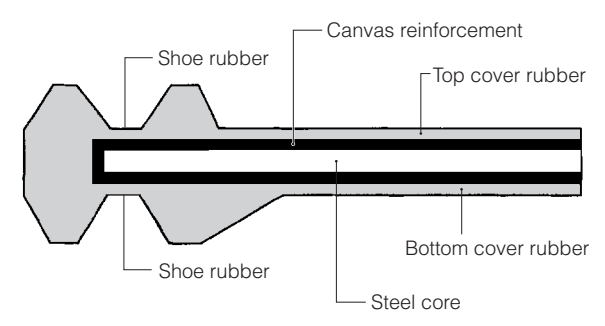
**Applications**

The cables are tensioned, so the belts are suitable for long distances. There are lines in Japan that run 3000 – 6000m; runs overseas can reach up to about 10 kilometers.

**Features**

1. Rubber projections, called shoe rubber, are built into both sides of the belt on the top and bottom surfaces. The wire cables run below the shoe rubber.
2. Steel bars are built horizontally into the belt core to support the load.
3. Additionally, fabric reinforcements above and below the steel bar cores help to distribute load, and function to transmit driving force from the cables to the belt.

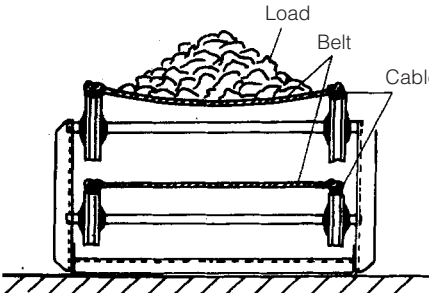
**Structure**



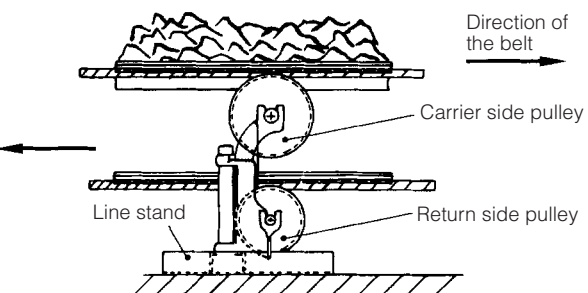
**Belt specifications**



Example of use



Cross-sectional view



Side view



# Rip Resistant Conveyor Belts

## Type-6 and Type-6B

With increasingly larger facilities using continuous conveyor lines, potential loss due to a ripped belt has increased, including a potential factory shutdown to repair or replace belts to restore operations. Rip resistant belts are suitable for use on remotely controlled conveyor systems, in which a gouge to the belt may cause the entire circumference of the belt to rip.

### Applications

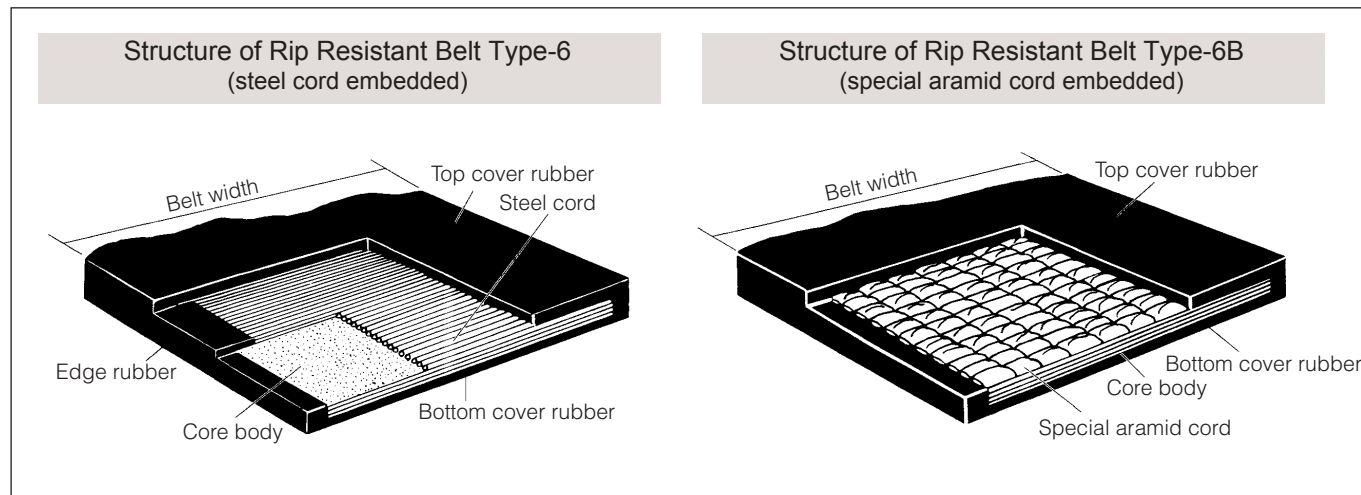
- Lines conveying sharp objects where belts may be easily gouged.
  - Lines containing foreign matter, such as steel or iron pieces, which tend to cause belt rips
- Examples
- Cullet conveyance in glass plants
  - Burr conveyance in foundries
  - Pressed steel conveyance in machinery plants
  - Slag conveyance
  - Bulk waste disposal sites, crusher lines
- Examples
- Cargo unloading lines
  - Bulk materials receiving yards
  - Mine feeder belts

### Features

1. Superior rip resistance
2. Superior impact resistance, with effective impact absorption
3. Superior gouge resistance and mitigation
4. Improved belt durability reduces costs
5. Reduced maintenance

### Structure

Steel cord (Type-6) or aramid cord (Type-6B) are embedded, in the width direction at constant pitch, between the core EP canvas and the top cover rubber. This enhances gouge protection, which is a cause of belt ripping, and strengthens rip resistance.



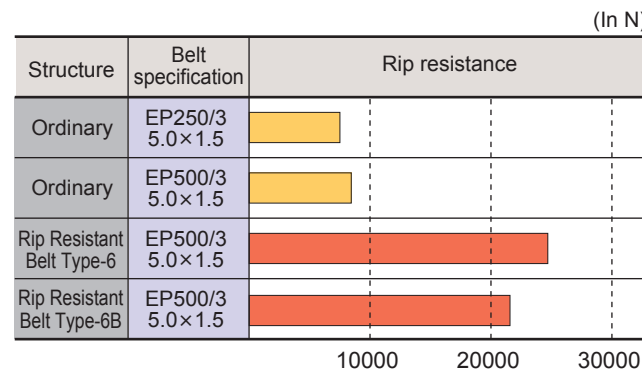
### Rip Resistant Belt Type-6B selection criteria

1. Type-6 steel cords become exposed, and metal fragments mix into the load being carried.
2. Lines using metal detectors and magnetic pulleys.
3. Items being conveyed come into contact with the steel cord and the load is rejected after inspection.

## Rip Resistant Belt Capabilities

### Vertical tear resistance

Rip Resistant Belt Types 6 and 6B have remarkable lateral reinforcement, with resistance 2.5 – 3 times more effective than belts without such reinforcement.



### Impact resistance

Lateral reinforcement is remarkably effective. Type-6, with stronger reinforcement that Type-6B, is best suited to large bulk conveyance exposed to large impact force.

Structure	Belt specification	Impact resistance	
		Impact conditions	Core body strength retention rate
Ordinary	EP250/3 5.0×1.5	● Drop height 0.96 m	(Severed after 3 times)
Ordinary	EP500/3 5.0×1.5	● Impact: 100 times	(Severed after 14 times)
Rip Resistant Belt Type-6	EP500/3 5.0×1.5	● Impact weight (knife-edge shaped) 15 kg	~80%
Rip Resistant Belt Type-6B	EP500/3 5.0×1.5		~50%

### Gouge resistance

The effect of lateral reinforcement and the resistance and mitigation effect against gouging is substantial. Ideal for the conveyance of materials prone to gouge, such as cullet, cast burrs, pressed steel sheets, etc.

Structure	Belt specification	Sticking resistance	
		Conditions	Depth of flaw
Ordinary	EP250/3 5.0×1.5	● Drop height 1.54 m	~100%
Ordinary	EP500/3 5.0×1.5	● Single impact	~100%
Rip Resistant Belt Type-6	EP500/3 5.0×1.5	● Impact weight (knife-edge shaped) 15 kg	~50%
Rip Resistant Belt Type-6B	EP500/3 5.0×1.5		~50%

Labels for depth of flaw: Top cover rubber, Reinforced layer, 1P, 2P, 3P, Bottom cover rubber, Sever.



Rip Resistant Belt Type-6 and Type-6B



# Pipe Conveyor Belts

Pipe Conveyor Belts are environment friendly, as the items being conveyed are enclosed, preventing spillage and dust. Curved conveyance is also possible.

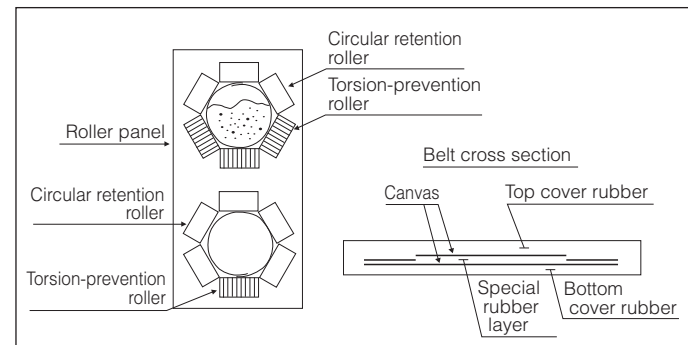
## Applications

- Boilers (coal, coke, ash)
- Steelworks (slag, de-siliconizing agents, coal pellets)
- Paper manufacturers (woodchips)
- Cement
- Chemicals (fertilizers, chemicals)
- Foods (oil refining, milling materials)
- Feed (raw materials, finished products)
- Powdered substances, pellet-shaped materials

## Features

1. Enclosed conveyance.
2. No spillage as the return side is also enclosed.
3. Inclined and curved conveyance on a single conveyor (rather than using 2 – 3 lines.)
4. Little noise and vibration, along with the first two features above, make pipe conveyors environment friendly.
5. General purpose, heat resistant, flame resistant and oil resistant specifications are available.

## Structure



Example of use ▼



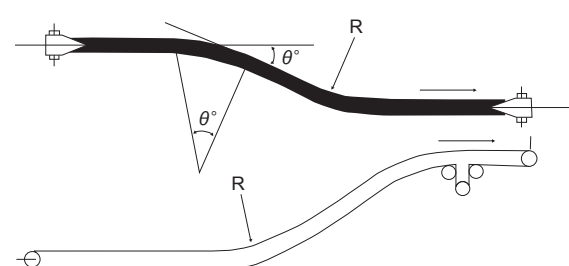
## Standard specifications

Pipe diameter (φ mm)	Belt width (mm)	Top Ply × cover × cover (mm)	Bottom cover (mm)	Belt strength (N/mm)	Belt weight (kg/m <sup>2</sup> )
100	400	2P × 3.0 × 2.0		100 125 160	6.5
150	600	2P × 3.0 × 2.0		125 160 250 315	8.4
200	780	2P × 3.0 × 2.0 2P × 5.0 × 2.0		160 250 315 400	9.1 10.9
250	1000	2P × 3.0 × 2.0 2P × 5.0 × 2.0		250 315 400 500	10.0 11.8
300	1100	2P × 3.0 × 2.0 2P × 5.0 × 2.0		315 400 500 630	11.4 12.5

Note:  
Please contact us for products with a pipe diameter of 350 mm or more.

Range in which curved travel is allowed (R)

R	Radius of curvature	R = 300 × pipe diameter (φ)
θ°	Radius allotted angle	45° or less



# Cylindrical Conveyor Belts

The edges of Cylindrical Conveyor Belts come together using seal rollers. Maintenance is easy and there is no belt rolling or snaking.

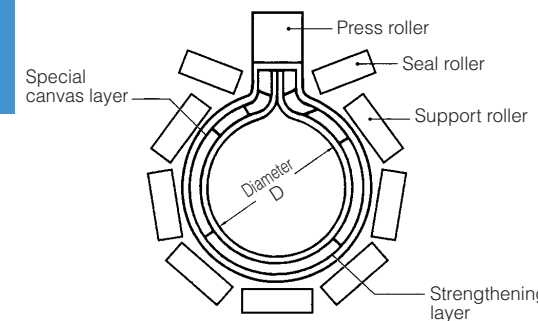
## Applications

- Boilers (coal, coke, ash)
- Steelworks (slag, de-siliconizing agents, coal pellets)
- Paper manufacturers (woodchips)
- Cement
- Chemicals (fertilizers, chemicals)
- Foods (oil refining, milling materials)
- Feed (raw materials, finished products)
- Powdered substances, pellet-shaped materials

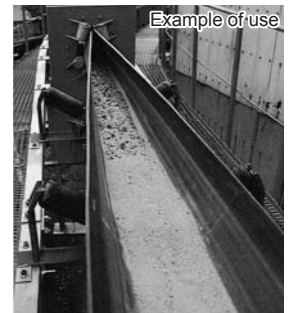
## Features

1. **Enclosed conveyance.** Cylindrical conveyance prevents scattering or spillage of items conveyed, and foreign matter contamination is not a concern.
2. **Curved and steep incline conveyance.** The belts are capable of vertical and lateral rotation at specified curvature radii. They are also capable of inclined conveyance at angles 10 – 20% greater than conventional conveyor belts.
3. **Safety and economy.** Complex adjustments due to snaking are unnecessary as the belt safely runs on a predetermined course. Excellent economy, as machine length can be shortened.

## Structure



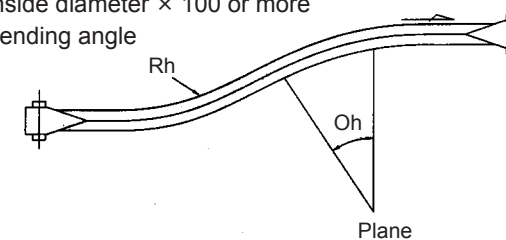
The shape retaining effect of various rollers makes the cross section cylindrical. The edges are brought together and the load is carried in a sealed enclosure.



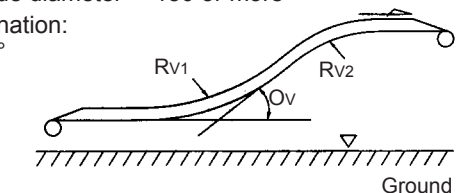
## Standard specifications

Belt width B mm	Belt inside diameter D mm	Cross section area × 10 <sup>-2</sup> A m <sup>2</sup>	Transportation capability by belt speed Q = 60 · A · V [m <sup>3</sup> /h]													Maximum dimension of bulk mm	
			40m/min	60	80	100	120	140	150	160	180	200	220	250	Grain size uniform	80% fine grains	
600	150	1.416	34.0	51.0	68.0	85.0	102.0	118.9	127.4	135.9	152.9	170.0	186.9	212.4	40	70	
750	190	2.272	54.5	81.8	109.1	136.3	163.6	190.8	204.5	218.1	245.4	272.6	299.9	340.8	50	80	
900	230	3.329	79.9	119.8	159.8	199.7	239.7	279.6	299.6	319.6	359.5	399.5	439.4	499.4	60	100	
1,050	275	4.759	114.2	171.3	228.4	285.5	342.6	399.8	428.3	456.9	514.0	571.1	628.2	713.9	70	120	
1,200	320	6.444	154.7	232.0	309.3	386.6	464.0	541.3	580.0	618.6	696.0	773.3	850.6	966.6	80	140	
1,600	430	11.685	279.2	418.9	558.5	698.1	837.7	977.3	1047.2	1117.0	1256.6	1396.2	1535.8	1745.3	110	200	
1,800	485	14.802	355.2	532.8	710.5	888.1	1065.7	1243.4	1332.2	1421.0	1598.6	1776.2	1953.9	2220.3	120	220	
2,000	530	17.676	424.2	636.3	848.4	1060.6	1272.7	1484.8	1590.8	1696.9	1909.0	2121.1	2333.2	2651.4	140	240	

1. Horizontal radius of curvature  
RH = Belt inside diameter × 100 or more
2. Maximum bending angle  
Oh = 90°



3. Vertical bending radius  
RV1 = Belt inside diameter × 200 or more  
RV2 = Belt inside diameter × 150 or more
4. Maximum inclination:  
Ov = about 30°





# Endless Conveyor Belts for Tumblers

## Shot Blast Conveyor Belts

### Applications

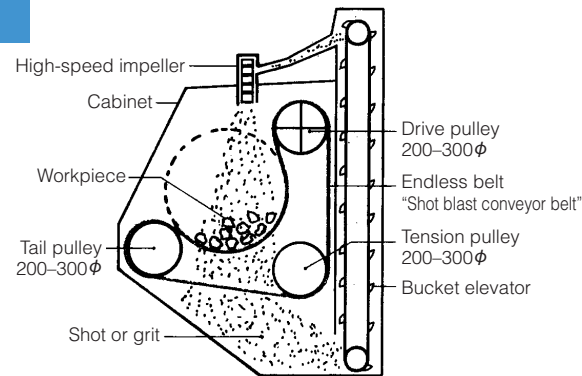
Plastic shot peen machines throw abrasive cleaning agents onto workpieces at high speed to remove sand from cast objects, reduce the size, remove burrs, or treat metal surfaces. They are widely used in the casting and machine tool processing industries. Endless belts play a central role in the tumbler-type shot peen machines.

### Features

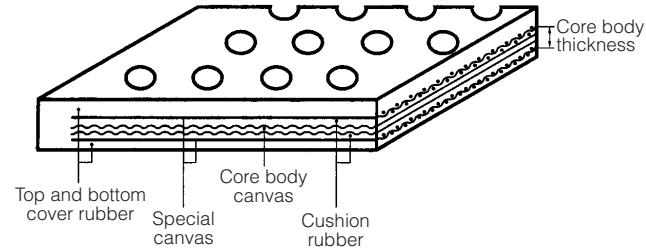
- 1. **High rigidity in the direction of belt width.**  
There is little flex in the middle of the belt, even in forward-reverse operation, so there is little snaking or buckling. **Result: Reduced failure and increased service life**
- 2. **Good flexibility in the direction of belt length.**  
Good small pulley conformability, with superior durability and fatigue resistance. **Result: Reduced failure and increased service life**
- 3. **Superior tear/crack resistance in the bored section of the belt.**  
Little scratching from workpiece impact, with little crack propagation around the bore holes. **Result: Increased service life**
- 4. **Superior abrasion resistance against shot and grit.** **Result: Increased service life**

### Structure

#### ● How the belt is used



#### ● Belt cross section structure



### Belt specifications

Custom designed and manufactured to meet customer use conditions.

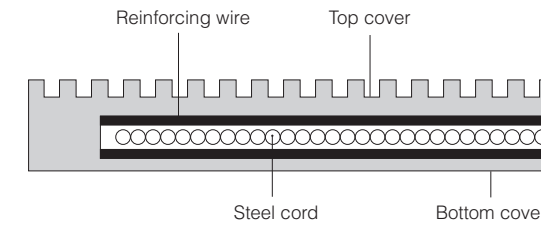
# Moving Walkway Conveyor Belts

Moving Walkway Conveyor Belts have longitudinal grooves. They are flexible in the direction of belt length and rigid in the direction of belt width. The core body steel cord has little elongation, so small pulleys can be used and the belt contributes to compact conveyor systems.

### Applications

Bando Moving Walkway Conveyor Belts conform to Construction Ministry guidelines. They are widely used in airport terminals, shopping centers, theme parks and hospitals.

### Structure



### Features

- 1. Bando Moving Walkway Conveyor Belts have the greatest track record in Japan, with proven safety, quality and service life.
- 2. Reduced cost designs are possible using small pulley diameters.
- 3. Wheelchair safe.
- 4. Long service life reduces maintenance costs.

Model	Model 800	Model 1200
Belt width	706 mm	1100 mm
Tread width	600 mm	1000 mm
Speed	30 m/min	3,600 persons/hour
	40 m/min	4,800 persons/hour
	50 m/min	6,000 persons/hour
Inclination angle	0-15°	
Allowable load	270 kg/m <sup>2</sup>	



### Belt size

(In mm)

Belt width	Strength	Cover rubber thickness	Belt thickness (Standard)	Unit weight
732.5	ST-630	8×3	About 26	25.0 kg/m
1100	ST-630	8×3	About 26	37.5 kg/m
732.5	ST-800	8×3	About 26	28.0 kg/m
1100	ST-800	8×3	About 26	42.1 kg/m

Impact absorbing material for conveyor belts

# Impact Bar AR

Using Impact Bar AR in place of impact rollers provides increased belt support, alleviates impact and helps to prevent belt damage. Impact rollers cause the belt to sag at the point of impact which, in turn, causes gaps in skirt rubber and leads to spillage and dust. Impact Bar AR does not rotate. The load impacts a flat surface, so there is no belt sagging at the point of impact. Use of Bando's Non Spill skirt rubber further prevents load spillage and dust.

## Features

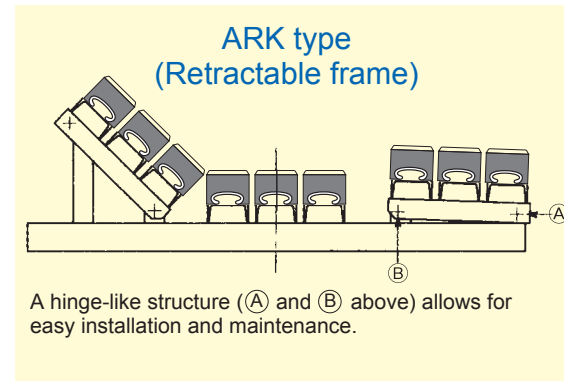
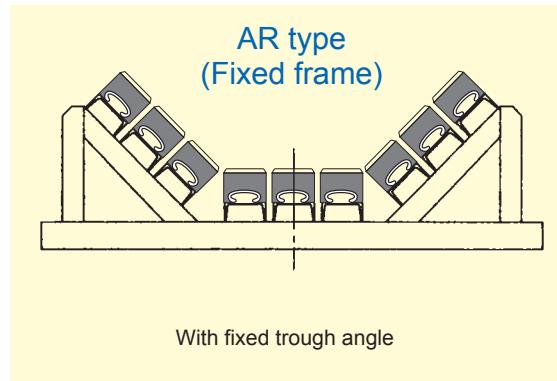
1. Effective spill and dust prevention as there is no belt sag at the point of impact (unlike rollers).
2. Using rubber that is superior in impact resilience, Impact Bar AR is high in impact absorption, reducing belt damage.
3. Low frictional properties ( $\mu=0.08 - 0.1$  friction coefficient with rubber) reduces belt running resistance.
4. Impact Bar AR does not rotate so it is maintenance free.
5. Easy installation and replacement using aluminum clamps.
6. Retractable frame type available.

## Method of indicating dimensions

Standard specification: Impact Bar AR 100 × 77 × 1500 (Product number: 144S213261)

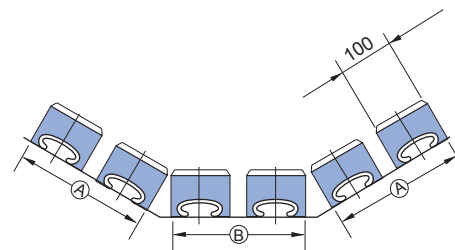
## Frame

Standard Impact Bar AR frames accommodate belt widths of 450 – 2000mm with trough angles of 20, 30 or 45 degrees, in place of standard roller frames complying with JISB8803-1990. We can custom design frames outside this JIS standard.



## Standard specifications

Belt width	(A)	(B)	Total
450	2	2	6
500	2	2	6
600	2	2	6
750	2	2	6
900	3	3	9
1050	3	3	9
1200	4	4	12
1400	4	4	12
1600	5	5	15
1800	5	5	15
2000	6	6	18



# Non Spill – Conveyor belt skirt rubber

## Applications

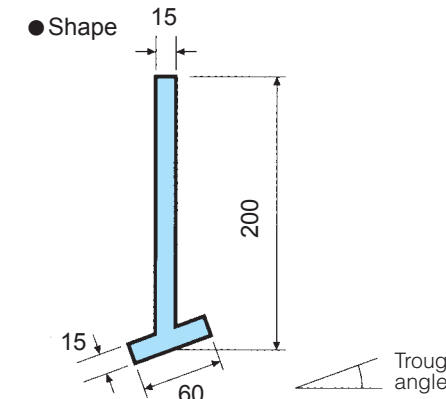
Non Spill Conveyor Belt Skirt Rubber products are selected based on the trough angle of the carrier rollers. Applications include the conveyance of:

- Cement
- Iron ore
- Coal and pulverized coal
- Crushed rock, etc.

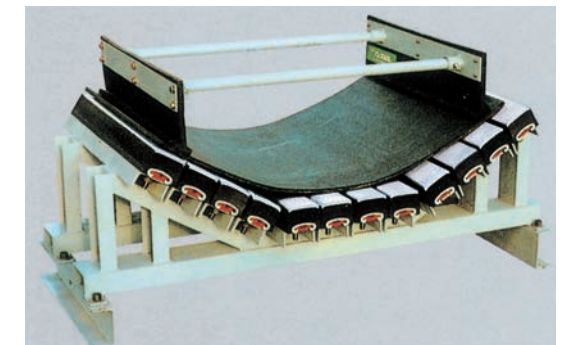
## Features

1. Effective in preventing spillage and dust in the conveyor belt chute portion.
2. Prevents localized abrasion where the skirt comes into contact with the belt.
3. Use of Non Spill Skirt Rubber with Impact Bar is effective against powdery substances being blown off the conveyor.

## Structure



● Example of using Impact Bar AR together with Non Spill

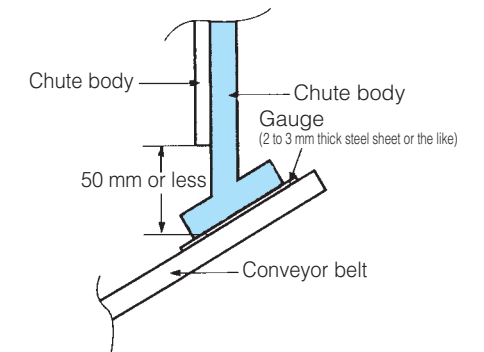


## Installation

Non Spill installation is the same as that for other skirt rubber, by making holes in it.

### Non Spill Installation Points

1. Use a gauge to adjust the gap to about 2mm between Non Spill and the belt.
2. The Non Spill support frame should be within 50mm of the conveyor belt surface. (Increasing the gap will cause the skirt to sag, causing spillage or dust.)



## Standard specifications

Trough angle	Product name	Product number
0	Non Spill L = 5000×0	144R 101171
10	Non Spill L = 5000×10	144R 101271
20	Non Spill L = 5000×20	144R 101371
30	Non Spill L = 5000×30	144R 101471
35	Non Spill L = 5000×35	144R 101571
40	Non Spill L = 5000×40	144R 101671
45	Non Spill L = 5000×45	144R 101771

\* The standard length is 5.0 m.



# Rubber Cloth, Canback™ (Linings for inner surfaces of hoppers and chutes)

Linings in light load applications, such as inside hoppers, silos, feeders and chutes, improves the environment, increases durability and reduces running costs.

## Applications

1. Linings inside hoppers, chutes, silos, etc.
2. Flat pulley linings
3. Concrete mixer linings
4. Use as cushioning material

## Features

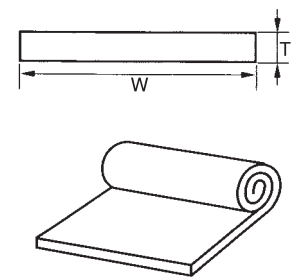
1. Ultra abrasion resistant, high tensile strength, superior tear resistance, and particularly superior resistance against impact and wear.
2. Superior adhesion prevention.
3. Easy installation.
4. Much greater noise prevention compared with metal liners, prevents noise pollution and improves the work environment.
5. Easy disposal at the end of service life.

## Types and physical properties

Product name	Product number	Hardness (JIS-A)	Tensile strength (MPa)	Elongation (%)	Tear strength (N/mm)	DIN wear (mm <sup>3</sup> )
Canback™		60 ±5	≥15	≥550	≥85	≤60
Rubber Cloth	HT	60 ±5	≥15	≥550	≥85	≤60
	ST	35 ±5	≥20	≥670	≥35	≤350

- Canback™ is canvas-reinforced. ● Rubber Cloth is made entirely of rubber.
- Buffing is required when bonding Rubber Cloth HT and ST.

## Standard specifications



	Product number	Thickness (mm)	Width (mm)	Standard length (m)
Canback™	11QRA13000	5	1220	30
	11QRA23000	10	1220	30
	11QRA33000	15	1220	20
	11QRA43000	20	1220	15
	11QRA53000	25	1220	12
Rubber Cloth HT	11QRG13000	5	1220	70
	11QRG23000	10	1220	50
	11QRG33000	15	1220	30
	11QRG43000	20	1220	20
	11QRG53000	25	1220	15
Rubber Cloth ST	11QRJ12000	5	1200	30
	11QRJ22000	10	1200	30
	11QRJ32000	15	1200	20
	11QRJ42000	20	1200	15

- The table above shows maximum widths manufactured. Widths may be joined for widths greater than those shown above.
- Please contact us for special size requirements to determine whether production is possible.
- \* Please refer to the product catalogs for specification details and installation methods.

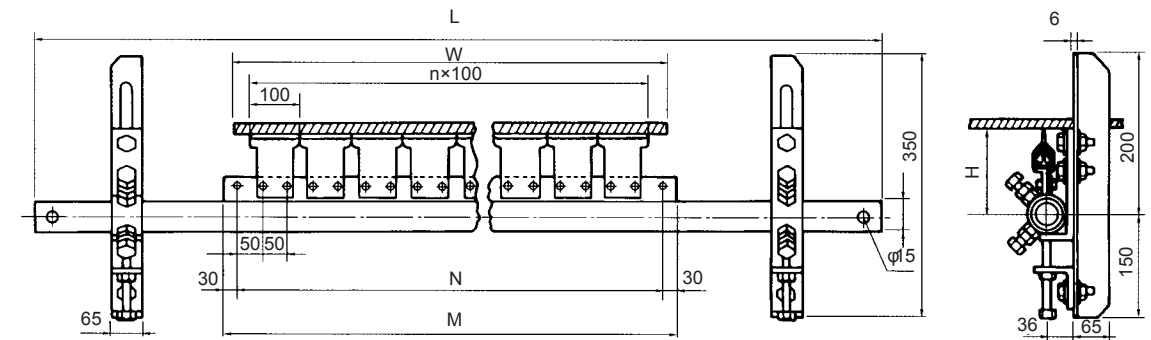
# RC- I Belt Cleaner

It has been said that belt cleaners are only effective in the early stages of belt use, after which they need frequent adjustment. Making the most of the know-how we have obtained from belt inspection services and our design and manufacturing technology for rubber vibration isolators, Bando has developed an epoch-making belt cleaner equipped with a two-stage spring rubber system that softly scrapes the belt surface when foreign matter has weak adhesion and forcefully when foreign matter has stronger adhesion. This dramatically increases cleaning effectiveness and sustainability.

## Features

1. **Excellent scraping effectiveness**  
The reactive force of the cushion rubber changes depending on the adhesive strength of the foreign matter. The tips and cushion rubber are integrated. The horizontal resilience of the cushion rubber supporting the tips is provided by a two-stage spring structure with a soft rubber layer and a rigid rubber layer. The soft layer works when foreign object adhesion is weak and both layers work when such adhesion is stronger. Cleaning is effective, with reactive force determining the tip angle.
2. **Cleaning sustainability**  
The cushion rubber is compressed by metal so it retains its firmness. This, in turn, maintains tip pressure and allows for sustained cleaning.
3. **Superior operational safety**  
The vertically-flexible cushion rubber and tips evade belt surface unevenness to prevent belt damage. The vertical tips are unaffected by forward/reverse belt operation.
4. **Superior durability**  
The hard-metal alloy tips have superior wear resistance. The material and shape are the fruit of our vibration isolator rubber design and production technology, which provide a high quality design with high reliability and durability.

## Standard specifications



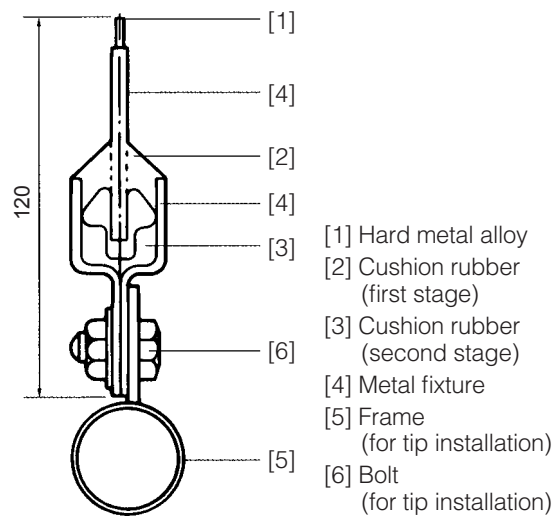
Model	Belt width W (mm)	Number of tips n		Cleaner width (mm)	Pipe length L (mm)	M (mm)	N (mm)	D (mm)	H (mm)	Weight of a set (kg/unit)
		Standard	Maximum							
RC- 40	300, 400	3	4	300	900	410	350	42.7	157	14
RC- 50	450, 500	4	5	400	1050	510	450	42.7	157	15
RC- 60	600	5	6	500	1150	610	550	42.7	157	16
RC- 75	750	6	7	600	1350	710	650	42.7	157	18
RC- 90	800,900	7	8	700	1500	810	750	48.6	160	20
RC-100	1000	8	9	800	1600	910	850	48.6	160	21
RC-105	1050	9	10	900	1700	1010	950	48.6	160	22
RC-120	1200	10	11	1000	1800	1110	1050	60.5	166	26
RC-140	1400	12	13	1200	2000	1310	1250	60.5	166	28
RC-150	1500	13	14	1300	2200	1410	1350	60.5	166	35
RC-160	1600	14	15	1400	2300	1510	1450	60.5	166	46
RC-180	1800	16	17	1600	2500	1710	1650	76.3	174	52
RC-200	2000	18	19	1800	2700	1910	1850	76.3	174	57
RC-220	2200	20	21	2000	2900	2110	2050	76.3	174	61
RC-240	2400	22	23	2200	3100	2310	2250	76.3	174	65

# RC- I Belt Cleaner

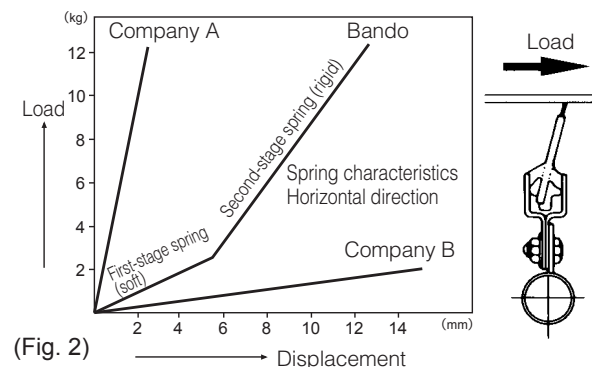
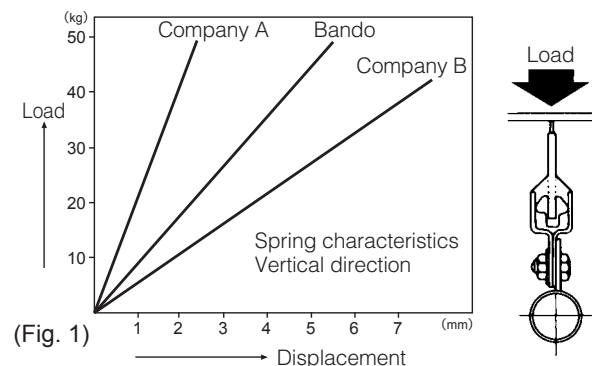
## Two-stage spring effect

Fig. 2 shows tip displacement in the horizontal direction of load during operation. At about 6mm the rigid, second rubber layer springs into place. Fig. 1 shows the change in the vertical direction.

## Tip structure (scraping section)

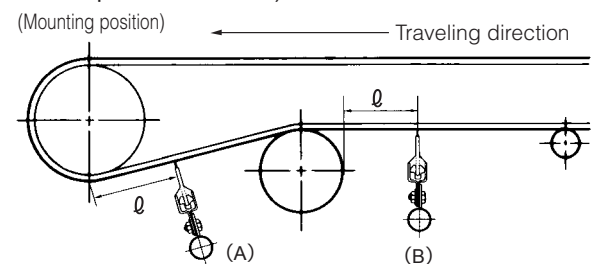


## Performance



## Installation

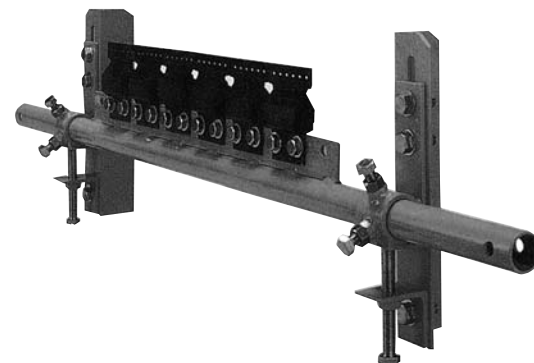
1. The optimum mounting position is in the range:  $l = 100\text{--}300\text{ mm}$ .
2. Mount the cleaner at right angles ( $90^\circ$ ) to the belt surface.
3. Position the cleaner tip so that it touches the belt surface lightly, and tighten the bolts (SUS).
4. Rotate the push-up adjustment bolt by one turn. (The cleaner tip is pushed upward by about 1 mm to use the first-stage rubber spring.)
5. To further increase the cleaning effect, rotate the adjusting bolts by another turn. (The cleaner tip is pushed upward by about 2 mm with the tip inclined  $5\text{--}10^\circ$ .)



Install the cleaner where the belt surface is flat with little vibration.

## Cautions

1. If the frame shows microvibration during operation, this is because the pressure on the belt surface is too strong. Immediately rotate the bolt until vibration disappears.
2. Use the cleaner normally under  $70^\circ\text{C}$ .
3. The cleaner is not oil-resistant. Note that oils and solvents may soften the rubber.



# SAC Belt Cleaners

The SAC Series of belt cleaners were developed from the viewpoint of conveyor belt professionals to be "belt-friendly," maintenance-free and to improve the work environment. We have eight types of SAC Belt Cleaners and a rough-cleaning scraper (RCC) to meet your conditions of use.

## Features

1. No adjustment of the cleaning tip blade (SAC-I, SAC-II).
2. Easy and quick installation below the head pulley (SAC-I).
3. Overload avoidance mechanism prevents belt damage (SAC-I).
4. Highly effective scraping (SAC-I, SAC-II).
5. Improved scraping sustainability (SAC-I, SAC-II).
6. Superior durability and wear resistance (SAC-I, SAC-II, RCC).
7. Easy, on-site component replacement, as the cleaner base has a rotating bracket.
8. SAC-I and SAC-II are left-right symmetrical, allowing for forward or reverse operation.
9. Easy selection based on the conditions of use.

## Systematic diagrams of SAC Belt Cleaners

### ● SAC-I (Head type: installed directly below the head pulley)

Overall assembling diagram		Cleaning blade specification		Remarks
Specification	Type	Specification	Type	
SAC-I (with automatic tip tracking and overload prevention mechanism)	Ordinary	Heat-resistant, oil-resistant	Standard	<ul style="list-style-type: none"> <li>• Automatic tip tracker</li> <li>• Overload avoidance mechanism (with side spring)</li> <li>• Dust cover</li> <li>• Bracket rotation mechanism</li> </ul>
	High-speed/large-width		High-speed/large-width	
SAC-I (Tip tracker type)	Ordinary	Standard	<ul style="list-style-type: none"> <li>• Automatic tip tracker</li> <li>• Overload avoidance mechanism (with side spring)</li> <li>• Dust cover</li> <li>• Bracket rotation mechanism</li> </ul>	
	High-speed/large-width	High-speed/large-width		

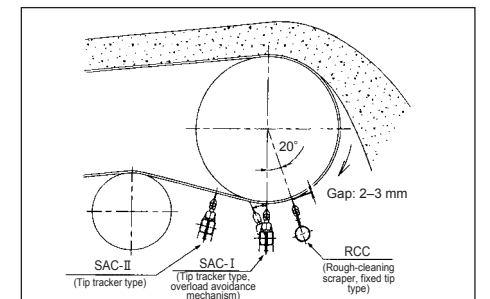
### ● SAC-II type (Return type: a type of cleaner that is mounted between the head pulley and the snap pulley)

Overall assembling diagram		Cleaning blade specification		Remarks
Specification	Type	Specification	Type	
SAC-II (Automatic tip tracker belt cleaner)	Ordinary	Heat-resistant, oil-resistant	Standard	<ul style="list-style-type: none"> <li>• Automatic tip tracker</li> <li>• Dust cover</li> <li>• Bracket rotation mechanism</li> </ul>
	High-speed/large-width		High-speed/large-width	
SAC-II (Tip tracker type)	Ordinary	Standard	<ul style="list-style-type: none"> <li>• Automatic tip tracker</li> <li>• Dust cover</li> <li>• Bracket rotation mechanism</li> </ul>	
	High-speed/large-width	High-speed/large-width		

### ● RCC type (rough scraping type)

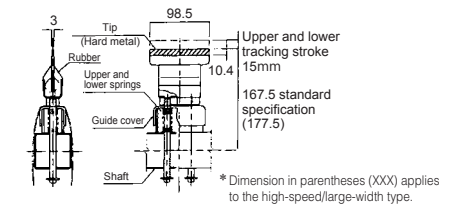
Overall assembling diagram		Cleaning blade specification		Remarks
Specification	Type	Specification	Type	
RCC (Belt cleaner equipped with a rough scraping tip fixing mechanism)	Ordinary	Heat-resistant, oil-resistant	Standard/high-speed	<ul style="list-style-type: none"> <li>• Fixed tip</li> <li>• Bracket rotation mechanism</li> </ul>
	Large-width		Large-width	
RCC (Tip tracker type)	Ordinary	Standard	<ul style="list-style-type: none"> <li>• Fixed tip</li> <li>• Bracket rotation mechanism</li> </ul>	
	High-speed/large-width	High-speed/large-width		

## SAC Belt Cleaner Combination installation example

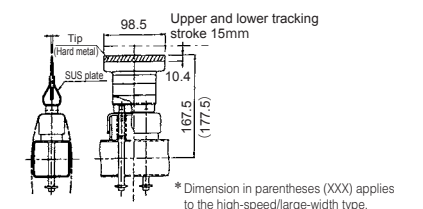


## Cleaning blade specification diagram

### Ordinary specification



### Heat-resistant, oil-resistant specification



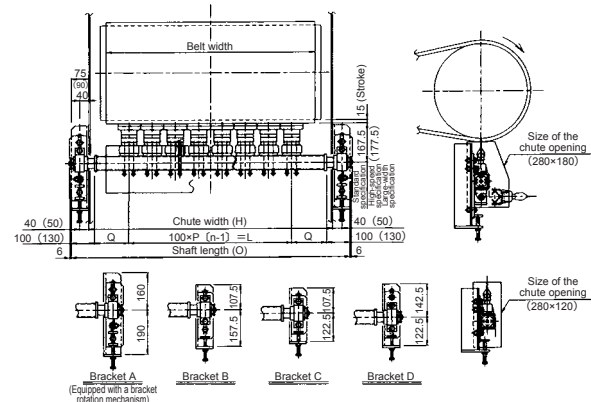
### RCC (ordinary specification only)



# SAC Belt Cleaners

## Standard Dimensions

### SAC-I products



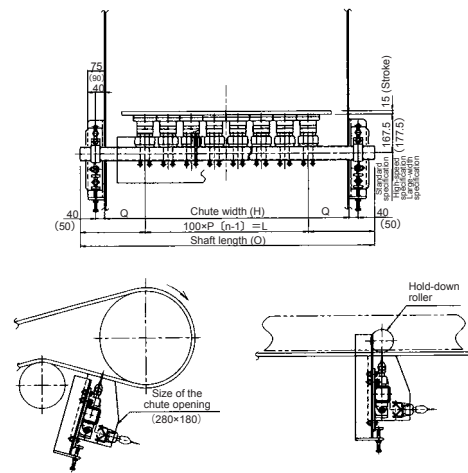
- Criteria for selecting a mounting bracket
- Bracket A equipped with a rotating mechanism is taken as the standard mounting bracket.
  - In cases where there is no margin for a mounting bracket to be mounted, you can select from among the following brackets:  
Bracket type B: Cases where no space is available in the upper section (No bracket rotating mechanism)  
Bracket type C: Cases where no space is available both in the upper section and in the lower section (No bracket rotating mechanism)
  - Bracket type D: Cases where no space is available in the lower section (No bracket rotating mechanism)
  - Mounting brackets that are mounted inside the chute are available; consult us.
  - For a case that does not fall into any of the above conditions, consult us.

● Table of dimensions  
(Standard/high-speed, large-width/oil-resistant, heat-resistant specification) In mm

Belt width	Chute width (H)	Number of tips (n)	Shaft length (O)	Q	Weight (kg)	Applicable specification		
						N	H	T
500	600 or more to less than 850	4	760 - 985	135 - 247.5	17.6 - 18.8	○	○	○
600	700 or more to less than 950	5	860 - 1085	135 - 247.5	18.7 - 19.9	○	○	○
750	900 or more to less than 1150	6	1060 - 1285	185 - 297.5	20.3 - 21.5	○	○	○
900	1050 or more to less than 1300	8	1210 - 1435	160 - 272.5	22.3 - 23.5	○	○	○
1050	1150 or more to less than 1400	9	1310 - 1605	160 - 247.5	23.4 - 34.4	○	○	○
1200	1350 or more to less than 1600	11	1510 - 1805	160 - 247.5	25.6 - 37.0	○	○	○
1400	1550 or more to less than 1800	13	1710 - 2005	160 - 247.5	27.9 - 39.6	○	○	○
1600	1800 or more to less than 2050	15	2030 - 2255	160 - 247.5	40.9 - 42.5	-	○	○
1800	1975 or more to less than 2225	16	2205 - 2430	197.5 - 310	42.7 - 44.4	-	○	○
2000	2200 or more to less than 2450	18	2430 - 2655	210 - 322.5	45.5 - 47.1	-	○	○

Legend for applicable specification: N: Standard specification; H: High-speed/large-width specification; T: Heat-resistant/oil-resistant specification  
For products with a width of 2000 mm or more, contact us.

### SAC-II products

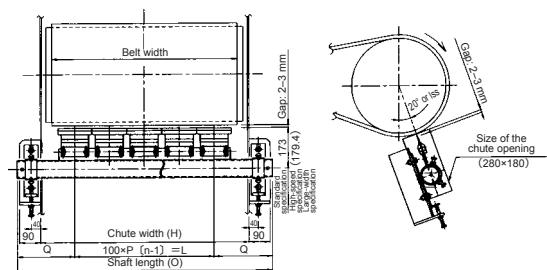


● Table of dimensions  
(Standard/high-speed, large-width/oil-resistant, heat-resistant specification) In mm

Belt width	Chute width (H)	Number of tips (n)	Shaft length (O)	Q	Weight (kg)	Applicable specification		
						N	H	T
500	600 or more to less than 850	4	1050	375	17.1	○	○	○
600	700 or more to less than 950	5	1150	375	17.9	○	○	○
750	900 or more to less than 1150	6	1350	425	19.3	○	○	○
900	1050 or more to less than 1300	8	1500	400	20.8	○	○	○
1050	1150 or more to less than 1400	9	1600	400	21.6	○	○	○
1200	1350 or more to less than 1600	11	1800	400	23.4	○	○	○
1400	1550 or more to less than 1800	13	2000	400	25.1	○	○	○
1600	1800 or more to less than 2050	15	2300	450	32.6	-	○	○
1800	1975 or more to less than 2225	16	2500	500	34.4	-	○	○
2000	2200 or more to less than 2450	18	2700	500	36.6	-	○	○

Legend for applicable specification: N: Standard specification; H: High-speed/large-width specification; T: Heat-resistant/oil-resistant specification  
For products with a width of 2000 mm or more, contact us.

### RCC



● Table of dimensions  
(Standard/high-speed, and large-width specifications) In mm

Belt width	Chute width (H)	Number of tips (n)	Shaft length (O)	Q	Weight (kg)	Applicable specification		
						N	H	T
500	600 or more to less than 850	3	1050	375	21.8	○	○	-
600	700 or more to less than 950	3	1150	350	22.6	○	○	-
750	900 or more to less than 1150	4	1350	375	25.4	○	○	-
900	1050 or more to less than 1300	5	1500	375	27.7	○	○	-
1050	1150 or more to less than 1400	6	1600	425	29.8	○	○	-
1200	1350 or more to less than 1600	7	1800	450	32.5	○	○	-
1400	1550 or more to less than 1800	9	2000	400	36.5	○	○	-
1600	1800 or more to less than 2050	10	2300	475	43.2	-	○	-
1800	1975 or more to less than 2225	11	2500	500	46.3	-	○	-
2000	2200 or more to less than 2450	12	2700	525	49.2	-	○	-

Legend for applicable specification: N: Standard specification; H: High-speed/large-width specification; T: Heat-resistant/oil-resistant specification  
For products with a width of 2000 mm or more, contact us.

\* Please contact us about installation methods, adjustments and servicing.

## Other Products

### 1. Wear Component (Ultra wear resistant, impact resistant rubber liners)

Linings for large hoppers and chutes with large bulk loads and strong impact from drops. Standards available are ML Plates (wear bar, fixed clamps), IR Plates (rubber vulcanized on steel plate) with 30 - 50mm thickness for light and medium loads, and SB Plates (all rubber) with 60 - 120mm thickness for heavy loads.

### 2. TB Plate Linings (for dump trucks)

The elasticity of the rubber mitigates load impact and improves the work environment for drivers. The use of rubber prevents noise, adhesion, and damage to the vehicle, and it is maintenance-free. These advantages reduce costs as well as noise pollution.

### 3. Pulley Lagging (Conveyor belt slip prevention)

The grooved surface design prevents belt slippage on drive pulleys.

### 4. Mill Linings

Interior linings at crusher mills with remarkably reduced weight compared with metal linings (1/7 the weight of metal linings), improved durability and safety, and noise prevention.

### 5. Sun Cleaner (Conveyor belt surface cleaner)

Wear resistant tips together with vulcanized rubber are "belt-friendly." Highly effective scraping and long service life.

### 6. Rubber Screen

Rubber screen is an elastic mesh used in vibrating sieve machines to sort sizes of gravel, crushed stone, ore, limestone, etc. Medium and large sizes are available.

Detailed information about these products is available in their respective catalogs.

# ⚠ Safe Usage of Conveyor Belts

As used below, "Danger" means there is imminent risk of serious injury or death due to incorrect or improper handling; "Warning" means there is risk of serious injury or death due to incorrect or improper handling; and "Caution" means there is risk of personal injury or property damage due to incorrect or improper handling.

## Storage and transportation

- ⚠ **Danger:** Do not move the belt by rolling it. This could cause serious injury or even death if someone is caught beneath the belt.
- ⚠ **Warning:** Keep the belt clear of open flames. To avoid the risk of fire, do not store near heat sources or devices producing electric sparks, such as stoves, and avoid storage near steam, oil and chemicals.
- ⚠ **Warning:** When lifting the belt, use cranes and hoists that match the weight of the belt.
- Caution:** Store the belt at temperatures between -10 and 40°C, with low humidity levels, and avoid direct exposure to sunlight, wind and rain.
- Caution:** Use a stopper under the belt so that it does not roll or tip over in storage.
- Caution:** Do not store or transport the belt on its side, in a leaning position, or in a distorted state.
- Caution:** Use a protective cover when lifting the belt to protect the belt edges.

## Routine inspection

Routinely inspect the belt before use, and take corrective action when needed. Contact your dealer if abnormalities continue after taking corrective action.

Inspection items	Remedial actions
1. Belt body damage or wear	Repair or replace
2. Belt joint separation or damage	Repair
3. Defective roller rotation	Servicing or replace
4. Accretion on pulley or rollers	Remove accretion
5. Take-up device operation abnormality	Servicing
6. Skirt or belt cleaner abnormality	Servicing
7. Abnormality in the chute	Servicing
8. Foreign object adherence	Remove foreign object(s)

\* Never touch a moving belt. It is only safe to inspect a belt after it has come to a complete stop.

## During operation

- ⚠ **Danger:** Install safety barriers and covers to prevent any type of body contact with the belt.
- ⚠ **Danger:** Do not enter areas behind safety barriers while the belt is in operation.
- ⚠ **Danger:** Do not wear a necktie or items that may dangle from clothing. These items could be drawn into the belt operation.
- ⚠ **Danger:** Keep your hands and body off of the belt surface.
- ⚠ **Warning:** Do not place foreign objects on the belt, particularly cigarette butts which may cause a fire.
- Caution:** Check control panel switches and emergency stop device before operating the belt, and know the location of emergency exits.
- Caution:** Comply with maximum load (weight) limitations to prevent abnormal tension, which can cause malfunction.
- Caution:** Place loads so that they do not fall from the conveyor.
- Caution:** Install devices to detect or prevent abnormal operation, such as a reverse running prevention device, belt tracking detector, emergency shut-off device, etc.

## During operation

- Caution:** If you detect trouble needing maintenance, such as an abnormal sound or belt tracking, stop the belt immediately and conduct an inspection.
- Caution:** Do not walk under the belt or enter the area under the take-up device.
- Caution:** Do not remove or dispose of build-up while the belt is in operation.

## While belt is stopped

- ⚠ **Danger:** Turn the operating switch off and hang a tag on it indicating that the belt is "Not in operation."
- ⚠ **Danger:** Do not get on the belt or walk on it unless necessary for repairs.
- ⚠ **Danger:** Do not stop the belt with hot items still on it, as there is a danger of fire.
- ⚠ **Danger:** Confirm that the entire length of the belt is safe before re-starting operations.
- Caution:** Do not wear spiked shoes if you must get on the belt for repairs.
- Caution:** Do not allow oil, chemicals, welding sparks, or heavy or foreign objects to fall on or adhere to the belt and cause damage.

## Performance considerations

- ⚠ **Warning:** Do not use the belt outside the ranges listed in the catalog.
  - Examples (1) Belt performance: cover rubber performance, belt strength, adhesion performance, etc.
  - (2) Design conditions: safety factors, pulley diameters, etc.
  - (3) Use conditions: appropriate properties of items transported, etc.
- Caution:** Do not transport items having temperatures above the allowable ranges on heat-resistant belts. Heat-resistant belts are not resistant to flames.
- Caution:** Flame-resistant belt performance complies with JIS K6324, but may ignite depending on operating conditions.
- Caution:** Do not use ordinary belts for special applications requiring heat resistance, oil resistance or flame resistance. (Cover rubber performance in accordance with JIS K6322.)
- Caution:** Use Bando Sunline Belts for the conveyance of unpackaged foods, or in applications where rubber may come into contact with food.

## Belt joints

- ⚠ **Danger:** Open flames are prohibited at worksites to prevent the risk of fire.
- ⚠ **Warning:** During the splicing process, do not allow exposure to direct sunlight, water or dust to prevent a lowering of adhesive strength.
- ⚠ **Warning:** Ensure adequate ventilation when using rubber cement or solvents as they may pose a health risk.
- ⚠ **Warning:** Do not leave rubber cement or solvents at the worksite as they cause fire.
- Caution:** Follow manufacturer-recommended procedures when splicing belts.
- Caution:** Use only manufacturer-specified materials when splicing belts. Also, do not use bonding materials beyond their expiration date.



# Conveyor Belt Quality Requirements

1	User name		7	Document submitted to:			
2	Machine number		8	Product delivery to:			
3	Required delivery date		9	Number of copies			
4	Required manufacturing cost		10	Customer's specification			
5	Customer's drawings		11	Related documents			
6	Design of similar products: yes/no		12				
13	Place of installation	Indoors, Outdoors, Covered, Mine, Seashore					
14	Size	Width: _____ Length: _____ Including joint length Yes/No	22	Pulley	Drive: _____ Head: _____ Tail: _____ Take-up: _____ Snap: _____ Bend: _____		
15	Object to be transported	Name	Apparent specific gravity	23	Roller	Width : _____ Yes ( ) Crown: _____ No ( ) Cage-shaped: _____	
		Material size	Max. ( ) Ave. ( ) %				
		Characteristics	Sharp, dry, moist, sticky				
		Temperature of the object	Normal temperature: Max. ( )°C Min. ( )°C				
		Ambient temperature	Normal temperature: Max. ( )°C Min. ( )°C				
Belt surface temperature	°C; water spray Yes/No						
Oil and chemicals	Oil, acid, alkali ( )						
16	Belt speed	v = _____ m/min	24	Belt support	Roller; steel sheet; roller plus steel sheet		
17	Machine length	Actual length: $\ell_1 =$ _____ m ; horizontal length: $\ell_c =$ _____ m	25	Belt joint	Factory endless; on-site vulcanization; metal fittings; Sunpat		
18	Head	Upward, downward: h = _____ m	26	Tripper	Yes unit(s) (mm high); fixing No		
		Inclination: $\alpha =$ _____ °; inclined section: $\ell' =$ _____ m					
19	Quantity transported	Qt: Max. _____ Ave. _____ t/h	27	Chute	Head _____ m, direct head: _____ m; angle _____ ° Feeder Yes ( ); No _____ Cushion roller Yes, pitch: _____ m; No _____		
20	Drive unit	Scheme	Single, tandem-type single, tandem dual (two-shaft) Multi	28	Case where the hopper is pulled out	Outlet width ( ); outlet length ( ); height ( )	
		Position and motor layout	Head	First _____ KW _____ HP × _____ unit(s)	29	Accessory facilities	Alignment roller: Yes ( ); No _____ Skirt, scraper, turnover
			Head vicinity				
			Tail	Second _____ KW _____ HP × _____ unit(s)			
			Tail vicinity				
In-between							
Other							
Winding angle	180°, 200°, 210°, 220°, 230°, 240°, 360° Other angles ( )						
Pulley surface	Rubber racking, exposed (moisture: Yes/No)						
21	Take-up	Scheme	Screw, counterweight, carriage, power winch	Replacement	Current condition	Size _____ Belt strength _____ Rubber type _____	
		Position	Immediately behind the drive, tail, head, in-between			Time limit for use _____ State of damage _____ Points to be improved _____ Others _____	
		Stroke	mm; _____ weight _____ kg				
30	Conveyor shapes, line diagrams (Be sure to describe these when points of inflection exist in the middle.) Other requests and notes		For Flexowell®, enter the following dimensions.				

31 Remarks

Please inform us of the following when placing a conveyor belt order, particularly the items in parentheses.

- Issues related to odor, discoloration and toxicity of items conveyed (particularly the name and conveyance state of food products).
- Bucket elevators (bucket weight/unit, diameter and number of bolts, bucket pitch, loading method).
- Belt wrappers (drawings, maximum belt strength, hydraulic force, cylinder and pulley diameters, contact angle of crown and tension pulleys).
- Gypsum board conveyor belts (surface accuracy, board types and thicknesses, mold line machine number).
- Tonlex-type (oil types)
- Shot blast (pulley diameter, disk diameter, barrel width, processing weight, support roller (Y/N)).
- Belts with cleats or fins (shape of return roller).
- Belts with fins (trough angle, fin pitch, granular size of loads).
- Steep incline conveyors (load type, particle size distribution, moisture content).
- Weight scale belts (weight tolerance, pulley diameter, dimensional tolerance).
- Oil resistance applications (oil type and adhesive state, request for sample)
- Automated lubrication of rollers (Y/N)

\* The numerical values shown as Type (nominal designation of belt strength) in this catalog are in SI units, expressing the strength of a belt per 1 mm width in [N]; the unit is [N/mm]. The conversion between SI units and the conventional units is based on the relationship N/mm = 0.1 kgf/mm; a numerical value shown in Type (nominal designation of belt strength), when converted into the conventional unit system, shows the same value.