



**Power and Performance  
for the Steel Industry**



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# Product Line-up

## Products to Match Your Needs

From power transmission to material handling,

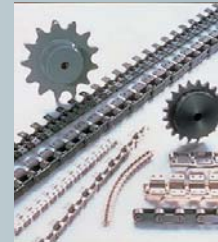
The Tsubaki group provides market leading solutions through advanced engineering practices and personalized product services.

### Chain

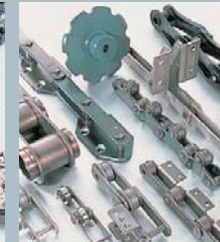
- Drive Chain
- Small Size Conveyor Chain
- Large Size Conveyor Chain
- Top Chain
- Sprockets
- Cable/Hose Protection Systems
- Timing Belts and Pulleys



Drive Chain



Small Size Conveyor Chain



Large Size Conveyor Chain



Cableveyor®



Sprockets

### Power Transmission Equipment

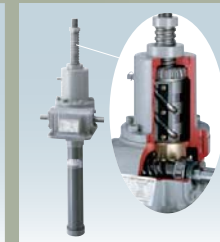
- Cam Clutches
- Linear Actuators
- Fasteners
- Couplings
- Overload Protection Units
- POWER-LOCKS®



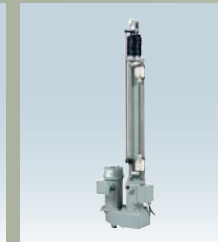
POWER-LOCK®



Shock Relays



Lini Power Jack



Power Cylinders



Cam Clutches

### Material Handling

- Distribution Systems
- Pharmaceutical Systems
- Newspaper Printing Systems
- Other Conveyance, Sorting, and Storage Systems
- Modular Conveyors
- Bulk Handling Systems
- Metalworking Chip and Coolant Processing Conveyors



Linisort®



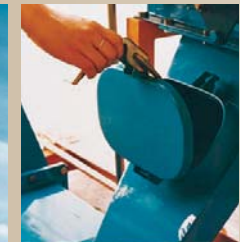
Conveyance System for Automobile Painting Lines



Coolant/Metalworking Chip Conveyor



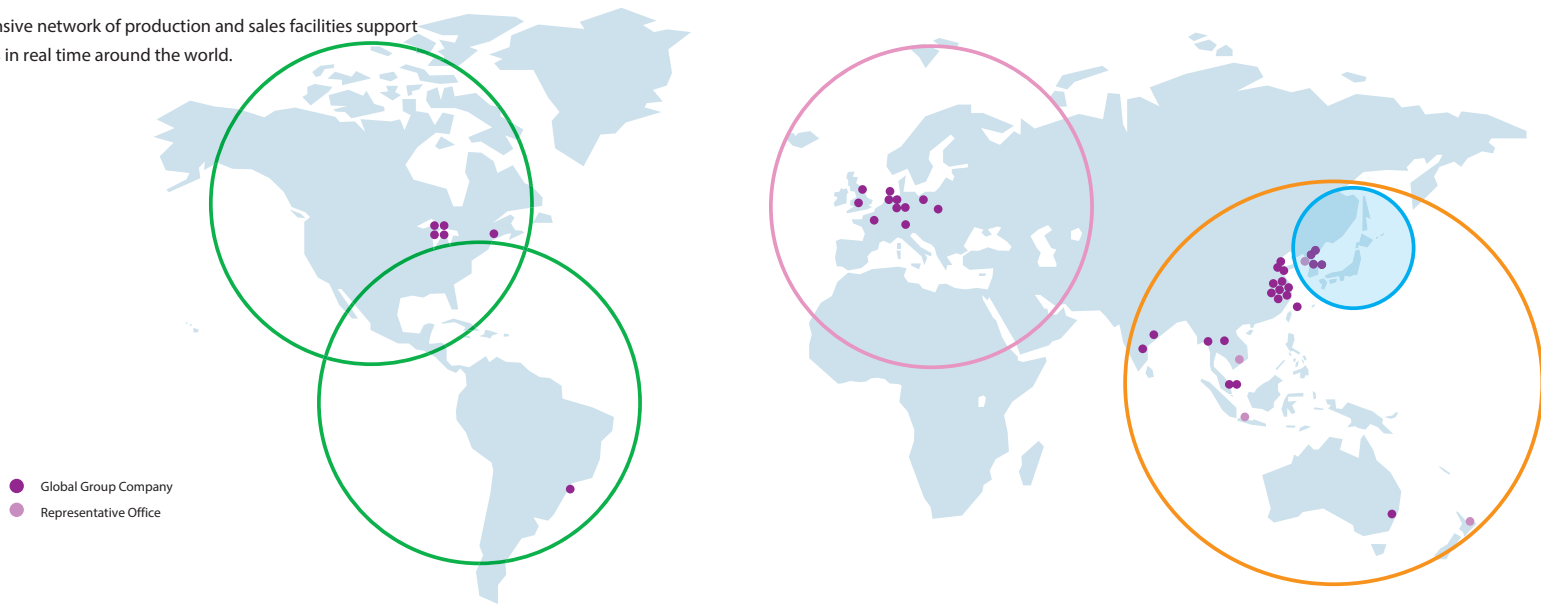
Bulk Systems



ONE-TOUCH INSPECTION DOORS®

# Tsubaki Global Network

The Tsubaki Group's extensive network of production and sales facilities support our customers' businesses in real time around the world.



## Japan (18 locations)



Kyotanabe Plant



Saitama Plant



Kyoto Plant



Hyogo Plant



Okayama Plant



Tsubaki Mayfran Plant

## North & South America (6 locations)



U.S. Tsubaki Power Transmission, LLC



Tsubaki Brazil



U.S. Tsubaki Automotive, LLC



Tsubaki of Canada Limited

## Europe (10 locations)



Tsubakimoto Europe B.V.



Tsubaki Kabelschlepp GmbH

## Asia & Oceania (23 locations)



Taiwan Tsubakimoto Co.



Tsubakimoto Singapore Pte. Ltd.



Tsubakimoto Automotive (Thailand) Co., Ltd.



Tsubaki Australia Pty Ltd



Tsubakimoto Automotive (Shanghai) Co., Ltd.

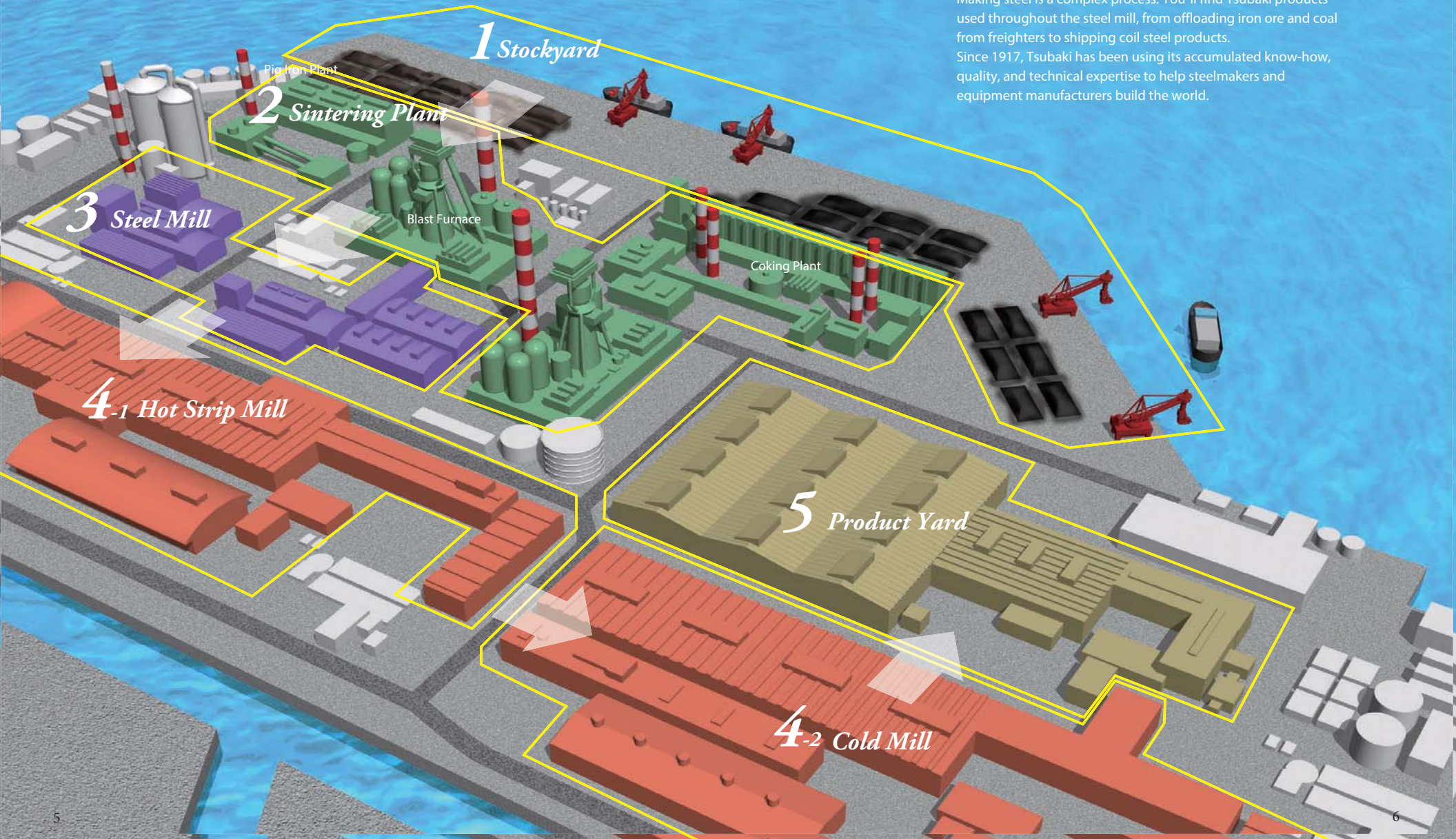


Tsubakimoto Chain (Tianjin) Co., Ltd.

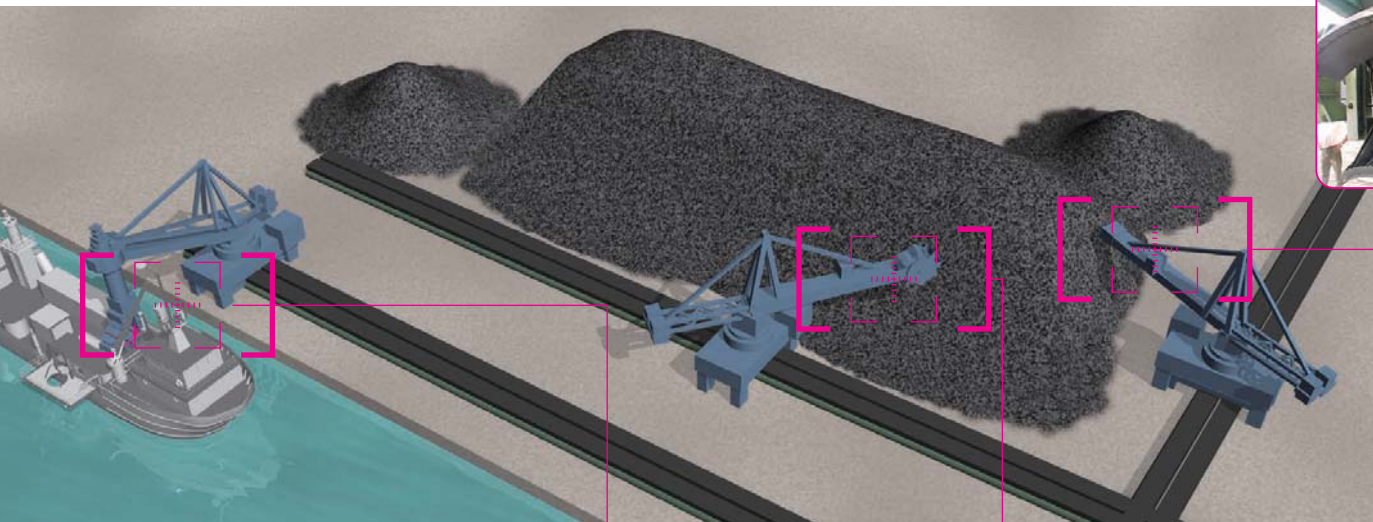


# Tsubaki – Serving the Steel Industry

Making steel is a complex process. You'll find Tsubaki products used throughout the steel mill, from offloading iron ore and coal from freighters to shipping coil steel products. Since 1917, Tsubaki has been using its accumulated know-how, quality, and technical expertise to help steelmakers and equipment manufacturers build the world.







### • *Chain Scraper Reclaimers*

A chain scraper reclaimer moves ore and other materials stored in stockpiles to a conveyor that transports the material to the next stage of the production process.



### • *Continuous Unloaders*

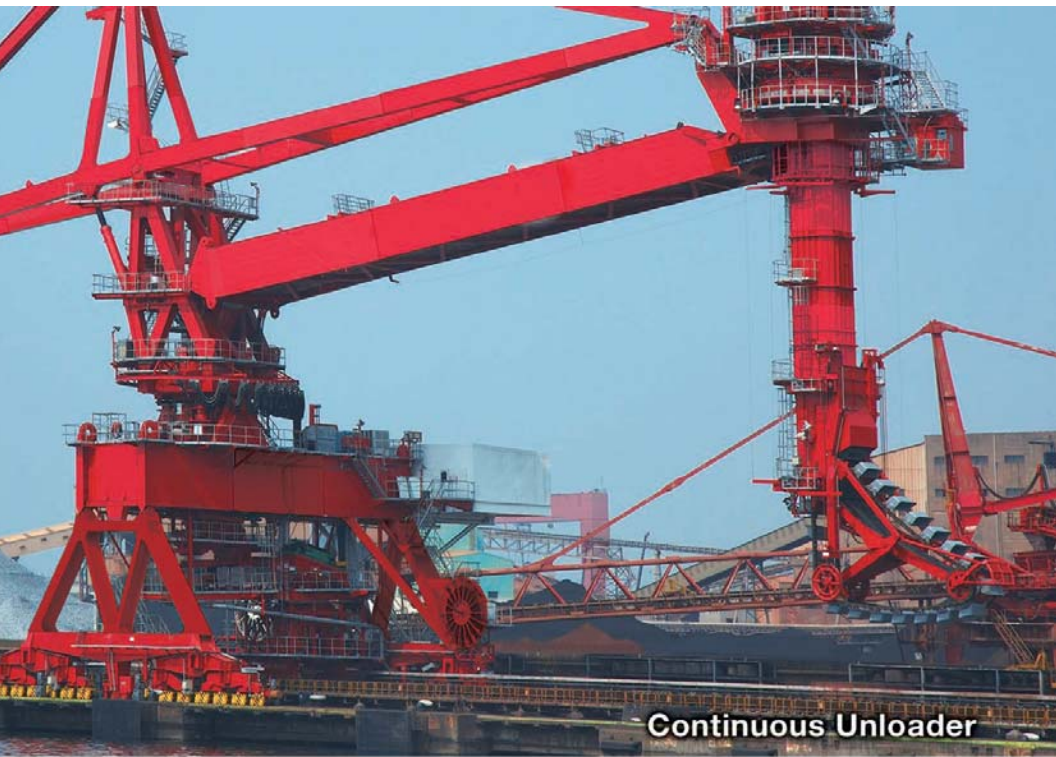
An unloader uses a bucket to unload coal, iron ore, and other loose material from a freighter. A continuous unloader can unload more efficiently and in less time, equating to much lower landing costs.



### • *Bucket Wheel Reclaimers*

Bucket wheel reclaimers feature buckets attached to a wheel at the end of a boom. The wheel rotates and feeds material from the stockpile to the next process





Continuous Unloader



Continuous Unloader

### Unloader Chains and Sprockets



Unique technology gives Tsubaki Unloader Chain its superb endurance and proven track record. We also offer various specifications and series to match the needs of the conveyed items. Unloader sprockets are optimized for use with unloader chains. We specially harden them for extremely effective wear resistance.



### Backstop Cam Clutches



Tsubaki's Backstop Cam Clutch products use a non-rollover design. The load distribution is among multiple cams and a large surface cross section, so even if an unexpectedly large reverse torque occurs, the clutches will not roll over. This will prevent the conveyor from reversing.



### Steel Cable Carrier Systems



TK / S / SX Series

Steel Cableveyor® has excellent strength and heat resistance. Stainless steel and side mount specifications are also available. We also offer an extensive line-up of tube type Cableveyors for added cable/hose protection.



Side mount specifications

### Wear Indicator Sprockets



Tsubaki's patented sprocket wear indicator technology offers users the ability to identify and schedule drive system maintenance before critical component failure occurs.



### Helical Reducers



Highly reliable Tsubaki Helical Power Drive reducers are often used in crane travel and swiveling sections.

Crane travel drive







**Chain Scraper Reclaimer**

**Reclaimer Chain**



When abrasive material infiltrates between bushes and rollers, chain wear significantly accelerates. Utilizing Tsubaki's patented dust resistant bearing rollers and our SJ3 seals, you can significantly extend the life of your reclaimer chains.



**Heavy Duty Roller Chain**



Tsubaki Heavy Duty Roller Chains provide proven performance. The optimal material and perfect heat treatment give Tsubaki Heavy Duty Roller Chains unparalleled tensile strength and shock resistance.



Heavy Duty Roller Chain on a reclaimer drive



**Bucket Wheel Reclaimer**

**Power-Lock®**



Power-Locks are friction-type fastening devices that simply and securely fasten to shafts and bosses eliminating the opportunity for backlash. You will find just the right type for your needs with our extensive line-up and range of sizes.



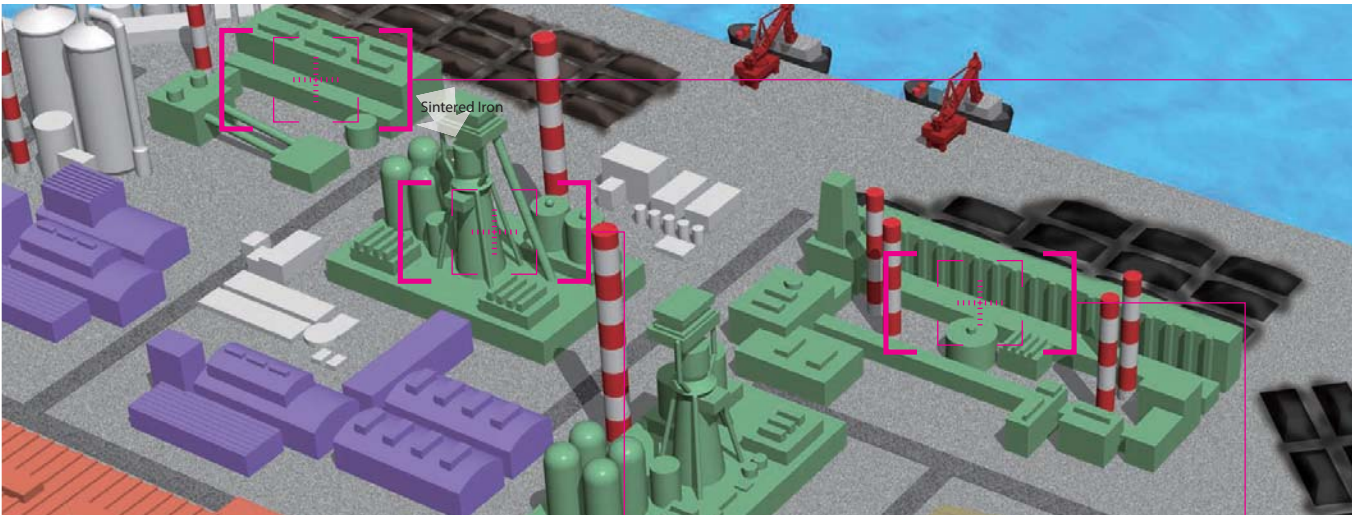
**Roller Chain Couplings**



These are flexible couplings made with two solid coupling-tailored roller chains wrapped around two sprockets. Used in standard drive situations.

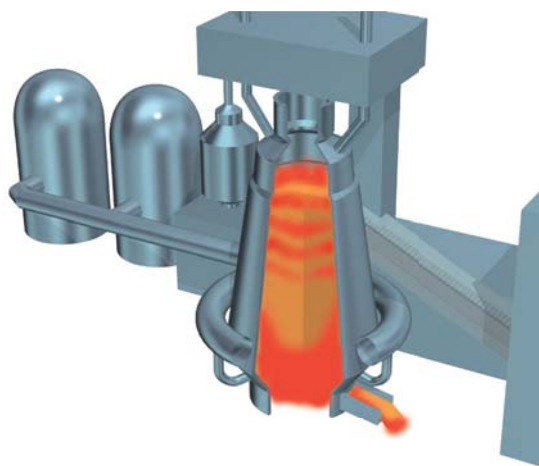






• **Sintering Plant**

In the sintering process, powdered iron ore, which makes up the majority of imported iron ore, is fused to create sintered ore.



• **Blast Furnace**

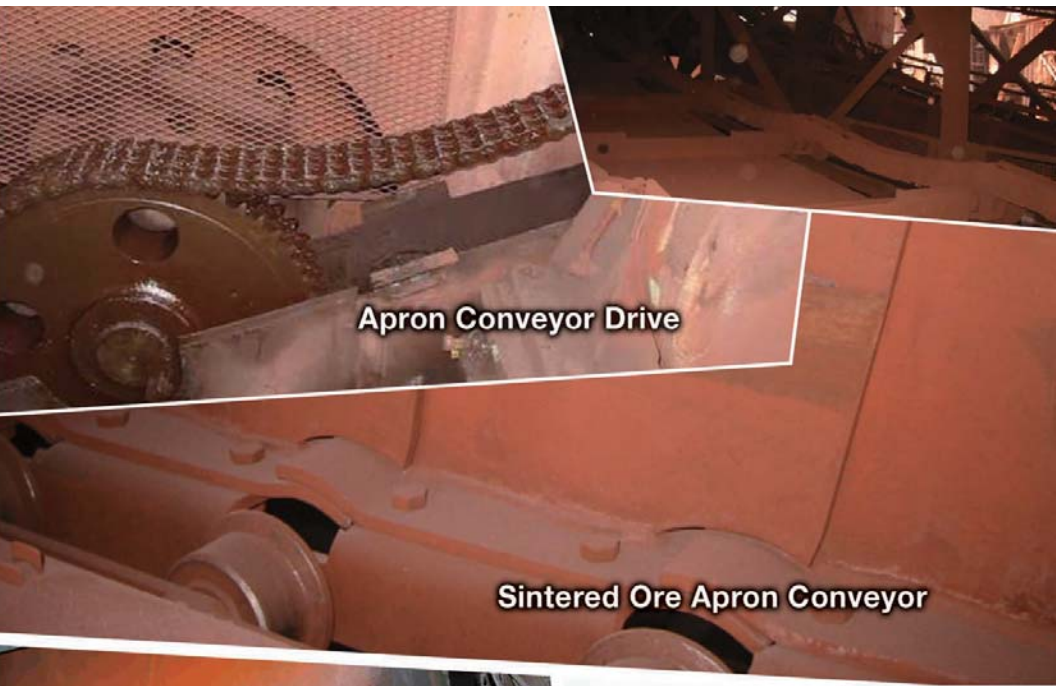
Here, iron is created from iron ore. Iron ore and coke are alternately charged in the furnace from the top, while hot air is pumped in from below. The CO<sub>2</sub> generated from the burning coke reduces the iron ore to iron. Temperatures inside the furnace can reach 2000°C. The melted iron (hot metal) is removed from beneath the furnace.



• **Coking Plant**

Coal in the furnace is distilled to manufacture coke. Iron is extracted by reducing iron ore in the presence of carbon, which also becomes a source of heat for melting ore and limestone.





**Apron Conveyor Drive**

**Sintered Ore Apron Conveyor**

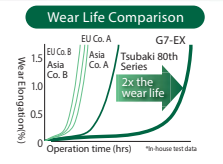


**Sintering Gas Treatment Equipment**

**RS® Roller Chain G7-EX**



Tsubaki's standard RS Roller Chain G7-EX uses a seamless solid bush developed by Tsubaki. The special lube grooves\* in our high precision solid bushes retain lubrication longer for twice the chain wear life.  
 \*Lube grooves available for RS80 - RS140 only.



**Drive Sprockets**



We ensure that our Tsubaki roller chain sprockets have a deep hardened layer over the entire sprocket – even the tooth bottoms. This ensures superb wear life for tooth bottoms and long life for the sprocket. We offer an extensive line-up of sprockets with a wide-ranging number of teeth, rows, and shapes, as well as finished bore sprockets and bore fasteners.



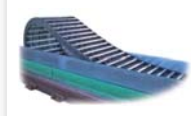
**Power Cylinders**



Tsubaki Power Cylinders are electric cylinders that can operate with just simple wiring. With no troublesome hydraulic or pneumatic pipes to worry about, maintenance is a snap. Standardized operation for small to large thrust forces, diverse options, and various built-in overload safety devices give our users peace of mind. Highly efficient ball screws provide long service life even under high speed/high frequency use.

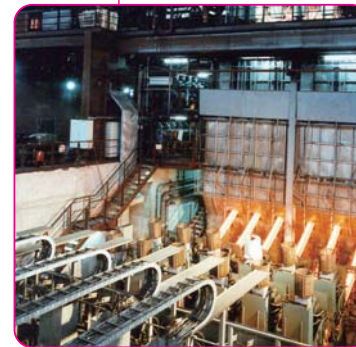
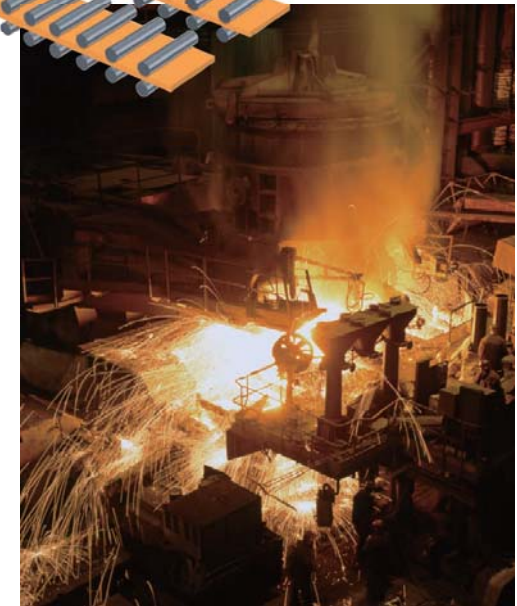
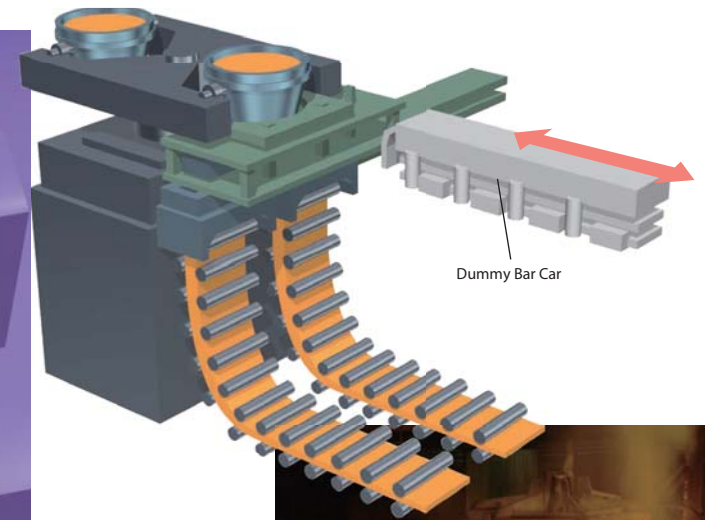
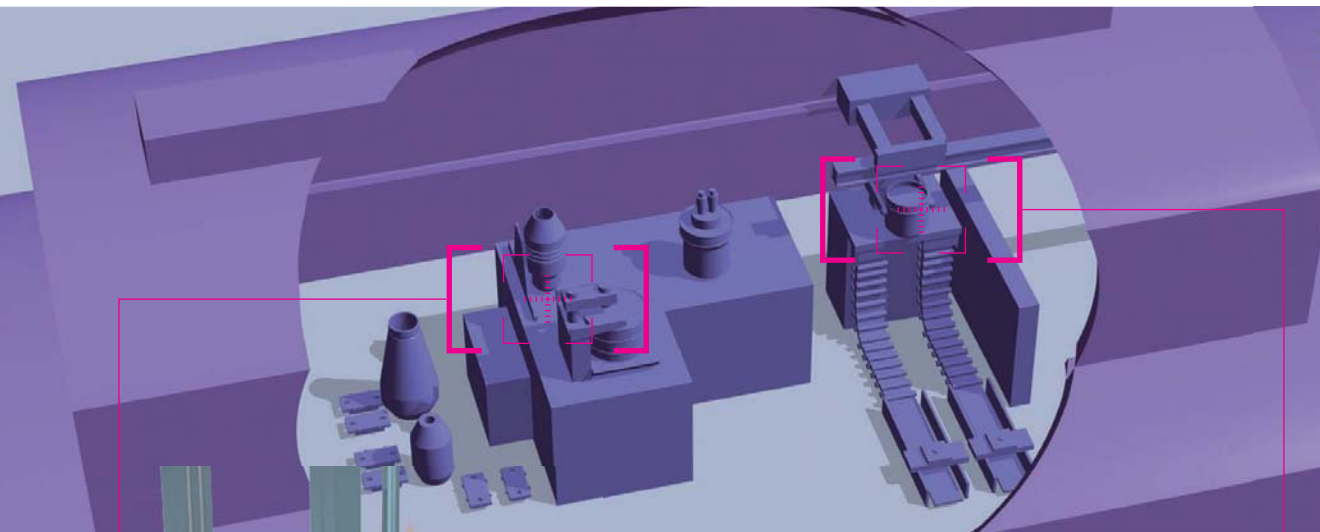


**Hybrid Cable Carrier System**



Hybrid cable carrier systems (sideband made of plastic and stays made of aluminum) are available in 1mm width increments to perfectly fit to the available mounting space. When operating on crane systems, the carriers run safely in guide channels made of steel sheet metal which are custom-made for any application. In doing so, we can accommodate almost any request for special shapes and fastening options.





## • Converter

Here, the hot metal from the blast furnace is reduced to form molten steel. The hot metal contains carbon, silicon, phosphorus, and many other impurities, so it is transferred to the converter, where oxygen is blown in from above and below to oxidize and remove the impurities. This allows the required optimal components to be adjusted to make steel.

## • Continuous Casting

Here, the molten steel reduced in the converter is hardened and shaped into billets. The molten steel taken from the converter is continuously poured from the ladle into a mold below and cooled. The cooled, hardened steel is cut to specific lengths and carried to the rolling process to be shaped.





Converter

Continuous Casting

### T Series Power Cylinder



The T Series Power Cylinder is a heavy thrust type power cylinder that uses AC power. Tsubaki offers a wide range of models to match any application, thrust, or speed. Thrust ranges from 2.45 to 313kN(250 to 32000kgf), with a maximum stroke of 2000mm. All models use a braked motor for reliable load support and safety. Heat resistant and other special braked motors can be easily installed for high temperature environments.



### Dummy Bar Car Chain

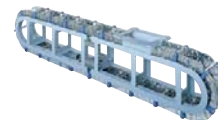


This chain returns dummy bars used in continuous casting to their original position. The attachments are individually designed to match the customer's dummy bars. The plates and the part of the attachment that engages the dummy bar are quenched hardened for added strength.



Dummy Bar Car Chain inside a dummy bar car

### TKV/TKI Series Steel Cableveyor® S/SX1252B / 1802B



TKV Series



TKI Series

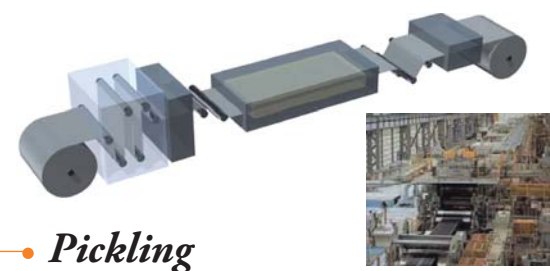
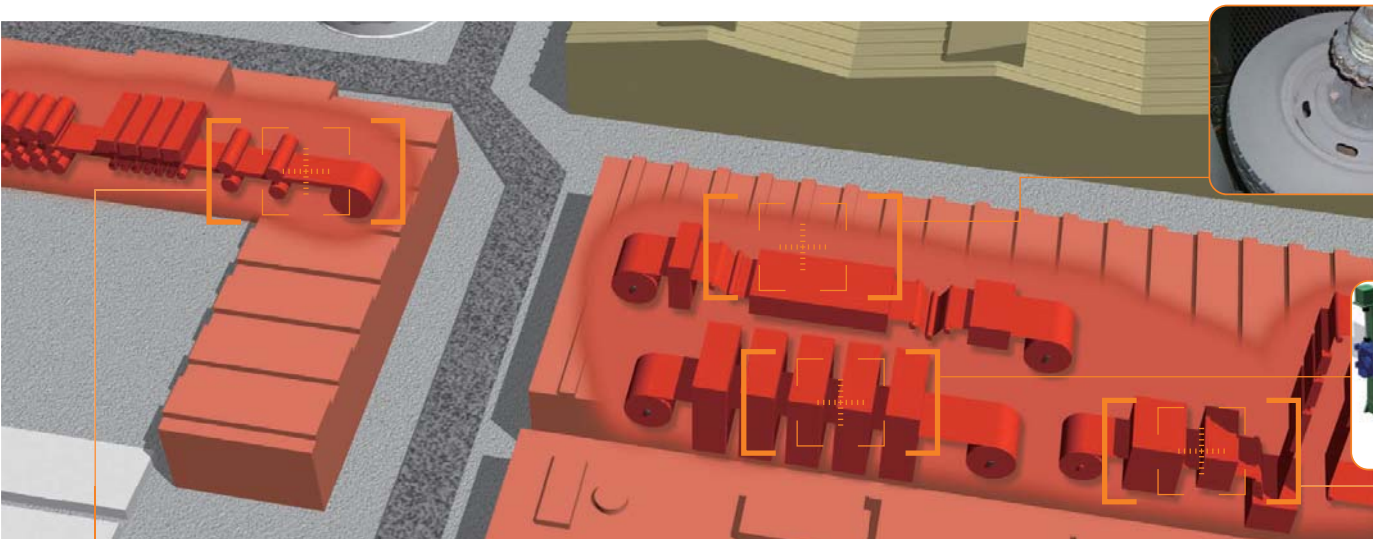


S / SX 1252B / 1802B

TKV Series Cableveyors have a maximum stroke of 30m (100m for the TKI Series). The maximum travel speed of the TKV Series is 150m/min, and TKI Series 120m/min, so they are usable in high frequency, high speed, and long travel stroke ranges where previous steel Cableveyors were not.

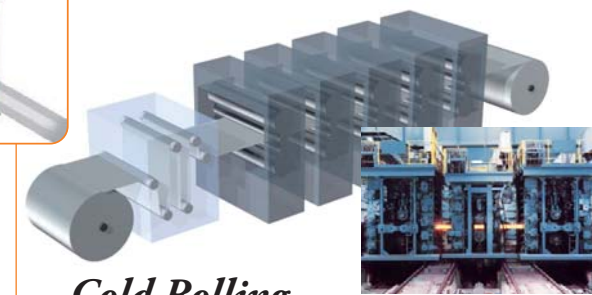
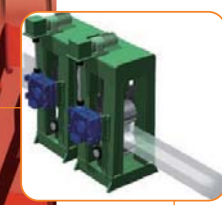
The optimized geometry of S/SX 1252B and S/SX 1802B reliably prevent costly downtimes and maintenance breaks for the entire system – especially in environments, where large amounts of very fine, abrasive media are generated. Foreign bodies entering into the system are removed from the stroke system by the self-cleaning effect of the cable carrier in motion.





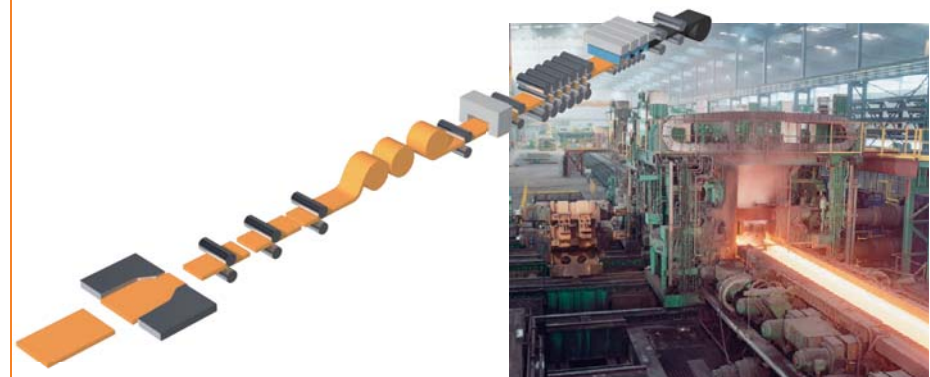
● **Pickling**

The surface scale (iron oxide) formed on hot coils in the hot rolling process are washed off ("pickled") using hydrochloric acid.



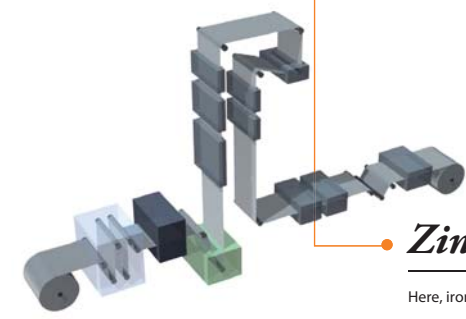
● **Cold Rolling**

Here, hot coils are rolled to a usable thickness at room temperature. Coils rolled even thinner during this process are called cold rolled coils.



● **Hot Rolling**

Here, slabs are pulled to make steel strips. The slabs are reheated to 1250°C and rolled while hot. The rolled strip steel is then wound up like a roll of toilet paper (called a "hot coil").

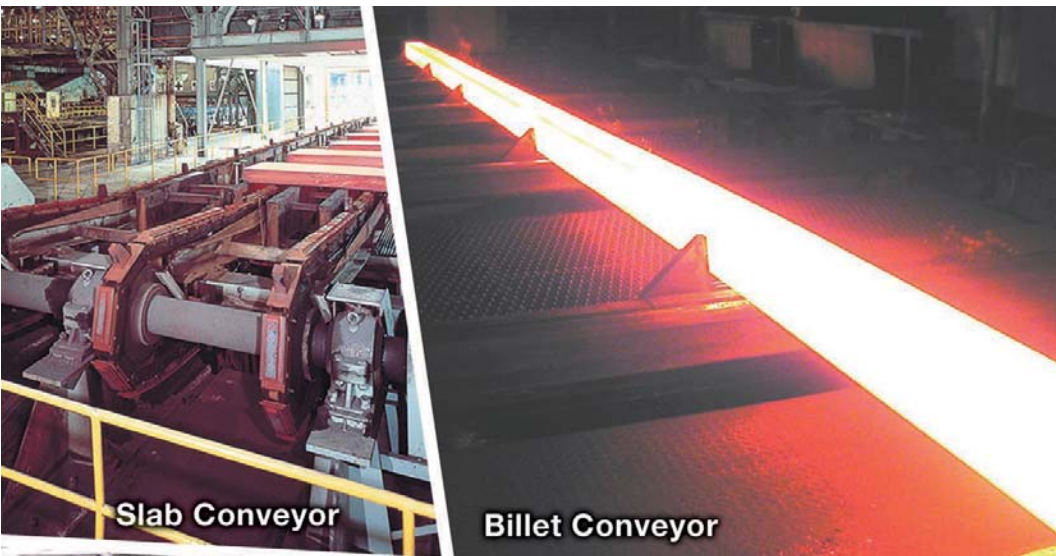


● **Zinc Plating**

Here, iron is dipped into and coated with molten zinc.





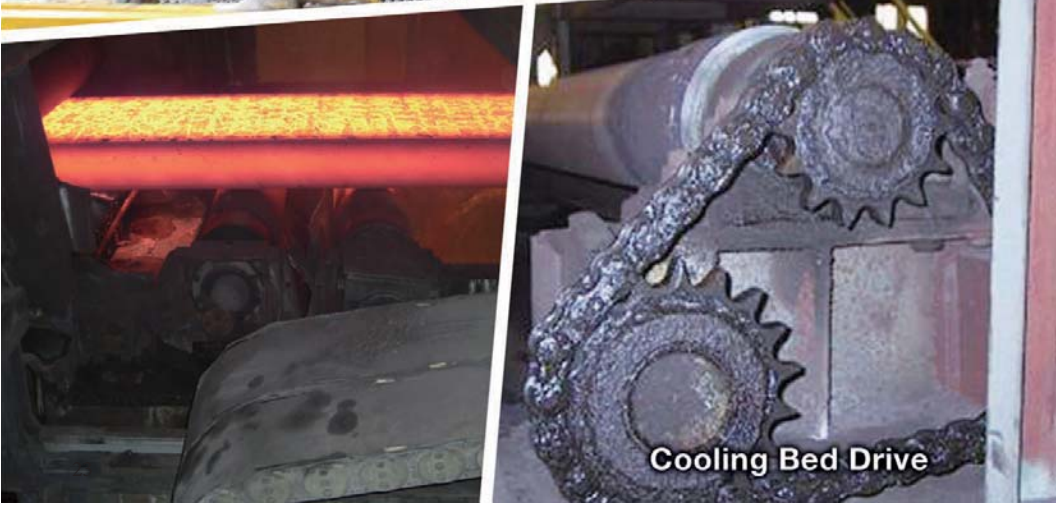


Slab Conveyor

Billet Conveyor



Cooling Bed



Cooling Bed Drive

### Semi-finished Product Conveyor Chain



Chains used to convey slabs, billets, and other semi-finished products have to be designed in light of the product's shape and temperature, as well as the conveying environment. Let Tsubaki's extensive track record help find the right specifications for you.



Billet conveyor



Slab conveyor



Slab conveyor



Cooling head



Wire rod conveyor



Wire rod conveyor

### NEP Series Roller Chain



Lines subjected to cold water sprays have problems with corrosion. With NEP Series, the pins, bushes, and plates have a unique triple layer coating, and the rollers are also specially coated, for added corrosion resistance. NEP Chain does not use hexavalent chromium, cadmium, mercury, or arsenic and so is RoHS compliant.

### Covered Cable Carrier Systems



Cover system RMD

Covered or closed steel cable carrier systems should be used for applications where hot chips or severe contamination occur. The cover system also protects the layed cables against short-term radiant heat impact. Available as covered types with the robust Covered system RMD or economically priced, light covered types (steel band cover) for flying sparks and small chips.



Steel band cover

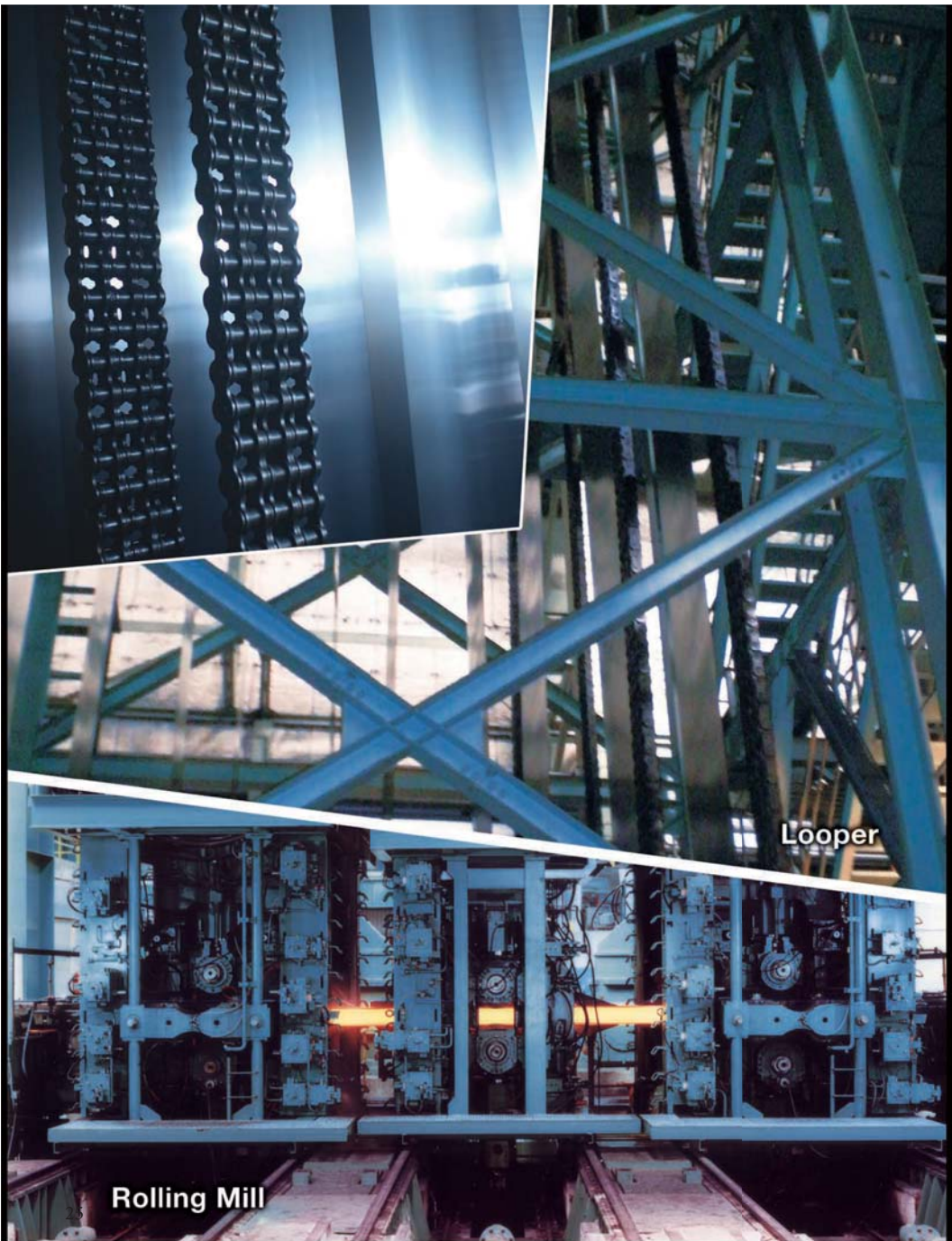
### Overrunning Cam Clutches



Overrunning Cam Clutches spin freely the majority of the time, occasionally being called upon to lock up and drive. In a two-speed drive, when the gearmotor drives at low speed, the clutch engages and when the faster electric motor drives, the clutch overruns switching between low and high speeds.





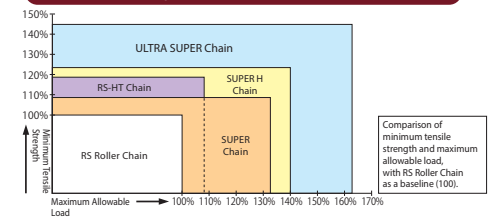


## Heavy Duty Roller Chain

The shape and thickness of heavy duty roller chain link plates are larger, allowing for more compact designs, excellent kilowatt ratings, and higher allowable load and tensile strength.

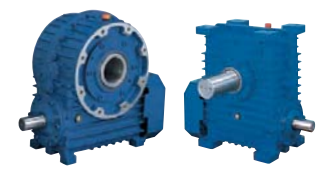


Minimum Tensile Strength & Maximum Allowable Load Comparison



- SUPER Chain**  
 We've adjusted the size of the plate waist to give the chain 30% greater maximum allowable load over standard Roller Chain.
- RS-HT Chain**  
 By increasing the thickness of the plate, we've increased this chain's tensile strength by 20% over standard roller chain over standard Roller Chain.
- SUPER H Chain**  
 SUPER H Chain has the same shape as SUPER Chain, but with a thicker plate. Ideal for applications requiring a higher allowable load, tensile strength, and shock absorption.
- ULTRA SUPER Chain**  
 The plates are oval and thicker than SUPER H Chain plates for the highest level of allowable load, tensile strength, and shock absorption for more compact designs.

## Worm Reducers

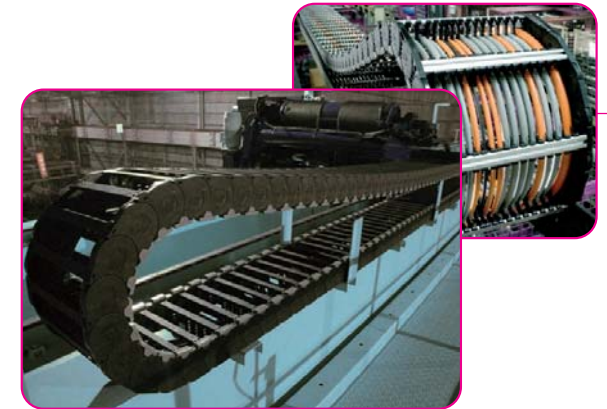
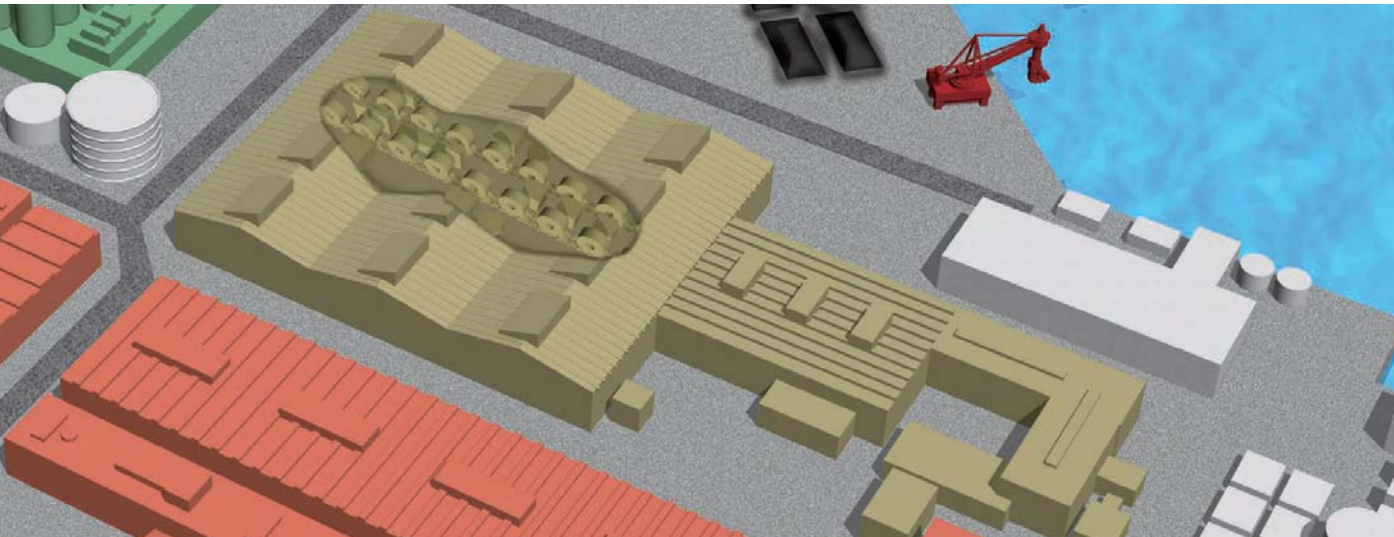


● **Troi Drive® Worm Power Drive®**  
 Rolling mills use Troi Drives, drum shaped gears that have a high load capacity.



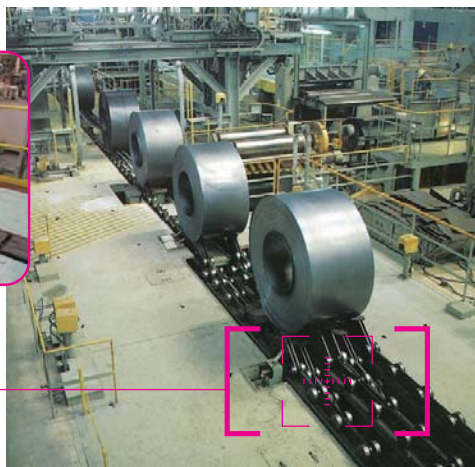
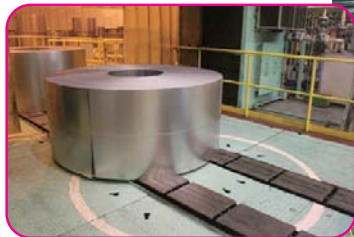
Rolling Mill





• **Ceiling Crane**

Ceiling cranes can hoist, move laterally, and more backwards and forwards. They provide reliable performance in a wide range of work areas, and are often used in conveying coils in the storage yard, product shipping yard, and so on.



• **Coil Conveyor**

A coil conveyor runs between the equipment upstream and downstream of the hot rolling, pickling, and cold rolling lines, the temporary storage area for coils needing production adjustment, and between various other lines. The conveyor must operate efficiently to meet production schedules.



• **Pallet Car**

There are many coil transfer systems in the coil storage yard and shipping yard.





Coil Conveyor

Scrap Conveyor

### Coil Conveyor Chain



Coil Conveyor Chains use our unique bearing rollers to reduce running resistance. (Coefficient of friction = 0.03)

The roller is also designed to be extremely resistant to cracking, and we manufacture the saddle to match your conveyor design.



### Bearing Roller Conveyor Chain



Previous Series

A unique Tsubaki roller that features cylindrical bearings inside the roller itself. Our line-up includes dust-resistant, water-resistant, and lube-free series chains.

Standard Conveyor Chain



Bearing roller functions

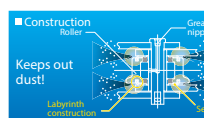
1. Reduce the chain running resistance (1/3 that of standard conveyor chain)
2. Greatly increase the roller allowable load

Bearing Roller Conveyor Chain

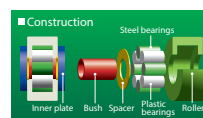


Bearing roller effects

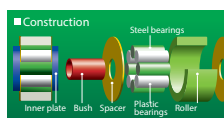
1. Reduced chain tension and required drive.
2. Eliminates stick-slip phenomenon on long lines and low speed operation
3. Suppresses poor roller rotation and reduces rail friction
4. Increased wear life (between bush - roller)



Dust Resistant Series



Standard Lube-free Series



Water-resistant Series

### Shuffle Conveyor



Shuffle Conveyors are a new type of conveyor that use a repeat back-and-forth motion to convey material. Unlike vibrating conveyors, Shuffle Conveyors are quiet during operation, and their simple construction makes maintenance easy. And unlike belt conveyors there is no way for conveyed goods to be returned.



### Overrunning Cam Clutches



Overrunning Cam Clutches spin freely the majority of the time, occasionally being called upon to lock up and drive. In a two-speed drive, when the gearmotor drives at low speed, the clutch engages and when the faster electric motor drives, the clutch overruns switching between low and high speeds.







Coil Robot System

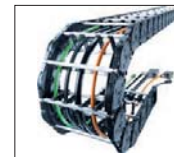


Ceiling Crane

### Long Span Cableveyor® with Glide Shoes



Long span specifications are a way of achieving longer travel strokes by having the Cableveyor glide on a guide rail. While normally this would cause wear on the tops and bottoms of the links, attaching glide shoes enables longer wear life, less energy required, and reduced running costs.



For very long travel lengths up to 200 m and over we also offer plastic cable carriers. Replaceable glide shoes made of a special, highly abrasion-resistant material with low friction coefficients increase the service life of the cable carrier systems many times over. For additional cable protection, covered types are available as well.

#### Wear Comparison <sup>\*After 130,000 cycles</sup>



Glide shoe (Amount of wear: extremely low)



Links on the inner surface with no glide shoe attached (wear evident)

With no glide shoes

10x longer life

With glide shoes



Longer lifetime : 3.1 million cycles tested with highly abrasion-resistant glide shoes.



# Other Solutions to Your Problems

## Patented SJ3 Technology

Tsubaki's patented triple seal SJ3 technology provides superior protection for your most demanding operations.

### Merits

Excellent performance and protection against harsh fine particulates and aggressive pin-bushing contaminants.



## ONE-TOUCH DOORS®

ONE-TOUCH INSPECTION DOOR® allows for quick and simple inspection without the need for special tools. No bolts to loosen and no covers.

### Merits

Durable and trouble-free  
Dust and rain tight  
Easy to open  
Easy to install  
Lockable

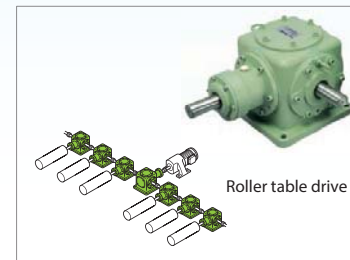


## Miter Gear Box

Distributes power laterally and across multiple shafts. Functions as a line shaft drive.

### Merits

Allows for simple simultaneous drive using just one motor.  
Equipment design can be made more compact.



## Lini Power® Jack

A direct linear actuator (jack) that combines a trapezoidal or ball screw with a worm gear.

### Merits

Choose from trapezoidal, ball, or high lead ball screws and multiple options to match your needs.



## Tsubaki Lambda® Chain

Lambda Chain uses special oil-impregnated bushes for lube-free operation.

### Merits

Reduced maintenance and replacement costs.  
Wear life is drastically increased compared to standard chain in lube-free operation.



## Dust Filtration Equipment Chain

The right combination of materials allows us to provide the ideal chain to meet your needs.

### Merits

Our line-up includes a wear resistant series, corrosion resistant series, and low noise series.



## BS Series Cam Clutch

Tsubaki BS (Backstop) series are engineered specifically for industrial conveyor and elevator applications.

### Merits

Higher torque/speed capacity.  
Anti-rollover cam design.  
Longer life.  
Low maintenance.  
Dust-proof construction.



## Wear Indicator Sprockets

Tsubaki's patented sprocket wear indicator technology offers users the ability to identify and schedule drive system maintenance before critical component failure occurs.

### Merits

Extended chain life through predictable maintenance.  
Eliminates the guesswork associated with worn sprockets.





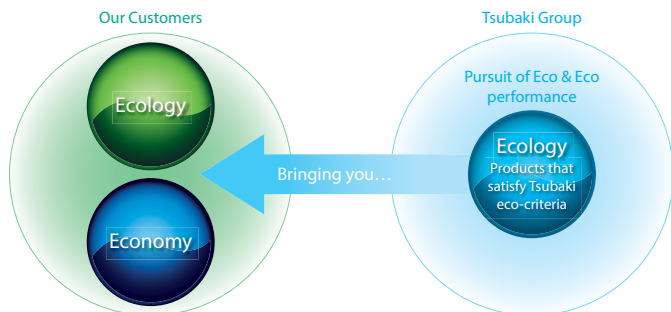
# Tsubaki Eco & Eco

## Let Tsubaki's Eco Products help you reduce energy costs and increase your bottom line

As a mechanical part and equipment manufacturer, the Tsubaki Group is working to develop environmentally-friendly products to reduce our environmental load ("ecology") and increase your bottom line ("economy").

### Tsubaki Group Eco & Eco

Our Eco & Eco (Economy & Ecology) philosophy is to reduce our environmental load while giving our customers cost incentives and other measures to help their bottom line by providing them with environmentally friendly products.



### Eco & Eco Benefits for the Customer

By using Tsubaki's eco-friendly Eco Products, you can reduce your environmental load, improve working conditions, and increase efficiency and quality. And by incorporating Tsubaki Eco Products into your products, you can increase your own business opportunities by providing environmentally conscious products.

#### Use Tsubaki Eco Products to

- bring procurement cost incentives to your customers by simplifying your products
- reduce running costs by providing a longer running life, lube-free operation, etc., and
- promote recycling and reduce disposal costs.

### Tsubaki Group Environmental Activities

A major goal of the Tsubaki Group is to expand our line-up of eco-friendly products to serve as the cornerstone of eco-friendly operations. We are working hard to improve our products' performance to give them longer life and increased power in your operations, which will help reduce waste.

#### Points in developing Eco Products

- Pursue eco-friendly designs and reduce the environmental load of procured items.
- Introduce LCA methodology and make our environmental approach logical.
- Contribute to society through business activities grounded in Eco Products.

### Tsubaki Eco Products

The Tsubaki Eco Link is our link to you and the environment, and your link to Ecology & Economy. The design is based on our popular roller chain link plate.



Eco Products catalog



### Eco Points

We have divided our environmental activities into seven categories, which are reflected in the design and development of Eco Products.

- Uses fewer resources, reduces waste
- Contributes to a clean workplace/usage environment
- Easily disposable
- Contains no harmful chemicals
- Reduces energy consumption and CO<sub>2</sub> emissions
- Contributes to the surrounding environment
- Reusable

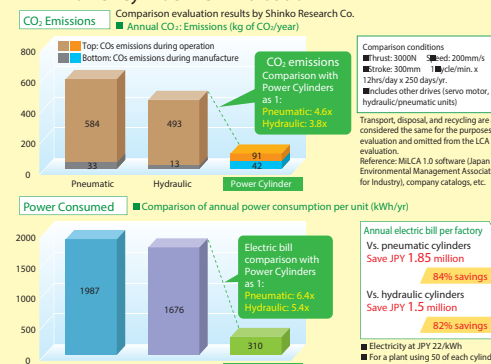
### Examples of Tsubaki Eco Products

#### Power Cylinders



- Powered cylinder reduces power consumed 1/5 the power of hydraulic cylinders, 1/6 of pneumatic cylinders
- Contains no harmful chemicals
- Using Power Cylinders opens up new markets for your products as eco-friendly products

#### Power Cylinder LCA Evaluation



#### Bearing Roller Conveyor Chain



- Over three times the bush - roller wear life
- Longer life means less maintenance and lower running costs.
- Coefficient of friction is reduced by 1/3, greatly reducing the required power and allowing for a chain two sizes smaller to be selected.
- Greatly reduced CO<sub>2</sub> emissions thanks to lower required power.

#### CABLE CARRIER SYSTEM STEEL-LINE S/SX1252B AND S/SX1802B



- Longer lifetime, no lubrication required, environmental-friendly.
- Maintenance time is reduced, less waste generated.
- Fits to the millimeter, no additional material or space needed, less downtime due to open construction.
- Resource conservation, less waste generated.