



## TSUBAKIMOTO CHAIN CO.

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# Power and Performance for Waste Incineration Plants

At Tsubaki, we know customers want the best. Indeed, we take pride in our ability to deliver an extensive product line up that satisfies these high expectations. We are also aware that each and every one of our customers has unique requirements. Therefore, we believe that in coming years there will be an increase in demand for products that can be readily applied to customers' global operational strategies. In other words, we foresee a rise in the need for highly customized products.

**Innovation in Motion.** With an eye on future trends and lifestyles, we are committed to taking on the challenge of technical innovation. Based on our brand message, which incorporates that commitment and is shared by all Group members around the world, the Tsubaki Group provides solid support for the global business activities of its customers. You can count on Tsubaki.

### Tsubaki Mission Statement

*Our Mission*

**We will provide the best value to customers around the world by capitalizing on our technical strengths in power transmission products and materials handling systems.**

*Our Vision*

**We aim to be a leading company in the global market for our products.**

### Global Network

The Tsubaki Group includes 28 production locations and 35 group companies worldwide. Our production and sales networks are more fully developed than ever.

### Global Operations

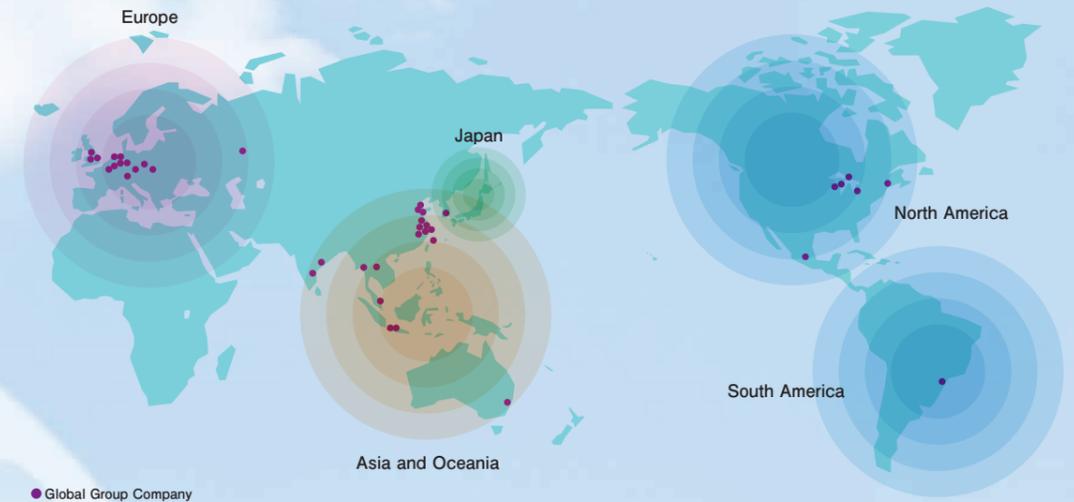
One of Tsubaki's strengths is its global production and sales networks. Through our group companies in the Americas, Europe, China and other Asian countries, and elsewhere we can provide the best product to customers around the world.

### Global Marketing

With a keen grasp on the needs of customers, we use the Group's comprehensive strengths to commercialize products rapidly.

### Tsubaki Group Products and the Tsubaki Network Tsubaki Global Network

The Tsubaki Group's extensive network of production and sales bases supports our customers' businesses in real time around Japan and around the world. (As of March 31, 2012)



### Tsubaki's Eco Efforts

#### Let Tsubaki's Eco Products help you reduce

As a mechanical component 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

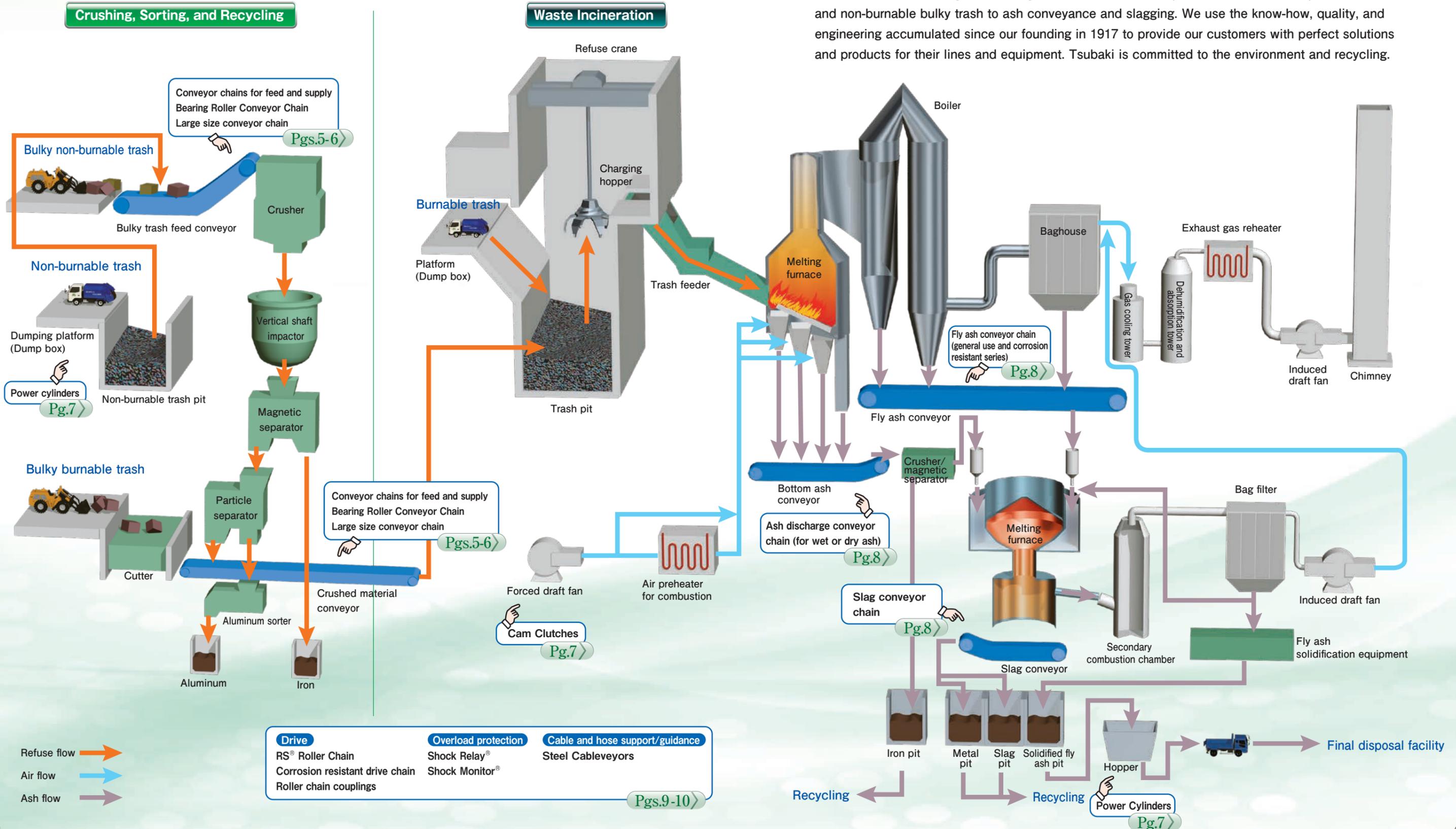
Our Eco & Eco (Economy & Ecology) philosophy is to reduce our environmental load while giving our customers cost incentives and other measures to help their bottom line by providing them with environmentally friendly products.



# Waste Treatment Flow

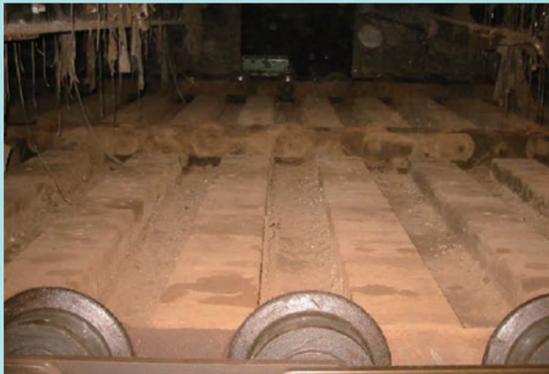
You'll find a variety of Tsubaki products at work in the non-industrial waste (trash) treatment process.

You'll find Tsubaki being used throughout waste incineration plants, from initial receipt of burnable and non-burnable bulky trash to ash conveyance and slagging. We use the know-how, quality, and engineering accumulated since our founding in 1917 to provide our customers with perfect solutions and products for their lines and equipment. Tsubaki is committed to the environment and recycling.



# Crushing, Sorting, and Recycling Equipment

## Bulky Trash Feed Conveyor



## Crushed Matter Conveyor



## Non-burnable Trash Conveyor



## Crusher Feed Conveyor



## Conveyor Chains for Receiving and Feeding



This conveyor chain has been specially designed for the initial conveyors that convey collected trash. They are designed to withstand the wear caused by the different kinds of trash as well as against the impacts of loading.

## Bearing Roller Conveyor Chain



Conventional Specifications

Bearing Roller Conveyor Chain features a unique construction of cylindrical bearings inside the roller. Tsubaki offers dust resistant, water resistant, and lube-free series as well.

Standard conveyor chain



Bearing Roller Functions

1. Reduces chain running resistance (1/3 that of standard conveyor chain)
2. Greatly increases roller allowable load

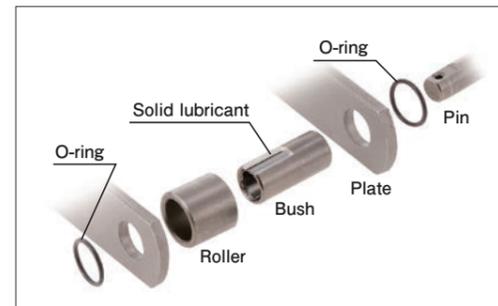
Bearing Roller Conveyor Chain



Bearing Roller Effects

1. Reduces chain load and required kW
2. Prevents stick-slipping on long conveyors at low speed operation
3. Suppresses poor roller rotation and decreases rail wear
4. Improved dust resistant capabilities

## FB Series Conveyor Chain



A solid lubricant has been bonded between the pins and bushes, and an O-ring has been fitted between links.

### Merits

The solid lubricant minimizes chain (pitch) elongation, while the O-rings help prevent conveyed material from infiltrating between pins and bushes and prevent the solid lubricant from escaping. This allows FB Series to achieve double the chain life.

## Large Conveyor Chain Sprockets - Split Sprockets

For areas where attaching or removing sprockets is difficult due to equipment layout, we offer a sprocket that can be replaced without having to remove bearing parts around the shaft. This can help reduce maintenance times and costs.



Split Series



Replaceable Tooth Insert Sprocket



Ring-type Replacement Tooth Insert Series

## Sprocket and Shaft Delivery Service

Let Tsubaki handle troublesome shaft finishing and sprocket phase alignment for you with our sprocket and shaft set delivery service.



# Waste Incineration Facilities

## Hoppers



## Platforms (Dumping Boxes)



## Power Cylinder

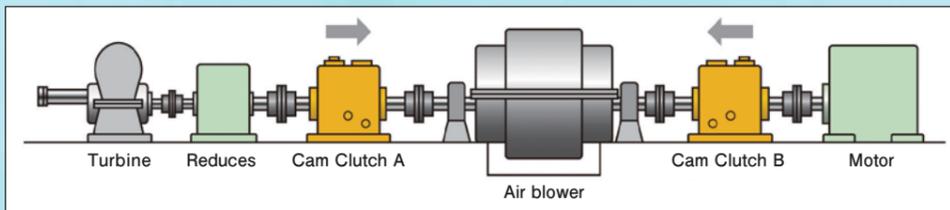


The Tsubaki T Series Power Cylinder is a strong thrust type Power Cylinder that can be used with AC (alternating current) power. We offer a complete line-up to match any application, thrust, or speed needs.

Thrust force: 2.45 – 313kN(250 – 32000kgf) Max. stroke: 2000mm

All Power Cylinders use a brake motor to provide reliable load support for safe operation. Heat resistant brake motors and for high temperature applications are also available.

## Forced Draft Fan



Cam Clutch B engages when the main motor drives the fan, while Cam Clutch A idles. The opposite occurs when the steam turbine drives the fan using surplus steam.

## Cam Clutch Box



### Features

The Cam Clutch is housed in a protective casing for continuous high speed idling operation.

### Applications

For continuous high speed idling operation. Also ideal for energy saving fans and energy recovery pumps.

## Bottom Ash Conveyors



## Bottom ash (dry/wet) conveyor chain

This conveyor chain is specially designed for bottom ash conveyors and helps prevent problems with articulation, roller rotation, and wear problems stemming from bottom ash. Wet type chains (where the chain conveys bottom ash that has been dropped into water for cooling) also feature increased corrosion resistance.

## Fly Ash Conveyor



## Fly ash (normal and corrosive) conveyor chain

This conveyor chain is specially designed for conveying fine, highly abrasive ash (fly ash) generated in the boiler or collected by dust collectors, and helps prevent problems with articulation, roller rotation, and wear stemming from fly ash. Features increased resistance to corrosion from additives ash as well.

## Slag Conveyor

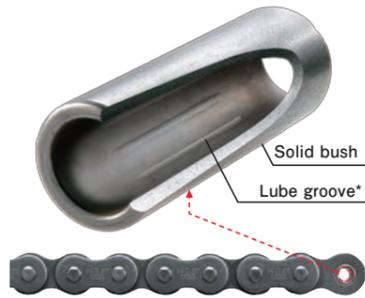


## Slag conveyor chain

This conveyor chain is specially designed for conveying waste and ash that have been fused and solidified into slag. Features wear resistance to molten slag and corrosion resistance to changes in water quality (pH).

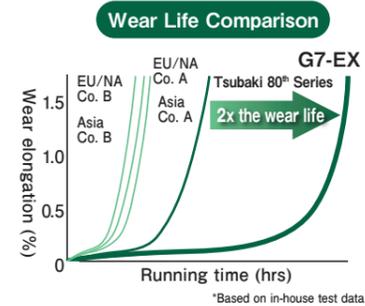
# Other Products for the Waste Treatment Industry

## G7-EX RS<sup>®</sup> Roller Chain



Tsubaki's general use G7-EX roller chains utilize a seamless solid bush thanks to our unique production technology. (Available for RS40 – RS240 chains.) The high precision solid bush utilizes special lube grooves (LG) to increase lubricant retention and give the chain twice the wear life.

\*Lube grooves available for RS80 – RS240 chains only.



## Shock Relay<sup>®</sup>, Shock Monitor<sup>®</sup>

Quickly detects overcurrents during overloads, preventing damage to the equipment.

### Merits

Can be housed in controls panels – eliminates worries of fly ash causing poor operation.



## Roller Chain Coupling

A flexible coupling with two strands of solid roller chains manufactured especially for couplings wrapped around two sprockets. Can be used on conveyors and a variety of drives.

### Features

- Wide line-up  
Transmission torque: 100N·m to 717kN·m  
Bore diameter range: 9.5mm – 700mm
- Excellent durability
- Can be easily connected and disconnected  
Tsubaki also offers various other couplings – let us recommend the perfect coupling for your needs.



## Corrosion Resistant Drive Chains

Stainless steel and surface treated drive chains offer greater corrosion resistance than general use drive chains.

Rough comparison of features

High strength



### AS Series

Stainless steel chain with 1.5x the allowable load of SS Series



### SS Series

Basic stainless steel chain (SUS304 equivalent)



### NS Series

Stainless steel chain with superior corrosion resistance to SS Series

High corrosion resistance



### LSC Series

A lube-free, long life stainless steel chain with a special engineering plastic sleeve insert.

### NEP Series

A specially surface treated RS Roller Chain. This eco-friendly highly corrosion resistant chain uses no harmful chromium.

## Steel Cableveyor<sup>®</sup>

Strong and tough, steel Cableveyors offer excellent durability. Exemplified by the TK Series, we process the supporter holes to match the diameters of your cables to provide top of the line cable guidance and protection. Stainless steel, rotating arrangements, and other made to order models available.



TK Series



TKF Series



TKS Series

Cableveyor<sup>®</sup> is a registered trademark of Tsubakimoto Chain Co.

# Other Products for the Waste Treatment Industry

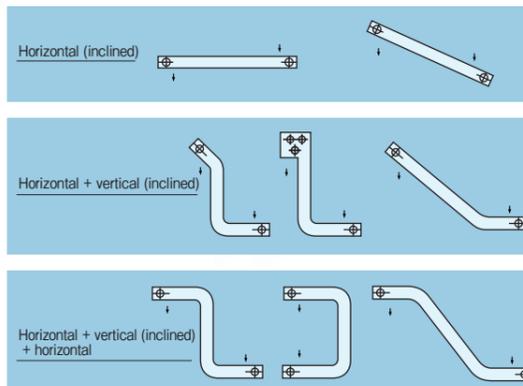
## Tsubaki NFV Flightveyor®

The Tsubaki NFV Flightveyor can transport general powder and grain, hard to convey material, and highly adhesive material with no problem. With its wide variety of layouts, and its tough yet easy to use features, the Flightveyor is finding use in more applications than ever.

### Principle of conveyance

Two strands of chain with flights attached run inside a sealed case in the horizontal area, while a bucket elevator operates vertical area, to reliably convey goods.

### 1. Allows for freedom of layout

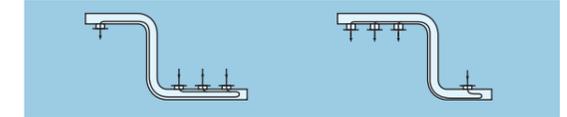


### 2. Compact and economical

The conveying cross-section is small, and conveyed material is fed and discharged in the horizontal part, to allow for extremely compact equipment (even indoors) and easy installation.

### 3. Flexibility in feed and discharge

Feed and discharge ports can be installed in several locations along the horizontal part.



### 4. Uses the ideal conveyor chain

A conveyor chain is an integral part of a conveyor. It runs in a tightly sealed case and uses flight attachments to convey material, which puts a lot of responsibility on the chain. Tsubaki uses its long history of success to provide the ideal chain for Flightveyors.

### 5. Inspection and maintenance are a snap

Easy-open windows are installed at strategic spots, and each case is able to be split, to make inspection and maintenance a snap.

### 6. Protects against dust and water

The entire conveyor is tightly sealed, so there is no damage from flying material or messes from escaping dust. It can be installed as-is outside as well.

