

CONVEYORS: A GUIDE



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SPECIFICATION, SAFETY, PRODUCTIVITY

How to specify your conveyor project for efficient, scalable and safer operations

www.cisco-eagle.com/conveyors

LET'S TALK CONVEYORS

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If you want an experienced partner with a proven track record, you won't find anyone more qualified and more committed to your success than Cisco-Eagle. Partnership means that you can count on us from the very first conversation to final implementation. We work to understand your business and help you find solutions that let you operate smarter, faster, safer and more efficiently.

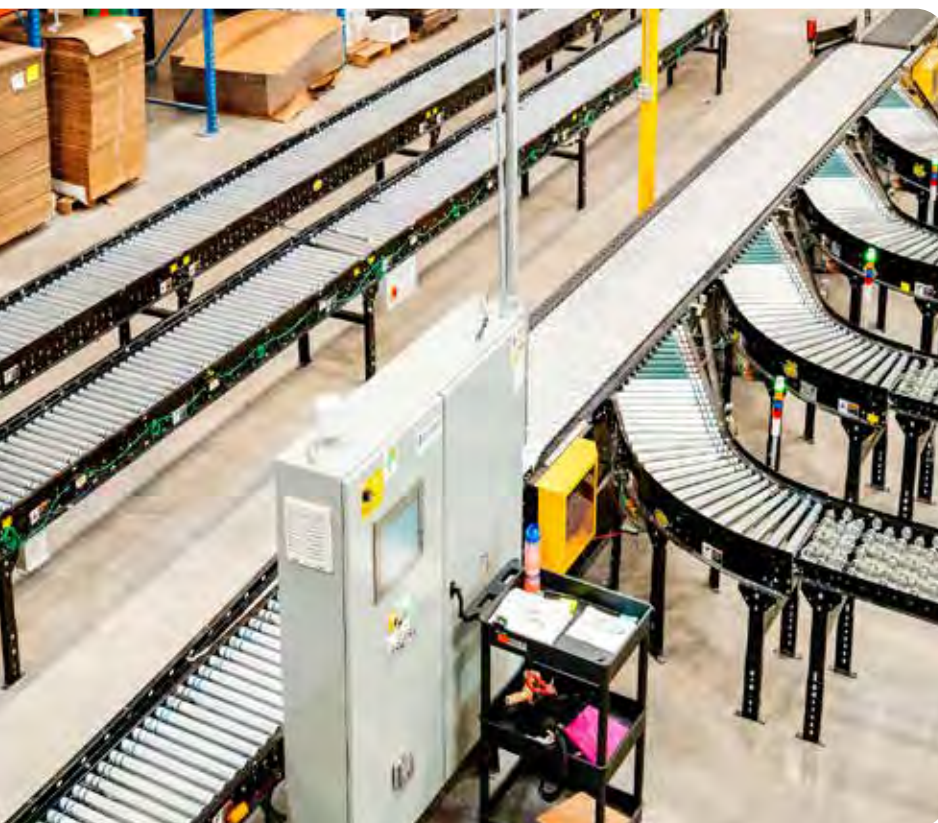
—Brandon, Employee Owner Since 2022
Systems Integration

”



CONVEYOR BLOG

A collection of conveyor tips, articles, tools, videos and more from Cisco-Eagle Employee-Owners.



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CONVEYOR SPECIFICATION



“We’ll help you get your project right. Whether you need to convey boxes, totes, wire bins, pallets, pipe, drums or components, we’ll help you do it economically and effectively. With 50 years of experience, we help companies reduce costs and increase efficiency for a range of systems, loads and applications.”

—Amanda, Employee Owner Since 2013
Systems Integration Engineer

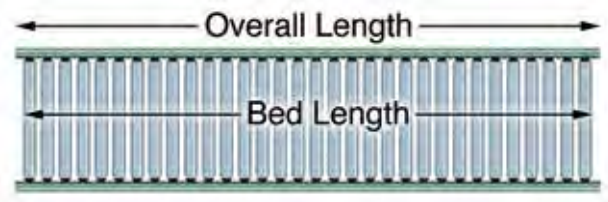


CONVEYOR TYPES

When designed to work with each other or plant machinery, any of these conveyor types can become part of an integrated conveyor system.

- **Gravity conveyors:** Set at an angle, these conveyors use rollers or skatewheels to move the load.
- **Flexible conveyors:** Flexible conveyors flex and change shapes to fill gaps, bridge to trucks and more. Both power and gravity are available.
- **Power roller conveyors:** Power, or “live” roller systems are a common warehouse, pallet and package conveyor.
- **Pallet conveyors:** Roller conveyors built for the size and weight of loaded pallets can be configured to handle most any load.
- **Power belt conveyors:** Ideal for transporting bags, envelopes, parts or irregular loads. They are commonly used in distribution areas.
- **Accumulation conveyors:** These conveyors let you adjust drive pressure on the conveyed product to a minimum—or eliminate it entirely.
- **Sortation conveyors:** Allows you to divert loads from one conveyor to another at varying speeds from very fast to relatively slow.
- **Pipe handling conveyors:** These conveyors utilize skewed or bowtie rollers, flat rollers or a v-shaped roller system to handle long, heavy tube and pipes.
- **Incline conveyors:** Installed at an angle to bridge between the floor and a mezzanine, machine, overhead conveyor or other elevated area.
- **Spiral conveyors:** These conveyors encircle a column and provide a space-efficient, high-throughput vertical product transport.
- **Low profile conveyors:** Usually less than 2” total height, these conveyors are ideal for tight spaces and specialized needs in processing and automation.
- **Overhead conveyors:** These conveyors suspend loads from a powered chain with specialized carriers that gently support awkward items.
- **Extendable conveyors:** Lets you control the conveyor length so that it extends as far as needed in the trailer for loading and unloading.

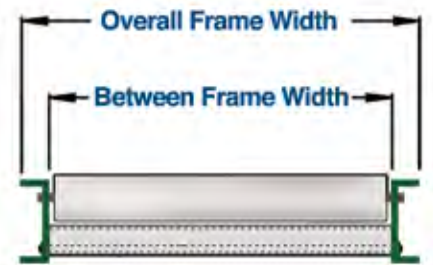
Lengths



Conveyors are measured by bed length and overall length. The amount of conveying surface (bed length) is usually the most critical, as it defines how much product can be conveyed on that section during a given moment. If there are multiple conveyors, note the length you have available for each—usually in 5’ and 10’ increments depending on conveyor type and manufacturer.

Widths

Conveyors widths have two width dimensions—overall (the dimension from the outside of your frames) and belt/roller width (the side-to-side conveying surface). One of the critical dimensions for width is to discourage people from leaning over a running conveyor. Widths should be set so that people can reach the loads without bending, stretching or leaning. This is both safer and more ergonomic.



How wide is your load? The width of your widest load dictates your roller/belt width. Some conveyor types allow loads to overhang the roller or belt. Both dimensions are needed for machine integration or merging with other conveyors.

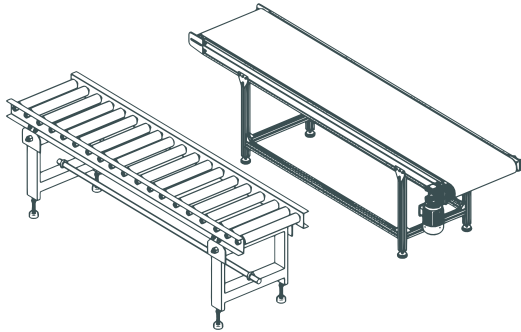
Heights and supports

Conveyor heights are defined as top-of-roller or top-of-belt; the height of the load and of guardrails should also be considered. The primary driver should be work positions and ergonomics when setting heights if people are interacting with the conveyor. Set your conveyors to “knuckle height”—about 30” from the floor—to the center of the operator’s hands to optimize it for the average worker. Also consider the height of your boxes or totes, if people work with them on the line. Ergonomic experts advise us to focus on your most frequently-handled box sizes.

CONVEYOR SPECIFICATION

BELT OR ROLLER: THE FACTORS

Belt and roller conveyor transport and accumulate loads in distribution and manufacturing facilities, but which meets your application needs?



When to use belt conveyors

- **When you convey irregular loads:** Belt is more forgiving of loads like bags, envelopes, small parts and cartons with damaged or rough bottoms than rollers, which can drop small items or allow them to tilt. Products with unbalanced weight distribution or bottoms that aren't flat should be conveyed on belts.
- **When you need precise load control and alignment:** You may need to align your products for a scanner, scale, taper or other machinery. Belts can position the product exactly where you want it, in exactly the orientation you need.
- **For machine integration:** Packaging equipment, scan tunnels, diverts and others demand belt conveyor's precise control of the load's orientation to function. Because belts grip the load surface, they don't allow shifting or rotation.
- **For pre-sortation & gapping:** When you need to gap and/or track loads heading toward sortation, belts have better control. If your system has a curve leading to a sort area and you must gap or track the load, use a belt conveyor. Because belts support 100% of the load bottom (weight and surface area don't matter), everything travels at a constant rate for gapping applications.

When to use roller conveyors

- **For versatility:** Rollers can accommodate accessories like pins, package stops, pop-up rollers, blades and other options to help stop and precisely control the load. Rollers are ideal for diverts or stops where blades can raise between rollers to stop or divert loads.
- **When the load must be manipulated during conveyance:** Rollers are better when loads must be pushed, pulled, removed or rotated. Due to low coefficient of friction, it's easier to slide a tote across rollers than a belt. Picking and packing applications or merge lines are frequently specified with roller conveyors. Sortation systems typically rely on rollers, since the load can be pushed across rollers to a different conveyor line.
- **For heavy-duty applications:** Standard rollers are 1.9" diameter, but you can get them in 2.5", 3.5" or larger sizes to move heavier loads. You can increase or decrease roller spacing to deal with these types of loads. Rollers can transport pipe or tubing, and tend to be the choice for heavier loads. Pallets, drums, large manufactured items and heavy components are usually conveyed on rollers.

This is a general set of guidelines. You can rely on Cisco-Eagle for all conveyor application assistance.



Belt or roller curves?

You can specify belt or roller for curve applications, which both offer the same functionality, but different features.

Belt curves: Like straight conveyors, belt curves give you better control of the conveyed load because it has increased friction, which allows less slippage and movement. Products that tend to move on rollers are much less likely to do so on belts, maintaining product orientation and position. If your curve involves elevation changes, belt conveyors are the choice.

Live roller curves: Roller curves give you versatility. You can add package stops (raised pins or blades between rollers) to stop the flow of goods. You can also add diverting wheels for sortation. Lift bars are used with roller conveyors because the bars can fit in between the rollers. The space between the rollers is ideal for underneath scanners to scan a barcode from underneath the conveyor.



CONVEYOR SPECIFICATION

GRAVITY CONVEYOR FACTORS



Roller vs. skatewheel

- **Skatewheel** is more economical. Good for items with a smooth, flat bottom. The load can be wider than your conveyor. Minimum of ten wheels should be positioned beneath your load. Skatewheel flows better than rollers.
- **Gravity roller** offers higher capacities than skatewheel. Use rollers for uneven, open, or rimmed bottom packages. Unlike skatewheel conveyors, product should never be wider than the rollers. Three rollers under a load at any given time.

Supports

Tripod stands are ideal for temporary applications. Used with skatewheel and smaller rollers. **Stationary supports** are anchored to the floor to support a conveyor line at 5' or 10' intervals.

What affects product flow?

- **Infeed and discharge elevations:** The steeper this slope, the faster product flows.
- **Type:** Skatewheel flows faster than rollers.
- **Bearings:** Grease packed bearings tend to roll slower.
- **Load weight:** Heavier loads flow faster than lighter ones. Some light loads won't move at all, while heavy loads may move too fast.
- **Length:** Loads move faster on longer runs.
- **Load characteristics:** Difficult loads tend to require rollers, which move slower. A firm carton conveys differently than a tote of the same weight, placed on the same slope.
- **The "acceleration effect":** The rate of flow for conveyed boxes is also affected by the "acceleration effect" of a spinning roller or wheel that's still moving after a preceding box has rolled across it.
- **Curves:** Adding curves or turns reduces flow speed.
- **Reducing speeds:** You can adjust the pitch or use retarding plates to manage roll speeds. You can also add end stops for managing the end of the line.
- **What if it's too slow?** Increase the slope to allow proper product flow.



CONVEYOR SPEED CALCULATION

The standard speed for most unit handling conveyors is 65 FPM (feet per minute) which works out to the average speed a person walks when carrying a 50-pound box. There are always situations where transport through an area, into a process, or toward a packing operation can be accelerated. You can slow your system, or increase its speed as needed.



Faster speeds; higher horsepower

Horsepower ratings are calculated according to the standard speed listed for that conveyor. When increasing the speed, more horsepower may be needed to drive the load. As a rule of thumb, it takes twice as much horsepower to move a given package at 130 FPM than at 65 FPM. The formula below may help to determine the approximate power requirements :

$$\text{Horsepower (based on 65 FPM)} \times \text{DESIRED SPEED} \\ (\text{In feet per minute}) / 65$$

Example: Model TA, (a slider bed conveyor) 11' long requires 1/2 horsepower motor at 65 Feet per minute for a total load of 320 pounds.

- You want your conveyor to operate at 90 Feet Per Minute.
- Calculate as follows: $(1/2 \times 90) / 65 = .69$
- You should select the next highest horsepower or 3/4 HP.

Pallet handling conveyors generally operate at 30 FPM. 30 may be substituted in the denominator of the formula. This formula should provide you with a good estimate, but it's always best to confirm it by consulting with Cisco-Eagle.

Higher speeds are tougher on conveyors

The service life of a conveyor running at a higher speed may be shortened. Most conveyors are not designed to run over 200 FPM. When they do, some parts may need to be balanced to prevent excessive vibration, and special bearings may be required. The type of belting used on a conveyor may also need to be considered.

LOAD CHARACTERISTICS

LOAD DEFINITION IS CRITICAL TO SUCCESSFUL CONVEYOR PROJECTS



VIDEO: CONVEYOR LOAD SPECIFICATIONS

In this Shoptalk video, we highlight various load considerations and explain how they impact your conveyor system design decisions.

Weight and flow rates

If the load consists of bulk materials, density and flow rate must be identified.

1. **Weight.** Maximum and minimum, filled and empty, weights of the load.
2. **Flow rate.** The rate of flow or capacity of a system is stated in units per minute for unit handling conveyor. Measurements of rate or capacity in bulk handling applications are cubic feet per minute or tons per hour.

Shape and dimensions

To specify the right conveyor, you must understand the load, its characteristics and how it interacts with the conveyor, integrated machinery, other load types and the system inputs/outputs. What do you need to know first?

1. **Define the shape and form.** Quantify the load(s)—pallet, box, drum, wire container, engine block, beer bottle or other item.
2. **Define the dimensions.** Length, width and height must be known. If it is a unit item, the dimensions of the interface between product and conveyor—such as the load bearing surface—are critical.

In the case of products on a container—such as a pallet load of beer cases—the dimensions of both the carrier and the load must be defined.

Load orientation

The position of the load on the conveyor must be established. A load length may actually become a height when the item is placed on a conveyor tow line, or monorail carrier.

Use specific with terminology

Ambiguous terms such as average rate or throughput capacity should be avoided. The rate usually varies in different areas of a system. There is often one point—usually an intersection or junction—that becomes a bottleneck that limits the rate of the system. This point must be identified and dealt with.

Footprint

The bottom (or footprint) of a load can have a strong bearing on the design and cost of a conveyor system.

- **Pallet:** Are there block feet or runners? In which direction? Are there any broken boards, protruding nail heads, or straps? What pallet materials—wood, plastic, metal or other?
- **Drum:** Are there chines? Does the bottom bulge outward?
- **Carton:** Is the bottom soggy? Are there protruding staples?
- **Casting:** Does it have irregular shapes? Is the surface machined?
- **Steel component:** Is the bottom flat—or warped? Is weld splatter present?
- **Container:** Does it have feet? Is there a full-faced bottom? Is it flat or does it have sharp edges? Are ribs or runners used? Is weld splatter present?
- **Bag:** Is the bottom flat, or is the shape like that of a bag of water?
- **Envelope:** The size; are there protrusions or bulges? Loose flaps or edges?

Match your objectives

System objectives should be evaluated on a step-by-step, component-by-component basis. We analyze the purpose of each piece of hardware. Is transportation the primary purpose of a certain conveyor, or is it accumulation and surging? Is the conveyor used as a moving assembly table? Can a particular conveyor be combined with an adjacent one to eliminate a drive?

Frequently, the layout will be simplified, the number of transferring mechanisms reduced and nonessential operations eliminated. This results in reduced costs and improved conveyor performance.



“Cheap can get expensive. Don’t choose conveyor on an arbitrary or low cost basis. You’re asking for dysfunction, rework—and eventually higher total costs.”

—Gerry, Employee-Owner since 1993
Senior Applications Specialist



CONVEYOR SPECIFICATION

CONVEYORS AND ERGONOMICS

Because they reduce manual lifting, pushing, pulling and stretching by delivering product to workers and reducing the stress of carrying or pushing, conveyors are naturally ergonomic, but with the right layout, they can be even better.

Let conveyor do the shifting, rotation and other product positioning movements

Consider the benefits of providing the load at the correct position over hundreds of days, multiple shifts and many workers. Reducing ergonomic burdens tends to also increase speed and accuracy.

- Use ball transfers or turntable lifts to position work. They allow workers to rotate loads on the conveyor without straining or reaching too far.
- Use tapered rollers to move the load from the center of the conveyor to the work side to reduce worker stretching and reaching.
- Use diverts or pushers to move product into position for ergonomic work.
- Use rotating tables, which can be built with flat tops or rollers and allows workers to access the load without moving, bending or stretching.



Ergonomics and reaching

Reach distance is the distance in front of and to the side of the body over which the operator has to reach to perform the task. Conveyors that encourage extended reaching have poor ergonomics—but are also dangerous in other ways since people stooping over running conveyors can cause snags.

Conveyor heights: supports can't be easily adjusted once the conveyor is installed, so it's important to set your height for ergonomics.

The vertical distance from the floor to the center of the operator's hands (the "knuckle height") is critical. This is 30", which is why the most conveyor supports are around this height. If you work with tall cartons, you may want to reduce conveyor height to make it easier on line workers to deal with them.

If you have many varied heights, ergonomic experts say to focus on your most frequently handled box sizes. If you have conveyors integrated with workstations, you can make the workstations height-adjustable to deal with varying sizes.

UNDERSTAND ALL YOUR COSTS

Lower purchase prices may cost **more** over time



The total cost of ownership falls as operational and maintenance costs decrease and the conveyor's useful life increases.

- **Initial costs:** Equipment, installation and controls.
- **Operational costs:** Electrical usage and air consumption
- **Maintenance costs:** Spare parts, replacement parts and labor costs

These costs are spread over a conveyor's life, so a formula that expresses your overall cost is: **TCO** (total cost of ownership) = **IC** (initial cost) + **OC** (operational costs) + **MC** (maintenance costs) / **UL** (useful life of the system). Reduce TCO by making good decisions at the point of purchase: Will the conveyor do the job? This is the most important question—no amount of maintenance is as expensive as having to replace a conveyor that doesn't do its job.



VIDEO: CONVEYOR SYSTEM ROI

When considering conveyor investments, evaluate all the costs and ROI factors.

Ways to reduce operational & maintenance costs

- Use a sleep feature to cut power to idle zones or the entire conveyor to save 10-20% in energy costs for power conveyors and 99% on 24-volt systems.
- Use controls to adjust conveyor speed to adapt to your throughput requirements. Run the conveyor at an appropriate speed for the season.
- Energy-efficient motors might reduce usage 3%, but in a large operation, that can cause significant energy and maintenance saving. Higher efficiency gearboxes can reduce horsepower requirements and saving energy costs.
- Relatively inexpensive synthetic lubrication extends conveyor life.
- Eliminate power transmission components with direct drives. Chain and sprocket drives require more frequent maintenance.
- Look at newer technologies. 24-volt conveyors cost more initially, but reduce maintenance and energy costs over time.

CONVEYOR OPERATIONS



“Keep your conveyor up and running. If any machine is forced to do things beyond its design, stresses and strains will reduce its lifespan. Modern conveyors are highly reliable and last many years if you specify them right, keep them maintained, operate them in the right environment and load them the right way.”

—Alan, Employee-Owner since 2017
Field Services Technician



WAYS TO EXTEND THE LIFESPAN OF YOUR CONVEYORS

Specify it to handle the load

Conveyors that aren't suitable for the job won't do it well and won't do it long. The wrong conveyor in the wrong application won't offer the efficiency you need, even if it continues to work. Drives that overheat or over-torque are under stress that can cause critical failures.

Use the right parts and components

There are many high-quality conveyors on the market and all of them accept spare parts from a variety of sources. Most conveyor manufacturers build their systems with a specific size and type of reducer or chain or belt or pulley in mind, so you should replace existing parts with components that meet manufacturer specifications. Good components cost more, but pay off not only with longer life, but with less downtime and fewer repairs to the system.

Operate the conveyor as intended

Your conveyor's lifespan will be reduced if misused. Some common errors:

- **Don't convey out-of-tolerance loads:** Loads that are too large or heavy can damage or wear out components. If your load significantly changes, you may need to alter your conveyor to cope with it.



- **Don't shock load:** Conveyors can be shock-loaded, but should be designed and constructed to handle impacts. Shock-loaded conveyors will suffer due to the impacts if not manufactured to handle it. You should understand how your conveyor will be loaded or unloaded at every point to ensure you aren't damaging your system.
- **Don't change the environment:** If it's not designed for its environment, your conveyor is likely to fail sooner than if it was designed for dust, oils, chemicals, a wet environment or other contaminants. When you re-task older conveyor, be sure you understand the environment it came from and its new environment. If you introduce a machine that causes dust or airborne debris, your conveyors could be impacted.
- **Don't run conveyors outside design specifications:** For instance, if you increase the speed of your system without taking into account load and drive types, you may damage your components.

Maintenance should be defined & predictable

Conveyor maintenance should be consistent and scheduled. If your system is well-maintained, it will last longer and perform better. Points of a defined maintenance program include:

- Stop and start points
- Belting and connections
- Bearings, universal joints and pulleys should be checked and lubricated
- Electrical components, including connections to the system
- Investigate any noises or other issues reported by staff
- Anything else defined by your conveyor manufacturer



Check and watch

Frequent eyes and hands on the system helps you spot problems, replace worn-out components and head off pressing issues. Speak to operators and line workers about any issues they find with the system. They'll know before you do.

CONVEYOR SAFETY

ESSENTIAL RULES FOR SAFE CONVEYOR OPERATIONS

These are basic rules that no operation where conveyor is utilized should ignore. Adhering to these rules is the start of successful conveyor safety programs.



Do not climb, sit, stand, walk, ride, or touch the conveyor in an unsafe manner at any time

Never climb, sit, stand, walk, ride or even touch the conveyor line. It's common sense, but people tend to get mischievous about it and there are injuries and equipment damage due to not following this rule every year. Conveyors aren't meant for transporting people.

Right: consider signs like this one from Accuform



Don't perform maintenance until electrical, air, hydraulic, and gravity energy sources are locked out or blocked

Never perform maintenance—or even open a panel—until electrical, air, or hydraulic power sources are disconnected or blocked out. Block the incline on a gravity conveyor before working. Technicians can become overconfident in their ability to work on connected and powered machinery. This is dangerous and will eventually lead to accidents and injuries.

Keep clothing, body parts & hair clear of conveyor

Workers should keep their hands off of conveyors except as needed for trained job functions like picking or inspection. Those who have long hair, loose clothes or ties should bind their hair and clothes before going near the machinery. Ties should be removed or tucked in. Long sleeves should be restrained or rolled up. Visitors to your plant should be briefed on safety and inspected for potential clothes or hair that could be caught in a conveyor line.

Ensure everyone is clear of moving parts before starting the conveyor

Always be certain everyone is clear of the conveyor before startup. Install warning horns to alert people that the conveyors are about to become active. This is an excellent, and relatively inexpensive safety upgrade you can make, but you shouldn't stop there. Training should also be included about what the warning horn means and how injuries can occur if it's ignored.

Allow only authorized personnel to operate or maintain your conveyors

Only trained personnel should be allowed to work on or near conveyors. This is for two reasons:

1. The safety of the technician. Conveyors can be dangerous to those who don't thoroughly understand the equipment and how to safely work on it.
2. Expertise. Only trained technicians can maintain a conveyor to perform at peak efficiency. This isn't necessarily a safety concern, although it can be if poorly-maintained conveyor performance causes workers to try to look at it on their own or bypass guards.

Don't modify or misuse conveyor controls

Conveyor controls are more than just on/off switches; they can be any kind of electronic or mechanical devices used during conveyor operation. These controls should never be modified for any reason except by qualified personnel. Monitor your various controls to be sure no one has misused, modified or disconnected



See More



CONVEYOR SAFETY

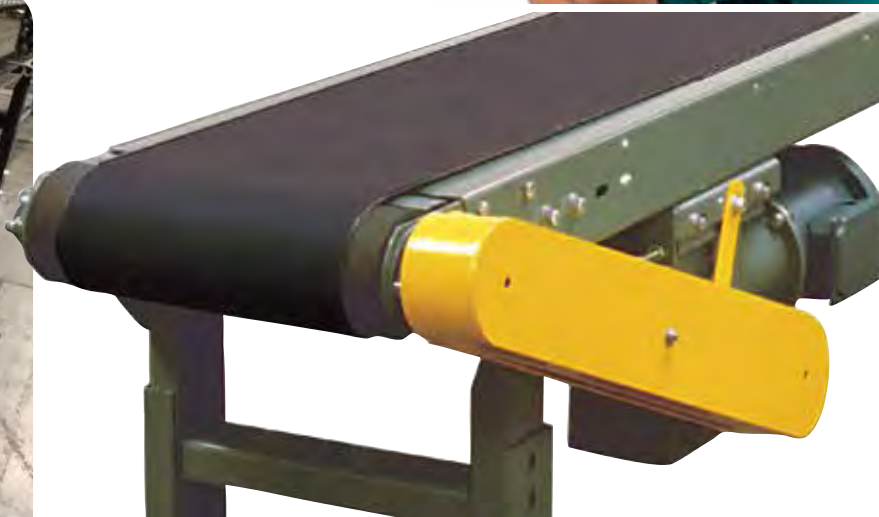


“Everyone who works near conveyors should train on emergency stops and know how to use them. When you look at your conveyor, can you see emergency stops at a glance? Could you reach them in a crisis? Do your people know where they are and what to do? Line workers must be able to quickly shut down the conveyor if they need to.”

—William, Employee-Owner since 2019
Systems Integration Project Manager



Above: emergency stop pull cord



Above: chain guard installed on a slider bed conveyor

them. Incorrect modifications can cause dangerous issues with the conveyor.

Ensure emergency stops are visible and accessible

In case a conveyor needs to be stopped suddenly, all the controls and pull cords need to be easily accessible and plainly visible so that anyone working in the area can reach them. Be sure everyone who works in the area is trained.

Know the location and function of all stop & start controls

Everyone who regularly works in a conveyor area must be familiar with the location and function of stop and start controls. The controls must be marked to avoid confusion and allow people to make fast decisions on using them. Train all employees about the controls, where they are, when to use them, and how to access them. It's best if this fundamental safety training is repeated frequently. If you reconfigure your plant, change layout, or update equipment, update the control training to reflect the changes.

Remove trash, paperwork and other debris only when power is locked out and tagged out

Areas around and beneath your conveyors should be kept clean and free of dirt, oils and other contaminants to ensure efficient operation—but it's unsafe to do

this when the conveyor is powered. Familiarize your cleaning crews with conveyor safety along with operators and maintenance personnel.

Don't operate conveyors without covers & guards in place

Missing guards and covers accidents one of the most dangerous—and most common—problems with conveyor safety. Guards are sometimes removed by plant employees for maintenance and never reinstalled. Line workers remove guards because they can make work less convenient. This exposes machinery, gears, chains and moving parts that can crush or pull fingers, clothes or hair into gears or rollers or moving belts.

Report all unsafe conditions. Jams should be cleared only by authorized, trained personnel

Develop a culture of safety around your conveyors that encourages workers to report unsafe conditions like loose guards, people working too closely with the conveyors with unrestrained clothes or hair, etc. Training about safety issues and when to report them should be made to all employees and repeated often. Untrained people trying to clear conveyor jams can result in unsafe situations as well as damaged equipment. Workers should be trained to call facility maintenance to clear jams.

CONVEYOR SYSTEM DESIGN



Visit www.cisco-eagle.com/conveyorsystems for more information.

- **Labor cost reduction:** Conveyor systems reduce materials transport costs. Conveying an item is far more efficient than moving it by forklift, cart or hand. Reducing the number of people required to process a shipment, pick an order or transport materials is often the most critical ROI factor.
- **Ergonomic and safety enhancements:** Conveyors are inherently safer than other material transport methods. Many companies need to reduce the volume of forklift traffic due to safety concerns, and have used that as a justification to implement a pallet conveying system. Any automation that removes people from lifting, straining and moving enhances safety, so cartons, totes, or even lightweight loads on conveyors are safer than alternative movement methods.
- **Space savings and facility efficiency:** Because conveyors move materials vertically, they can be installed on the floor, from the ceiling and at multiple levels. This frees up critical floor space.
- **Faster material flow and throughput:** Conveyors increase the amount of product that's delivered to a packing, picking, assembly or shipping operation. Conveyors justify themselves by delivering product to a function faster and more efficiently than other methods.
- **Conveyor systems control pace:** Typically people think of systems in terms of their ability to increase speeds. But in some cases, you need to regulate pace—slower, faster—and more attuned to the needs of the operation. Conveyors can serve as work buffers, allowing processes upstream to execute while serving up product and materials as quickly as needed.
- **Error reduction:** Because conveyor systems enforce standardization and can divert, accumulate or sort loads to their proper destinations, they can significantly reduce rework, errors and accuracy issues.
- **Reduce forklift presence on the floor:** Many companies use conveyors to reduce the number of forklifts in their facilities for safety and efficiency. A well-designed system can reduce forklift presence throughout the operation.
- **Versatility:** Conveyor systems can be designed for virtually any type of operation, from receiving to returns. They can be reversible; they can change heights; they can sort; they can rotate cartons or shoot them into a buffer for work down the line. They can be retracted. They can feed directly into a truck or dump items into bins as needed. A well-designed system can transform tedious work into fast-paced productivity.



VIDEO: CONVEYOR SYSTEM ROI

When considering conveyor investments, evaluate all the costs and ROI factors.

BELT CONVEYORS



“The belt is the only part of a system that’s in direct contact with your load, so choosing the right type is critical. Your load characteristics and operating environment will determine the belt needed for your application—you have many options.”

—Ed, Employee-Owner Since 2002
Project Coordinator



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Many other belt conveyor models available. Visit www.cisco-eagle.com/beltconveyor for more information.

Model TA medium duty slider bed belt conveyor

Versatile and economical

Great for applications like assembly lines, tote, parts, carton transport, sorting, packing and inspection. Sets up quickly and easily. Slider belt conveyors are good for progressive assembly, inclines and declines.



Model TL heavy duty slider bed belt conveyor

Ideal for inspections, testing, sorting, and packing

Model TL conveys heavier loads than TA. It can be floor supported or ceiling hung. An excellent conveyor for wide, long and heavy product loads. Reversible (with center drive).



Model TR med. duty troughed slider bed conveyor

Built-in guard rails create an enclosed “trough”

Conveyor with built-in guard rails is ideal for overhead conveying applications. It easily conveys boxes, cartons, cases and bags and loose parts. Bed - 4" deep x 12 ga. formed with 2-1/2" high guards.



Model SB horizontal belt - slider bed

Helps create product gaps preceding a sortation system

Model SB conveyor is used for assembly line operations, inspections, testing, sorting and packing. SB has a higher capacity than standard slider bed. Use it to create product gaps preceding a sortation system. Ideal for matching up with roller bed conveyors.



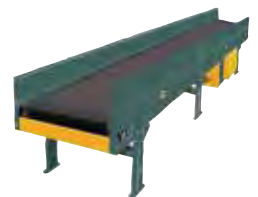
SEE MORE

Videos, pricing, estimators, application information, case studies and more.

Model TH trash & empty carton belt conveyor

Disposal & returns applications

Model TH handles empty cardboard boxes, paper trash and other bulky applications like baggage handling, returns, pick modules and receiving. Features integral side guards and an underside bed cover the length of the conveyor.



Model RB belt-over roller-conveyor

Handles heavier loads

Due to its roller bed design, Model RB reduces friction and conveys heavier loads than slider bed designs. Good for assembly, inspection and packing operations. Available in 15 belt widths. Trough bed (CRB) and merge (25-RBM) roller bed conveyors also available.



Inclines: SBI (slider bed) & RBI (roller bed)

Incline conveyors have chain drive power feeders and an adjustable nose-over at the discharge end to ensure smooth transfer from the incline to the horizontal plane. RBI conveyors have higher load capacities. SBI slider bed has full-width galvanized pans. Adjustable up to 30°.



BELT CONVEYORS

Many other belt conveyor models available. Visit www.cisco-eagle.com/beltconveyor for more information.

Belt curve conveyors

Transport a wide variety of products through belt curves



Belt curves provide positive product flow using a belt driven by tapered pulleys. They transport the same wide variety of products that straight belt sections do. Belt curves are ideal for positive tracking and product positioning. Model SBC has 9 belt widths (21" to 37") with 45°, 60° and 90° turns.

Model PSB plastic belt conveyors

For food service and other wet applications



Model PSB with modular plastic belting uses a positive drive system to eliminate belt slippage and mistracking. The Model PSBC (plastic belt curve conveyor) can be used in conjunction with the PSB. Bed - UHMW on aluminum slider bars, mounted to frame spacers. Mounted in 7-1/2 in. x 12 ga. powder painted, formed steel channel frame bolted together with butt couplings.

The "Gapper" Capping Belt Conveyors

Feed conveyor system sawtooth merges, combiners, sorters, palletizers, in-motion scales, label application systems or other equipment where gaps must be created.

Blow-through gappers

A more basic, less expensive and simpler gapper that runs at fixed speeds to create the gaps necessary for the next process on a conveyor line. Used for applications that transport or sort uniform loads in size and type. A distribution center that ships out only one or a very limited range of cartons is a good example of a blow-through application.

Gap optimizers

Faster, more expensive and provide better throughput for a broader variety of loads. These gappers create uniform spaces between loads of different dimensions and weights. Optimizers adjust their speed based on sensors and control protocols. They're often deployed for high-throughput, e-commerce and 3PL applications that require variability and speed.

SEE MORE



Article: a guide to gapper conveyor types & applications.



Heavy-duty parcel handling belt conveyors

Use heavy-duty belt-over conveyors in applications where normal belt conveyors aren't wide or robust enough for the weight or products being transported. As with other belted conveyors, a heavy-duty belt-over conveyor may also carry product up inclines. Frequently used in parcel handling applications.

- Heavy gauge frames with stiffeners
- Heavy-weight, low-stretch belts
- Robust drives

Model HSS is used in the parcel handling industry for singulated flow. Bed widths of 37", 43" and 49".

Model BPC is used for bulk parcel handling applications. Bed widths of 37", 43", 49" and 61.5".



LIVE ROLLER & ACCUMULATION



“Even though it’s more expensive than traditional conveyors, E24 will save you money. Because 24-volt conveyor has a decentralized drive system, each motor can run at a different speed, which lets you precisely control zones and save energy. It’s compact, versatile, runs quietly and dissipates heat far better than external drive conveyors. It lasts about six times longer than conventional systems.”

—Kevin, Employee-Owner Since 2017
Systems Integration Coordinator



Visit www.cisco-eagle.com/e24 for more information.

E24™ 24-VOLT LIVE ROLLER & ACCUMULATION CONVEYORS

24-volt live roller technology lasts longer, improves heat dissipation and slashes maintenance costs



E24™ 24-volt accumulation conveyor utilizes a decentralized drive system with a pancake motor located in each accumulation zone running at a selected speed. Quick-connect modules reduce wiring and installation costs, including substantial energy reductions and maintenance—it has 10 times the life of traditional MDR motors.

Because there are no gears in the system, there is no need for a different motor. Since the drive train is distributed along the conveyor length of a single piece of equipment can perform multiple functions. This includes multiple speeds, directions and start/stops.



E24MC Modular Conveyors

Ideal for quick deployment, last-mile applications



Fully pre-wired conveyors ship with modular systems architecture consisting of 24-volt E24 drives and supports with casters. **Configurations include:**

- 2.0 - Start/stop stations every section
- 2.5 - Start/stop stations and E-stop cords every section
- 3.0 - Network control provides condition monitoring from motors to HMI

Conveyor applications: Straight 2" or 3" roller centers • tapered curves • herringbone skewed rollers • 75/25 skewed roller sections. • coated roller incline applications.

E24EZ Accumulation: no air bags required

E24™ and E24i™ with EZLogic® allow multiple accumulation and product release options. EZLogic® combines the sensing accuracy of photo-electronics with discrete electronic logic control without a PLC or pneumatic logic components.



E24™ belt accumulation conveyors



These conveyors use 24-volt motor driven rollers and the EZLogic® accumulation system with belt conveyors for accumulation of small items like letters or poly bags. Belt conveyors allow accumulation of cartons or totes on inclines, where they might otherwise slip.

LIVE ROLLER & ACCUMULATION



“Accumulation systems let you adjust drive pressure on the load to a minimum, or eliminate it altogether. This is great when long lines of cartons must move without pressure so they can be utilized in processes like loading, sorting, taping, strapping, palletizing, picking, machine feeding or shipping area buffers.”

—Eric, Employee-Owner Since 2018
Systems Project Coordinator

shop **talk**

For complete information, visit www.cisco-eagle.com/accumulation or call today

SEE MORE



ABEZ - air-actuated, zero-pressure live roller accumulation conveyors

Ideal for applications that require product accumulation without line pressure build-up. Singulation feature allows products to be easily removed from any location on your conveyor. The conveyor consists of zones with an EZLogic® accumulation module for each. Accumulation modules detect product presence to determine whether the zone should be driving or accumulating.



Model 190-LR flat-belt driven live roller conveyors

Ideal for medium to heavy duty cartons in manufacturing and distribution. Also used for transferring or deflecting boxes on or off conveyor lines. Live roller design also permits stopping or holding (not accumulating) without stopping the conveyor. Ideal for merging where positive product flow is required. Curved models include light and medium duty, v-belt-driven live roller conveyors negotiate 30°, 45°, 60° and 90° curves. Curves may be self powered or slave driven.

SEE MORE



More on power roller conveyors, including specifications & video.

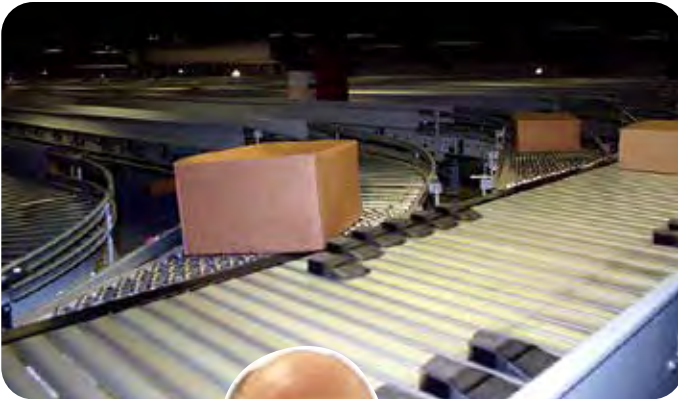
190-ACC medium duty v-belt accumulation conveyors

The simplest accumulation method ever devised for cartons and totes. Eliminates complicated adjustments and allows a minimum of 2% back pressure. By maintaining constant minimum pressure on the tread rollers, long loads are conveyed, accumulated or stopped on the conveyor at any point with little pressure.

The driving of the tread rollers on minimum pressure conveyor is accomplished with the top surface of a standard section endless flat belt. The strength and wear qualities of the tread rollers and this belt have been thoroughly tested for continuous duty.



SORTATION SYSTEMS



SEE MORE



Extensive sortation conveyor information, including video.



“Induct, track, sort, scan, and more for optimal throughput with ProLogix® sorter controls that direct all devices on Hytrol sorters so they send product to the right lane, handle photo eyes and more. ProLogix controls ensure consistent monitoring, safety, speed and accuracy.”

—Thad, Employee-Owner Since 1994
Senior Applications Specialist

shop **talk**

Below: partial list of sortation technology Visit www.cisco-eagle.com/sortation for more information

ProSort series high-speed shoe sorters for rapid small item sortation

Loads move on flight tubes, and are pushed with divert shoes that slide across the conveyor. Ideal for high-speed sortation of smaller products, with speeds up to 450 feet per minute.



E24™ powered pivot diverters

The E24™ powered pivot diverter is used with E24™ and E24EZ accumulating conveyors to divert products to adjacent 30° spur lines. These diverters allow more package control.



Intralox activated roller belt (ARB) sortation technology

ARB systems selectively activate or deactivate rollers along the conveyor belt, moving and sorting items. Because there are no mechanical pushers or diverters, packages can be gently moved at high speeds.

Model SC integrated belt sorters

A belt driven sortation conveyor. The belt provides a reliable method of tracking packages to the divert stations. Diverters controlled by photocells, code readers, PLC controllers and more.



ViperSort right-angle sorters

Ideal for sorting small to medium size products. Patented design lets you sort a diverse range of loads such as cylindrical products and extremely thin items like blister packs or vinyl envelopes.

ProSort MRT 30° & 90° narrow belt transfers

Multiple narrow belts transport the load. Rollers pop up between the belts to transfer items at right angles to the sorter. Features include right-angle and two-side transfer, high sort rates, close transfer locations and flexible sort locations.

PALLET & DRUM CONVEYORS

25/26-CRR chain-driven live roller systems convey oily parts, pallets, drums and similar loads

The heavy construction of the 25/26-CRR power roller chain drive conveyor transports tough loads like fully-loaded pallets and heavy drums. Chain-driven rollers are ideal for conveying parts in bottling and steel industries.

25-CREZD zero-pressure accumulation conveyors

These chain-driven live roller conveyors accumulate loads like pallets and drums with zero back pressure, reducing the chances of collisions. Ideal for shipping & receiving, taller loads and interfacing with palletizers or stretch wrappers.

190-PVR Medium duty poly-v belt-driven roller conveyors

Features a roll-to-roll belt drive that facilitates quieter, smoother operation. 199-PVR is ideal for lighter duty pallet handling in applications where noise reduction and lower maintenance costs are desirable.



“Not all pallets are the same and it affects the way they will convey. Pay close attention to the bottom deck. Are the pallet runners parallel or perpendicular to your rollers? Perpendicular orientation is best for conveying; parallel should be avoided if possible. If your pallets have runners in both directions you can convey them either way.”

—Landry, Employee-Owner Since 2021,
Account Executive

shop**talk**



For complete pallet conveyor information, visit www.cisco-eagle.com/palletconvey



199-CRR medium-duty chain-driven live roller conveyors

Its roll-to-roll chain drive makes this conveyor ideal for light to medium-duty pallet handling or oily conditions—which aren't suitable for belt-driven live rollers. Eleven roller widths ranging from 15" to 39". This conveyor is reversible.

DC and DCEZ Heavy duty drag chain pallet conveyors

Drag chain conveyors convey pallets with bottom deckboards perpendicular to travel direction. Capacities up to 6,000 pounds and frame widths up to 104-1/2". Models: DC-62, DC-63 and DC-82. Drag chain accumulation: DCEZ-63 is a three-strand drag chain pallet conveyor with an EZLogic accumulation module.

PLEZD Heavy duty plastic belt accumulating conveyors

The Model PLEZD is a heavy-duty plastic belt conveyor that handles footed pallets, slip sheets and unitized loads—the kind of loads that can't normally be conveyed on rollers. PLEZD provides zero pressure accumulation, reducing the possibility of product damage. Handles up to 2,000 pounds per zone.

EXTENDABLE CONVEYORS



shop **talk**

“Extendable conveyors bridge the gap between the end of a conveyor system and your dock doors. They let you control the length of the conveyor so it extends as far as needed in the trailer for loading and unloading. You can deliver cartons for stacking to precise, adjustable points in the trailer, then retract the conveyor to clear dock and staging space.”

—Mark, Employee-Owner Since 2023
Account Executive



For complete information, visit www.cisco-eagle.com/extendableconveyor or call today

Rigid-belt drive-out conveyors



Reaches from a permanent conveyor all the way into a trailer. The conveyor is easily powered in and out with no operator effort for improved ergonomics and safer operations.

Rigid drive-in belt conveyors

Rigid belt systems function similarly to roller systems, but are used for varying loads. They extend your conveyor system so it matches up to trailers and docks. Optional pull-out gravity conveyors for more flexibility.



Mobile ergonomic trailer loading & unloading conveyors



Reduce labor costs and boost productivity with Destuff-it ergonomic mobile conveyors. These conveyors limit reaching and carrying in trailer loading and unloading operations.

Telescopic Belt Conveyor

This conveyor gives you precise control at the shipping dock by extending automated loading all the way to the nose of the trailer. This allows faster, more ergonomic loading and unloading at busy shipping and receiving operations, and ties directly into powered conveyor systems without extensive integration.



SEE MORE

Detailed information: extendable truck loading systems.

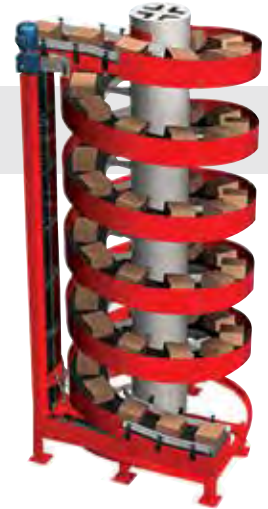
MORE CONVEYORS

SPIRAL CONVEYORS AND CHUTES FOR VERTICAL MOVEMENT

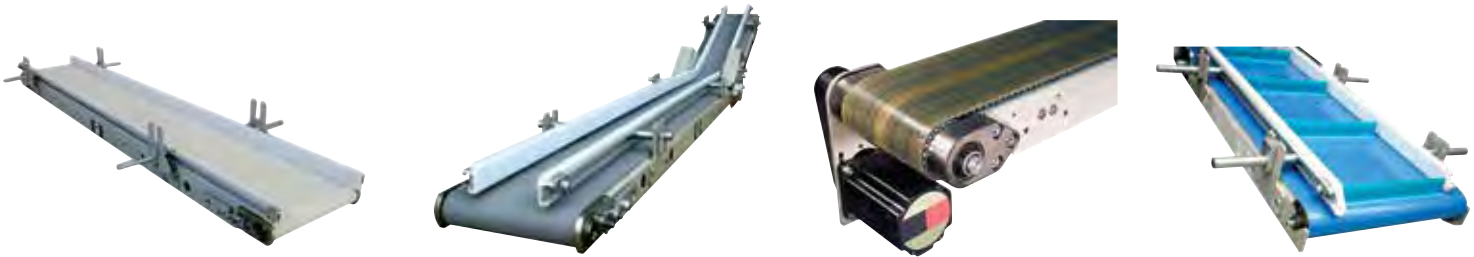
For video & complete information, visit www.cisco-eagle.com/spirals

Spiral conveyors quickly and efficiently transfer loads vertically between levels without interrupting the flow. They reduce manual handling and are excellent for load transfers to other equipment. Ideal for mezzanines multilevel buildings or elevated conveyor lines.

- **Small operating footprint:** For space savings, it's difficult to imagine a solution that outperforms spiral conveying
- **High throughput:** Continuous flow for high throughput. Can operate at speeds up to 200 FPM; many models are reversible
- **Single drive:** Only one drive usually required. This means cost savings, noticeable energy savings and easier controls integration
- **Ease of installation:** Many spirals are shipped as one piece, pre-assembled and tested
- **Spiral chutes:** Spirals raise & lower from mezzanines, work platforms, overhead conveyor lines, pick modules or multi-levels of any kind



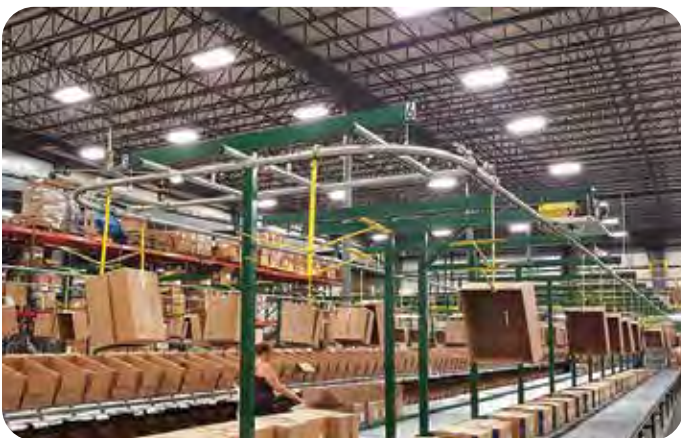
LOW PROFILE CONVEYORS FIT TIGHT SPACES



Low profile conveyors are used in packaging, machine integration, sanitary and packaging applications in medical, pharmaceutical, warehousing, food handling, manufacturing and more. They're ideal for tight spaces and machine integrations. Models include the Automation, Industrial and HydroClean Sanitary Series.

For more information, visit www.cisco-eagle.com/lowprofile

OVERHEAD CONVEYORS



When your load is oddly shaped, unbalanced or difficult to seat, flat belt or rollers may not be ideal to convey it. With overhead conveyors, loads hang on specialized carriers, so the load's shape and ability to rest on a surface is no issue.

- Enclosed track conveyor
- Heavy duty enclosed track conveyor
- "Power and free" conveyors
- I-beam monorail conveyors

PIPE CONVEYORS



Safe, reliable pipe transport

Transport a variety of pipe diameters and lengths on the same line with trough roller designs. Interface with cutters, saws, cranes or other equipment. A number of methods (bowtie or flat rollers, v-pattern rollers) are used to control pipes on the line and make conveying safer and faster than manual handling.

GRAVITY & FLEXIBLE



“Flexible conveyors let you change your discharge points by rolling and curving conveyor sections to fit your needs. They’re commonly used at shipping docks or the discharge end of a conveyor system to connect to truck trailers. A single conveyor can serve multiple dock doors.”

—Mario, Employee-Owner Since 2019
Systems Integration Group



For specs, video and more, visit www.cisco-eagle.com/gravconveyor

GRAVITY CONVEYOR SOLUTIONS

Skatewheel conveyor is ideal for temporary conveyor lines in warehousing, shipping departments, assembly areas, etc. It's often paired with power conveyors. **Gravity roller conveyor** can carry heavier items than skatewheels, and also handles less ideal load types. Available in steel and aluminum frames with curves and spurs available.



For specs, video and more, visit www.cisco-eagle.com/flexconveyor

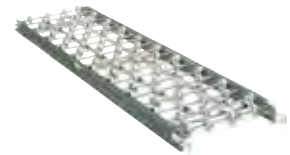
FLEXIBLE CONVEYORS: POWER & GRAVITY

Flexible skatewheel perfect for docks, stockrooms or receiving operations

Ideal for packaging lines and lighter volume shipping & receiving applications. With capacities from 175 to 300 pounds per linear foot, it can handle the load. Conveyor features 12-gauge side plates, zinc-plated to resist corrosion. Cartons follow twists and turns of the conveyor path without using engineered curves. It's fitted with a 5" swivel caster on each leg for easy transportability.

Handle odd-shaped boxes, bags & low-grade cartons with roller conveyors

Built with 1-3/8" zinc plated steel rollers that feature sealed bearings for longer life. It's self-tracking—cartons follow the twists and turns of the conveyor path without side rails or engineered curves. Features 1-1/2" aluminum alloy side plates with ribbed construction for added durability.



Power conveyor runs smoothly; no dead spots—power transmitted to every roller

Power roller flexible conveyor is ideally suited for truck loading and unloading, distribution centers, packaging, portable assembly lines, shipping and receiving operations. It runs smoothly with no dead spots—power is transmitted to every roller by durable polyurethane belt similar to line shaft conveyors. Zinc plated rollers constructed with solid steel axle and precision bearings for performance and long term reliability. Features 1-1/2" aluminum alloy side plates with ribbed construction for added durability. Each leg is fitted with a 6" x 2" swivel caster & brake that roll easily and lock into place while conveyor is in use. Heavy duty square legs mean a longer service life.

CONVEYOR ACCESSORIES

Safety nets protect people & products

If a conveyor suddenly stops or a load is too near the edge, it can fall, but conveyor safety makes a soft catch that protects people from falling components or cartons that escape the limited reach of fixed guardrails. It will even catch a loose conveyor roller. Highly recommended for conveyor that travels above a warehouse floor where people are at work.

Withstands the punishment

Features a knotless, sewn border and 1" square mesh nylon, fire retardant NFPA 701 specifications. Mesh twine has 190 lbs. tensile breaking strength. Border rope is .170 diameter. with 1,200 lbs. tensile breaking strength.



Conveyor crossovers & steps

When conveyor, pipe, channels, conduit, machinery and other obstacles make getting from one place to another difficult, consider a crossover. We can help you design and implement structures to help make any part of your operation accessible. Available with a variety of stairs, ladders, platforms, railing and other options to ensure accessibility.



Ball transfer tables

Manually rotate or position loads with ergonomic ease. Ideal for work station or other similar operation that requires quick handling. Use when multiple conveyor lines converge and packages must be transferred from one to another.



CONVEYOR GATES

SUPPORTS



Poly-tier supports let you set up multilevel conveyor lines.



Adjustable tripod stands for gravity, temporary lines.



LS, HS & MS "H" type conveyor supports work with power and heavier conveyors.



Gates are available for use with a variety of conveyors. Gates provide a passageway for personnel, lift trucks, and other equipment. Manual and gas power gates are available.

Package stops

Angle end stop mounts to end of conveyor to stop the load. Available in all standard widths. Many other stops available for various conveyor configurations.

Dead type package stops are placed on bed section of gravity wheel and 1-3/8 in. roller conveyor. Because no hardware or bolting is required, the package stop can easily be lifted off and moved to alternate sections as needed.

Specialized package stops: These are more specialized for specific package stopping applications. Includes raised end rollers, air, hand or foot operated blade/roller, and turning wheels.



Manual gates for gravity conveyor are hinged on one side. Standard models come in 3', 4' and 5' lengths, with overall widths from 12" to 24" for skatewheel and 1-3/8" models, or roller widths from 13" to 39" for 1.9" rollers. Roller centers are set to match the needs of your load and application.

Spring balanced gates for gravity conveyor provide a passageway for personnel, lift trucks and other equipment. Equipped with adjustable tension springs, which help you lift the gate. This is important for gates that are being used by people who might not be able to lift a manual gate.

E24 power roller gate uses a die spring to assist manual opening and closing for powered conveyor. When raised, its rollers automatically disengage. The rollers reactivate and continue to convey products once the gate is closed.

CONVEYOR REQUEST

Email to 24hours@cisco-eagle.com or fax to 972-406-9577. **Skip questions you can't answer.**

About you

Name: _____

Company: _____

Phone: _____

Email: _____



Load details

Load type:

- ☐ Cartons ☐ Totes ☐ Pallets ☐ Bags ☐ Bottles
☐ Loose items ☐ Bulk ☐ Components ☐ Other (describe)

Load description/notes:

Load dimensions, in inches:

Length: _____ Min. _____ Max.

Width: _____ Min. _____ Max.

Height: _____ Min. _____ Max.

Weight: _____ Min. _____ Max.

Products/minute: _____ (throughput)

Process onto and off of the conveyor:

Height Infeed: _____ Outfeed _____

Direction: ☐ One-way ☐ Reversing

Width: Roller/Belt: _____ Overall: _____

Conveyor Speed: _____ (feet per minute)

Loaded Via: _____

Unloaded Via: _____

Application

- ☐ Transport
☐ Accumulation _____ ft/length
☐ Accumulation _____ dwell time
☐ Accumulation _____ #items
☐ Combination: _____
☐ Other: _____

Describe your application:

Environmental factors

- ☐ Dry / painted mild steel ☐ Wet / High Corrosion Resistant
☐ Wash down / all Stainless Steel

Temperature: _____

Power available

_____ Volts - _____ Phase - _____ Hertz

Finish/color: _____

Conveyor notes

Please add any notes or other information.