BASIC TRAINING MANUAL Number 1

Ways to recognize and implement solutions to potential conveyor application problems

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This manual is designed to help you choose the right conveyor for your needs.

NOTE: Basic Training Manual No. 1 is printed to supplement other training manuals published by HYTROL CONVEYOR CO., INC. To receive full advantage of this issue, it is suggested that other manuals also be studied.

Section 1 - GENERAL CONVEYOR APPLICATION

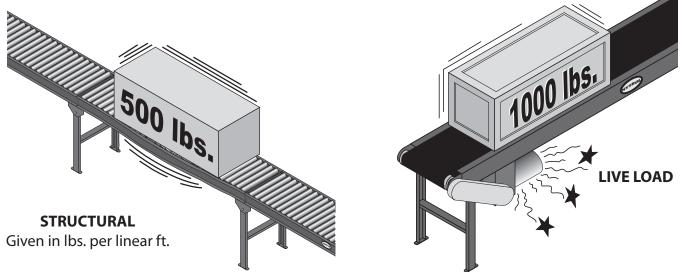
CAPACITY

A conveyor has two capacities:

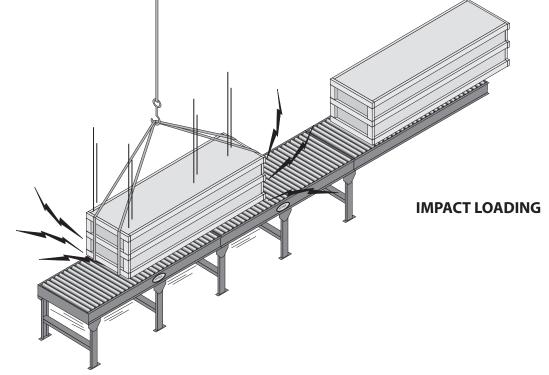
1. Structural or Static Capacity

2. Live Load or Drive Capacity

Both of these capacities are given in the HYTROL General Catalog and should be checked carefully to avoid overloading.

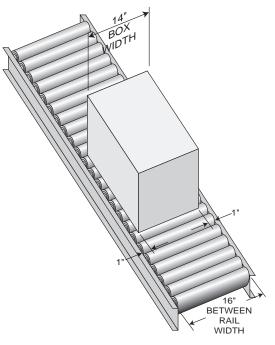


If cases are to be dropped on a conveyor, a shock plate or extra heavy rollers should be used at that point.

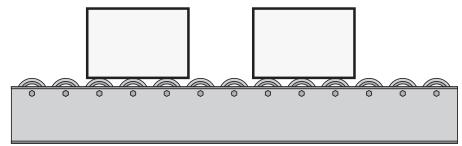


PACKAGE SIZE

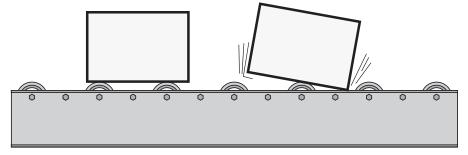
1. Roller Conveyors - Box Width - The box width on roller conveyors should never exceed the width of the rollers and should preferably be at least two inches narrower than the between rail width.



2. Roller Centers - Rollers may be placed in a frame at various centers specified in the general catalog. However, there should always be at least three rollers under a box.



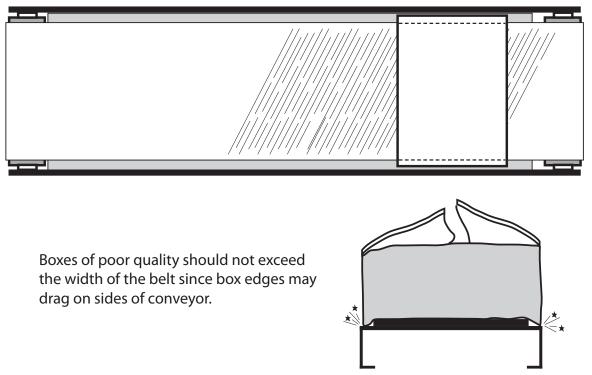
Boxes will not tumble when three rollers are under the box at all times.



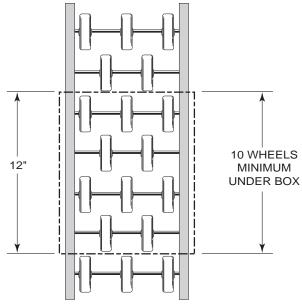
Less than three rollers...boxes tumble.

Determine the roller centers needed by measuring the smallest box to be placed on the conveyor.

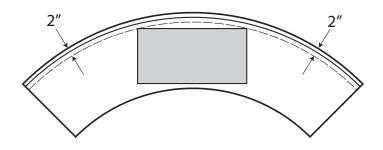
3. Belt Conveyors - Boxes moved by belt conveyors should not exceed the overall width of the conveyor.



4. Skatewheel - Various skatewheel patterns are available. There should always be ten wheels, minimum, under a box.

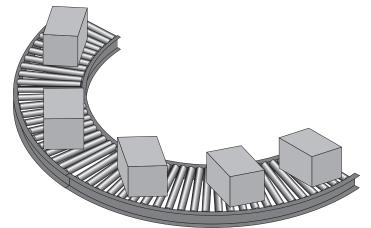


5. Curves: Powered and Gravity- A two inch clearance must be maintained between the package corners and the outside radius. This may necessitate using curves wider than the straight sections in order to accommodate packages.

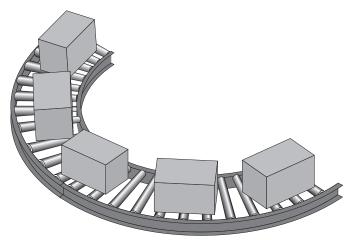


ORIENTATION ON CURVES

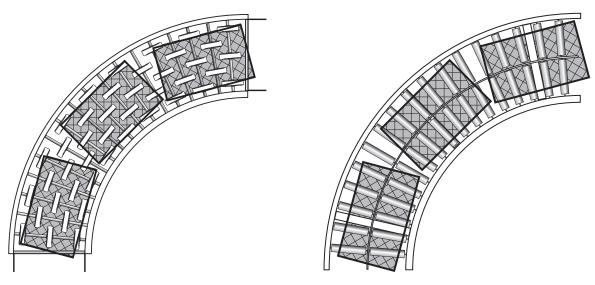
Unless certain precautions are taken, boxes traveling around curves will not stay oriented. This is because the outside of the box must travel a greater distance. Boxes, using straight conventional roller curves, will not exit the curve in the same position as they enter.



Boxes, using tapered roller curves, will maintain better orientation through the curve.

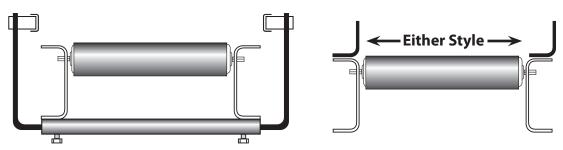


Tapered rollers allow outside of box to travel the greater distance required to keep the box oriented. Skatewheel curves and split roller curves also allow boxes to stay oriented.

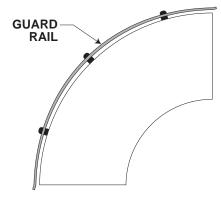


GUARD RAILS

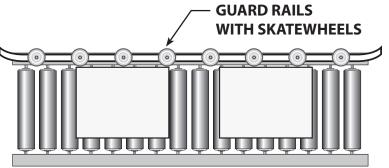
Guard rails are available in a number of different styles and sizes. Their purpose is primarily to prevent boxes from falling off the conveyor. However, they may sometimes be used to help guide boxes.

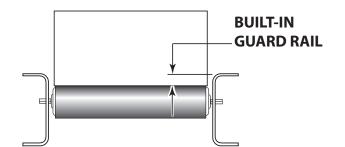


Some different types of guard rails



If a guard rail is used to guide boxes, caution should be taken. If too many boxes, especially heavy boxes, are forced up against the guard rail, they will overload the drive. This is because the drive must now overcome the friction of boxes against the rail. In this case, a skatewheel rail face may be considered, especially on heaver boxes over 20 lbs. Curves should nearly always have a guard rail mounted on the outside radius to prevent boxes from falling off.





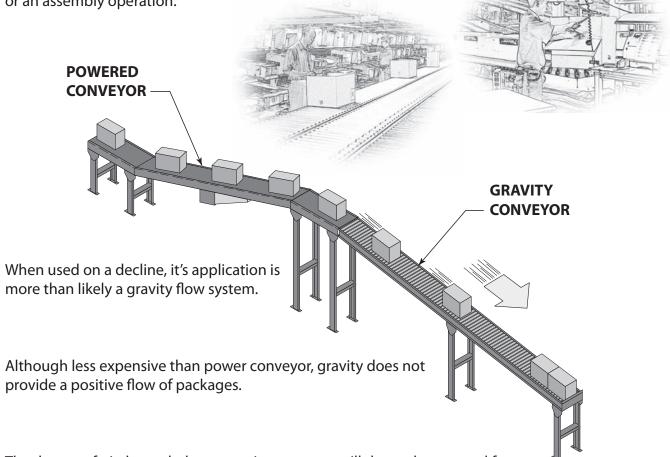
Also available are rollers set low in the frame. This allows the use of the frame as a guard rail.

Troughed rollers are sometimes used where items cannot be placed on a horizontal conveyor. This will help to contain the item being conveyed. When doing this, always maintain six rollers under the product being conveyed.



Section 2 - GRAVITY APPLICATION

Gravity conveyors can be installed on a decline or horizontal. When used horizontally, the most likely application will be for order picking or an assembly operation.



The degree of pitch needed on a gravity conveyor will depend on several factors:

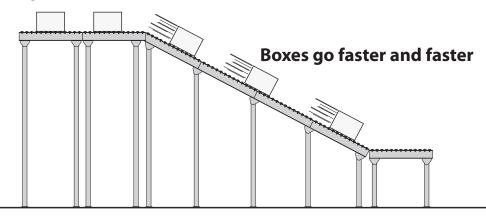
- 1. The type of conveyor, roller or skatewheel.
- 2. Are the bearings grease packed or lightly oiled? (Grease packed bearings roll slower.)
- 3. The weight of the package.
- 4. The quality or firmness of the package bottom.

The chart at the right gives some idea of how much pitch is required on a gravity conveyor.

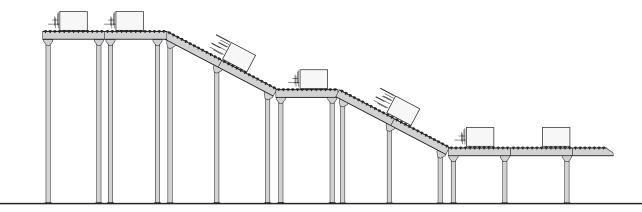
Although this is a good guideline, if you want to be sure, test the product! Contact factory if using free-running gravity for boxes over 200 lbs.

ITEM	APPROXIMATE WEIGHT (IN POUNDS)	SLOPE OF CONVEYOR (INCHES PER 10 FT.)
BARRELS	-	5 in.
BASKETS	-	5 in.
BOXES, WOOD	15-25	6-1/4 in.
BOXES, WOOD	25-50	5 in.
BOXES, WOOD	50-100	3-3/4 in.
BOXES, WOOD	100-250	3-1/8 in.
BRICK	-	5 in.
CANS, MILK, (FULL)	-	5 in.
CANS, MILK, (EMPTY)	-	6-1/4 in.
CARTONS	3-6	8-3/4 in.
CARTONS	6-12	7-1/2 in.
CARTONS	12-25	6-1/4 in.
CARTONS	25-30	5 in.
CRATES	-	5 in - 6-1/4 in.
DRUMS	150-300	2-1/2 in 3-3/4 in.
LUMBER	-	5 in.
PANS, TOTE	-	2-1/2 in 5 in.

The flow rate of boxes on a gravity conveyor is also affected by the acceleration of a spinning roller or wheel which is still spinning after a box has travelled over it.



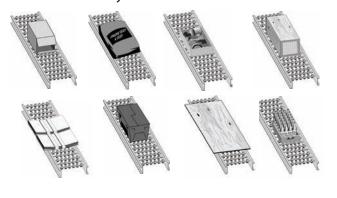
Retarding plates and other restraining devices are available to slow boxes. Boxes may be slowed by changing the angle of incline periodically.



The two primary types of gravity are roller and skatewheel. Each is suited for certain uses.

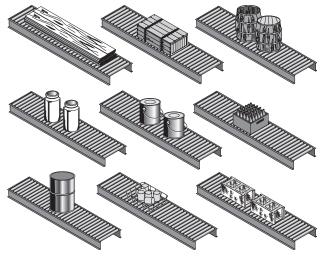
Move These On Wheel Conveyors

Any items with a smooth, flat bottom. These items can be wider than the conveyor; 6 inches over on each side is not too much. Extra wide items like plywood can be moved as well, but center it carefully.



Move These On Roller Conveyors

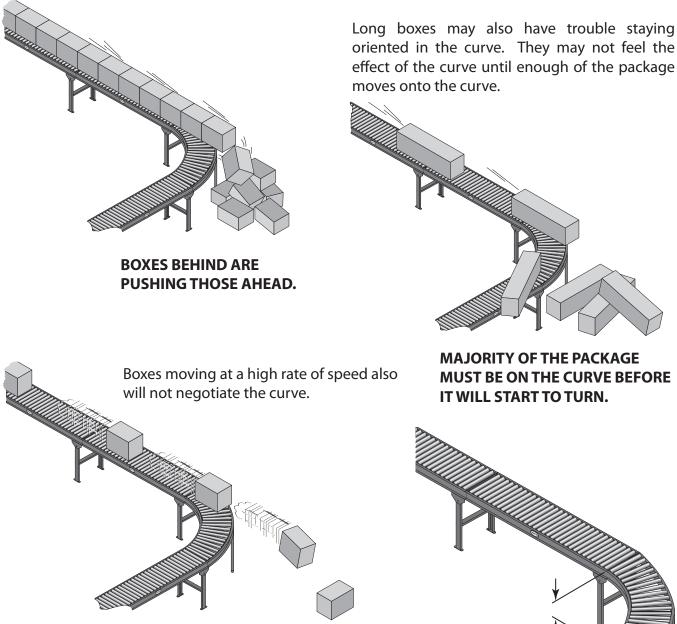
Any items with an uneven or open bottom, or with a rim on the bottom. These items should never be bigger around than the rollers are long.



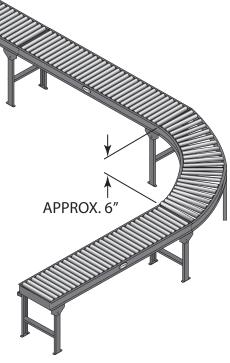
Items usually flow easier on a skatewheel than a roller conveyor.

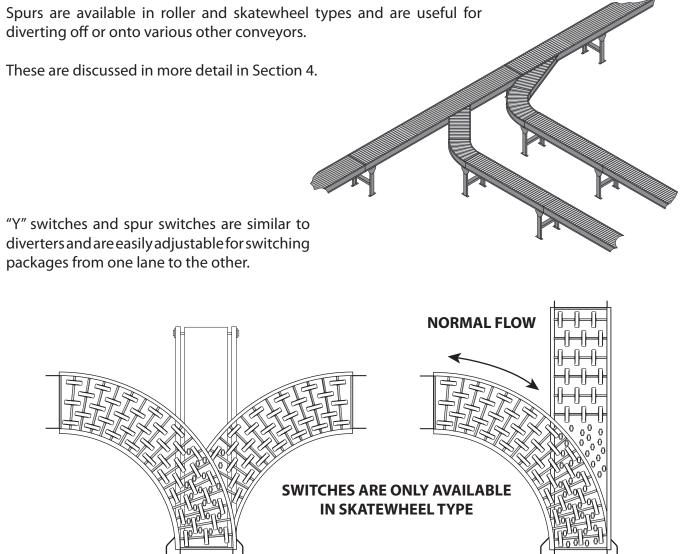
Curves are available in both roller and skatewheel types.

Boxes which must stay oriented should be moved on tapered roller or skatewheel curves. However, boxes should be spaced so the rollers will function properly. If boxes go through in a train (front to back) they may not stay oriented.

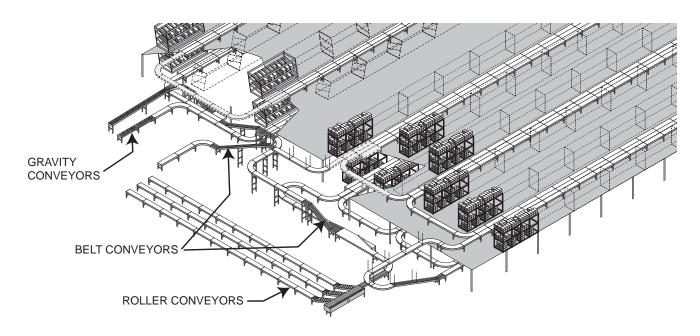


In a gravity flow system, it may also be necessary to decline the curve. This is difficult since the curve must be twisted. Although this is not desirable, a slight twist is permissible up to a decline of 6 inches for a 90° curve.

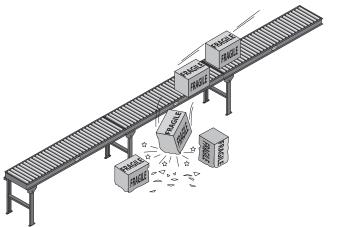




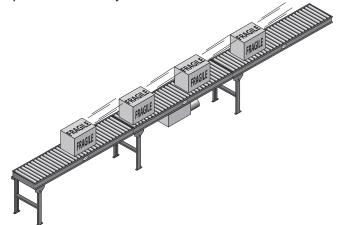
Gravity conveyors may be used alone or in a system in conjunction with power conveyors. This is called a "Flow System."



Section 3 - HORIZONTAL POWERED CONVEYORS AND WHEN TO USE THEM



Boxes of different weights travel at different speeds on gravity conveyors. Therefore, to maintain a positive flow of products, powered conveyors should be used.



Horizontal power conveyors come in several different types. Each type serves a different application.

1. Slider Bed Belt Conveyor - This type of conveyor is probably the most widely used package handling power conveyor. Its' solid steel bed construction is inexpensive, simple, quiet, and easy to install. It is frequently used for assembly operations and general transportation.

Its' live load capacity, however, is limited due to the friction between the bed and the belt. Because of heavier load demands, it may be necessary to use a roller bed belt conveyor.

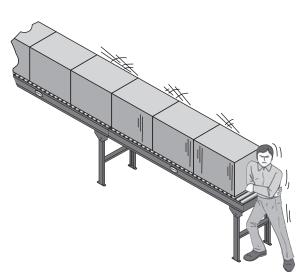
2. Roller Bed Belt Conveyor - This conveyor increases the amount of load which can be conveyed. This is because the belt is now traveling over rollers which have a very low coefficient of friction.

- 3. Live Roller Conveyor Live roller conveyors are available in three types:
 - A. Belt Driven
 - B. Chain Driven
 - C. Spool

Live roller conveyors have a greater live load capacity and are used primarily for application where boxes must be transferred off of or onto a conveyor.

A special low-friction belt should be used when pushing boxes across the conveyor due to the belt tracking problems which might occur.

It is possible to stop or hold a box momentarily on a live roller conveyor. More than one or two boxes cannot be accumulated due to the excessive drive pressure. To accumulate boxes, an accumulating conveyor is needed.



4. Accumulation Conveyor - This conveyor is similar to a live roller except the drive pressure can be adjusted to a minimum or even eliminated. Many times it is necessary to accumulate a long line of boxes to be fed into an operation. These can include: loading, sorting, strapping, palletizing, staging, etc. Accumulating conveyors come in two basic types: A. Minimum Pressure B. Zero Pressure MINIMUM BACK PRESSURE (2% OF TOTAL A. A "minimum pressure" conveyor DISTRIBUTED has enough drive to the tread rollers LOAD) to move the package. The amount of back pressure on this type of conveyor allows a minimum of 2% of the total live load on the conveyor.

B. A "zero pressure" is used to accumulate products with no products touching. This is accomplished by using various methods to completely remove all drive pressure in select zones on the conveyor. These zones vary in length according to the product being conveyed.

Sensing beams of light are used to activate the mechanism in the conveyor to remove drive pressure in the zone.

Depending on the type of conveyor used, applications must be reviewed carefully. Many factors affect the proper operation of these units such as conveyor speed, box weight, and box size. Zero pressure conveyors may be either mechanically, pneumatically, or electronically operated. Electronically operated units (Hytrol's EZLogic[®] models) have no minimum weight requirement and use no sensing rollers.

Horizontal Conveyor, Additional Information

The standard speed for most conveyors is 65 FPM. This is the average speed a person walks when carrying a 50 pound box. Other speeds, both faster and slower than 65 FPM, are also available. However, some facts should be pointed out when changing speeds:

 Horsepower ratings in the catalog are calculated according to the listed standard speeds. When increasing the speed, more horsepower may be needed. As a rule of thumb, it will take twice as much horsepower to move a given package at 130 FPM than at 65 FPM. The formula below may help to determine the appropriate power requirements:

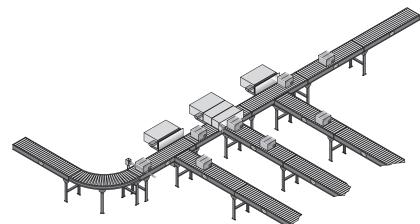
horsepower required @ 65 FPM x desired speed 65



Although this formula may be used, it is best to do a complete belt pull and horsepower calculation.

- 2. The service life of a conveyor running at a higher speed may be shortened considerably.
- 3. 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.
- 4. The type of belting used on a conveyor may also need to be considered. This subject is covered in detail in Section 6.

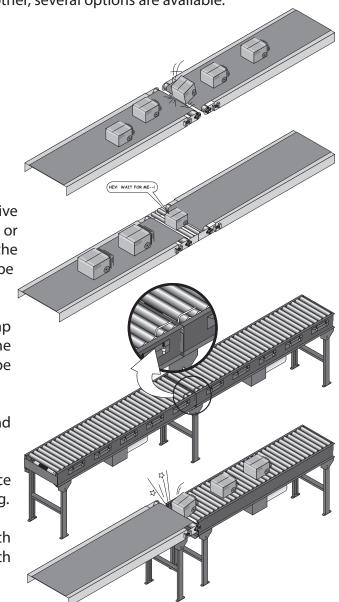
TRANSFERS



When transferring packages from one conveyor to another, several options are available.

Transfers are divided into five different categories:

- 1. Straight
- 2. Diagonal
- 3. Perpendicular
- 4. High Speed
- 5. Centering Sections
- 1. Straight Transfers—These may be made from a live roller to a belt, belt to live roller, roller to a roller, or from a belt to a belt. These transfers are usually the least troublesome, but some precautions should be taken.
- A. Small packages may hang up or tumble at the gap between two conveyors. The larger the pulley, the wider the gap. A smaller pulley or a nose-bar may be required. Box may tumble on Belt Conveyors
- **B.** Small boxes may hang up on unpowered system end pop-out rollers.
- **C.** Live roller conveyors provide the best transition since it is possible to power the end rollers with an O-ring.
- **D.** During installation, it must be assured that both conveyors are at the same level to insure a smooth transfer.



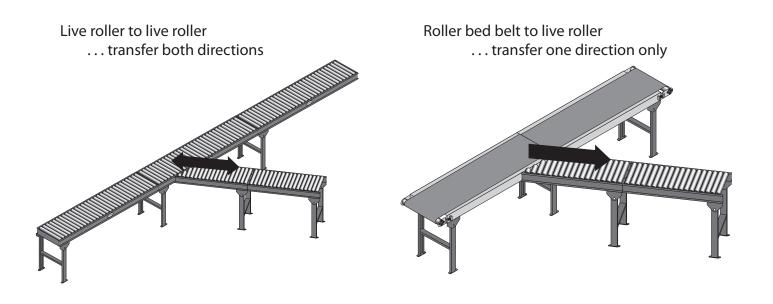
Gravity Section at least as long as longest package

- **E.** It is possible to speed up one conveyor to pull a gap or provide separation. Separation may be necessary for several reasons:
 - 1. Sortation
 - 2. For stops or transfer devices
 - 3. Counting boxes
 - 4. To separate prior to a curve or incline

When transferring a package from a power conveyor to a gravity curve, a straight section of gravity should precede the curve. This straight section should be at least as long as the longest package. The force of the belt may be greater than the force of the curve, resulting in the package overshooting the curve.

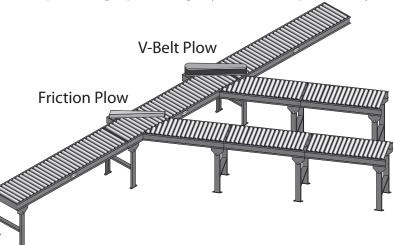
F. Power curves should also be preceded by a straight section of powered roller conveyor as long as the longest box. If boxes jam, it may be necessary to speed up the curves.

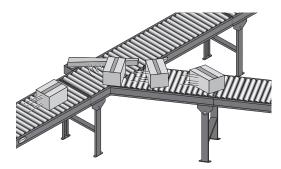
2. Diagonal Transfers—When moving packages laterally, diagonal transfers may be used as follows:



A. Live Roller to Live Roller Spur (Diverging)

- 1. 30° spurs are available when transferring onto a spur, using a plow. Slightly more horsepower may be needed on the conveyor from which boxes are transferred.
- 2. The plow may be either the straight friction type or the powered type. The straight type may be used in most cases. However, if the boxes exceed 50 lbs., or if the 45° spur is used, a powered V-Belt plow should be used.



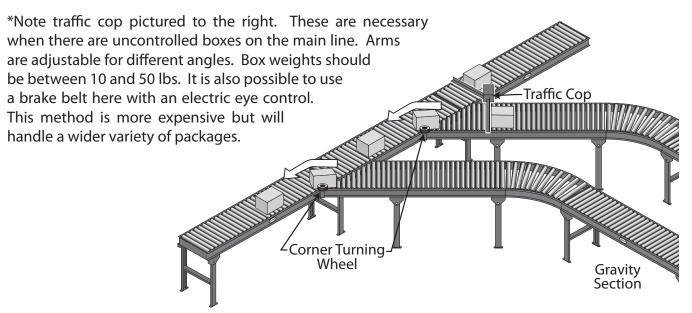


Also, if it is necessary to maintain box orientation, a powered plow should be used. This is because square boxes will sometimes rotate when hitting a straight plow. The plows may be manually or pneumatically activated.

SQUARE BOXES ROTATE

B. Live Roller Spur to Live Roller (Converging)*

When transferring onto a live roller from a spur, either 45° or 30° is suitable. A corner turning wheel is necessary to help negotiate the turn. Also, it will be necessary to have a live roller or gravity conveyor prior to the curve at least as long as the longest box.



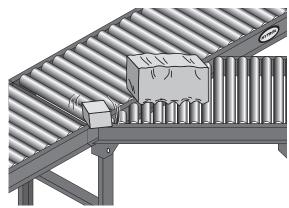
C. Roller Bed Belt Conveyor to Live Roller Spur

Care must be taken when transferring boxes from a belt conveyor onto a spur. Packages should not exceed 15 lbs. or the belt may track off the Roller Bed convevor. A special low friction Belt Conveyortop belt may be necessary when conveying heavier This belt has a boxes. 15 lbs. sticky underside which Maximum prevents the belt from slipping on the rollers and tracking off when boxes are transferred.

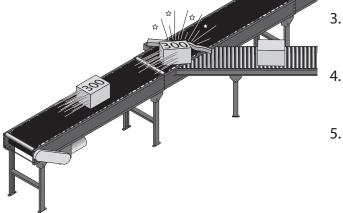
A straight or V-Belt plow may be used with the smooth top belt. However,

even this belt can track off the conveyor if many diverts are used or if several diverts are activated at the same time.

- D. Some other things to consider about all the diagonal transfers just covered are:
- 1. Small boxes may hang up when transferring in either direction. Also, boxes with soft bottoms may hang up on the flanges of the conveyors at the transfer points.
- 2. Boxes may be transferred onto or off of a minimum pressure accumulating conveyor. When this is done, however, this unit does not have as much drive power and the boxes may not divert as easily. V-Belt powered plows may be needed here.



Live Roller Spur



- Boxes should not be transferred from a spur to a belt due to belt tracking problems.
- A take-away conveyor, moving at a faster speed, may be used to move a package or pull a gap.
- Heavy boxes moving at high speed could damage 5. the plow mechanism. At 65 FPM, a box weighing up to 200 lbs. may be acceptable. Packages that are too heavy may damage the plow.

45° Worst

Roller Bed

Belt Conveyor

Live Roller

Spur

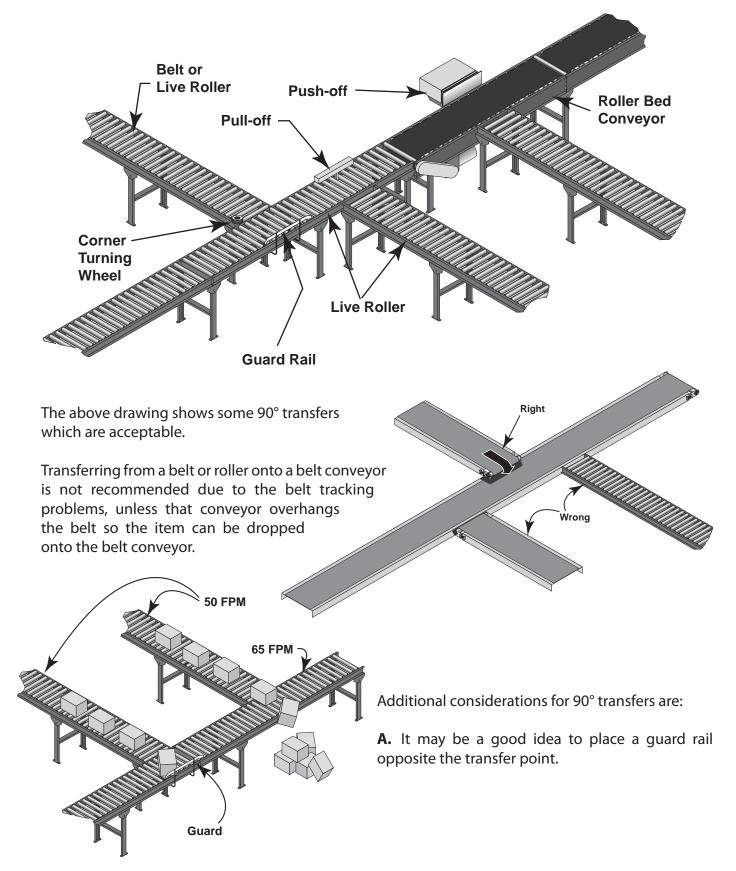
2300

Best

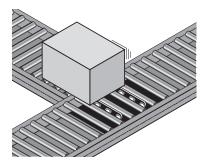
V-Belt

Plow

3. 90 Degree Transfer—Virtually the same rules apply to these as the diagonal transfers. The main difference here is that a push-off of some type is used to make the 90° transfer. These push-offs come in a variety of types and capacities to handle almost any need.

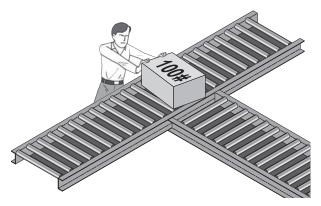


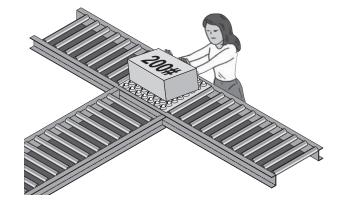
- **B.** It may be a good idea to run the pull-away conveyor slightly faster.
- **C.** Transfer points opposite each other may cause jams.



D. Another means of transferring at 90° is the pop-up V-belt or drag chain transfer. Here it will be necessary to use pop-up stops and/or limit switches to stop the package and activate the transfer.

E. Boxes up to 100 lbs. can be manually pushed. Boxes up to 200 lbs. can be manually pushed using a ball transfer.





F. Traffic cops may also be needed if take-away line is uncontrolled.

4. High Speed Transfers

A. If transferring fast moving boxes or cases onto a spur, a single or double powered pivot diverter may be used.

List of Uses:

- 1. Rapid Singulation
- 2. 10 lbs. to 75 lbs. unit loads
- 3. Sorts up to 40 times per minute

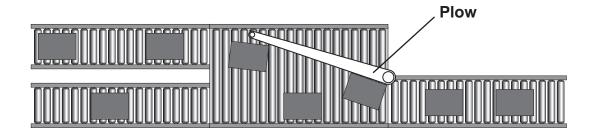
B. Sortation—When it becomes necessary to sort boxes, there are many alternatives. If there are only two or three different sorts, then photo eyes may be used, in most cases, to do the job. When two or three sorts are exceeded, a programmable controller (computer) may be needed to tell the conveyor where the boxes go. 30° or 90° transfers may be used on a belt or live roller conveyor to transfer boxes. Boxes must be coded to be read by a reader (scanner). Upon reading the code, the scanner tells the computer which divert should be activated. Many variations of this type of system are available. Instead of using a reader, an operator can read the box and then type in the information into the **High Speed** 90° Push-off computer. Computer or Programmable Controller Encoder RPM Counter

Bar Code

5. Centering Section—Centering sections are a convenient device for moving boxes laterally across a conveyor to merge into a single line. Gravity or power may be used here.

Update Encoder (Used only with live roller to compensate for slippage)

6. Plow Merges—A simpler method of moving two lines onto one is to use a plow.

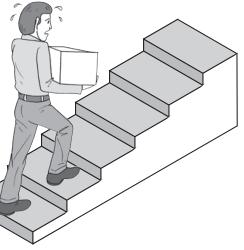


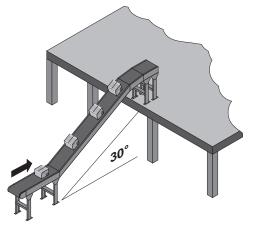
INCLINES

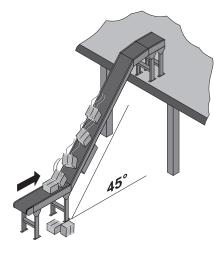
It takes more effort when moving boxes up from horizontal.

The amount of effort or power it takes depends on the degree of incline we are ascending.

- 1. For most applications, the maximum angle for an incline conveyor is 30°. Most catalog calculations are based on 25°.
- If a 30° incline is exceeded, the following problems may occur:

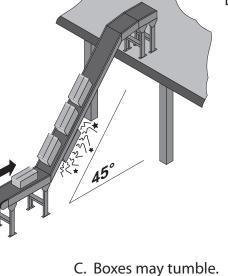


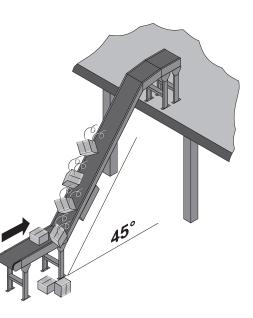




A. Boxes may slip back down the conveyor.

B. Drive capacity may be exceeded.







To determine if a box will tumble at any angle:

1. Draw conveyor angle and box size (H & L)

2. Find center of box by adding lines "A" & "B"

3. Draw vertical line "C" 4. Determine lower third of box length (1//3 L)

Figure 1: If line ""C" falls within upper 2/3, box will not tumble.

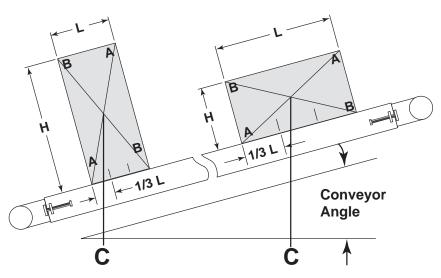
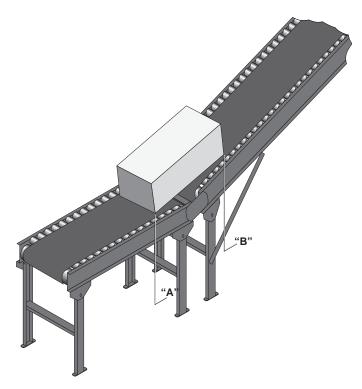


Figure 2: If line "C" falls within lower third, the box may tumble depending on the weight distribution within.

2. When transferring packages from a horizontal conveyor to an incline, some means of helping the package onto the incline must be provided. A belt conveyor or power feeder must be put in front on the incline and should be as long as the longest package.

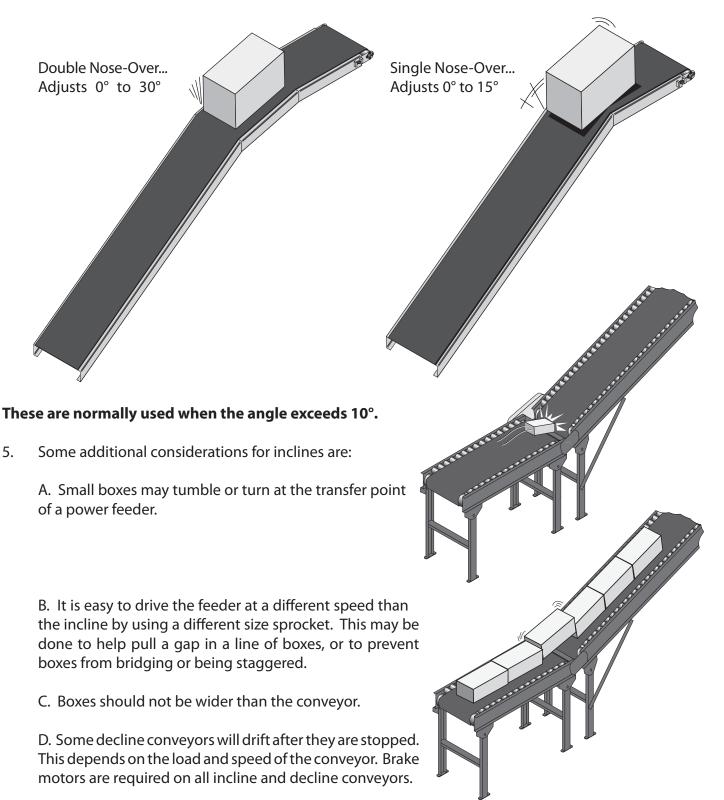


To prevent package from tearing, a smooth surface belt should be used on all feeders attached to lower end of inclined conveyor.

REASON

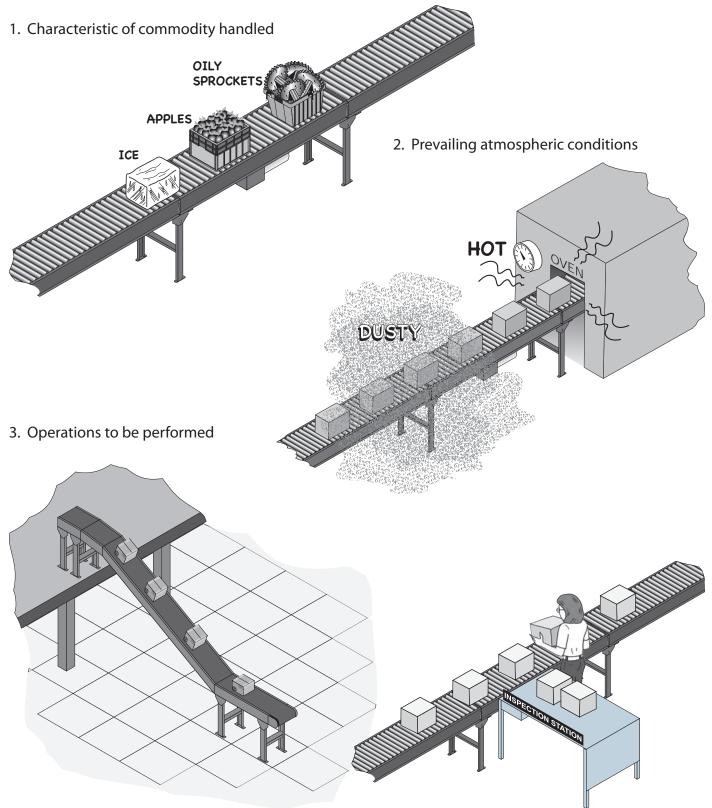
Point **"A"** is moving horizontally faster than point **"B"**. A smooth belt on feeder will allow package to slip at point **"A"** until it transfers to incline conveyor.

- 3. A power feeder should normally be 2-1/2 times as long as the belt width. Powered feeders are best powered by a chain attached to the incline conveyor. This is called a chain driven powered feeder.
- 4. Another item available as standard on most incline conveyors and optional on other units is a noseover. This may be a single or double nose-over. The nose-over allows a smooth transition from the horizontal to the decline or the incline to the horizontal.



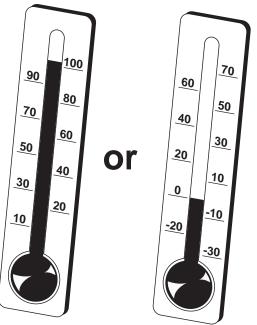
BELTING

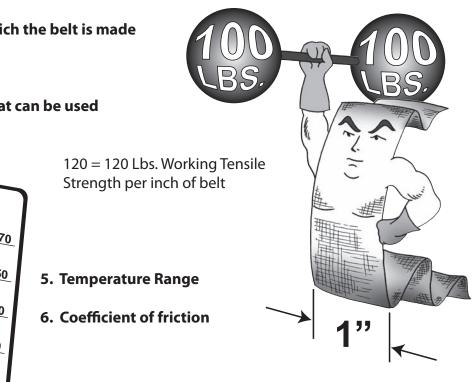
Slider bed and roller bed conveyors use belts to convey different products. There are many different types of belts from which to choose. There are three general things that will determine the type of belt required:



Some of the physical things that will be considered when analyzing a belt:

- 1. The compound or fiber of which the belt is made
- 2. The strength of the belt
- 3. Minimum pulley diameter that can be used
- 4. FDA or USDA approved





As to the composition of the belt, there are two basic parts: The **Cover** and the **Carcass**

1. The top cover is there to protect the lower portion (carcass) of the belt or to provide a specific conveying surface.

- A. PVC (poly vinyl chloride) (resists: animal fat, vegetable and mineral oil)
- B. Neoprene (resists: oils)
- C. Polyurethane (resists: oils and abrasions)
- D. Silicone (resists: heat and cold)
- E. Teflon (resists: sticky materials)
- F. Rubber (resists: cold and water)
- G. Nitrile (resists: all oils)
- H. Kevlar (resists: heat, mildew, and chemicals)
- 2. The carcass is the fabric or cords that make up the strength of the belt. The carcass can be made of multiple piles or interwoven with various fabrics for added strength. These piles or weaves are made of various fabrics, mainly synthetic materials.

Taking all the previous considerations into account, here are the basic **seven types of belt** found in the Hytrol General Catalog and Price List:

1. Ultimate 140 BBS (Nitrile Impregnated, Brushed Both Sides)—Good for general purpose package handling. More oil resistant, quieter, and withstands higher temperatures. Less build-up on rollers. Standard on most horizontal slider bed and roller bed conveyors.

2. Ultimate 140 SD (Nitrile Impregnated, Thin Polyurethane Top)—More oil resistant, quieter, and withstands higher temperatures. Less build-up on rollers and higher coefficient of friction against rollers to improve driving capacity. Standard on ABEZ and 190-LR.

3. Black Trackmate 533-COS-PVC (PVC Cover One Side)—Resists abrasion and abuse. Minimum stretch and good trackability.

4. White Polymate 100 RMP-COS (Thermoplastic Cover One Side)—Good oil, fat and grease resistant. Easily cleaned. May be used in general food applications such as canning or packing lines. Meets FDA requirements and USDA acceptance.

5. Black Trackmate 120 RT-B w/PVC Cover—PVC Impression top surface. Standard on incline and decline belt conveyors.

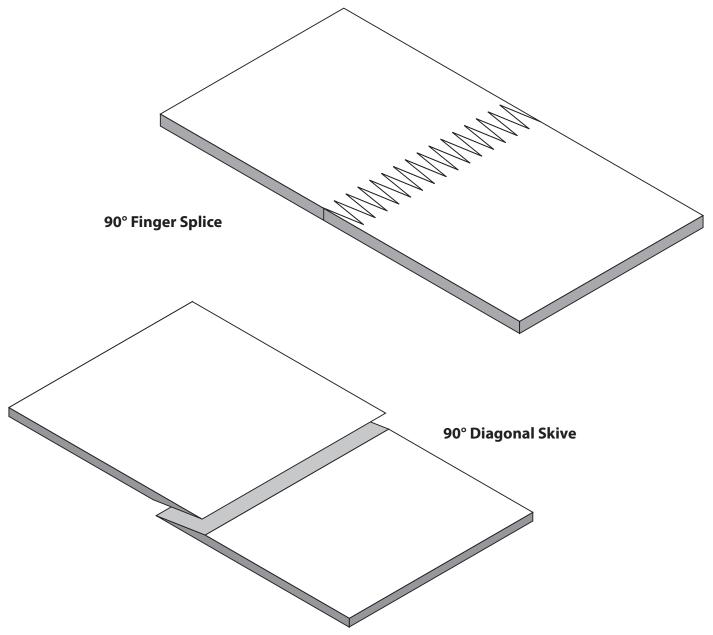
6. Brown Polymate Roughtop w/Nitrile Cover—Incline use for moving oily or greasy items.

7. Tan Glide Top (Bare Nylon Top, Friction Bottom)—Nylon top provides a low friction, abrasive resistant surface. Ideal for applications where gates or diverter arms are used.

Other Commonly Used Belts:

- 1. **PVC-150 Bare-Back (Black)**—Same composition as PVC-120 Bare-Back with 30# more working strength.
- 2. Wire Mesh—1/2" x 1" flat wire mesh belt. Good form use in hot, cold, or oily conditions. Also good for wash-down application.
- **3. Rubber**—Provides good gripping surface. May be used where PVC may not.
- 4. **Cleated**—Prevents boxes or small parts from sliding backwards.

Another type of belt is the continuous belt that is used when standard belt lacing must not come in contact with the product bottom. This is also known as an "endless splice." Two common examples are:



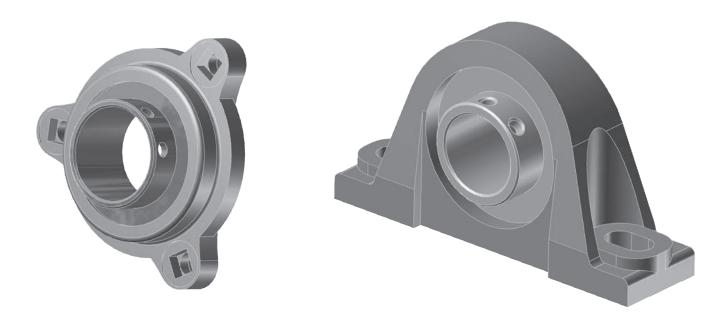
BEARINGS, FLANGE AND ROLLER

Although most roller and bearing information is contained in the Engineering Books, the basic principles of bearing construction and use are included in this manual to help familiarize the reader.

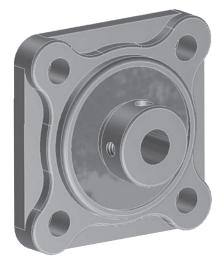
Bearings in conveyors are used (1) in the drive train components and (2) the many rollers which hold up the load.

1. **Drive Bearings**— These include the drive and tail pulley bearings. They are normally cast iron flanged and/or pillow block type.

All of these bearings are sealed and pre-lubricated. The bearings may or may not be regreaseable. Many operators prefer regreaseable bearings in heavy use applications. Although convenient, this is not always necessary even in heavy use applications since experience has shown that bearings of this type have an excellent life span.



Although sealed and lubricated, these bearings are still subject to foreign matter or moisture entering in extreme wet or dusty conditions. Under these conditions, it would be best to use a bearing with an improved seal and special grease.

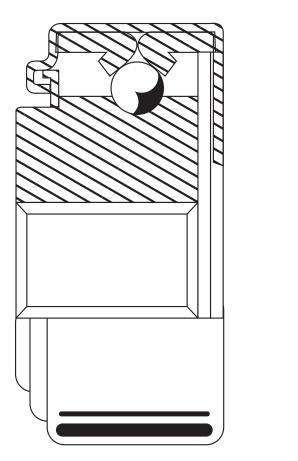


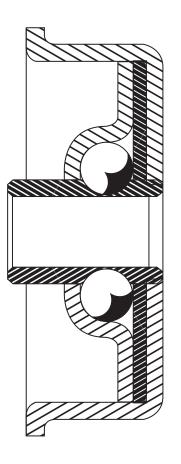
2. Roller Bearings— Roller Bearings come in a variety of types. Although the load capacities vary, they will not be exceeded if the guidelines of the load capacities in catalogs or engineering manuals are followed. From an application standpoint, two important items about these bearings should be considered:

A. Seals—Roller bearings generally have either no seals, a labyrinth seal, or more effective teflon or felt seals. For most warehouse applications, a no seal or labyrinth seal bearing is suitable. For problem environments, a sealed bearing should be considered.

Bearings without seals have no protection from foreign matter. The labyrinth seal has an offset or a fixed rigid barrier which inhibits but does not restrict foreign matter.

The Teflon seal is most effective. Its contact with the shaft will keep out most foreign matter.



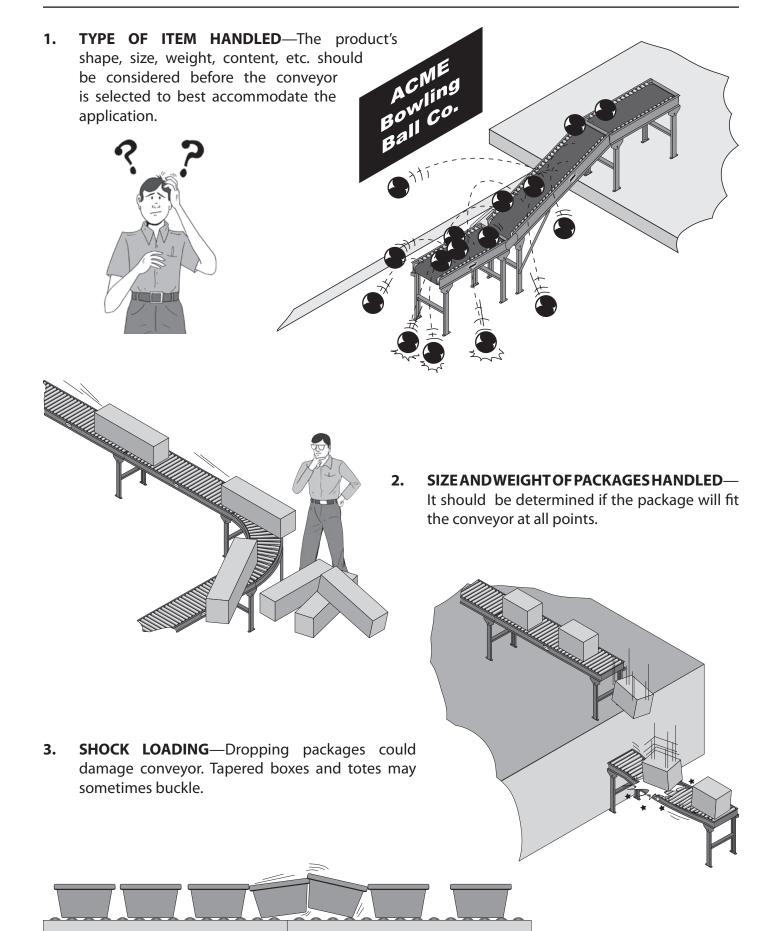


B. Lubricant—Most rollers are greased or oiled to withstand temperatures of about -40°F to 250°F. Sometimes a special lubricant is needed to meet environmental requirements.

GENERAL ENVIRONMENTAL CONDITIONS

There are also other considerations to take into account when applying a product to a conveyor. The following list gives an idea of what to look for and what questions to ask about a particular job. This should be used as a checklist.

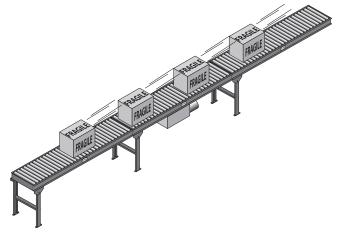
	OF ITEM H Cartons Wood boxes	Dru	ms Is of paper			MBER OF HOURS CONVEYOR L BE USED DAILY
	Tote pans Crates Baskets Pallets		s of cloth s idles		U If so	L CONVEYOR BE REVERSIBLE? No . b, how many es per minute?
2				BE HANDLED	10	PAINT FINISH other than HYTROL green powder paint, plea supply 2" x 2" metal
	S Length	ize of Packa Width	ges Height	Weight		
Min. Avg.					11	SPECIAL MOTORS OR DRIVES
Max.						Brand Voltage Phase Cycles Standard Totally Enclosed
RAT	E OF ITEMS	S PER HOUF	R		17	Washdown duty
RAT	E OF ITEMS	S PER HOUF	R		12	CONDITIONS SURROUNDING CONVEYOR
Тот	AL LIVE LO	AD		Lbs.		Excessive or abrasive dust Moisture or humidity
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4. RATE OF ITEMS PER HOUR— The conveyor must meet the flow demands of the products handled now and in the future. **Conveyor: 50 cases/min. or more** Case Sealer: 50 cases/min. Take-away conveyor must run fast enough to take away all boxes or input must be reduced. **25 CASES/MINUTE** If the machine at the end of the line will handle 50 cases per minute, then the conveyor must be able to feed that amount or bottlenecks could occur. **25 CASES/MINUTE 75 CASES/MINUTE 25 CASES/MINUTE** 5. TOTAL **LIVE LOAD**—There should be enough horsepower WUN TON for the job.

- 6. **STARTING AND STOPPING**—This may double the horsepower demands on certain applications. Inclines require a brake motor.
- **7. MAXIMUM NUMBER OF STARTS PER MINUTE**—Cycling applications vary widely. If you have a cycling application, contact Hytrol to determine the best drive for your application.
- 8. NUMBER OF HOURS OF USE PER DAY—Light duty conveyors should not be used in 18 or 24 hour per day operations. Even though the conveyor may be rated for that load, it may not last long under that type of use.
- 9. WILL CONVEYORS BE REVERSED?—Caution. Not all drives will run in reverse. A center drive may be needed.
- **10. PAINT FINISH**—If a special color is needed, specify. A minimum 2" x 2" metal sample of the color desired must be provided to formulate a match.



11. **SPECIAL MOTORS**—Every plant has special motor requirements. Check to see what is needed.

Will there be an unusual amount of moisture around the motor? Should the motor be explosion proof?

12. SURROUNDING CONDITIONS MAY AFFECT OTHER COMPONENTS—This is very important. The environment in which the conveyor is placed in can have a significant impact on whether or not the conveyor will operate properly.

Bearings may not last long in dusty, dirty conditions. Oil, dust, flour, etc. could adversely affect the operation of conveyors.

Conveyors are not warranted when used outside.

As you know, *lead times are critical*. Make sure to communicate your information to your Hytrol Application Team and let them help you select the right conveyors at the right price and delivery for our customers.



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