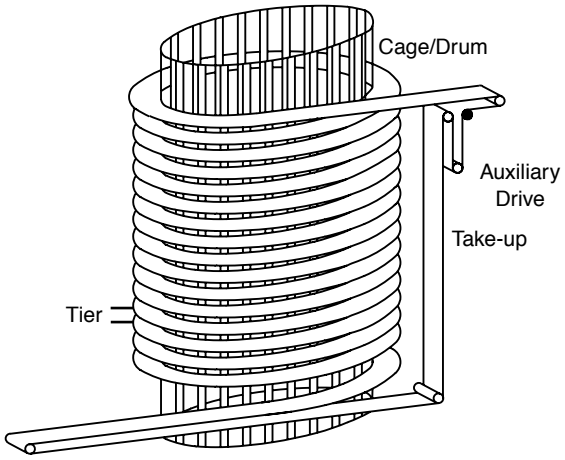
Installation of Spiral Belts

Preparation

Before installing a new spiral belt, the wear strips should be examined for excessive deterioration. These are located on the belt support rails and usually made from Ultra High Molecular Weight Polyethylene (UHMWPE). They should be clean, smooth, and free from embedded debris. Worn or contaminated wear strips should be replaced. Wear strips should also be examined to see that they are firmly seated on the rails and that their leading ends are firmly attached to the leading ends of the rails. The leading edge of all rails should be relieved or bent down to prevent catching of the belt as it comes onto the rails.



Tier Pitch = Change in elevation over one revolution

UHMWPE cage bar caps on the spiral cage should also be inspected. If the cage bar caps are heavily grooved or worn, they should be replaced. Make sure they are firmly attached to the cage bars. They should be clean and free from grease or oils that could reduce the driving friction of the drum. The cage bar caps should also have rounded or beveled edges where they meet the belt. This prevents the belt edge from catching on the corner of a cage bar cap and temporarily eliminating all overdrive.

An Advantage™ belt may be installed on cage bar systems with or without cage bar caps. Bare, stainless steel cage bars will typically increase the driving force against an Advantage™ belt's inside edge. Take care to eliminate any sharp corners or rough surfaces that might gouge or prematurely wear the belt. The cage bar surface finish should be smooth to the touch.

An Advantage™ belt can similarly be installed directly on steel support rails, without UHMWPE wear strips. When implementing this alternative, the spiral operator should insure that support rails are smooth and sharp corners eliminated. The spiral operator should also be aware that the friction coefficient for steel is higher than for UHMWPE, so total belt tension (radius weight) increases with this installation alternative. See the "Spiral Belt Selection & Engineering Calculations" section for more information on friction coefficients and radius weight calculations.

Next, check motor rotation in new systems and make sure the proper number of sprockets are on the take-up drive shaft. A short piece of belting can be used as a template to properly space these sprockets on the shaft (refer to belt assembly instructions for proper locations). This is also a good time to clean all construction and repair debris from the system enclosure. This will help prevent the possibility of the belt dragging metal filings and other sharp debris into the system during installation.

Finally, take a few minutes to plan the actual installation. Determine placement of the rolls of new belt, where you will feed them into the system, and how you will gather up the old belt (if you are removing it at the same time). Each spiral system is unique, so no standard plan will suffice; however, some general installation guidelines are provided in the next section.

Conveyor belting can be heavy and awkward to handle, elevating safety concerns during its installation. Safety is, therefore, the number one priority during installation of a new belt, so it is important to make sure all safety procedures are observed, including proper lockout and tagout procedures. Special care should be taken to know where everyone is prior to starting any machine.

Installation of a New Belt (Not a Replacement)

Always follow proper lockout / tagout procedures to ensure worker safety.

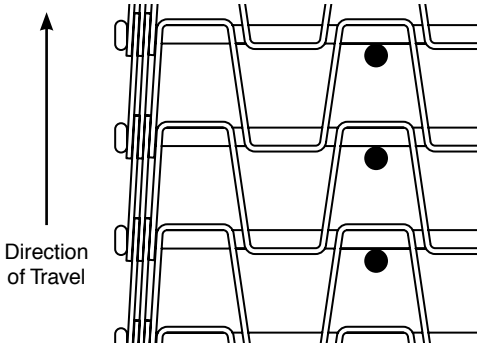
The new belt should be fed into the spiral system in the correct direction of travel. In an Omni-Flex® belt (Figure 10), the formed flat strip (picket) leads the rod. In Omni-Grid® (Figure 11) and Omni-Pro® belts (Figure 12), the link leads the rod with the link opening opposite the direction of travel. With these belts, the drive sprocket teeth come in direct contact with the rod, not the flat strip or link.

For Advantage™ belts (Figure 13), the rod leads the link with the link opening (the "legs" of the link) facing the direction of travel. This appears backward as compared to steel "Grid" belts; however, directional arrows molded into the Advantage™ links provide the correct visual orientation. On Advantage™ belts, drive sprocket teeth directly contact the link which is compressed solidly against the rod

● = drive sprocket location

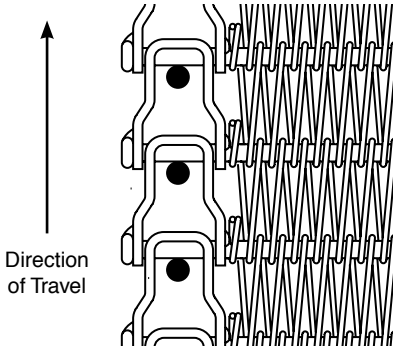
[Figure 10]

Omni-Flex®

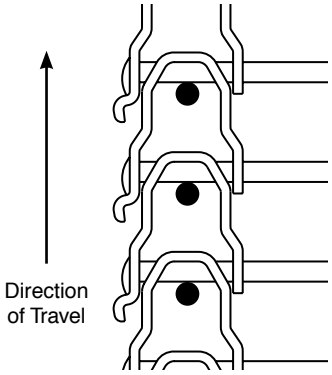


[Figure 11]

Omni-Grid®

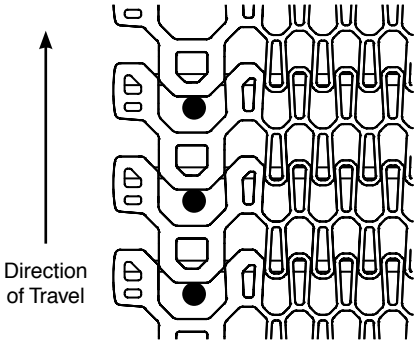


Omni-Pro®



[Figure 12]

Advantage™ Series*



[Figure 13]

** Includes Advantage™ 120 & Advantage™ 200*

Installation of Spiral Belts

New belts are most often installed by pulling the belt onto the support rails at the system in-feed. Once the belt is wrapped around the cage several times, the system can be energized and the drum used to help pull the belt through the system, providing the belt is held tightly against it. This can be accomplished by fasten-ing a section of rope to the leading inside edge of the belt and pulling it tightly against the drum. Additionally, the take-up drive can sometimes be used to unwind the heavy rolls of new belt so they can be more easily fed into the system. The ability to utilize the take-up drive will be determined by the system layout and space for the rolls of new belt.

As the end of a belt roll approaches the feed-in point, the system is de-energized so the next new roll of belt may be spliced onto the succeeding roll (for splicing instructions, see the appropriate Technical Bulletin on belt assembly). Because the belt will continue running through the system for several feet after the system is stopped, it is advisable to know how much the drive will coast after the power is turned off. Otherwise, the end of the belt could run too far and delay installation.

Splicing During Installation

For an Omni-Flex® type belt, splices should always be made with the preformed buttonhead at the inside edge of the belt. The nut goes on the outside edge of the belt. Any excess thread should be trimmed off the rod and the rod and nut should be welded together. However, Omni-Grid® type belts require that both the button-head and nut be welded to the link. The rod also needs to be welded to the inside of the link at both edges of the belt. This prevents the possibility of one of the links (usually at the inside edge) from “tenting up.” At this point, it is a good idea to file or grind these splices and welds smooth to prevent cutting of the cage bars.

An Advantage™ belt is easier to splice than a steel belt, as no welding is required. Follow the assembly instructions, making sure that the stainless steel rod is fully seated in the link by pushing it in at a slight angle with a screwdriver or assembly tool. When correctly seated, the end of the steel rod cannot be seen from the side of the link.

As the installation progresses, make sure the belt is not catching on any framework, baffles, or doors. On tall systems, ladders or other means of observing and guiding the belt must be employed as it gets higher and higher off the floor. Never stand on the support rails or the belt as this can damage the rail and/or belt, and it is unsafe. Be sure that the leading edge of the belt does not catch on the ends of wear strip sections as these can be pulled loose. Keep in mind that the leading edge of the new belt may turn up or down, and is far more likely to hang up than other areas of the belt.

Once the belt is completely pulled into the system, the leading edge is spliced to the trailing edge to make it endless. Prior to splicing, the leading edge should be checked for damage that may have occurred during in-stallation. If there is any doubt about the condition of the leading edge, it is best to remove a few pitches. New belts normally lengthen out during the first few weeks of operation. On initial installation, adjust belt length so as to position the take-up weight just above center in the take-up tower.

Installation of a Replacement Belt

If a newly purchased belt is to serve as a replacement in an existing system and it has been determined that the wear strips on the cage bars and support rails do not require replacement, then the installation of the replacement belt is potentially less involved than installation on a completely new system or one requiring cage bar or support rail cover replacement. When only the belt is replaced, the new belt can be spliced to the old belt (assuming that the new belt is the same specification as the old) at a point just after the sprocket drive. The system can then be energized and stopped to remove the old and to pull on new sections of belt, continuing until the old belt is completely removed and final splice of the new belt is in place.

After Installation

Once the new belt is installed, there are several items that should be examined before the belt is cleaned and used for production. First, check the system carefully for catch points, especially along the outside edge of the belt. The in-feed and outrun are particularly vulnerable, as the belt will typically swing wide in these areas. Also check any flanges on enclosure doors for the potential to catch on the belt when the doors are closed. While inspecting the system, make sure that the flip-up detectors or product height detectors are not going to impinge on the belt. If there are any hold-down rails on the system, be sure there is 1/4" to 3/8" clearance between the belt and the rails. Next, check the location of the drive and idler sprockets. Be sure that they are centered in the belt or link opening and are locked down to the shaft. Any filler rolls should also be checked to ensure they are set in place and are the proper size to work with the sprockets.

After the system has been thoroughly checked for proper clearances, it should be energized to confirm it is running correctly. Start the system out at slow speed and continue to monitor the sprocket placement. Listen and observe for any indication of belt impingement on the framework or other parts of the system. Note the position of the take-up drive at start-up and watch whether it rises or falls as the system operates. A take-up roll that rises indicates reduction of belt tension. A take-up roll that falls indicates that belt tension is rising. The position of the take-up should quickly stabilize to a mid-position. Once the system has operated for a few complete turns, check the overdrive.
Adjust the overdrive, if necessary, to achieve the lowest possible belt tension with the belt operating smoothly.

If possible, the system should be operated for up to 200 hours before final cleaning and product loading. This is particularly important for new systems utilizing a steel belt, as this will help the belt components polish each other and reduce the chances of excessive internal wear.