

CONVEYOR BELTING

INSTALLATION, OPERATION AND MAINTENANCE MANUAL



Index

1. Safety Precautions	3
2. Introduction/ Applicable equipment	4
2. Handling & Storage	5
3. Installation/ Set Up	6
4. Operation of Belt Systems.....	7
5. General Maintenance	8
6. Belt Repairs.....	9

1. SAFETY PRECAUTIONS



WARNING: DO NOT ATTEMPT MAINTENANCE ON ANY CONVEYOR WHILE IT IS IN OPERATION.

BEFORE STARTING MAINTENANCE:

1. Maintenance functions are to be performed while the conveyor is off. The main power switch to the conveyor should be locked in the off position. This will prevent anyone from applying power to the system while maintenance personnel are at work.
2. Never work on a conveyor while it is running, unless maintenance procedure requires operation. When a conveyor must be operating to perform the maintenance; allow only properly trained maintenance personnel to work on the conveyor.

DURING MAINTENANCE:

1. Do not wear loose clothing while performing maintenance on operating equipment.
2. Be aware of hazardous conditions, such as sharp edges and protruding parts.
3. When using hoists, cables or other mechanical equipment to perform maintenance, use care to not damage conveyor components. Misaligned parts are dangerous as conveyor is started after maintenance is completed.
4. Keep area clean. Clean up lubricants and other materials before starting conveyor.

AFTER MAINTENANCE:

1. Before starting any conveyor after maintenance is completed, walk around the equipment and make certain all safety devices and guards are in place, pick up tools, maintenance equipment and clear any foreign objects from equipment-
2. Make certain all personnel are clear of the conveyor and made aware that the conveyor is about to be started.
3. Only authorized personnel should be permitted to start any conveyor following maintenance or emergency shut-off.

3. Handling & Storage

3.1 Handling

Conveyor belting is generally supplied in cylindrical wooden or steel reels and in cases of overseas transportation in fully enclosed steel reels, racetrack or similar.



Before lifting the belt ensure that facilities can handle the weight and the dimensions, which are always marked on the reel side.

The reels are always equipped with a square center to take each company's winder shaft.

Insert the shaft and make sure that it is protruding at least 200mm from each side to accommodate the slings or the forklifts tines. To avoid damaging belt edges you should use a spreader bar.

The best practice for running out the belt is to use a braked stand. Small roll can be pulled from a freewheeling stand, however care should be taken to avoid the belt from running away.

If the belt is to be dragged along the ground, then care should be taken to ensure that no objects are blocking the area.

In cases where there is a headroom limitation it may be necessary to remove the belt from its reel and store it in a flat position. If that happens make sure that large loops are maintained to prevent carcass fracture.

3.2 Storage

General recommendations for storage and handling of conveyor belts are given in ISO/DIN 5285. As substitution DIN 7716 (Rubber products, storage and maintenance) can be used also. This standard however partially formulates excessive requirements which not necessarily have to be taken into consideration for conveyor belts and storage duration of maximum 1 to 2 years.

In any case the conveyor belts have to be stored upright in the factory package until used, protected from direct sun light and permanent water. The storage area shall be prepared for stable putting down of the reels and preventing the belts from being damaged by foreign parts. A cool dry warehouse, free from direct sunlight, oil, ozone producing machinery or corrosive fumes is recommended.

Points of attention:

- Avoid long term storage near the sea
- Ensure the initial integrity of the wrapping
- Do not lean the belt against walls as this can cause telescoping

If prolonged intermediate storage is necessary, it is advisable to suspend the coiled belt with one axle in two movable stands. If this is not feasible, the coil should be turned at intervals to change the contact surface.

The location in the storage premises should be selected so as to avoid heat and direct sunlight. The belt should also be protected from contact with chemicals, grease or oil. Premature ageing, cracking, hardening or swelling would affect the service life of the conveyor belt (cf. DIN standard 7716, May 1982- Rubber products: Requirements for storage, cleaning and maintenance).

In case of prolonged storage in the open air (for steel cord belts) the cut edge at the start and end of the belt has to be protected from moisture. It may be advisable to coat the cut edge with cold splicing cement.

4. Installation/ Set up

Whereas narrow and short belts can be pulled in with a cable tensioner, longer, heavier belts require motor-operated cable winches.

Before pulling in the belt make sure that the bottom of the belt is facing the support idlers of the carrying run.

The beginning of the belt needs to be prepared in the following way before being drawn in:

- If the belt is heavy, a drawbar is attached to the beginning of the belt to allow it to be joined to the traction cable. This drawbar consists of two metal plates or flat iron bars with a number of holes. The belt end is provided with matching holes, and it is clamped between the two parts of the drawbar with sufficiently large machine bolts
- The two belt corners of the front end are cut back at an angle or elevated so that they do not hit the trough idlers when pulled in

If the cable cannot be pulled in the direction of the conveyor run, the cable can be pulled from the side via hinged idlers or deflection idlers. These idlers are attached so that the conveyor frame cannot get twisted or otherwise damaged

5. Operation of Belt Systems

5.1. Loading Point Considerations

The loading point of any conveyor is nearly always the critical, life determining point of the belt. This is the point that the belt receives its major abrasion, and practically all of its impact. The “ideal condition” is to have the material pass from chute to belt at the same speed as the belt, in the same direction of travel as the belt with no impact. Off center loading of the product on the belt will cause the belt to move sideways after loading as the center of the load seeks the lowest point in the troughing idlers. This can usually corrected by proper chute arrangement provided, of course, that the belt is centered as it enters the loading point.

5.2. Belt Scrapers and Cleaners

Poor adjustment of these elements can lead to:

- insufficient belt cleaning and therefore tracking problems due to material build up

- accelerated idler wear
- directly damage of the covers

These elements play a substantial role in the protection of the belt. Regularly they should be inspected and adjusted accordingly.

5.3. Inspection of Belting

Regular inspections of conveyor belting will ensure belt's life by identifying problems and damages, which might require immediate action.

Establish a scheduled inspection program and follow it to ensure that you keep your belt under control and make sure that it will keep serving you for many years.

6. General Maintenance

Conveyor systems represent a large part of the overall plant cost and as such warrants regular inspections and maintenance to protect this investment.

Generally, apart from normal abrasive wear, rubber conveyor belting fails through chemical/thermal attack or mechanical damage in one form or another.

Chemical/Thermal Attack

Chemicals such as oil, grease, solvents or animal fats should be removed as soon as detected from belts not purposely designed to handle these materials. Belts that are susceptible to attack should be washed down with detergent immediately.

Thermal attack requires correct belt selection and efficient heat transfer/cooling of the belt and product.

Mechanical damage.

This is best prevented by correct design and installation. Regular monitoring of the system and prompt correction of any faults found will prolong the life of any belt system.

The following items should be regularly inspected:

Belt cleaners- These items perform a very important role in the performance of the belt. If they are incorrectly adjusted they can cause excessive wear due to friction, allow carry back to build up on idlers or pulleys or in some cases cause mechanical damage to the belt.

Idlers - Any noisy idlers should be looked at immediately. Any seized or broken idlers should be replaced immediately. A jammed idler causes increased friction resulting in excessive cover wear, higher power consumption and may create sufficient heat to start a fire when the belt stops. Also a worn idler can create a razor sharp edge that can cut a conveyor belt in two and contribute to poor belt tracking.

Pulleys - Material trapped between a pulley and belt may cause belt wander and if hard lumps are present they may rupture the belt. Plough cleaners should be fitted wherever a spill onto the return

side can be carried into a pulley. Bearings and lagging should be maintained in good condition to help tracking and maintain good power transmission.

Take-up - This item can be automatic or manual

The automatic take-up is the most desirable as properly maintained it will ensure correct tension of the belt in all operating conditions including starting, running and braking.

If for any reason the automatic travel becomes restricted or jammed, belt slippage at the drive may occur, which may cause extreme damage to the belt.

The manual take up has the advantages of compactness and low cost. It is however, unable to maintain optimum tension through normal operating conditions. This includes starting, running stopping and changes in belt length caused by changes in ambient and operating temperature. Manual take-up should therefore only be used on short centre or low-tension conveyors.

7. Belt Repairs

To repair damaged covers please refer the attached instructions for Textile and Steel cord conveyor belting.

Usually to make a repair you need the following material:

- Cover rubber
- Cover cement
- Bonding rubber
- Bonding cement
- Rubber strips
- Solvent
- Hand roller
- Silicon paper
- Knife
- Rotating wire brush
- Brushes
- Heating platens