



Operation & Maintenance Manual for Conveyor & Elevator Belting

The life of the belts depends on various factors such as:

Handling, storing, belt alignment, good loading conditions, proper cleaning, care & maintenance procedures.

Handling

Conveyor Belts are despatched with wooden cores. All rolls are marked with an arrow sign showing the direction in which they are to be rolled or hoisted. Belts should always be moved by lifting and transporting rather than rolling, due to the danger to men and possibility of damage to the belt and specially, if collapsing as a result of being rolled. Needless to emphasize, the belt edge should be protected carefully.

Storing

Unless damaged in transit, belt should be kept in an upright position until it is being commissioned. The belts are to be stored in a cool, dry covered and well-ventilated place away from direct sunlight. Other factors like exposure to sunlight, ozone in sea area, contact with all types of solvents and corrosive liquids should be avoided.

If proper warehousing is not possible then belt should be covered with black polythene, suitably fastened against wind damage. In case of belts weighing excess of 1500 kgs and not installed within two/three months and beyond, it should be supported off the ground. Belt kept as spares should definitely be stored off the ground and rotated $\frac{1}{4}$ turn every six months. Whenever lengths are cut off from the belting roll, the end should be sealed with conveyor belting repair solution to prevent ingress of moisture into the carcass.

The drums in storage should be examined once in two/three months to ensure that packing is not failing due to white ants and similar insects. Spraying of DDT over packing will prevent this type of damage.

If stored, as suggested, the shelf life of the product is a minimum of 5 years from the date of manufacture.

Belt Alignment

On long Conveyor, where conditions are likely to be unfavourable, training of the belt must be taken into consideration. There are several factors, which cause the belt to run erratic. Some of the factors are listed below:

- (a) Misaligned pulleys often tend to run to low side. In such cases the training is done by shifting the axis of snub pulley.
- (b) When entire belt runs to one side along some portion of the conveyor at each cycle of operation at a particular spot, the belt can be aligned in two ways:
 - (i) By shifting one side or both sides of some of the troughing idlers in the direction of belt travel at that particular portion.
 - (ii) Slight lifting of troughing idlers forwarded in the direction of belt travel by placing steel washers under the idler strand.
- (c) Improper loading conditions can cause faulty belt training.

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- (d) Misalignment of structure.
- (e) Building up of materials on return idler and snub pulley will throw the return belt off centre.
- (f) During splicing it is extremely important to cut the belt ends in perfect square, otherwise it may affect the centering of the belt.

Trough training and return training idler, mounted on centre pivot are used in training the belt. Some time off centered idler and tilted idler (2 degree forward) help the system to keep the belt in central position. After having been trained and the empty belt running satisfactorily, the belt should also run centrally after being loaded. If it does not happen, design of feeding chute should be checked properly. Sometimes it may be done by introducing a deflection plate inside the chute.

Good Loading Condition

Method of loading is one of the vital factors of belt life in which cover as well as carcass may get damaged. While loading on conveyor belt, the following points should be considered.

1. Loading should be at the centre of the belt.
2. In case of abrasive materials (large), bed of small lumps may be provided by screening them inside the chute.
3. Spacing of impact idlers should be such that (usually less than troughing idler), most of the materials fall on impact idler but not between idlers.
4. Slope of chute should be such that material cannot fall directly on belt under gravity. In ideal case material at the time of touching the belt gets the same velocity as that of the belt.
5. The skirt board should have a clearance at an angle upward towards the belt travel.
6. Ensure that delivery chute is not choked.

Proper Cleaning

Any sticky materials when being conveyed may adhere after discharging portion, which may effect the following:

- (i) Excessive wear.
- (ii) Build up material on return idlers.
- (iii) Misalignment of belt.

It is therefore expected, the material should be cleaned before it reaches snub pulley or return idler.

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Cleaning is done by the following ways: -

- a) Single or multiblade scrapper.
- b) Rotary belt cleaner.
- c) Water spray and wipers.
- d) V-type return belt scrapper.

Running Care and Maintenance Procedure:

Extensive care and proper-maintenance at regular interval of running should be carried on by every belt user, which largely extend the life of conveyor belting. The following are a few factors, which come under this trial:

- (1) Any minor cuts or gouges on cover.
- (2) Major damage.
- (3) Carcass failure.

It is advisable to repair this type of damage at once, as any belt even with any minor damage should not be used further without repairs.

Other factors, which are also to be considered in the regular maintenance, are: -

- (a) Easy rolling of individual idler.
- (b) Training of the belt.
- (c) Take-up problem.
- (d) Deposit and trapping of materials.
- (e) Improper condition of skirt rubber, belt cleaner, etc.

If the spillage is likely, return run of the belt should be protected by decking plate otherwise it may develop local stress following failure of belt cover as well as carcass. Belt should not be allowed to rub against any stationary parts of conveyor like skirt boards metallic part, stringer support, bottom of chute etc. Skirt board rubber should have lower hardness than belt being used.

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Belt Fastener and Splicing:

Basically joining of belts may be classified into two main groups:

Mechanical joint and Splice joint.

Mechanical Joint:

Bolted plate and Alligator type: Bolted plate type fastener is generally used in heavy duty belt and Alligator type fasteners are used for medium and low duty belt. Care should be taken in choosing the diameter of bolt sizes in relation to belt thickness.

Splice Joint:

There are two types of splice, namely Diamond splice and bias splice. The splicing and repair details can be referred to in the splicing section in this manual.

