

Belt Conveyor Take Up Design | Conveyor Belt Take Up System | Horizontal Take Up In Belt Conveyor

Belt Conveyors for bulk materials:

Take up Arrangement:

All belt conveyors require the use of some form of take up device for the following reasons:

1. To ensure adequate tension of the belt leaving the drive pulley so as to avoid any slippage of the belt.
2. To ensure proper belt tension at the loading and other points along the conveyor.
3. To compensate for changes in belt length due to elongation.
4. To provide extra length of belt when necessary for splicing purpose.



Usually there are two types of take up arrangements.

These are:

1. Fixed take up device that may be adjusted periodically by manual operation
2. Automatic take up device (constant load type)

Manual Screw Take Up:

The most commonly used manual take up is the screw take up. In a screw take up system the take up pulley rotates in two bearing blocks which may slide on stationery guide ways with the help of two screws. The tension is created by the two screws which are tightened and periodically adjusted with a spanner. It is preferable to use screws with trapezoidal thread to decrease the effort required to tighten the belt.



The main problem with the use of manual take up is that it requires a vigilant and careful operator to observe when take up adjustment is required. Perfect tension adjustment with this system is also not possible. For these reason these devices are used only in case of short conveyors of up 60m length and light duty.

Automatic Take Up:

In automatic take up arrangement the take up pulley is mounted on slides or on a trolley which is pulled backwards by means of a steel rope and deflecting pulleys. The carriage travels on guide ways mounted parallel to the longitudinal axis of the conveyor, i.e., horizontally in horizontal conveyors (Ex.: Gravity type automatic take up arrangement) and at an incline in inclined conveyors. Hydraulic, Pneumatic and electrical take up devices are also used.



Automatic take up has the following features:

1. It is self adjusting and automatic
2. Greater take up movement is possible



For the perfect conveying of materials, adding a resistance with the peripheral forces on the driving pulley of a belt conveyor is important. Some of the resistances are:

1. The inertial and frictional resistance due to acceleration of the material at the loading area
2. Resistance due to friction on the side walls of the skirt board at the loading area.
3. Pulley bearing resistance applicable for other than the driving pulley
4. Resistance due to the wrapping of the belt on pulleys
5. Special resistances include
 - a. Resistance due to idler tilting
 - b. Resistance due to friction between material and skirt plate
 - c. Frictional resistance due to belt cleaners
 - d. Resistance due to friction at the discharge plough

Special resistances are usually small. Here the resistance due to idler tilting and skirt resistance is ignored. There being no discharge plough the resistance due to plough is ignored. For belt speeds greater than 3 m/s, the edge clearances are applicable.

Source:

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