

FAQ

Module-7: Cone pulleys

- 1) The sum of diameters of cone pulleys is same at every vertical plane of the pulleys. Is it for simplifying the design?

No. When a profile of cone is generated, profile of another one can be obtained by simply subtracting that from the sum of two profiles. But it is not for that purpose. When a fixed length of belt is enveloping both the cone pulleys, the sum of their diameters shall be same at any position of belt. This is the design criteria.

- 2) What is the problem in using hyperbolic cone pulleys on roving machine?

The main problem is during initial stages of winding where the rate of change of diameters of cone pulleys is quite large. The belt has finite width and is not so flexible. Due to this belt will tend to have line contact rather areal contact on the pulleys. The contact line would be diagonally connecting the larger diameters of both cones. If the required radii of top and bottom pulleys are r_1 and r_2 ; the belt must be enveloping radii at $r_1 + \Delta r_1$ and $r_2 + \Delta r_2$ on the top and bottom pulleys respectively. The belt would slip to a large extent due to line contact on the pulleys. Hence, the motion transmission to bobbin would not be as per the requirement and mostly results in roving slackness.

3) The belt initial position is quite some distance from the edges of cone pulleys on roving machines. Why?

This is to accommodate the empty bobbins which are smaller in diameter compared with the one recommended by the machinery manufacturer. Smaller bobbins require larger and smaller diameters on top and bottom pulleys respectively for winding all layers of roving.

4) Is the design of cam for unequal shifting of belt on straight cone pulleys complex?

Yes. But it helps the yarn manufacturer to a great extent.

5) The initial position of compensating rail is in alignment with the faces of cone pulleys. Why?

There are various reasons for the incidence of smaller magnitudes of slackness or stretch on roving. These must be compensated by changing the inclination of rails from the reference position. It gives enough freedom to the operator to solve the problems.