



NIBA—The Belting Association
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Tech Note

Technical Notes from the Technical Committee, NIBA – The Belting Association

#22 Curve or Turn Belts

A growing number of applications require the use of curve or turn belts. Due to the nature of the application, considerable precision is needed in order to achieve accurate dimensions of the belt. In addition, the strength (warp) in the conveyor belt must always be in the running direction.

General:

- 451 conveyor belts should utilize two sections of conveyor belting
- 901 conveyor belts should utilize three sections of conveyor belting
- 1801 conveyor belts should utilize five sections of conveyor belting

Each section of conveyor belting should be less than 40 degrees in order to keep the warp in the running direction of the curve/turn. By exception, some fabric constructions in conveyor belting are similar in both the warp (length) and weft (width). If so, the curve/turn belts can be manufactured in larger sections - check with your belt manufacturer to confirm the structure and properties of the fabric plies relative to curve/turn belts. **Monofilament polyester fabric belting should not be used for curve/turn belts. The fabric, while flexible in one direction, is rigid in the other direction and curve/turn belts require flexibility in both directions.**

The joints of each section can be manufactured with a step lap, finger splice, overlapping finger splice, and/or mechanical fasteners. When step laps are used, the laps should be consistent regarding direction of travel. **When selecting a mechanical fastener, avoid using types which are rigid widthwise.** In most cases, the dimensions of a curve belt are from pin to pin or joint to joint.

What Dimensions are critical to a curve/turn belt?

The inside radius (R_2), outside radius (R_1) and belt width are vital dimensions. In addition, the lengths of the inner and outer curve can be important for ensuring precision in the curve. This can be measured on the curve (inner and outer) or measured from inner edge to inner edge and outer edge to outer edge.



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Belt for 451 Conveyor	Belt for 901 Conveyor	Belt for 1801 Conveyor

Are there any preferred or suggested methods of measuring and cutting belt curves/turns?

It is **not** advisable to use a used belt as the sole template for a new belt. A used belt is often a slight distortion from the specific dimensions required of a new belt due to stretch, shrinkage, etc.

One method of making a curve belt is by first producing a template from paper, cardboard, wood, metal, or remnant belting. In this manner, the template can be retained for future reference or use.

In order to produce a template or a finished belt, it is useful to make a device/fixture that resembles a protractor - with an axis on one end and a knife blade on the other end. Ideally, the knife blade within the device should be adjustable so that it can be moved closer or more distant to the axis. This allows the device to be versatile and an effective tool for a variety of belt curve requirements.

Another alternative is to produce a print, sketch, or drawing on a transparency that can be used with an overhead projector. The projector, aided by a mirror, can project the curve on the belt material laying on a table or floor. The projector can enlarge or shrink the drawing until the exact image is displayed. Now the material can be cut with a utility knife or rotary knife.

Finally, the dimensions of the curve belt can be measured and drawn on the belt material and cut with a utility knife or rotary knife.

To ensure success, it is very important to obtain complete dimensional requirements from the customer--with a strong preference toward a print, sketch or drawing.