

Transverse contraction due to elongation at fitting

When tensioning conveyor and processing belts (elongation at fitting and retensioning) the belt material loses width and thickness. Transverse contraction occurs, which accounts for about 30% of the elongation figure lengthways. In other words, with elongation at fitting of 1%, the belt loses approx. 0.3% of its width. The exact values are available on request.

$$\text{Transverse contraction [mm]} = \frac{\text{EF} \times 0.3 \times \text{W}}{100}$$

EF = Elongation at fitting [%]
0.3 = Transverse contraction figure
W = Belt width not elongated [mm]

Example

$$9 = \frac{1.5 \times 0.3 \times 2000}{100}$$

EF = 1.5%
0.3 = Transverse contraction figure
W = 2000 mm

Transverse contraction must be taken into account, particularly when the sizes of a belt have to correspond relatively accurately with those of the conveyor (perpendicular to conveying direction). This could be the case where there are perforations, sidewalls and longitudinal profiles.

Example: Perforated belts in vacuum suction conveyors

Together with the belt width, the center distances of the perforations decrease due to transverse contraction. If the rows of perforations in the belt have been made to align with the centers of the suction channels, they will no longer be centered over them once the belt has been tensioned. Particularly in the case of perforations with small diameters and when faults with manufacturing tolerances are added when making the perforations (± 1 mm), the suction cross section can decrease until it no longer works properly (fig. 1).

Therefore, when making the perforations, the center distances of the perforations must be increased perpendicular to the direction conveyed in so that transverse contraction is compensated for (fig. 2). The centers of the rows of perforations and the suction channels will then match after tensioning the belt (fig. 3).

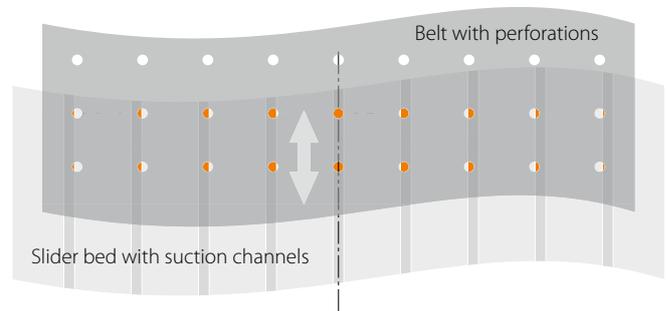


Fig. 1: Decreased suction cross section due to transverse contraction

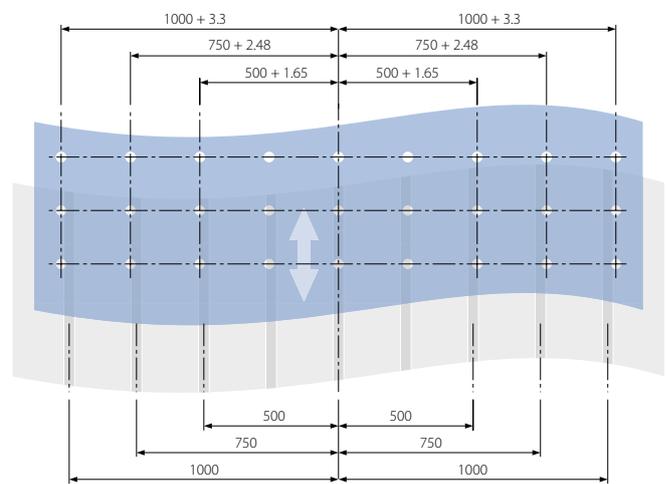


Fig. 2: Increase in the perforations' center distances during production (sizes serve as examples)

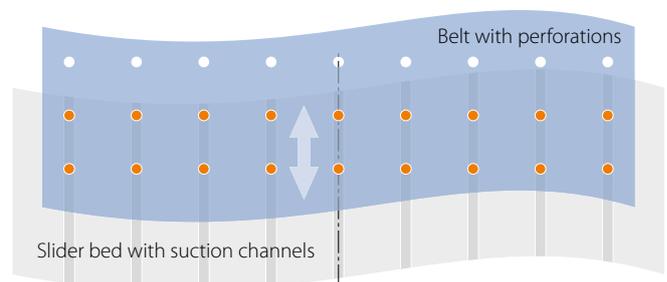


Fig. 3: Optimum suction cross section after belt tensioning because transverse contraction has been taken into account beforehand