

IPCO shot peening of deformed press belts

Press belts in double belt presses have a tendency to deform into a convex shape in relation to belt supports such as press and heating plates and roller chains.

The wear on the belt where it touches these supports induces compression stresses to the back of the belt. In addition, foreign particles of various types can enter between the back of the belt and the supports, causing impressions and wear on the press belt. To find a balance in the stress pattern and elongation, the belt deforms and acquires a concave shape on the product side (the edges lift and induce so-called troughing).

A deformed belt has the following disadvantages:

- Unequal pressure is applied to the product
- Tracking problems are caused in the press
- Belt is exposed to unnecessarily high stresses
- Risk of accidental damage to belt edge increases

A common solution to this problem used to be to turn the belt. What was previously the back of the belt became the product side and the belt became flatter after turning because of an equalization of the stresses on the two sides.

However, the belt would continue to change its shape, eventually acquiring the same deformed shape as before, but in the 'opposite direction'. As a result, belts would often need turning again within a year.

Time-consuming and costly, this method involved cutting the belt, dismantling it from the press, turning, remounting and re-joining it (including welding and grinding) and running-in. A one-week stoppage was not uncommon and all these operations also required equipment for handling as well as welding-jigs and skilled personnel for the joint-welding.

One of the big press manufacturers therefore approached IPCO for an alternative solution.

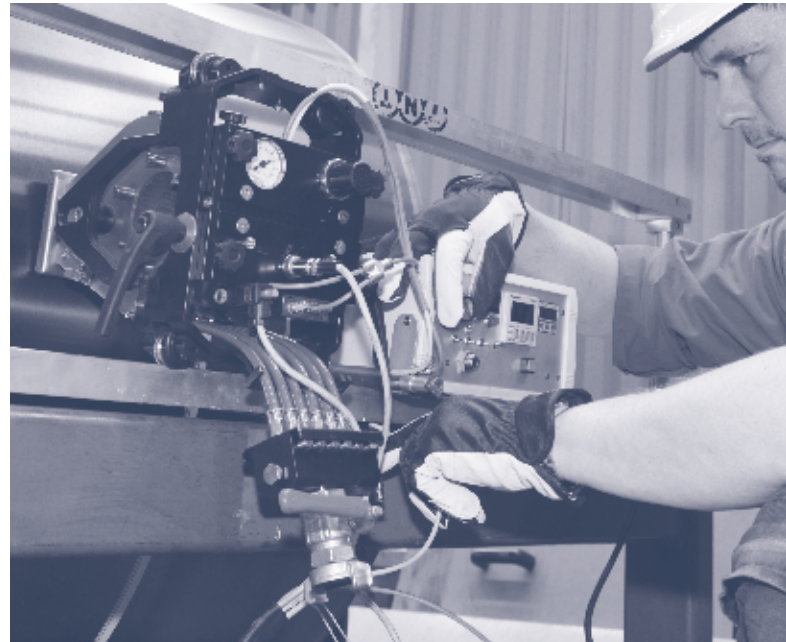
Following examinations of turned belts at IPCO Materials Technology Research Center, trials began and it was shown that deformed belts could be flattened by means of shot peening; the compression stresses on the back of the belt could be balanced by introducing similar stresses to the other side.

The next step was to develop equipment which could be taken to plants and employed without interrupting production.

The result was the IPCO portable shot peening unit. A blasting head travels across the belt at one terminal drum – while the press is still running – and 'shoots' special balls at high pressure across the width of the belt. Air pressure, belt speed and the type of balls can be varied to achieve the best result.

This technique provides a number of clear advantages:

- No costly dismantling of belts.
- No need for tricky joint welding and running-in procedures.
- No plant stoppage: no loss of production.
- Fast and effective: 6–24 hours per belt once the unit has been mounted (depending on belt length, width and degree of deformation).
- Process can be repeated during the life time of the belt.



Mounted shot peening in rail.

Installation of the shot peening unit at a plant involves building a simple frame to fit a rail which guides the shot peener heads across the width of the belt. This frame can be stored and used again on the next occasion.

There is also a need for air pressure. This is rarely if ever a problem as most plants have their own air pressure supplies with suitable pressure (6,0 bar, 500 l/min free of oil and water); if not, compressors can be hired in.

The experience gained so far is extremely positive. Press belts of virtually every kind, in every part of the world have been successfully flattened using the IPCO shot peening technique and equipment.