INSIGHTS™
Belt Conveyor Maintenance
TECHNICAL SOLUTIONS FOR BELT CONVEYOR PRODUCTIVITY

Required Splice Pressure is Dependent Upon Press Design

The quality of your endless splice depends on the combination of three factors: temperature, pressure, and dwell time. Finding the right balance, or combination, is critical for a superior splice.

Ideally, your splice parameters are set based on the correct temperature needed to bring the plastic up to the melt point where the polymers will flow, the proper amount of pressure to force the molten material to flow evenly through the fingers, and the required amount of time for this process to take place. While increasing any of these factors results in needing to reduce another one, selecting the proper temperature is the most important.

Some operators will set temperatures too low and therefore have to increase pressure and dwell time. They also often make the assumption that known splice parameters can be used on different press constructions without modifications.

Let's take a closer look at pressure settings. Presses are constructed with air bladders, which when inflated, will apply pressure to the belt. But a common misconception is that the amount of air pressure in the bladder is equal to the amount of pressure on the belt. This isn't, in fact, true. The air pressure in the bladder is converted into a force and applied to a splice platen. The amount of that force is dependent on how much of the surface area of the bladder is in contact with the back of the splice platen. That force is converted back into pressure when the splice platen makes contact with the belt.

Aside from this conversion, there are many other factors that affect the amount of pressure on the belt.

Splice Plate Surface Area

The surface area of the belt side of the splice plate is much larger than the surface area of the actual bladder that is in contact with the back of the splice plate. Because of this, the pressure applied to the belt is proportionally reduced.

Example (using flat bladder):

- Bladder Air Pressure = 20 psi
- Bladder to Splice Plate Surface Area – 4 x 25 in = 100 in2
- Resulting force applied to splice platen – 20 psi x 100 in = 2,000 lbs. of force

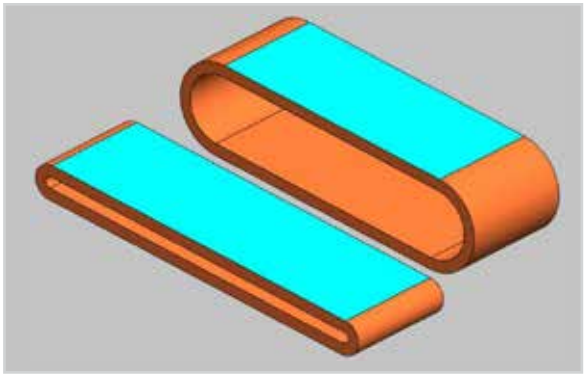
Since splice plate surface area is larger than the bladder surface area, the force applied by the bladder is distributed over a much larger area, further reducing the amount of pressure applied.

- Force applied to splice plate = 2,000 lbs.
- Splice plate surface area - 8 x 28 in= 224 in^2
- Resulting pressure applied to the belt – 2,000 lbs. / 224 in = 8.93 psi

So, the belt pressure is only 45 percent of the air pressure contained in the bladder.

Design of Bladder

The design of the bladder also makes a difference. As the press deflects, bladders round out, reducing contact with the splice plates. A rounded bladder, which is popular in many splice presses, features a reduced surface area when in contact with the belt, which means less pressure is applied to the belt.



Example (using rounded bladder):

- Bladder air pressure = 20 psi
- Rounded bladder-to-splice plate surface area – 3 x 25 in = 75 in^2
- Resulting force applied to splice platen – 20 psi x 75 in = 1,500 lbs. of force
- Splice plate surface area – 8 x 28 in = 224 in^2
- Resulting pressure applied to the belt – 1,500 lbs. / 224 in = 6.70 psi

This example shows that the pressure for a rounded bladder is 33.5% of the bladder air pressure at 20 psi, and 25% less than the pressure of a flat bladder.

Press design

Not all presses are designed the same. Some presses use two bladders and some use one. A single, large bladder that focuses pressure near the center of the splice on some presses results in an improved butt splice.
Two smaller bladders are used on other presses to focus more pressure near the outside of the splice, where pressure is needed at the tips of the fingers. This results in an improved step splice and finger splice.

INSIGHTS™

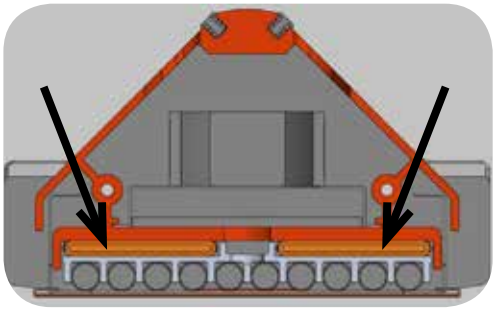
Solutions from Flexco

Novitool® Aero® Splice Press

The Aero® Press is ideal for splicing lightweight, thermoplastic belting. With cycle times as short as 8 minutes, the Aero allows your belt to be up and running fast, helping you minimize downtime and maximize productivity.

- The dual, flat air bladder design of the Aero Press exerts pressure evenly near the fingertips.
- Wide Effective Heat Zone of 150 mm allows for easy positioning of the splice within the press.
- Ability to set independent temperatures of top and bottom heating elements to ensure optimal splice.
- The proprietary Flexco Aero Recipe Management Tool makes it easy to import, create, or modify recipes. Recipes can then be exported from the tool and transferred to your press via a USB flash drive. Users with multiple presses can quickly load the same set of recipes to all of their equipment.

Aero® Ordering Information			
Belt Width		Ordering Number	Item Code
in	mm		
24	625	AERO-625	09000
36	925	AERO-925	09001
48	1225	AERO-1225	09002
60	1525	AERO-1525	09003
72	1835	AERO-1835	09004
84	2135	AERO-2135	09005



Dual, flat bladder design

Other Endless Splicing Tools from Flexco

Novitool® Pun M™ Mobile Finger Punch

The Pun M™ is designed to effortlessly punch fingers into PU and PVC conveyor belts in preparation for installing endless splices.

Novitool® Ply 130™ Ply Separator

The Ply 130™ is used to separate plies of a conveyor belt in preparation before splicing a belt with a splice press. The Ply 130 can precisely separate as deep as 5" (130 mm) in one action.

CE

Aero® Splice Press Patent number: US 9,090,022 B1 and other Patents Pending

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