

GET THE FACTS

About Mechanical Belt Fasteners

Strength, longevity and easy installation make them
a smart option for heavy-duty belt conveyor operations.



Partners in Productivity

Mechanical Belt Fasteners Or Vulcanization?

No matter what you're moving, minimizing downtime and maximizing output are always top priorities — and they can be significantly affected by the way you splice your belts.



Most belt conveyor operations rely on one or both common methods of splicing:

- *Mechanical Belt Fastening: the process of joining belt ends by metal hinges or plates*
- *Vulcanization: the process of joining belt ends through heat and/or chemicals*



Hot vulcanized splices are cured in a vulcanizing press over time and under pressure.



When it comes to choosing a splicing method, there are a lot of factors to consider — from the thickness of your belt and its operating tension to the temperature and moisture levels in your environment. Vulcanization, for example, tends to work best when you have:

- > ***A clean belt that's free of contaminating agents, such as oil and sand***
- > ***A belt that is compatible with adhesives***
- > ***A trusted, certified vulcanizer to perform the procedure***
- > ***Optimal temperature, environmental conditions, and humidity levels***
- > ***Easy access to the splice area and plenty of room to work***

The quality of the belt and the amount of wear it exhibits are also important when vulcanizing. A worn belt doesn't always cure evenly, which can result in a weaker splice.

If you have to splice under less-than-ideal conditions, mechanical belt fasteners can be a smart alternative — one that can have a big impact on your overall productivity.



Aggregate/Sand & Gravel



Cement



Underground Mining



Bulk Material Handling



Above Ground Mining

Vulcanization: Some Common Misconceptions

Every splicing method has its limitations, and vulcanizing is no exception. That's why it's essential to get the facts before you decide how to splice.



Misconception:
All belts can be vulcanized.

Not true. Old and/or worn fabric belts are not well-suited to vulcanizing because the layers are weaker and will become brittle when heat is applied. In addition, older rubber belts are also poor candidates for vulcanizing, as the bondable properties of rubber deteriorate over time. Finally, vulcanizing requires additional belt length, so operations with little take-up simply may not have enough belt to work with.



Misconception:
It's easy to make a good vulcanized splice.

Actually, vulcanizing is a complex process with a substantial chance of error. It takes specialized tools, a skilled professional who knows the proper temperatures and pressures to use, and the appropriate amounts of adhesives when applying the chemical bonding materials. In addition, the adhesives used in the chemical bonding process must be stored at the appropriate temperature levels in order to create a strong bond.

Misconception:
Vulcanization doesn't mean a lot of downtime.

In fact, vulcanization requires you to shut down your belt for a substantial amount of time — much longer than mechanical splicing would. At minimum, a properly vulcanized splice requires several hours for the chemicals to cure, but you're also at the mercy of your vulcanizer's schedule.



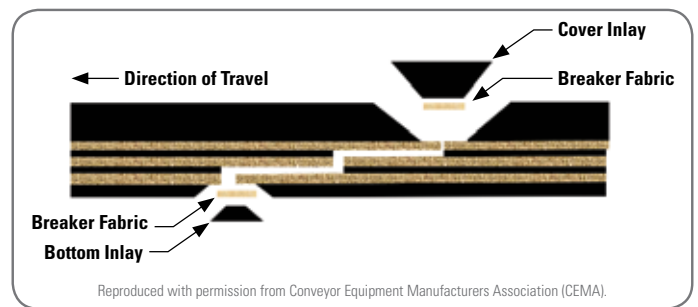
Misconception:
Vulcanization doesn't compromise belt strength.

Not true. Vulcanizing actually robs your belt of an entire ply of strength — even more if it's not done properly.



Misconception:
You can vulcanize anytime, anywhere.

Only clean, dry, and relatively warm conditions are suitable for vulcanizing. Chemical residue, excessive moisture, and cold can interfere with the curing of the adhesives and cause air pockets. These, in turn, weaken the strength of the splice. In addition, vulcanizing can be extremely difficult in areas that aren't easily accessible.



STANDARD STEP SPLICE	BELT STRENGTH LOSS
4 Ply Belt	25%
3 Ply Belt	33%
2 Ply Belt	50%

Misconception:
Inspecting a vulcanized splice is easy.

In reality, the early signs of adhesion breakdown are nearly invisible to the naked eye. Often, operators aren't even aware that a splice is experiencing problems until it fails — a catastrophic event that requires the immediate shut down of the line.

Mechanical Belt Fasteners: Real Benefits For Your System

Mechanical belt fasteners combine surprising strength and durability with affordability and easy installation. That makes them a smart option when your priority is saving time and money.

Fact: Mechanical fasteners are easy to install, which helps reduce downtime.

Most mechanical fasteners can be installed in an hour or less, using only your on-site crew. Plus, Flexco offers a complete line of portable, time-saving installation tools to make mechanical splicing even more efficient.



Fact: Mechanical fasteners can be installed under virtually any conditions.

Unlike vulcanization, mechanical fasteners are not affected by temperature, dirt, or humidity levels, so they're ideal for harsh environments.



Fact: Mechanical fasteners are compatible with almost any type of belt.

In addition to extendable, high stretch and worn belts, mechanical fasteners work with:

- Rubber plied belting
- Straight warp belting
- PVC solid woven belting

They're also suitable for both temporary and permanent splices.

Fact: With mechanical fasteners, maintenance can be anticipated and scheduled.

Because mechanical fasteners can be visually inspected, it's simple to monitor splice performance and strength. This not only lets you avoid sudden splice failures, but allows you to schedule maintenance and repairs for the most convenient times.

Fact: Mechanical fasteners are incredibly strong and durable.

Flexco manufactures fasteners that have been specially engineered to withstand extremely heavy loads and high belt tensions. In fact, we have fastening systems that deliver consistent, long-lasting performance at up to 350 kN/m (2000 P.I.W.) of tension.

HOW DO MECHANICAL FASTENERS WORK?

The way belts are manufactured has evolved over the years — and so have mechanical belt fasteners. Because today's belts tend to be thinner and made of synthetic materials, Flexco has designed fasteners with lower profiles that grip almost any belt carcass.

Our fasteners achieve their holding power through a combination of compression and penetration. They feature plates that apply firm, even pressure to top covers. Some systems, like our rivet-based fasteners, are able to penetrate the belt without damaging carcass fibers. They literally “push” the fibers aside, passing between them to embed the fastener in the belt. Testing has shown that, with the right fastener, mechanical splices can withstand tensions of up to 350 kN/m (2000 P.I.W.). Just be sure to check the mechanical fastener rating of your belt before splicing — that way, you can be sure you've chosen a fastener that is compatible with the belt's rating.

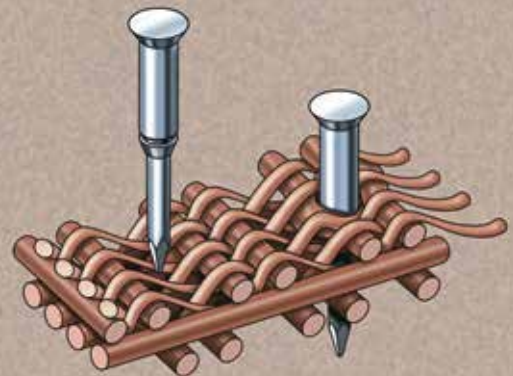
Fact: Mechanical fasteners are compatible with other belt products.

Flexco fasteners feature a coined or “scalloped” edge, allowing them to interface seamlessly with belt cleaners, pulley lagging, and other conveyor components. Our fasteners can also be countersunk to create a completely smooth splice. In addition, we offer a complete line of belt cleaners that offer multiple points of relief so they maintain maximum contact with the belt — and still pass easily over mechanical splices.



Fact: Mechanical fasteners come in an extensive array of sizes, configurations, and materials.

Flexco offers both solid plate and hinged fasteners in everything from steel to rust-resistant alloys. Even our hinge pins come in a variety of materials to ensure they deliver the performance you need.



A Complete Line of Heavy-Duty Fasteners

Exclusively from Flexco

Our extensive line of heavy-duty mechanical belt fasteners includes both solid plate and hinged designs. Solid plate fasteners are specifically engineered to stand up to the toughest loads. They eliminate sifting, while delivering high tensile strength. Our hinged fasteners are well-suited for surface and underground mining, as well as applications with smaller pulleys, like those in construction equipment or road machinery.

Flexco® BR™ Rivet Solid Plate

Features:

- Multi-point rivet attachments that pass between the belt's carcass fibers to ensure maximum grip
- Smooth, coin-edged profile that eliminates hang-ups
- Incredible wear and longevity
- For belts with mechanical fastener ratings from 70 to 140 kN/m (400 to 800 P.I.W.) and minimum pulley diameters from 350 – 900 mm (14" – 36")

Materials:

- Steel, Stainless Steel, MegAlloy®, Everdur

Recommended for:

- High-tension applications in sand and gravel, hard-rock mining, and cement, with a belt thickness from 6 – 24 mm (1/4" – 15/16")

Installation:

- MBRTA Tool – For driving up to five rivets simultaneously; holds the belt, fastener strip, and guide block securely in place for safe, easy installation



Flexco® SR™ Rivet Hinged

Features:

- Hinged mechanical belt fastener with self-setting rivets
- Low-profile, Scalloped Edge™ design that reduces hang-ups on cleaners, pulleys, etc.
- Durable, long lasting, and easy to install
- For belts with mechanical fastener ratings from 60 to 350 kN/m (330 to 2000 P.I.W.) and minimum pulley diameters from 125 – 1050 mm (5" – 42")

Materials:

- Steel, Stainless Steel, RustAlloy®, MegAlloy®

Recommended for:

- Underground mining, asphalt plants, log belts, and other demanding applications, with a belt thickness from 3 – 25 mm (1/8" – 1")

Installation:

- SRTA Tool – For single-rivet driving; includes an anvil plate and driver to properly position each rivet
- MSRT Tool – For driving up to five rivets simultaneously; holds the belt, fastener strip, and the guide block in place for safe, easy installation



Power Rivet Drivers: To make installation of mechanical rivet fasteners quicker and easier, we also offer portable power tools. They not only reduce worker fatigue, but also ensure the creation of uniform splices, every time.



Electric Powered Rivet Driver

Features:

- Portable, electric-powered tool
- Adjustable settings that can be used with multiple rivet sizes
- Works with standard MSRT and MBRTA guide blocks to ensure proper rivet placement



Air Powered Rivet Driver

Features:

- Portable, air-powered tool
- Works with standard MSRT and MBRTA guide blocks to ensure proper rivet placement
- Required air pressure 90 PSI



Hilti DX 460-SR Powder Actuated Tool

Features:

- Fully-automatic, .27 caliber, powder-actuated tool
- Works with Flexco steel guide blocks and MSRT application tools
- Purchase the Hilti DX 460-SR from Hilti Mining
- MSHA approved for underground gassy mines

NOTE: Contact Flexco for other belt shop applications.

Flexco® Bolt Solid Plate

Features:

- Sift-free splice with superior hold
- Ideal for high-tension, main-haulage belts
- Available with rubber covered top plates for increased impact protection and compatibility with belt cleaners
- For belts with mechanical fastener ratings from 30 to 105 kN/m (150 to 620 P.I.W.) and minimum pulley diameters from 300 – 1200 mm (12" – 48")

Materials:

- Steel, Stainless Steel, MegAlloy®, Everdur, Rubber Covered Top Plates

Recommended for:

- Sand, gravel, crushed stone, and cement, with a belt thickness from 5 – 30 mm (3/16" – 1-3/16")

Installation:

- Belt Punches, Boring Bits, and Templets – Speed installation by helping to correctly position and create bolt holes



Flexco® Staple

Features:

- Machine-applied, narrow-looped staple splice
- Patented built-in belt stops that ensure accurate installation
- Beveled edges and deep, recessed staple pockets that create a smooth profile
- For belts with mechanical fastener ratings of up to 140 kN/m (800 P.I.W.) and minimum pulley diameters of 225 – 300 mm (9" – 12")

Materials:

- Steel, Stainless Steel

Recommended for:

- Mining operations that prefer a machine-applied, narrow-looped staple splice

Installation:

- FST Tool – Portable tool that ensures correct placement and finished profile; sets two staple legs simultaneously



Flexco® Bolt Hinged

Features:

- Compression fasteners with high tensile strength bolts
- Strong, dependable, and easy to install
- For belts with mechanical fastener ratings from 33 to 52 kN/m (190 to 300 P.I.W.) and minimum pulley diameters from 150 – 225 mm (6" – 9")

Materials:

- Steel, Stainless Steel, MegAlloy®, Everdur

Recommended for:

- Belts with frequent belt-length alterations or smaller pulleys, with a belt thickness from 6 – 22 mm (1/4" – 7/8")

Installation:

- Belt Punches, Boring Bits, and Templets – Speed installation by helping to correctly position and create bolt holes



	Flexco® BR™ Rivet Solid Plate	Flexco® SR™ Rivet Hinged	Flexco® Bolt Solid Plate	Flexco® Bolt Hinged	Flexco® Staple
Quick Installation and Minimal Downtime	****	*****	**	**	***
Impact Resistance	****	****	*****	****	****
Abrasion Resistance	*****	***	*****	***	**
Fastener / Cleaner Compatibility	*****	****	***	**	****
Overall Splice Strength	*****	*****	**	*	***
Non-Magnetic	***	***	***	*****	***
Small Pulley Diameters	***	*****	**	*****	*****
Inexpensive Splice	***	**	*****	*****	****
Inexpensive Installation Tooling	**	**	*****	*****	*

Belt Maintenance Tools With Built-In Safeguards

Flexco makes mechanical splicing safer and easier

At Flexco, we know that even routine belt maintenance carries the risk of injury for your crew. So we've developed an exclusive line of tools with built-in safety features to protect against on-the-job injuries. It's part of our commitment to giving your workers the resources they need to be safe and productive.

Flex-Lifter™ Conveyor Belt Lifter

Features:

- Easily and safely lifts a tensioned belt up to the stated ratings
- Wide, dual-rail base to maintain unit stability
- Optimized lift height to provide sufficient room to make repairs safely



Electric Belt Cutter

Features:

- Available in two sizes
- The EBC1 allows for cuts up to 25 mm (1") thick while the EBC2 provides for a thicker cut up to 50 mm (2")
- Easily cuts all types of belting from the softest of natural rubbers to the hardest constructed solid woven PVC and fabric plied belts
- High speed, steel blade provides for a smooth, accurate cut and is protected by a spring loaded blade guard for enhanced worker safety
- Designed for cutting all belt widths, as well as for extended, longitudinal cuts



Far-Pul® HD® Belt Clamps

Features:

- Provides even clamping tension across entire belt width for safer belt maintenance
- Securely grips belts up to 25 mm (1") thick
- Adjusts easily for a variety of belt widths
- Special built-in retaining pins to ensure the clamps stay locked and securely in place



FSK™ Belt Skiver

Features:

- Lightweight, portable
- Accurate and adjustable cutting depth
- Blade safely enclosed during skiving operation
- For use on rubber covered belts with top covers of 1.5 – 10 mm (3/16" – 3/8")



900 Series* Belt Cutter

Features:

- Safely and accurately cuts belts up to 38 mm (1-1/2") thick
- Blade is guided at the top to ensure perpendicular cuts
- Single-sided clamp reduces operator cutting effort



* Patent Pending

Maximize Your Productivity With Mechanical Belt Fasteners

Incorporating mechanical belt fasteners into your splicing routine can have big benefits for your output and your bottom line.

Flexco offers an extensive line of heavy-duty fasteners that can be installed quickly, using only your on-site crew — and that means less downtime and fewer costs for your operation. In addition, our fasteners have been engineered to work seamlessly with cleaners, lagging, and other belt products.

We also employ conveyor belt experts who can assess your system and recommend the right fasteners. With decades of industry experience, they're uniquely qualified to help you find ways of getting more out of your system.

No matter how you choose to splice, make sure to take necessary precautions to protect your crew. And when you're ready to learn more about mechanical belt fasteners, contact your partners in productivity at Flexco.

Flexco Mechanical Belt Fastening Systems



BR™ Rivet Solid Plate



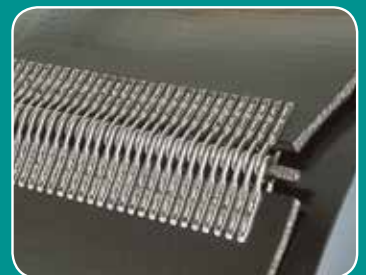
SR™ Rivet Hinged



Bolt Solid Plate



Bolt Hinged



Flexco® Staple

MAXIMIZE YOUR OPERATION'S PERFORMANCE WITH FLEXCO



Visit our website or contact your local distributor to learn more.

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