EF100M

Splicing and Conveyor Solutions

Welcome to Flexco

Your worldwide resource for belt conveyor maintenance solutions.

Now it is easy to turn to a single source for the help you need to maximize belt conveyor uptime, productivity and safety. From coal mines to grocery stores, companies turn to Flexco for the most complete selections of belt conveyor maintenance solutions in the industry.

Turn to us for the genuine Flexco products and tools you need to splice belts of almost any size and capacity. Turn to us for simple and effective remedies for belt slippage or conveyor spillage. Need belt cleaning solutions tailored to the special needs of your operation? Or a permanent, easy-to-install remedy for belt mistracking problems? Flexco is the source you can confidently rely on for a broad range of solutions like these, as well as unsurpassed product support.

Flexible Steel Lacing Company

A worldwide resource

From product selection and installation to troubleshooting, turn to Flexco and Flexco distributors for fast response to your day-to-day and emergency needs. Rely on us for expertise in all facets of belt conveyor maintenance and support.

Flexco products are available through a select, worldwide network of qualified belting and industrial supply distributors. This means we can back our customers with reliable support from locations around the globe.

Catalogs tailored to your application needs

Detailed product catalogs tailored to your specific application are now available. Featuring such trusted brand names as Flexco,® Alligator,® Eliminator,® and Tatch-A-Cleat,® these catalogs include:

- Heavy-Duty Applications
- Underground Mining Applications
- Belt Cleaners
- Belt Conveyor Products
- Pulley Lagging
- Light-Duty Applications
- Belt Cleats

To request a catalog, use the order form found on our Web site at **www.flexco.com**. Or contact us at **+1-630-971-0150**, or via fax at **+1-630-971-1180**.

www.flexco.com

For up-to-the-minute information on products, applications, and distributors – as well as late-breaking news and product bulletins – visit our Web site. You'll find links to:

- Products
- Specification Guidelines
- Technical Support
- Application Stories
- Frequently Asked Questions (FAQs)
- Product Literature
- International Locations
- Global Sales & Distribution Facilities

You'll also find helpful links to other industry and trade association sites.

Splicing Solutions from Flexco

Around the world, the most respected name in belt conveyor solutions is Flexco. The reason is simple. Flexco belt splicing products have earned a reputation for quality and performance in the most demanding material handling applications on earth.

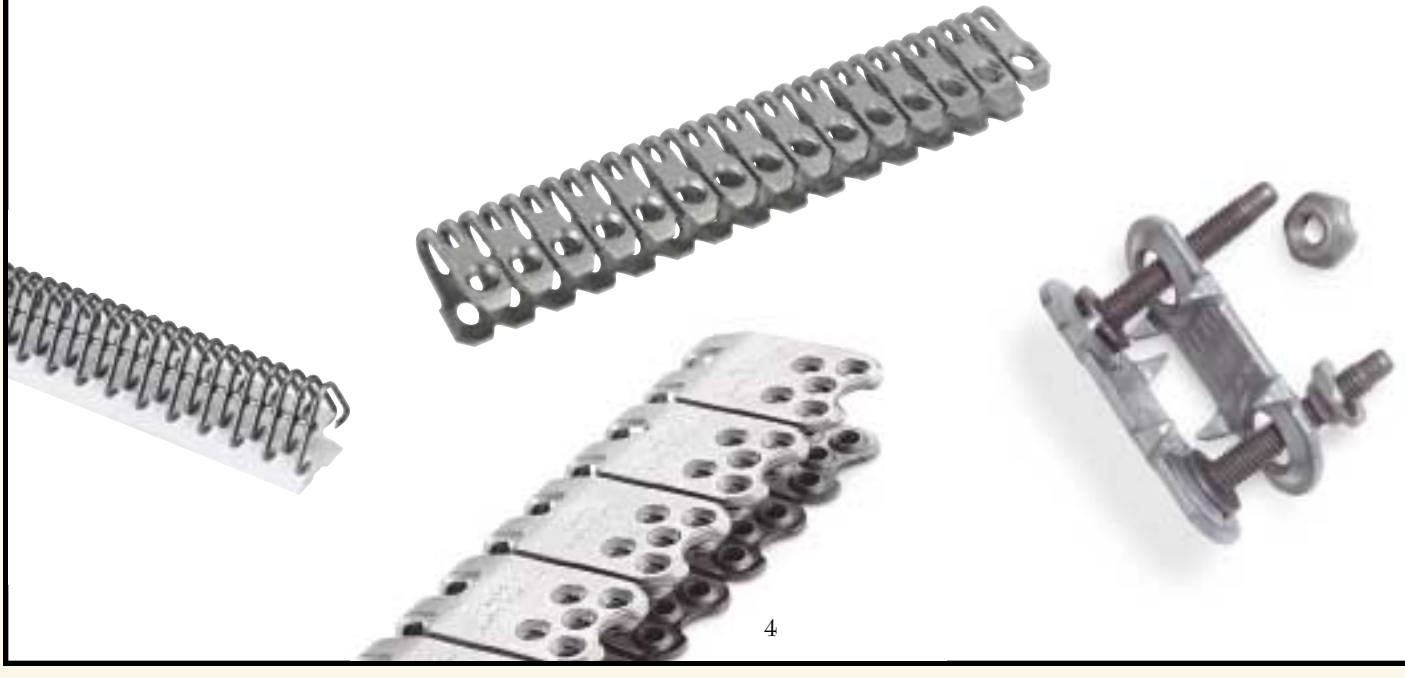
Our fasteners set the industry's highest standards for design, ease-of-use and reliability. Plus the knowledgeable advice and proven solutions we provide our customers help keep conveyor efficiency high and conveyor operation costs low.

The mechanical fastener advantage

Mechanical belt fasteners simplify conveyor belt maintenance. Mechanical fasteners can be installed faster and easier than vulcanized splices, resulting in less downtime and increased productivity. Plus, mechanical fasteners can be installed by your own maintenance crews, eliminating the need to rely on outside contractors.

Furthermore, some conveyor designs simply rule out vulcanizing as a legitimate fastening alternative. Use mechanical fasteners for:

- High-stretch belts when take-up capacity is exhausted.
- Applications requiring frequent belt removal for cleaning.
- Applications that cannot afford extended downtime.
- Belts requiring frequent length alterations.
- Conveyors not easily disassembled for belt installation.



Heavy-duty applications

• Coal • Mining • Aggregate • Steel Mills • Wood Processing

Newer synthetic belting fabrics are leading to increasing preference for mechanical fastener solutions for belt tensions up to 140 kN/m (800 P.I.W.). Older belt designs and carcass materials simply would not hold mechanical fasteners. As a result, vulcanization remained the only choice for many conveyor operators.

Now, the ability to accommodate higher tension ratings combines with the speed and simplicity of mechanical fastener installation. That means mechanical fasteners have become the standard wherever fast, dependable and economical belt repairs help companies maintain top productivity.

Light-duty applications

• Package & Baggage Handling • Assembly Lines • Food Processing
• Checkout Counters • Agricultural Equipment

Mechanical fasteners remain a clearly preferred alternative to vulcanization in light-duty applications. Improved fastener designs result in faster, simpler installation. And new non-metallic fasteners made with FDA-recognized materials expand fastener use throughout the food and pharmaceutical industries.

A choice of two fastener types

Hinged fastener systems

- Hinged fasteners can be separated in order to remove, extend or clean belts, simply by removing the hinge pin.
- Hinged fasteners can be spliced in the shop. This means only the hinge pin has to be inserted on site.
- If belts of slightly different thicknesses must be joined, this can be accomplished using hinged fasteners.

Solid plate fastener systems

- Ideal for larger pulley diameters requiring higher tension belt splicing.
- With no "working" movable parts, will generally deliver long, trouble-free service life.
- Helps eliminate sifting of fine materials between plates.
- Solid plate fasteners can be used successfully on elevator belts.

Mechanical Fasteners vs. Vulcanization

Fast and simple installation

The speed and simplicity of mechanical splice installation represent major advantages over the vulcanization process. Depending on belt width and thickness, most mechanical splices can be finished in less than one hour.

Compare that to vulcanized splices. Installation can take from four to six hours, and also require ideal temperature and humidity conditions. Also, worn belts and many older belts won't accept a vulcanized splice, making mechanical fasteners the only alternative. And of course, timely installation often depends on the availability of a qualified vulcanization contractor.

Only standard tools required

Mechanical splice installation is simple when compared to vulcanization. Maintenance crews can finish the job using only simple instructions and portable application tools, such as hammers, punches, wrenches, or lacers.

Hot vulcanization, on the other hand, requires large and heavy heating presses. What's more, special hand tools are required to split the belt plies and prepare the belt surface. Newer belt synthetics must also be carefully matched with vulcanizing solvents, cements, and compounds. These substances are highly toxic, have limited shelf life and can be hazardous to both health and the environment, so installers must possess a thorough knowledge of vulcanizing materials and adhesives.

Easy inspection

Because a mechanical splice is visible, any wear or deterioration is immediately apparent. Replacement or repairs can be scheduled during brief periods of downtime or at the end of a shift.

A deteriorating vulcanized splice, in comparison, is not easily detected. Catastrophic line failure can be the first indication of trouble once adhesion breakdown occurs inside a vulcanized splice.

Splice installation is faster and easier with mechanical fastener systems. Maintenance crews using simple, everyday tools can install a splice on-site in a fraction of the time required for vulcanization.

In addition to special heat presses, vulcanization requires a thorough knowledge of vulcanization solvents and other chemicals. It is also a time-consuming process.

Fastener Selection Guidelines

Identifying the correct fastener for your application is the first key to ensuring maximum splice life and performance. Our broad selection makes that easy. As the charts on the following pages indicate, Flexco manufactures fastener systems for applications of all types. Your local Flexco distributor will help you determine which system matches your application.

How to specify the right Flexco fastener

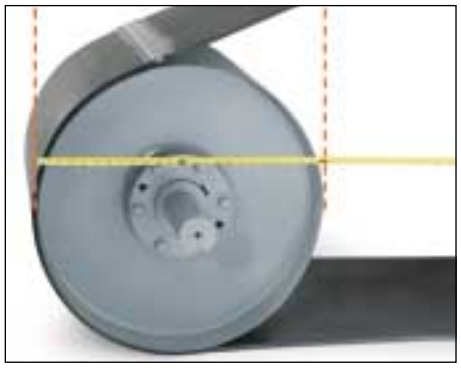
1. **Determine belt tension.**
   Most conveyor belting has a mechanical fastener rating. Care should be taken not to operate the belting or fasteners beyond their recommended ratings.

2. **Measure belt thickness.**
   If fasteners are to be countersunk, measure the belt thickness after a portion of the belt cover has been removed. Choose a fastener size which corresponds to belt thickness.

3. **Measure the diameter of the smallest pulley in your drive.**
   For tail or take-up of the self-cleaning "wing" type pulley, 25% larger diameter than dimensions described on pages eight and nine are generally required. Only consider pulleys over which the belt makes at least a 90° wrap.

4. **Choose the fastener size that is appropriate for your specifications.**
   Consult individual Flexco application catalogs to guide your selection.

5. **Hinged or solid plate?**
   When either style is appropriate, solid plate styles are preferred for longer life and to prevent sifting. Hinged fasteners are preferred on portable conveyors and on conveyors with smaller pulley diameters.



Belt Fastener Selection Guide

	HEAVY-DUTY APPLICATIONS			UNDERGROUND MINING APPLICATIONS		
	FLEXCO® BOLT SOLID PLATE	**FLEXCO® RIVET SOLID PLATE**	**FLEXCO® BOLT HINGED**	**FLEXCO® R2**	**FLEXCO® RIVET HINGED**	**FLEXCO® F-SERIES** *(Not available in Continental Europe)*
Market Applications	Higher-tension, main-haulage belts used in coal, hard-rock mining, foundries, grain elevators, aggregate plants, and steel mills.	Heavy-duty conveyor and elevator belts commonly used for handling sand, gravel, crushed stone, grain, coal, cement, and salt.	Construction and road equipment, coal, salt, and potash mines, stacking and stock-piling belts, and other applications involving smaller pulleys.	Underground mining, moveable construction machinery, wood processing, and other medium-duty applications.	Underground mining, construction equipment with smaller pulleys, asphalt plants, log belts, and similar applications.	Underground mining applications that require mechanical machine-installed splices.
						
						
Recommended Maximum Operation Tension	For belts with mechanical fastener ratings up to 105 kN/m (620 P.I.W.)	For belts with mechanical fastener ratings up to 140 kN/m (800 P.I.W.)	For belts with mechanical fastener ratings up to 70 kN/m (400 P.I.W.)	For belts with mechanical fastener ratings up to 60 kN/m (330 P.I.W.)	For belts with mechanical fastener ratings up to 140 kN/m (800 P.I.W.)	For belts with mechanical fastener ratings up to 140 kN/m (800 P.I.W.)
Belt Strength	For belt strengths up to 1000 N/mm	For belt strengths up to 1600 N/mm	For belt strengths up to 500 N/mm	For belt strengths up to 400 N/mm	For belt strengths up to 1250 N/mm	For belt strengths up to 1400 N/mm
Belt Thickness Range	5 mm – 30 mm (3/16" – 1 3/16")	6 mm – 24 mm (7/32" – 15/16")	6 mm – 22 mm (1/4" – 7/8")	3 mm – 10 mm (1/8" – 3/8")	6 mm – 18 mm (7/32" – 23/32")	6 mm – 14 mm (7/32" – 9/16")
Recommended Minimum Pulley Diameter*	300 mm and up (12" and up)	450 mm and up (18" and up)	150 mm and up (6" and up)	125 mm and up (5" and up)	225 mm and up (9" and up)	225 mm and up (9" and up)

*For operating tension of 75-100% of belt rating.

LIGHT-DUTY APPLICATIONS

ALLIGATOR® STAPLE	ALLIGATOR® LACING	ALLIGATOR® RIVET	ALLIGATOR® PLASTIC RIVET	SPIRAL LACE	WIRE HOOKS
Light- and medium-duty conveyor belts in package and baggage handling, cased goods, parts, food and agri-cultural products.	Manufacturing assembly lines, food, package and parts handling, checkout counters, and agricultural equipment.	Hay baling applications.	Applications requiring non-metallic fasteners. Airports, food, and pharmaceutical applications.	Applications requiring non-metallic fasteners such as food processing, baggage handling, and x-ray equipment at airports.	Packaging/parts/ baggage handling, food processing, checkout counters, laundries, filter media, and agricultural applications.
					
For belts with mechanical fastener ratings up to 35 kN/m (200 P.I.W.)	For belts with mechanical fastener ratings up to 35 kN/m (200 P.I.W.)	For belts with mechanical fastener ratings up to 52 kN/m (300 P.I.W.)	For belts with mechanical fastener ratings up to 11 kN/m (65 P.I.W.)	For belts with mechanical fastener ratings up to 8,7 kN/m (50 P.I.W.)	For belts with mechanical fastener ratings up to 35 kN/m (200 P.I.W.)
For belt strengths up to 400 N/mm	For belt strengths up to 250 N/mm	For belt strengths up to 500 N/mm	For belt strengths up to 100 N/mm	For belt strengths up to 100 N/mm	For belt strengths up to 400 N/mm
1,5 mm – 6,4 mm (1/16" – 1/4")	1,6 mm – 13 mm (1/16" – 1/2")	3,2 mm – 5,6 mm (1/8" – 7/32")	2,4 mm – 3,2 mm (3/32" – 1/8")	1,0 mm – 5,0 mm (1/32" – 1/4")	1 mm – 10 mm (3/64" – 25/64")
50 mm and up (2" and up)	25 mm and up (1" and up)	88 mm and up (3 1/2" and up)	38 mm and up (1 1/2" and up)	10 mm and up (1/2" and up)	24 mm and up (15/16" and up)

Fastener Material Selection Guide

Flexco® Bolt Solid Plate

Flexco® Rivet Solid Plate

Flexco® Bolt Hinged

Flexco® Rivet Hinged

Alligator® Staple

Fastener metals

To maximize fastener service life, fastener material must be matched to the application. Flexco manufactures fasteners from a broad range of materials. Our selection makes it easy to specify fasteners that will deliver maximum performance in a variety of conditions – from wet and abrasive applications to highly corrosive environments. The following information will help you match fasteners to available fastener materials.

Steel: For most applications, plated steel is the standard fastener material. Plating helps combat mild corrosion.

Note: The steel used for Flexco® Bolt Solid Plate fasteners is not plated.

RustAlloy®: To resist corrosion due to mine water exposure or other chemical attack, RustAlloy is an excellent choice. It is a low-chrome stainless steel alloy available in the SR™ Hinged Rivet system.

Promal: Fasteners made from Promal are heat-treated, malleable castings. Top plates are manufactured from cast Promal and deliver abrasion resistance in corrosive environments such as coke and sinter operations. Bottom plates are manufactured from steel. Available in select sizes in some fastener families.

Everdur: Copper and silicon alloy for use in grain elevators and other potentially explosive environments. Spark-free material compared to steel but fully non-magnetic. Also for belts with magnetic pulleys or separators.

MegAlloy®: Features superior resistance to wear and abrasion. Provides several times the service life of steel. Not recommended where impact or corrosion is a problem. Available in select sizes in some fastener families.

Stainless Steel: 300 Series stainless steel, available in selected sizes, provides extra resistance to abrasion, magnetic attraction, and corrosion from acids and other chemicals.

Alligator® Lacing

Alligator® Rivet

Wire Hook

Spiral Lace

Alligator® Plastic

Product Selection Overview

Fastener Material:	Abrasion Resistance	Chemical Resistance	Rust Resistance	Magnetic	Spark-Free	Flexco® Bolt Solid Plate	Flexco® Rivet Solid Plate	Flexco® Bolt Hinged	Flexco® Rivet Hinged	Alligator® Staple	Alligator® Lacing	Alligator® Rivet	Wire Hook	Spiral Lace	Alligator® Plastic
	CHARACTERISTICS					AVAILABILITY									
Galvanized Steel	Good	Poor	Fair	Yes	No	●	●	●	●	●	●		●		
400 Series Stainless Steel	Good	Fair to Good	Good	Yes	No		●						●		
300 Series Stainless Steel	Good	Good to Excellent	Excellent	No	No	●		●	●	●	●	●	●		
MegAlloy®	Excellent	Poor	Poor	Yes	No	●	●	●		●					
RustAlloy®	Good	Good	Good	Yes	No				●						
Everdur	Poor	Poor	Poor	No	Yes	●	●	●							
Promal	Excellent	Good	Good	Yes	No	●									
Rubber-Coated Steel	Good to Excellent	Poor	Poor	Yes	No	●									
High Tensile Steel	Good to Excellent	Fair	Good	Yes	No								●		
Rectangular High Tensile Steel	Excellent	Fair	Good	Yes	No								●		
Monel® 400	Fair	Excellent	Excellent	Slightly	No								●		
Inconel® 600	Fair	Excellent	Excellent	No	No								●		
Phosphor Bronze	Good	Poor	Good	No	Yes								●		
Hastelloy C-22	Good	Excellent	Excellent	No	No								●		
Black Oxide	Good	Poor	Fair	Yes	No								●		
Non-Metallic	Poor	Fair	N/A	No	Yes									●	●

Note: Please use as a quick-reference chart only.

Hinge Pin Material Selection Guide

Flexco® and Alligator® Hinge Pin Materials

	Abbreviation	Flexco® Bolt Hinged	Flexco® Rivet Hinged	Flexco® RAR6LP	Flexco® R2	Alligator® Staple	Alligator® Lacing	Alligator® Rivet
Nylon Covered Steel Cable 	NC	●	●		●	●		
Nylon Covered Stainless Steel Cable 	NCS	●	●		●	●		
Nylon Covered Armored Cable 	NAC	●	●	●	●			
Bare Steel Cable 	SC	●	●	●				
Bare Stainless Steel Cable 	SSC	●	●					
Bare Armored Cable 	AC	●	●	●	●			
Bare Armored Stainless Steel Cable 	ACS	●	●	●	●			
Nylon Covered Bronze Cable 	NB	●						
Steel Spring Wire	SP					●		
Stainless Steel Spring Wire	SS					●		●
Corrugated	H SH						● ●	 ●
Rocker 	RH SRH						● ●	

NC – Nylon Covered Steel Cable: *Nylon covering reduces corrosion and simplifies hinge pin insertion.*

NCS – Nylon Covered Stainless Steel Cable: *For greater corrosion resistance.*

NAC – Nylon Covered Armored Cable: *Combines a durable armored steel wrap with a nylon covering for smooth operation, and long service life.*

SC – Bare Steel Cable: *Recommended for abrasive or gritty material conveyance.*

SSC – Bare 300 Series Stainless Steel Cable: *For conditions where corrosion attacks steel pins.*

AC – Bare Armored Cable: *For extendible conveyors to accommodate easy pin extraction.*

ACS – Bare Armored Stainless Steel Cable: *The same advantages as bare armored cable plus corrosion resistance.*

NB – Nylon Covered Bronze Cable: *Fully non-magnetic hinge pin.*

SP – Steel Spring Wire: *For flat belt conveyors conveying abrasive or gritty materials.*

SS – Stainless Steel Spring Wire: *For use with stainless steel fasteners.*

H – Corrugated: *For all sizes of Alligator® belt lacing and smaller sizes of transmission belt lacing. Built-in lugs engage lacing loops and minimize pin migration. Available in steel (H) and stainless steel (SH).*

RH – Rocker: *For transmission belt lacing, the rocking action of two-piece pin reduces friction on loops and lacing. Available in steel (RH) and stainless steel (SRH).*

Connecting pins

Connecting pins are the vital link that, when combined with properly selected and installed hooks, completes the perfect splice. They are available in a wide range of sizes and application-matched materials.

Wire Hook Hinge Pin Materials and Characteristics	Abbreviation	Pin Wear Factor	Hook Wear Factor	Rigidity	Magnetic	Flexibility	Composition
Nylosteel	NY	Good	Good	Good	Yes	Good	Nylon and music wire
Nylostainless	NYS	Good	Good	Good	Slightly	Good	Nylon and 316SS spring wire
Nylon Covered Cable	NCS	Good	Good	Average	Slightly	Good	Nylon and 316SS cable
Cold-Rolled Steel	Smooth - SM	Average	Fair	Excellent	Yes	Fair to Poor	Mild cold-rolled steel
	Notched - N	Average	Fair	Excellent	Yes	Fair to Poor	Mild cold-rolled steel
Stainless Steel	Smooth - SMS	Average	Fair	Excellent	Slightly	Fair to Poor	302 or 316 stainless steel
	Notched - NS	Average	Fair	Excellent	Slightly	Fair to Poor	302 or 316 stainless steel
Duralink™	DL	Excellent	Excellent	Average	Slightly	Good	Wear-resistant nylon and 316SS spring cable
DuraStainless™	DSS	Excellent	Excellent	Good	Slightly	Good	Wear-resistant nylon and 316SS spring wire
Nylon Plus	NP	Good	Excellent	Fair	No	Excellent	Nylon

Skiving/Grooving the Belt Surface

In order to improve fastener/cleaner interface, and to "smooth out" encounters with skirt boards and return idlers, mechanical fasteners can be recessed into the belt surface. This requires removing material from the belt surface to accommodate the fastener – a process known as skiving or grooving. The tools below simplify this process.

Belt Skiver

The Flexco® FSK™ Belt Skiver is portable, lightweight and adjusts easily for various cutting depths.

The Flexco® Belt Groover allows you to quickly and simply cut a single groove into your conveyor belt allowing the leading or trailing edge of a fastener to "nest" below the belt's top surface. This prevents cleaners from wedging underneath and snagging a splice.

RB-1 Belt Grinder

Hand Skiver

For light-duty applications, the RTBS Hand Skiver (for rough-top belting) or RB-1 Belt Grinder are easy-to-use tools that make it easy to get a quality job done fast.

To reduce the impact of a splice on cleaners or return idlers, and to reduce fastener wear, fasteners can be embedded in the belt beneath the belt surface. This process is called skiving, and requires a belt thickness of at least 5 mm (3/16″).

Ideal for heavy-duty applications, the FSK™ Belt Skiver is designed to gauge cutting depth from the bottom of the belt surface. So no matter what condition the belt cover is in, you always get an accurate, uniform skive.

More Innovative Solutions from Flexco

In addition to mechanical fasteners, Flexco is also the source for a complete family of belt cleaners, belt trainers, lagging, cleats, tools, and other accessories to maximize productivity and performance up and down the conveyor line. Contact your Flexco distributor for additional product information.

Eliminator® Belt Cleaners

Select from a wide variety of fastener-friendly Eliminator® belt cleaners, including precleaners, secondary cleaners, and reversing cleaners. *(Not available in Continental Europe.)*

Deflector™ Plows

A selection of Deflector™ belt plows feature an innovative blade design for superior protection of tail pulleys from the damaging effects of rocks, fines, and other clinging debris. *(Not available in Continental Europe.)*

Flex-Lok™ Skirt Clamps

Flex-Lok™ skirt clamps from Flexco provide a simple, easy-to-install solution to loading-point spillage problems.

Persuader™ Belt Positioners

The Persuader™ belt positioner is an effective and easy-to-install solution for belt mistracking problems.

Maintenance Tools

Choose from a wide selection of tools specially engineered to simplify conveyor belt maintenance and installation.

Flex-Lag® Pulley Lagging

Flex-Lag® easy-to-install, high-performance ceramic and rubber pulley lagging delivers exceptional traction, eliminates belt slippage.

Tatch-A-Cleat® Belt Cleats

Complete line of mechanically fastened and bondable cleats that help restore full carrying capacity to incline or conveyor belts – without removing your belt from the conveyor.

From coal mines to grocery stores, companies that rely on conveyors also rely on Flexco for belt conveyor maintenance solutions that help maximize uptime, productivity, and safety. We offer the most comprehensive selection of quality products in the industry. And we back customers with product and application support second to no one.

To request a catalog, use the order form found on our Web site at ***www.flexco.com****. Or contact us at* ***+1-630-971-0150****, or via fax at* ***+1-630-971-1180****.*

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