



# BELT CONVEYOR **GUARDING**

Proven Safety Guarding Solutions

**STAY AWAY - STAY SAFE**

# ABOUT BELT CONVEYOR GUARDING

Belt Conveyor Guarding supplies customized safety guarding products and solutions that protect workers. Our streamlined modular designs are engineered to reduce workplace injuries while improving productivity. BCG's products are functional, affordable and ergonomic, while providing the following benefits:

- Eliminating workplace injuries
- Decreasing fines, citations and costly shutdowns
- Improving your productivity
- Ensuring compliance with OSHA, MSHA and CSA
- Extending the life of your equipment



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# FIXED GUARDING

Fixed Guarding refers to a guard that is a physical barrier between a worker and a danger zone and it requires a “tool to remove.”



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# WHY DO WE NEED GUARDING?

According to CSA:

## **Rotating shafts, spindles and couplings:**

Guarding of the rotating shafts may be accomplished by means of:

- a) fixed guards of solid construction;
- b) bellow-type guards; or
- c) telescopic-type guards

*A physical barrier (fixed guarding) is a means of physically preventing access to dangerous areas.*

***It is a requirement by law!***



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# WHAT CREATES A MECHANICAL HAZARD?

- In-running nip points (pinch points)
- Rotating motions/equipment
- Belts or gears
- Flying chips or sparks
- Parts that impact or shear



**BELT CONVEYOR GUARDING**

Proven Safety Guarding Solutions



# AUTO

The guarding should take into account the physical characteristics of the people involved and, in particular, their abilities to reach through openings and over or around barriers or guards.

WHEN YOU ARE GUARDING EQUIPMENT YOU  
**MUST NOT** BE ABLE TO REACH THE HAZARD FROM

**Around**



**Under**



**Through**



**Over**



**BELT CONVEYOR** **GUARDING**

Proven Safety Guarding Solutions

# MAINTENANCE-FRIENDLY & ERGONOMIC

Design your guards to be ergonomic and maintenance-friendly.

**CSA states that:**

Machinery should be designed to enable all adjustments, lubrication, and maintenance to be carried out without removing the guard or disabling a safety device, and without extensive dismantling of machinery components. When removal of safeguards **are required**, it shall be conducted under appropriate administrative controls ensuring that:

- a) The work is conducted using procedural controls and alternate safeguarding techniques to control the risk as effectively as possible; and
- b) The safeguards are restored to full operational status, and their operation verified before the machinery is returned to normal service.

**\*\*The maintenance and repair crew must never fail to replace the guards before the job is considered finished and the machine is released from lockout.\*\***



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# IS YOUR GUARDING COSTING YOU MONEY?

When an unexpected equipment breakdown occurs, one of the first things that happen after the machine is locked out is the need to remove Safety Guards in order to access the equipment. Also, one of the last things after repair work is completed is the need to put those same guards back in place before the machinery can be powered up.

**There are some questions in your checklist that should be asked:**

- How easy and quick are your guards to be removed and put back in place?
- Does it require additional manpower?
- Was additional equipment, such as forklifts or overhead lifts, required?
- How much time does this add to your unexpected downtime?
- What does this extra time cost you in lost production?



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions



# STATISTICS OF INJURIES DUE TO POOR GUARDING ERGONOMICS

The most common outcomes of poor guarding ergonomics are musculoskeletal disorders (MSDs), Repetitive Strain Injury (RSI), Cumulative Trauma Disorder (CTD) and Repetitive Motion Injury (RMI). MSD is not a medical diagnosis, it is a term used for the group of injuries, such as:

- Back Pain (low back strain, etc.)
- Muscle Strain
- Tendonitis
- Carpal Tunnel Syndrome (CTS)
- Tennis Elbow
- Shoulder Pains



According to Ontario's Ministry of Labour, only in Ontario employers paid more than \$1 billion in direct and indirect costs related to MSDs during the 2003-2007 period. Furthermore, there were approximately 37,500 MSD claims per year, which equates to more than 2.5 million workers were off their work place. Under indirect costs, such examples as overtime, equipment modifications, administration and lost productivity has been taken into account.



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# CALCULATE THE COST OF WORKERS' INJURIES

Even minor injuries like back strains caused by poor ergonomics could cost far more than you may think. We used an OSHA Safety Pays calculator to estimate what would be the cost of one strain occurrence. It appears that organizations need an additional \$532,407 in sales to cover the **direct** (direct penalty from authorities) and **indirect costs** (overtime, work time lost, administration, lost productivity) of a single strain due to poorly designed guards. See the next slide for detailed breakdown.



The estimate above is based off one injury to one person. The severity compared to many others injuries is minimal and yet the direct and indirect costs are significant. This is one of many reasons why ergonomics should always be considered when purchasing guards.

*Please note: there is no CSA tool to calculate direct and indirect costs. This is why we used an OSHA one. Results shown are for demonstration purposes. OSHA is an administration of the United States Department of Labour responsible for assuring safe and healthful working conditions.*



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# WORKER'S BACK STRAIN INJURY OUTCOMES CALCULATED

## Estimated Total Cost

The extent to which the employer pays the direct costs depends on the nature of the employer's workers' compensation insurance policy. The employer always pays the indirect costs.

Injury Type	Instances	Direct Cost	Indirect Cost	Total Cost	Additional Sale (Indirect)	Additional Sale (Total)	
Strain	1	\$ 32,959	\$ 36,254	\$ 69,213	\$ 278,883	\$ 532,407	<button>Remove</button>

## Totals

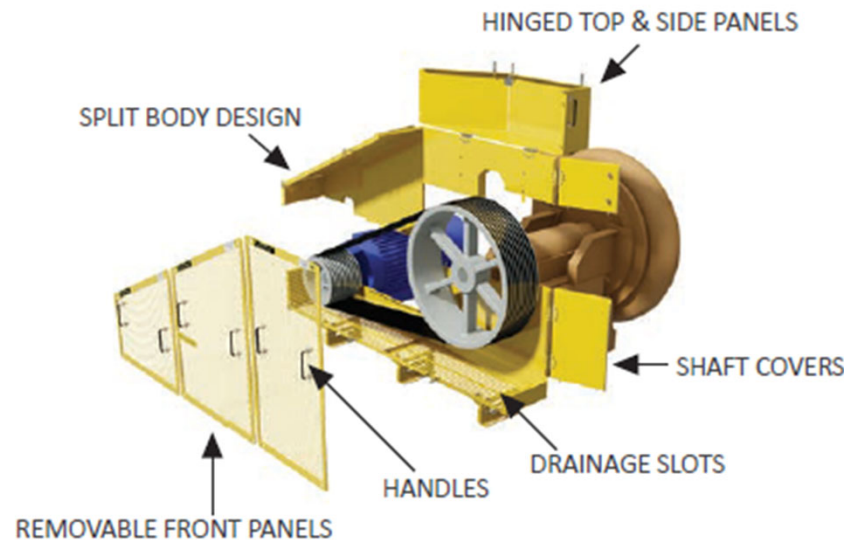
Estimated Direct Costs:	\$ 32,959
Estimated Indirect Costs:	\$ 36,254
Combined Total (Direct and Indirect Costs):	\$ 69,213
Sales To Cover Indirect Costs:	\$ 278,883
Sales To Cover Total Costs:	\$ 532,407



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# ONE-SIZE-FITS-ALL VS CUSTOMIZED SOLUTIONS

There are two general types of guarding for rotating equipment (such as V-Belts, Pumps, Couplings etc.) that is available: custom made and one-size-fits-all solutions. Very often companies prefer the second option because of its cost as well as availability in stock. However, most of the time it is not the optimal solution. See the comparison of two options on the next slide.



*In summary, the initial upfront cost of customized guarding is higher, however, it will generate a substantial ROI for your organization over time!*



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# ONE SIZE FITS ALL VS CUSTOMIZED SOLUTIONS

## One-Size-Fits-All Solution

- X Often larger than needed to be
- X Most require some field fitting for cut-outs
- X Poor or no visibility inside the guard
- X Time-consuming to remove the guard for maintenance
- X Not all rotating parts are properly covered making the guard non-compliant
- X Guards often not put back on because they are not user-friendly

## Custom Made Guards

- ✓ Guards are custom designed for each application
- ✓ Guards designed to fit around obstructions
- ✓ Good visibility through the guard due to expanded metal and color (black mesh)
- ✓ Quick removal allows for easy and fast maintenance
- ✓ All rotating parts are protected ensuring compliance
- ✓ Optional accessories like handles and hinges that improve ergonomics
- ✓ Workers replace guards because they are user-friendly



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions



# GENERAL ERGONOMICS GUIDELINES



- A well designed guard should weigh less than 50 pounds.

---

- A guard should not require more than one person to remove or install it.

---

- Putting weight labels on all guards will ultimately reduce injuries.



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# SAFETY GAUGE

The Machine Safety Gauge is a helpful tool to verify machine safety guarding compliance and ensures that workers are kept safe around rotating equipment and conveyors.



## Performance Criteria for Safeguarding

CSA Z432-16 & CSA Z142-02

Developed to determine guard mounting distances based on the maximum opening sizes in the guarding.



# BELT CONVEYOR GUARDING

Proven Safety Guarding Solutions

# SMART WEDGE CLAMPS

The New Smart Wedge Clamp is our innovative Machine Safety Guarding Fastener that never has to be removed. It also, allows to easily remove and reinstall safety guards and ensures the wedge is forced into the closed position.



**FULLY OPENED POSITION**



**PARTIALLY OPENED POSITION**



**PARTIALLY CLOSED POSITION**

**Tie Wrap to Lock:  
CSA's Tool to Remove**

**REMEMBER TO REPLACE  
THE TIE WRAP**



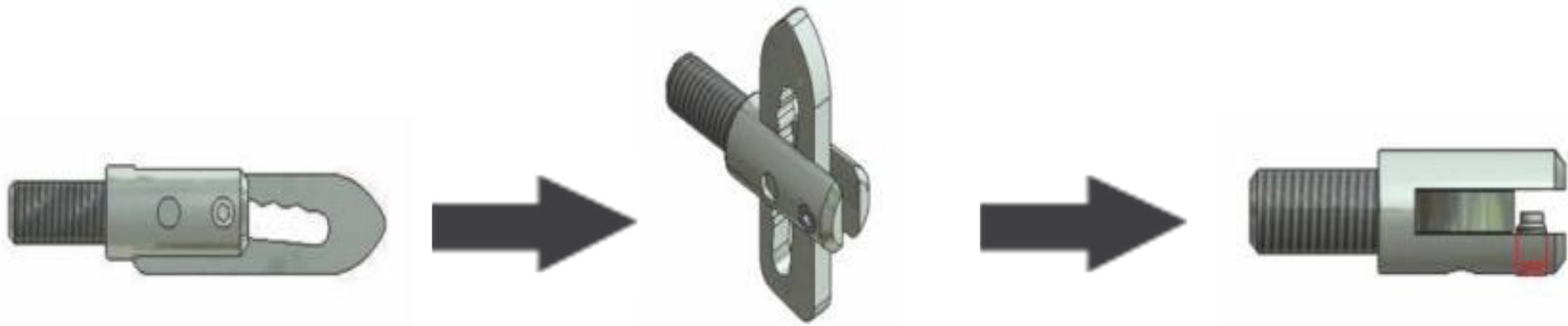
**PATENT PENDING**



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# LOCKING WEDGE CLAMPS

This is designed for applications where using a cable tie is not desirable.  
It requires an Allen key to quickly lock or unlock the set screw.



In open position, set screw allows installation or removal of guards

Locking Wedge Clamp body shows built in set screw

Bird's eye view of set screw tightened, securing the guards in place

**PATENTED**

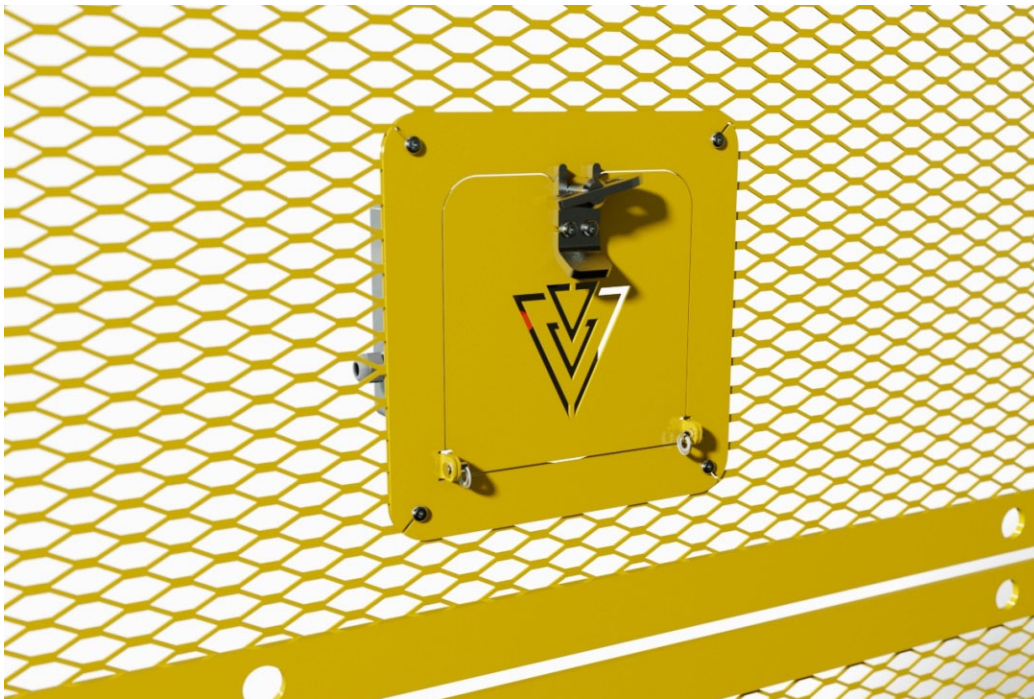


**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions



# INSPECTION DOORS

Inspection Doors are necessary when you need to keep machinery running and still want to be able to inspect or access certain areas. The unique 2-piece design allows for retrofitting existing compliant guarding or installing in new.

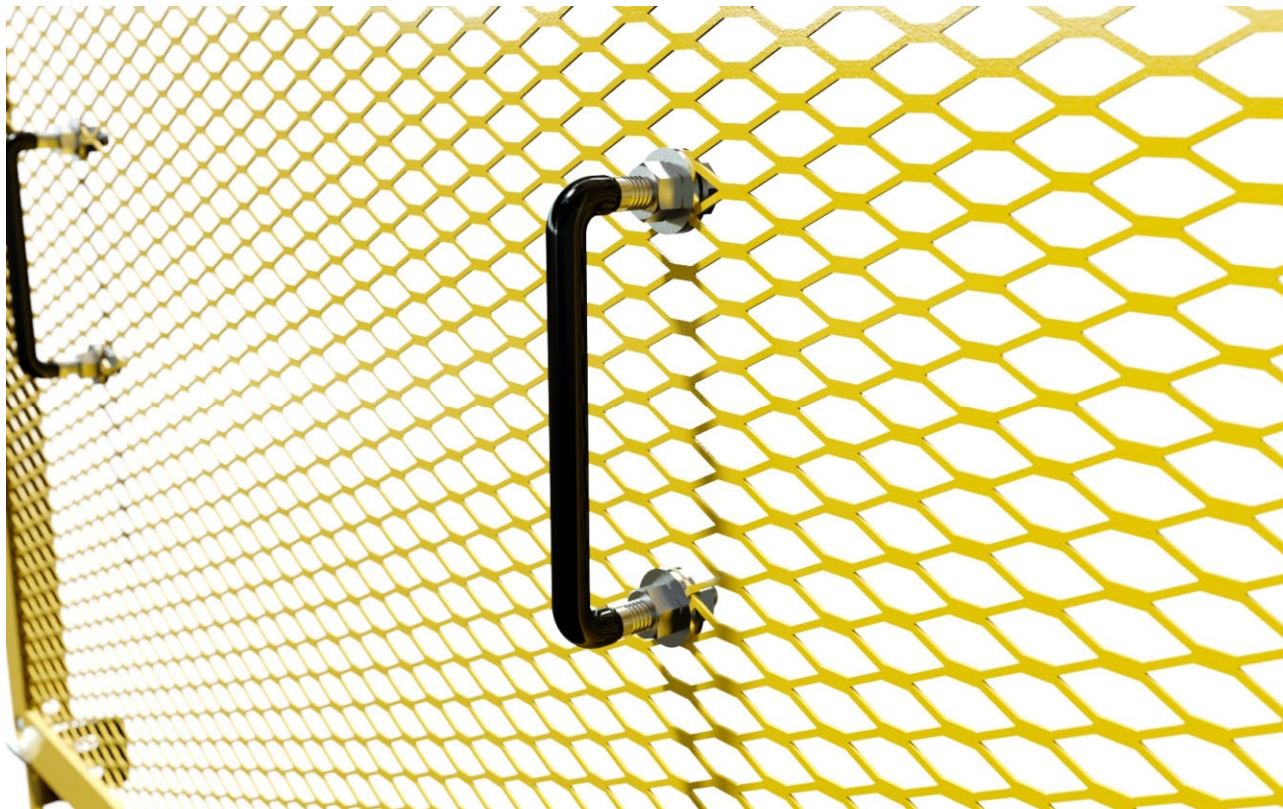


**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions



# GUARD HANDLES

Guard Handles are designed to improve ergonomics of Safety Guarding and allow for easier removal and handling of guards. Furthermore, they are rubber-coated in order to add more comfort during removal or installation of a guard panel.



**BELT CONVEYOR** **GUARDING**

Proven Safety Guarding Solutions

# GUARD HANGERS

Guard Hangers are created in order to hang flat guard panels onto other guards or handrails during maintenance procedures. It significantly improves ergonomics as well as solves the problem of where to put your guard when removed, eliminating a potential tripping hazard.

- Easy installs on flat guards
- Hang guards on other flat guard panels or handrails
- Can be used on both new and existing guarding
- The unique non-slip design ensures a tight fit when hanging
- Rubber-coated for increased friction
- No negative impact on any part of your equipment due to a compact design



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions



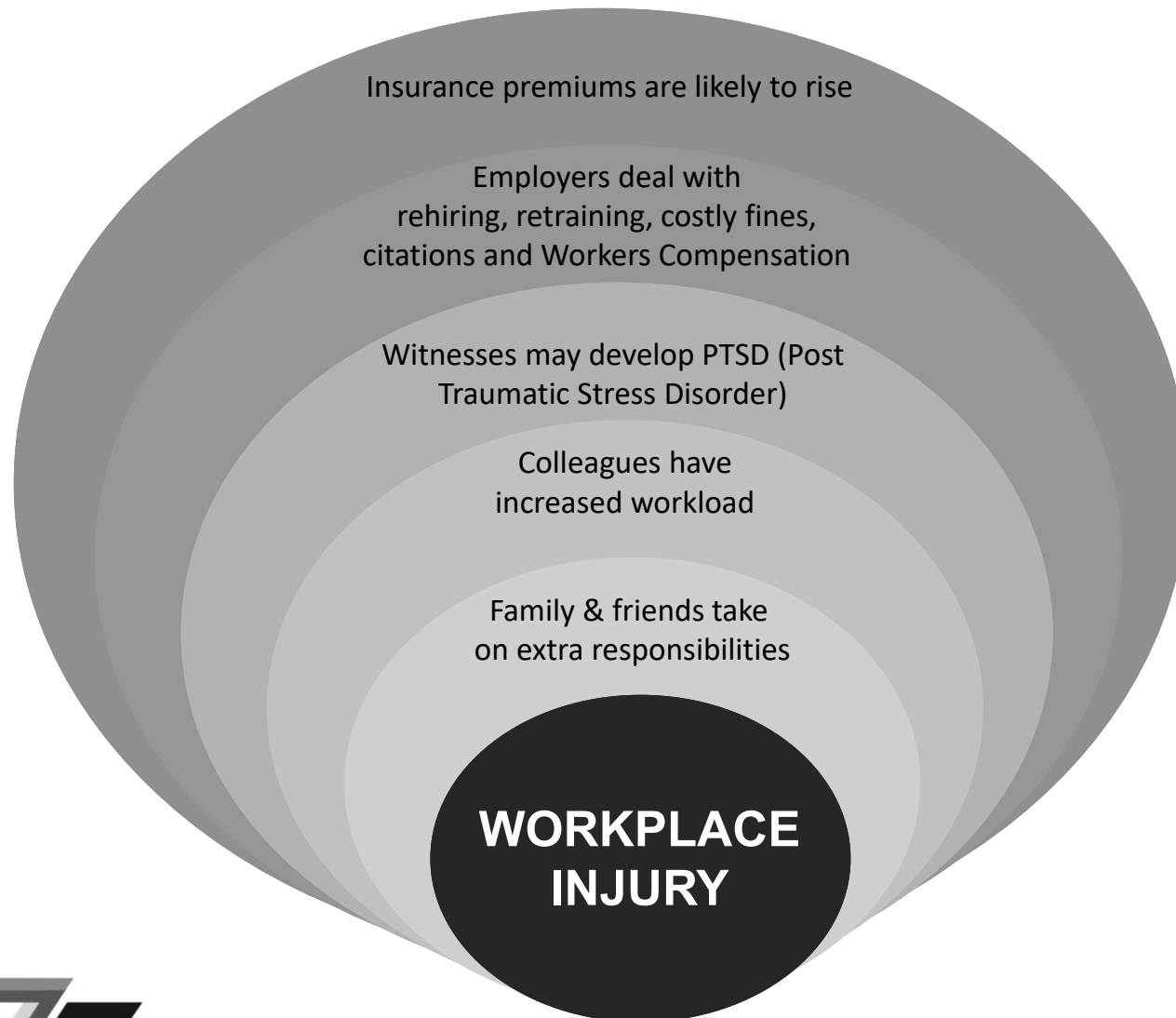
# GUARD SEATS

Guard Seats securely hold the lower portion of the machine safety guard with no need for fasteners. As a result, they improve ergonomics and functionality of removing and replacing Flat Guards.



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# RIPPLE EFFECT



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

# SUMMARY

In summary, even though proper machine guarding is vital for any organization, it is also very important to make sure that guards are ergonomic and maintenance-friendly for the following reasons:

- It will reduce the number of MSD injuries
- The increased ROI will make up for the cost of custom guards
- Faster maintenance and clean-up process
- Guards will always be put back on, ensuring compliance and workers' safety



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions



ONCE YOU HAVE MADE THE DECISION  
TO GUARD YOUR ROTATING EQUIPMENT  
**- BE SURE TO GUARDSMART.**



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions

THANK YOU!



**BELT CONVEYOR** **GUARDING**

Proven Safety Guarding Solutions

# REFERENCES

1. Prevent Workplace Pains & Strains! It's time to take action! | Ministry of Labour. (2015, November 26). Retrieved from [https://www.labour.gov.on.ca/english/hs/pubs/ergonomics/is\\_ergonomics.php](https://www.labour.gov.on.ca/english/hs/pubs/ergonomics/is_ergonomics.php)
2. OSHA Small Business | Safety Pays Program - Estimator | Occupational Safety and Health Administration. (2015, November 16). Retrieved from <https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html>



**BELT CONVEYOR GUARDING**  
Proven Safety Guarding Solutions