



# CBM Beltspy Vision Monitoring



Maximising the return on your assets

## WHY USE VISION MONITORING?

In all conveyor belt systems that are used for transporting bulk materials such as coal, mineral rock and ores over long distances, effective use of “condition based monitoring” contributes to increased plant uptime, accurate and reduced maintenance costs, that combine to increase the return on net assets of a mining operation.

Typically, the wearing of the conveyor belt surface has been inspected visually, photographed, marked up where events observed, combined with thickness and hardness testing to project the expected life of the conveyor belt. This service whilst accurate, requires a significant amount of downtime of the target belt to be performed.

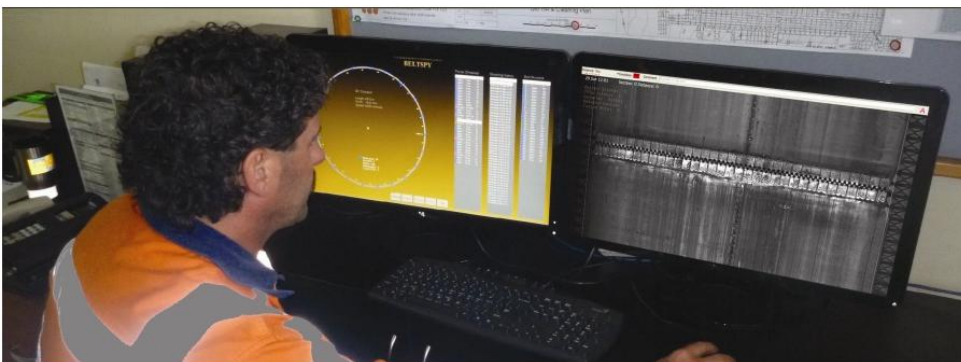
Accordingly, it has long been recognized that an automated “condition based monitoring” system for early detection of deterioration, excessive, uneven or unusual wear and tear in conveyor belts is desirable.

Unplanned downtime is a major avoidable cost for most mining based businesses. In addition, if the failure is of a “catastrophic” nature, the increased costs of replacing assets alone demand their greater utilization through well planned “Non-Disruptive” condition based monitoring and pro-active preventative maintenance programs.

CBM Beltspy™ is the world's leading conveyor belt inspection and conveyor belt monitoring system utilising machine vision technology for use in surface and underground mines.

It is designed to be used during production hours with a full conveyor load. A single workstation located in an office or control room on the surface, allows the operator to perform an inspection of all conveyor belts in the mine by visually analysing high resolution images anywhere along the conveyor belts. The system can be configured to inspect either carry or pulley covers, or both.

The system employs proprietary processing algorithms to automatically detect and flag clip joints, splice joints, damaged conveyor belt surfaces and belt edges, collectively called Events. The system maintains precise conveyor belt metrics relative to reference location (RL). The locations of all events (distances from RL) are stored by the system thus providing instant access to event images. Sequential conveyor belt browsing is also available.



The CBM Beltspy Vision Monitoring System assists to lower maintenance costs through the reduction of unplanned stops, rework and associated down time.

*At the same time productivity and safety is enhanced resulting in an overall improvement of operation reliability, allowing for a better return of investment on the assets employed. The equipment payback cycle is rapid considering the elimination of unplanned stoppages.*

Vision Monitoring helps mining operations to improve asset performance by focusing maintenance on the right conveyor belt at the right time.

## RELATED SERVICES

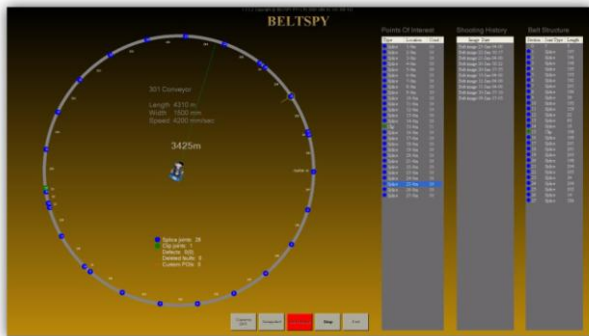
- CBM – Conveyor System Inspection
- CBM – Remote Monitoring
- CBM – Semi-Remote Monitoring
- CBM – Steel Cord Belt Scanning
- CBM – Fabric Belt Scanning
- CBM – Cover Thickness Testing
- CBM – Longitudinal Cover Thickness Testing

Partner of Choice

- ✓ Machine Vision Technology
- ✓ Inspection during production hours
- ✓ Single workstation to handle multiple belts
- ✓ Synchronised view of both sides of the belt
- ✓ Monitoring of fault development

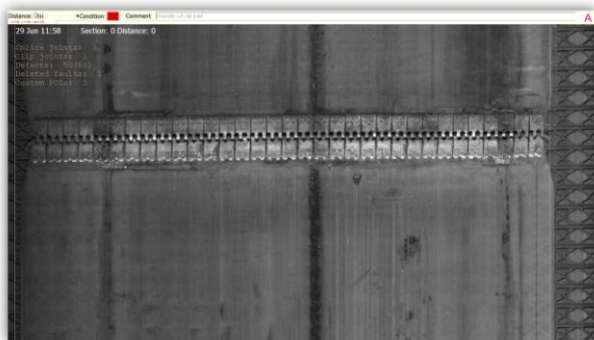
- ✓ Automatic Surface Damage and Joins Detection
- ✓ Instant Visual Access to joins and surface faults
- ✓ Stopping conveyor at predefined position for repair
- ✓ Low cost maintenance
- ✓ Takes full belt image at any time

The workstation uses two-monitor configuration:



The left monitor controls system activity and depicts the graphical representation of the conveyor with all events placed on it.

The right monitor is dedicated to rendering conveyor belt fragments (about 1m in length) for belt cover sides.



*This unique monitoring system has been developed to mitigate the risk of "catastrophic failure" on conveyor belts and the associated lost production.*

This system is separate from the belt and **can be fitted and retrofitted to any belt, at any time.** There is no contact with the belt and hence the removal of "*false positives*" due to contact related issues.

The operator can visually compare two images of the same location taken at different times (dates). This allows the operator to analyse historical changes in damage development. The operator can take a full belt image at any time.

The system can be scheduled to automatically stop the conveyor in a particular position, guaranteeing that the location to be repaired will arrive to the assigned repair station.

Sample images



Image of damage to edge of belt

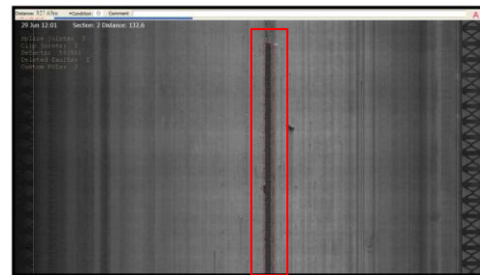


Image of longitudinal belt damage

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### ➤ FOR MORE INFORMATION

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