

# QUICK SELECTION GUIDE FOR PRODUCTS

CONVEYOR BELTS · INTELLIGENT CONVEYING · FULL-STACK EPC SERVICES

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Technology Delivers a Better Life

# About Us

Founded in 2000, BOTON has been committed to continuous innovation and development across industrial and mobile solutions. Since its listing on the Growth Enterprise Market in 2009, the company has become an industry benchmark for cross-sector innovation and value creation.

Stock Code  
**300031**

## - Industrial Solutions -

Our Industrial Solutions division delivers full-lifecycle digital conveying solutions and full-stack intelligent conveying services for industries including mining, steelmaking, building materials and cement, ports and terminals, and thermal power. We lead the market in green conveyor belts and rank first in exports of our proprietary conveyor belt brand.



## - Mobile Solutions -

In the mobile sector, BOTON operates as a leading mobile game publishing platform, distributing games in over **150** countries and regions and serving more than **200** million users worldwide. Committed to promoting global digital entertainment culture and ecosystem development, we continuously enhance the gaming experience through artificial intelligence and virtual reality technologies, delivering high-quality entertainment and enriching people's lives.



### Our Mission

Making Industrial Bulk Material Conveying Greener



### Our Vision

To Become a Global Leader in Intelligent Conveying Services



### Core Values

Benevolence & Integrity  
Collaboration & Sharing  
Innovation & Growth

# Our Business

## Industrial Solutions

Driven by our vision to become a global leader in intelligent conveying services, we focus on delivering full-stack smart conveying solutions, including digital conveyor belts, intelligent hardware monitoring systems, dust and material handling systems, integrated smart mine operations, digital twin technologies, embodied intelligent industrial applications, and turnkey conveying system services. Leveraging the BOTON Smart Conveying Industry Green Development & Research Institute as our innovation platform, we uphold the principles of sustainable development, maximize our industrial chain advantages, and help partners achieve innovative breakthroughs and transformative growth.



Full-Lifecycle Management Services for High-Performance Digital Conveyor Belts



Turnkey Conveying System Integration Services



Intelligent Digital Conveying Solutions

## Mobile Solutions

We specialize in providing professional services for the global expansion of mobile game products. As one of China's earliest mobile game publishers to go overseas, we have extensive experience in international game distribution. Our business is centered on four key markets—Hong Kong, Macau & Taiwan, Japan, South Korea, and Southeast Asia—while also supporting expansion into other emerging markets worldwide, including the Americas, Europe, and the Middle East, gradually establishing a global game publishing presence.

In the course of global game publishing, the company has established long-term, trusted partnerships with internationally renowned companies such as Facebook, Google, X (Formerly known as Twitter), Line, and Kakao. To date, we have published over **320** games, serving approximately **224.69** million players worldwide, including around 14.88 million active users in 2024.



Global Digital Entertainment Content Development and Cultural Export

10+  
Years

Game Developing Experience

320+

Total Published Games

200+  
million

Cumulative Player Count

150+

Country/Regions Game Published Over

Through the deep integration and mutual empowerment of these two business divisions, we have established a closed-loop ecosystem of **"Technology - Application - Business"**. By leveraging technological innovation to break industry boundaries, we continuously create additional value for our customers and lead the global shift toward greener and smarter industrial practices.



National Enterprise Technology Center  
 National Science and Technology Progress Award  
 Full-Stack Intelligent Conveying Service Solution Provider  
 Conveyor Belt Cover Rubber Wear Monitoring System  
 Conveyor Belt Splice Monitoring System



CNAS Laboratory  
 Digital Twin Smart Mine System



Growth Enterprise Market (GEM)  
 Listed Company



- Number of Authorized Invention Patents
- Industry Ranking by Export Volume of Independent Brands
- Industry Ranking by Group Total Revenue
- Industry Ranking by Social Contribution Per Capita
- Wind ESG Rating AA-Level

- Market Share of Green Conveyor Belts
- Market Share of Digital Conveyor Belts
- Market Share of Aramid Conveyor Belts
- Market Share of High Temperature Resistant Conveyor Belts
- Market Share of Ply Fire Resistant Conveyor Belts
- Market Share of Intelligent Online Monitoring Products

World's First  
 Carbon Neutral  
 Conveyor Belt

World's First  
 High Bio-Based Material  
 Conveyor Belt

World's First  
 Φ600mm Aramid  
 Pipe Conveyor Belt

World's First Set  
 Extreme Cold Environment Belt Tear  
 Monitoring System

World's First Set  
 Conveyor Cleaning & Wash Water  
 Recycling System

Industry's First  
 Long-Distance Energy-Saving Aramid  
 Conveyor Belt for Mines

Industry's First  
 Anti-Adhesion Conveyor Belt

Industry's First  
 New Conveyor Belt Tear  
 Monitoring Technology

Industry's First  
 Conveyor Belt Intelligent  
 Tracking System

Industry's First  
 Pulley Lagging AI Video  
 Monitoring System

16 Items

Appraisal of Achievements Reaching

33 Items

Development/Revision of Various Standards  
 (International/Domestic, etc.)

9 Items

Undertaking Key National and Provincial  
 Scientific and Technological Projects

11 Items

National/Provincial and Ministerial Level  
 Science and Technology Progress Awards

BOTON Intelligent Conveying  
 Industry Green Development  
 & Research Institute

National Virtual  
 Reality Innovation  
 Center

National Engineering Laboratory for New  
 Materials and Advanced Manufacturing of  
 High-Performance Conveyor Belts in the  
 Petroleum and Chemical Industry

Academician Innovation  
 Center for Green and Intelli-  
 gent Conveying Technology

Jiangsu Provincial Engineering  
 Technology Research Center for  
 Conveyor Belts in Coal Mines

Jiangsu Provincial  
 Postdoctoral Research  
 Workstation



# Global Clients

## Domestic

Mining	China Energy	Shandong Energy	Pingmei Group	Huainan Mining	Yitai Coal	Jinmei Group
Steel	Baowu Steel	HBIS Group	Shandong Iron and Steel Group	TISCO	Hunan Valin Steel	Shougang Group
Building Materials	CNBM	Conch Cement	Power China	BBMG	HONGSHI Hongshi Group	Shangfeng Group
Power	China Energy	China Datang Power	China Huadian Group	China Huaneng Power	SPIC	China Resources Power
Ports	Zhejiang Hebei Seaport Group	Hebei Port Group	Shandong Port Group	Jiangxi Provincial Port Group	Qingdao Port	Zuhai Port

## Overseas

Mining	RioTinto	BHP	VALE	Fortescue	HANCOCK IRON ORE	IRON ORE
	CODELCO	Antofagasta Minerals	GLENCORE	MMG	Oyu Tolgoi Mine	Zijin Mining Overseas
	Alcoa	SOUTH 32	CHALCO	Newmont	CITIC PACIFIC MINING	KPC
Steel	ArcelorMittal	TATA Steel	POSCO	FHS Formosa Plastics	H2GREEN Steel	Tsingshan Group
Building Materials	HOLCIM	Heidelberg Materials	CEMEX	YTL Cement	Anhui Conch Cement	CNBM
Power	Vattenfall	EGAT	AGL	Stanmore Resources	MIBRAG	China Datang
Engineering	TAKRAF	Worley	Bedeschi	NEPEAN	BAOSTEEL	DHHI

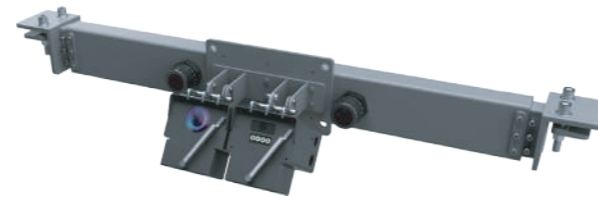
# Intelligent Conveying

Smart Conveying Solutions for  
Modern Industrial Bulk Material Handling

- ▶ Conveyor Belt Tear Monitoring System
- ▶ Underground Conveyor Belt Tear Monitoring System
- ▶ X-Ray Belt Scanner
- ▶ Underground Aramid Belt X-Ray Scanner
- ▶ Fabric Finger/Lap Splice Monitoring System
- ▶ Conveyor Belt Intelligent Tracking System
- ▶ Conveyor Belt Thickness Monitoring System
- ▶ Wireless Temperature Monitoring System
- ▶ Cleaning & Recycling System
- ▶ Belt Winder

# Conveyor Belt Tear Monitoring System

This system is primarily used in bulk material handling operations across industries such as Mining, Thermal Power Generation, Cement & Building Materials, Ports & Terminals, and Steel/Metallurgy. Installed at the loading and feeding points of belt conveyors, it effectively prevents the risk of longitudinal ripping.



The system is capable of detecting a rip and providing an early warning within 0.1 seconds, instantly triggering an interlock shutdown of the conveyor to prevent the accident from escalating. By replacing manual inspection, it significantly reduces labor costs and mitigates the risks associated with high-hazard environments, thereby ensuring the stable and safe operation of the conveyor system.

## Product Features

- ▶ **Real-time Monitoring and Early Warning**  
Provides real-time monitoring of both longitudinal rips and abnormal wear on the conveyor belt. It issues wear condition pre-alarms, prompting inspection personnel for targeted inspection.
- ▶ **High-Precision Recognition**  
Achieves comprehensive rip recognition by combining temperature variation analysis and image processing, delivering an accuracy rate of up to 99.5%.
- ▶ **Extreme Operating Condition Adaptability**  
Adaptable to ultra-low temperature environments (down to -50 °C). Equipped with an automated cleaning system to ensure stable operation in harsh on-site conditions.
- ▶ **Rapid Rip Detection and Interlock Shutdown**  
Detects belt fracture/rip and triggers an interlock shutdown signal within 0.1 seconds, preventing accident escalation and minimizing losses from unplanned downtime.
- ▶ **Dual-Level Alarm Function**  
Features a dual-level alarm for ripping and abnormal wear, enabling both proactive abnormality warning and immediate interlock shutdown upon belt rip, ensuring highly reliable conveyor system operation.
- ▶ **Automated Inspection**  
Reduces operational risks in high-hazard environments and substantially improves safety and management efficiency.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
Recognition Accuracy	≥99.5%	Operating Temperature	-50°C–60°C
Response Time	≤0.1s	Ingress Protection	IP66
Applicable Belt Width	650–3000mm		

## Return on Investment (ROI) Analysis

▶ **Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.**

Impact of a Major Rip Event in a High-Capacity Steel Mill

### Incident Impact

Taking a longitudinal rip incident in the blast furnace area of a steel mill as a benchmark: A single rip event resulted in 779m of damaged belt and 72 hours of unplanned downtime.



### System Value

Deployment of the BOTON intelligent monitoring system ensures early-stage detection. By preventing catastrophic escalation, incident-related losses are minimized to within 20\*.

Loss Mitigation  
Within **20\*** ↓

### Return on Investment

Based on typical deployment benchmarks (including a 5-year service contract), preventing just one major rip event can yield an approximate 2800% ROI. With a payback period of less than 12 months, the system ensures long-term operational continuity and significantly reduces maintenance overhead. Therefore, deploying this system in high-value conveying scenarios offers immense economic and strategic management value.

ROI per Averted Accident  
**2800%**

## Case Study / Application of Longitudinal Rip Detection System in Steel Mills

### Project Background

The steel mill's conveyor belts frequently experienced abnormal wear and friction issues during operation. Traditional manual inspection was unable to detect these defects early enough, resulting in unplanned shutdowns.

### Operational Results

Annual Maintenance Savings  
Over **100\*** ↓

#### EP1400 Conveyor Belt

- Problem: The wear of the tail pulley caused abnormal belt wear (capping/troughing reduced by 1mm).
- Solution: Deployment of the rip detection system for real-time monitoring of the belt condition.
- **Achievement:** In November 2023, the system issued an early warning for potential belt failure, preventing an unplanned shutdown. The issue was eliminated after a planned maintenance stoppage, resulting in annual maintenance cost savings exceeding 100.

#### ST1600 Conveyor Belt

- Problem: Material build-up caused friction and wear on the belt cover.
- Solution: Deployment of the rip detection system for real-time monitoring of friction and wear.
- **Achievement:** In March 2023, the system triggered an interlock shutdown within a 0.15-second response time, preventing a hidden danger from escalating. This demonstrates a significant improvement in safety.

## Frequently Asked Questions ?

### Q1: How does the system differentiate between abnormal wear and an actual rip/fracture?

By employing AI Bimodal Analysis: combining rip and friction-induced temperature monitoring (thermal anomaly) with physical monitoring (image analysis). The system automatically performs a comparison against the wear and rip characteristic database, achieving an accuracy rate of >99.5%.

### Q2: Can the system operate stably in high-dust environments?

Yes. The system is equipped with an Intelligent Self-Cleaning System combined with an Air Blade Mechanism, ensuring stable and reliable operation even in high-dust environments.

# Underground Conveyor Belt Tear Monitoring System

This system is designed specifically for bulk material handling in mining environments. It is typically installed near the loading/feeding points of the conveyor. The system can detect a rip and any abnormality in real-time, providing an early warning and triggering an interlock shutdown signal within 0.1 seconds to prevent catastrophic accidents. By automating the manual inspection process, it eliminates the need for personnel to work in high-risk areas, mitigates safety risks in harsh environments, and ensures the stable and safe operation of the conveyor system.



## Product Features

### ▶ High-Precision Rip Recognition

By analyzing the temperature profile of the ripping point and integrating it with image information, the system achieves a highly accurate recognition result with a verified precision rate of up to 99.5%.

### ▶ Stable Operational Capability

Equipped with an Automated Self-Cleaning System to ensure stable, continuous operation even in the dusty and harsh conditions typical of mining environments.

### ▶ Industry-Specific Design

Tailored for the underground mining sector, the design meets the complex requirements for conveyor safety monitoring and surveillance.

### ▶ Dual-Level Alarm Mechanism

Features both Early Warning Pre-Alarms and Interlock Shutdown capabilities, ensuring the high-reliability operation of the conveyor system.

### ▶ Enhanced Safety and Efficiency

Achieves Real-time Online Monitoring, replacing manual inspection, minimizing high-risk operational exposure, and significantly improving detection coverage.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
Recognition Accuracy	≥99.5%	Operating Temperature	-40°C–60°C
Response Time	≤0.1s	Ingress Protection	IP65
Applicable Belt Width	650–2200mm		

## Return on Investment (ROI) Analysis

【\*Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.】

### ▶ Improvement Measures

- **Installation of Rip Detection Device:** Monitors belt damage in real-time, provides advanced rip warnings, and minimizes unplanned downtime.
- **Strengthened Employee Training:** Enhances worker safety awareness and skills, thereby reducing the risk of errors caused by human factors.

### ▶ ROI Calculation Example

Calculation Benchmark: Assuming a mining facility installs one set of BOTON rip detection equipment, preventing one major rip event per year:

- Direct Loss Reduction: **↓ 100\*** (Belt replacement & repair)
- Indirect Loss Reduction: **↓ 300\*** (Downtime/Production loss)
- Total Benefit: **400\***

$$ROI = (400 - 30) / 30 \times 100\% = 1200\%$$

High ROI: Ensures long-term reduction in economic losses and operational production risks.

## Case Study / Application of Mine-Use Rip Detection System in Coal Mining

### ○ Project Background

A coal mine in Gansu (using a 1000mm Aramid Conveyor Belt) required continuous real-time online monitoring (24 hours x 365 days) of its conveyor belt, focusing on rip anomalies to minimize the risk of unplanned shutdowns and ensure the continuity of conveying operations.

### Operational Results

- Following deployment in April 2025, the system issued timely warnings for belt damage, averting a catastrophic rip-induced shutdown.
- After rapid corrective adjustments, maintenance workflows were optimized, leading to Annual Maintenance Savings exceeding 100\*.
- The system ensures peak inspection efficiency while removing personnel from high-hazard environments, securing the long-term reliability of the conveying infrastructure.

Annual Maintenance Savings

↓ Over **100\***

## Frequently Asked Questions ?

### Q1: How does the system differentiate between abnormal belt wear and an actual rip/tear?

By employing AI Bimodal Analysis: combining the temperature rise associated with the rip/friction (Thermal Monitoring) with physical rip detection (Image Capture). The system automatically compares these against the database of wear and rip characteristics, achieving an accuracy rate of >99.5%.

### Q2: Can the system operate stably in coal dust, high-dust, and humid coal environments?

Yes. The system is equipped with standard mechanical wipers and an Intelligent Self-Cleaning System, enabling stable operation in coal, high-dust, and humid coal environments.

# X-Ray Belt Scanner

Designed for bulk handling in mining, power, cement, ports, and steel sectors, this system is installed on the conveyor's return flat belt section to monitor internal carcass health online. It addresses core pain points: time-consuming manual inspection, invisible defects, high breakage risks, and lack of data-driven O&M support.

Through X-ray carcass visualization and AI algorithms, it automatically identifies cord breakage, wire fracture, corrosion, splice displacement, and abnormal alignment. This provides a comprehensive solution featuring full-belt coverage, image traceability, and reduced downtime, effectively replacing manual inspections with high-precision digital monitoring.



## Product Features

### Internal Carcass Visualization and Defect Recognition

The system visualizes the internal steel cord carcass of the belt using X-ray imaging. It automatically recognizes defects such as cord fracture, cord misalignment, cord splice separation, belt edge damage, thickness anomalies, and damage to the cord edges/splices. The system allows for manual review and confirmation of repairs.

### Defect Positioning and Report Generation

Based on image marking, the system automatically tags the defect location, size, and type, generating automated graphic reports for rapid decision-making.

### Online Inspection and Maintenance Optimization

Detection is achieved without stopping the belt, enabling proactive maintenance scheduling and reducing unplanned downtime and operating costs, thus improving maintenance efficiency.

### Safety Protection and System Reliability

Complies with safety standards, featuring 5mm lead shielding and dual-layer protection. The X-ray leakage rate is less than 5μSv/h, meeting National Standard (GBZ 117-2015). Software multi-layered safety control ensures abnormal operation triggers automatic shutdown.

### Automated Inspection and AI Recognition

Adopts standardized inspection processes and AI image algorithms, replacing manual inspection, minimizing human error, achieving unified monitoring standards, and mitigating risks in high-hazardous environments.

### Data Acquisition and Traceability Analysis

Complete storage of inspection images and data, which can be retrieved at any time for historical comparison and inspection analysis, providing scientific evidence for maintenance decisions.

### System Customization and Automated Operation

Supports custom configuration of inspection cycles and monitoring strategies, allowing users to set periodic, temporal, and long-term unmanned automated inspection.

### Environmental Adaptability and Self-Cleaning Design

Equipped with an optional Automatic Cleaning Device to effectively remove dust and residues without impacting production, ensuring long-term stable system operation and consistent test results.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
X-ray Leakage Rate	≤ 5μSv/h	Maximum Belt Thickness	80mm
Minimum Defect Resolution	0.8x0.8 (mm)	Operating Temperature	-20°C–60°C
Applicable Belt Width	650–3000mm		

## Return on Investment (ROI) Analysis

**!**Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.

Impact of a Steel Cord Belt Breakage in a Sand & Aggregate Plant

### Incident Impact

A single breakage incident caused a complete belt snap, production interruption, large-scale material spillage, and varying degrees of damage to conveyor components.

Downtime Duration  
**72** Hours

Direct Economic Loss  
↓ **348\***

### System Value

By deploying the BOTON X-ray Non-Destructive Testing System, internal steel cord breakages, splice anomalies, and minor defects can be identified at an early stage. This allows for planned maintenance, prevents accident escalation, and keeps potential losses within 10\*.

Loss Mitigation  
↓ Within **10\***

### Investment Return

Based on typical deployment benchmarks (including a 5-year service contract), preventing just one major incident can yield an approximate 870% ROI. With a payback period of less than 12 months, the system consistently reduces downtime risks, maintenance costs, and safety hazards. Therefore, deploying this system in high-value conveying scenarios offers immense economic and strategic management value.

ROI per Averted Accident  
**870%**

## Case Study / Application of X-ray NDT System in a Crushed Stone Yard

### Project Background

The client's crushed stone conveyor belt has a total length of 26km. Reliance on manual patrolling was time-consuming and could not achieve comprehensive inspection. Internal defects were difficult to detect, and the quality of repair sections could not be effectively confirmed, posing significant hidden dangers.

#### Operational Results

The X-ray NDT system was installed in January 2024. It promptly discovered a severe defect in one splice and one non-splice area, as well as multiple broken cords. The system assisted the customer in eliminating hidden dangers, reducing ineffective repair time, improving repair efficiency, and lowering maintenance costs.

## Frequently Asked Questions ?

### Q1: What are the characteristics of X-ray radiation?

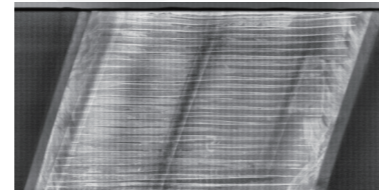
X-rays are high-energy electromagnetic waves that are ionizing radiation. Strict control is required in professional settings to ensure safety. Radiation is only generated when the X-ray tube is activated. There is no radiation when the system is not operating (shutdown or standby mode), and no protection is required.

### Q2: What types of conveyor belts does the system apply to?

The system covers mainstream types such as steel cord, embedded sensor, and aramid belts. It is suitable for belt widths up to 3000mm and belt speeds up to 10m/s, especially long-distance belts.

# Underground Aramid Belt X-Ray Scanner

This system is specifically designed for aramid conveyor belts in mining environments. It is installed at the conveyor's transfer or discharge point, where it monitors splice and belt surface damage, collects belt operating conditions, and gathers splice health data. Targeting issues like the high frequency of manual inspection, low inspection efficiency, and the difficulty of tracking broken cords, the system provides pre-alarm for potential defects. It automatically generates diagnostic reports, improves inspection efficiency, reduces unplanned downtime, and ensures the safety and continuity of conveying operations.



## Product Features

### ▶ Remote and Real-time Monitoring

- Centralized collection of monitoring data displayed on the ground control screen, which can be viewed on a large display.
- Real-time online display of belt and splice status, automatically collecting and storing monitoring data.
- Supports video recording and playback, allowing for the precise positioning of defects for review and detailed inspection.

### ▶ Automatic Recognition and Anomaly Sorting

- Supports automatic non-stop inspection, with AI automatically recognizing splice ID, carcass structure, and splice anomalies.
- Capable of categorizing defects such as multiple broken cords, missing cords, splice separation, foreign objects intrusion, etc..
- Allows for setting multiple monitoring levels to achieve refined fault differentiation and management.

### ▶ High-Precision Positioning and Alarm

- Utilizes high-resolution detectors and AI algorithms to achieve clear imaging for accurate determination of belt health status, which is displayed in the software interface and reports.
- Provides timely pre-alarms for problems, displaying magnified images for on-site troubleshooting and repair.
- Features interlock shutdown capability, allowing for integration with the conveyor system for automatic stoppage.

### ▶ Unmanned Operation

- Software initiates and completes the inspection automatically, requiring no personnel on duty.
- Personnel safety protection: Automatically shuts down when personnel enter the designated high-risk area.

## Return on Investment (ROI) Analysis

【\*Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.】

Installing a Non-Destructive Testing (NDT) system allows for real-time monitoring of belt damage and issues early warnings to prevent catastrophic breakage incidents.

Calculation Benchmark: Assuming a mining facility installs one set of BOTON NDT equipment, preventing just one major belt breakage event per year:

- Direct Loss Reduction: **↓ 100\***(Belt replacement & repair)
- Indirect Loss Reduction: **↓ 300\***(Downtime & Production loss)
- Total Benefit: **400\***

$$ROI = (400 - 50) / 50 \times 100\% = 700\%$$

High ROI: Ensures long-term reduction in economic losses and operational production risks.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
X-ray Leakage Rate	≤5μSv/h	Storage Temperature	-40~60°C
Resolution	0.8mmx0.8mm	Relative Humidity	≤95% (Non-condensing)
Conveying Speed	≤6m/s	Atmospheric Pressure	80~106Kpa
Belt Width	800~2000mm	Operating Power	127/220VAC
Max Detection Thickness	80mm	Operating Current	6A (max)
Operating Temperature	0~40°C	Protection Rating	Lead plate thickness ≥5mm, Lead capacity: 12~15m <sup>2</sup> , Weight:700-900kg

## Case Study / Application of Non-Destructive Monitoring Device for Mine-Use Aramid Conveyor Belts in Mining

### ○ Project Background

A coal mine in Shanxi Province, focusing on monitoring the splice health of steel cord and aramid conveyor belts.

#### Operational Results

The system issued an early warning one week in advance, preventing unplanned downtime caused by splice pull-out. Following re-vulcanization of the splice, Annual Maintenance Savings exceeded 400\*.

Annual Maintenance Savings **↓ 400\***

### ○ Project Background

A coal mine in Ordos, focusing on monitoring the health of aramid belt splices and cover rubber.

#### Operational Results

The system issued an early warning one month in advance regarding abnormal transverse fractures in the belt cover, avoiding a major shutdown. Following maintenance and new splice installation, Annual Maintenance Savings exceeded 400\*.

Annual Maintenance Savings **↓ 400\***

## Frequently Asked Questions ?

### Q1: What are the characteristics of X-ray radiation?

- X-rays are high-energy electromagnetic waves and are part of ionizing radiation, requiring strict control in professional settings.
- Radiation is only generated when the tube is activated; there is no radiation during standby or shutdown, and no protection is required at this stage.

### Q2: What types of conveyor belts does the system apply to?

The system covers mainstream types such as embedded steel cord and aramid belts, suitable for belt widths 2400mm, belt speeds up to 6 m/s, and belts of any length.

# Fabric Finger/Lap Splice Monitoring System

This system is installed at the conveyor belt return or transfer area. It addresses the common pain points of traditional manual inspection, such as low efficiency, high splice failure risk, and difficult defect traceability. The system enables real-time online monitoring of the conveyor belt splice. It can automatically identify the splice ID and its location, collect real-time splice health data, and issue alarms immediately upon detecting anomalies. This provides reliable assurance for conveyor safety, reduces labor costs and unplanned downtime, and improves conveying efficiency.



## ▶ System Value

By deploying the BOTON Splice Monitoring System, damage trends can be detected early. Timely maintenance keeps potential losses within 15\*.

Loss Mitigation  
 ↓ Within **15\***

## ▶ Return on Investment

With a typical investment benchmark of approximately 30\* (covering procurement and 5-year O&M), preventing just one major incident can yield an approximate 900% ROI. The payback period is less than 12 months, while consistently reducing downtime risks and maintenance costs.

ROI per Averted Accident  
**900%**

## Product Features

### ▶ 24/7 Non-Contact Monitoring

Performs 24/7 real-time non-contact monitoring of the splice health status while the conveyor belt is in operation.

### ▶ Automatic Splice Information Recognition

Identifies the splice ID and corresponding location, monitors the health status in real-time, and issues alarms promptly when detecting anomalies.

### ▶ Reduced Shutdowns and Replacement of Manual Inspection

Achieves non-stop inspection; uses algorithms to diagnose the health status of each splice, reducing labor costs and minimizing loss from downtime.

### ▶ Modularization

The device is simple to install and features high modular design. The number of monitoring modules can be adjusted according to the belt width, with one monitoring module deployed every 400-500mm, offering flexible adaptation to different working environments.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
Continuous Monitoring Time	7×24h	Applicable Belt Width	800–2400mm
Measurement Accuracy Range	±0.2%	Operating Temperature	0°C–60°C
Applicable Belt Speed	0.8–5.5m/s		

## Return on Investment (ROI) Analysis

Impact of an Aramid Belt Splice Breakage in a Coal Mine

### ▶ Incident Impact

A single breakage led to complete splice failure and production interruption. With a downtime of 72 hours, direct economic losses reached 270\*.

Downtime Duration  
**72** Hours

Direct Economic Loss  
 ↓ **270\***

【\*Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.】

## Case Study / Application of Aramid Conveyor Belt Splice Monitoring System in Mining

### ○ Project Background

A coal mine deployed the aramid belt. Due to the high tension of the conveyor belt, and the inaccessibility of the internal structure, it was impossible to accurately determine the splice health status during maintenance.

### Operational Results

After installation in April 2024, the system has operated stably, achieving non-stop, online inspection. Inspection results meet the expected standards, providing maintenance support, reducing ineffective maintenance time, improving maintenance efficiency, and lowering maintenance costs, thus providing reliable assurance for safe conveyor operation.

## Frequently Asked Questions ?

**Q1: What is the power supply voltage for the main unit of the splice monitoring system?**

DC18V. It requires power supply via MA power.

**Q2: What functions does the host computer software of the splice monitoring equipment have?**

It provides 24-hour online monitoring, outputting basic conveyor line information. It monitors splice status and position information. When an abnormality is detected, the host automatically alarms and issues an alarm message.

# Conveyor Belt Intelligent Tracking System

This system is widely applicable in bulk material handling operations across industries such as steel, thermal power, ports, mining, and cement. It achieves real-time monitoring of belt deviation conditions and actively adjusts the belt back to the center via an automatic correction mechanism. By collecting data curves and other metrics, the system can replace manual inspection and prevent the downtime and wear caused by abnormal belt deviation, thus realizing a comprehensive assessment of the conveyor belt's health.



## Product Features

- ▶ **Unique Horizontal Shaft Structure**  
Designed to distribute forces uniformly, offering longer service life and avoiding maintenance.
- ▶ **Dual-Wheel Correction Design**  
Correction actions are more flexible, and the correction effect is better.
- ▶ **Integrated Hydraulic Structure**  
Adaptable to different machine frames and belt widths, offering flexible installation.
- ▶ **Bi-Directional Support**  
Supports the conveyor belt running in both forward and reverse directions.
- ▶ **Intelligent Monitoring and Recording**  
Real-time monitoring and storage of the deviation curve and deviation angle data, providing data support for predictive maintenance.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
Correction Monitoring Accuracy	5mm	Relative Humidity	≤95% (Non-condensing)
Applicable Belt Speed Range	0–8m/s	Atmospheric Pressure	80–106Kpa
Applicable Belt Width	650–2400mm	Operating Time	24h
Protection Rating	IP65	Operating Power	220VAC (Customizable based on requirements)
Operating Temperature	-30–60°C	Storage Temperature	-40°C–80°C

Supports correction for both forward and reverse belt drifts.

## Return on Investment (ROI) Analysis

【\*Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.】

- ▶ **Direct Economic Benefits**
  - **Reduced Belt Wear:** Extends belt service life by 30–50%.  
Annual Savings **20K – 60K\***
  - **Lower Maintenance Costs:** Reduces manual tracking correction and general maintenance.  
Annual Savings **15K – 40K\***
  - **Decreased Material Loss:** Timely correction prevents material spillage.  
Annual Savings **10K – 50K\***
  - **Improved Operational Efficiency:** Significantly reduces unplanned downtime.  
Annual Production Value Increase **30K – 100K\***

## ▶ Indirect Economic Benefits

- **Enhanced Safety:** Significantly mitigates accident risks.
- **Reduced Manual Intervention:** Lowers labor intensity and personnel exposure.
- **Data-Driven Maintenance:** Advanced data collection supports predictive maintenance strategies.

## ▶ Comprehensive Returns

- **Total Annual Benefit:** Approx. **75K – 250K\***
- **Payback Period:** Typically **6–18 Months**.
- **Long-term Economic Value:** Highly significant for high-value material conveying and continuous production scenarios.

## Case Study / Application of Intelligent Belt Tracking System in a Large Steel Plant

### ○ Project Background

Due to excessively long conveying lines and frame deformation, the ore conveyor belts at this steel plant experienced frequent mistracking. Traditional tracking devices responded slowly, leading to severe material spillage and edge wear. The site required maintenance shutdowns 2–3 times per month, which increased costs and disrupted production continuity.

### Operational Results

Following the installation of the BOTON Intelligent Belt Tracking System in April 2025, high-precision ultrasonic sensors and AI algorithms now monitor and automatically adjust belt positions in real-time.



## Frequently Asked Questions ?

### Q1: What are the core functions of the Intelligent Deviation Correction System?

- **Real-time Monitoring:** Detects the position of the belt edge via ultrasonic sensors.
- **Automatic Adjustment:** Controls servo electric actuators to push correction rollers, adjusting the belt direction.
- **Alarm Function:** Triggers the alarm system or shutdown protection when deviation exceeds limits.
- **Data Logging:** Stores historical deviation data to facilitate fault analysis.

### Q2: How do I determine if I need to install an Intelligent Deviation Correction System?

Installation is recommended if the following situations occur:

- Manual correction is required > 3 times per month.
- Material spillage or belt wear is caused by deviation.
- You are pursuing intelligent upgrades to reduce labor costs.

# Conveyor Belt Thickness Monitoring System

This system is suitable for belt conveyor scenarios such as steel mills, power plants, terminals, and mines. It can collect conveyor belt thickness data and monitor the working status of the conveyor belt. Addressing pain points such as the inability of traditional inspections to detect wear and tear risks in time and the lack of data support for O&M decisions, the system can provide real-time warnings of abnormalities and generate "Conveyor Belt Health Diagnosis Reports" to provide scientific evidence for O&M, reduce downtime, and extend the service life of conveyor belts.



## System Value

By deploying the BOTON thickness monitoring system, early-stage warnings are issued as the belt wears. This proactive approach keeps potential losses within 20\*.

Loss Mitigation  
 ↓ Within **20\***

## Return on Investment

With a typical investment benchmark of approximately 30\* (covering 5-year O&M), preventing just one major accident can yield an approximate 1600% ROI. The payback period is less than 12 months, ensuring long-term reduction in downtime risks, maintenance costs, and safety hazards.

ROI per Averted Accident  
**1600%**

## Product Features

### Real-time Monitoring

The system can detect conveyor belt thickness abnormalities in a timely manner, accurately determine the fault location, and display the conveyor belt's working status in real time.

### Data Collection & Recording

Collects and records data for each conveyor belt and conducts health assessments based on historical data.

### Health Diagnosis Reports

Generates "Conveyor Belt Health Diagnosis Reports" to provide a reliable basis for O&M decisions.

### Preventive Maintenance

Reduces unplanned downtime, extends the service life of conveyor belts, replaces manual inspections, and improves O&M efficiency.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
Measurement Accuracy	within 1mm	Operating Temperature	-20°C–60°C
Belt Width	650–3000mm	Storage Temperature	-40°C–80°C
Device Scanning Frequency	≥80Hz	Relative Humidity	≤95% (Non-condensing)
Device Lateral Resolution	50mm	Atmospheric Pressure	86–106Kpa
Conveyor Running Speed Range	0–10m/s	Working Power Supply	AC85V-AC264V (Customizable per customer needs)
Core Component Protection Level	IP66		

## Return on Investment (ROI) Analysis

\*Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.

Impact of a Belt Breakage Incident in a Mineral Processing Plant

### Incident Impact

A single incident led to belt ripping or complete breakage. With a downtime of 72 hours, direct economic losses exceeded 500\*.

Downtime Duration  
**72** Hours

Direct Economic Loss  
 ↓ **500\***

## Case Study / Application of Intelligent Belt Tracking System in a Large Steel Plant

### Project Background

- Conveyed Material: Ore
- Belt Type: BOTON High-Wear Resistant Aramid Composite Belt
- Traditional O&M: Average annual downtime of ~40 hours, with economic losses exceeding 100\*.

### Operational Results

Following the system upgrade and integration of intelligent monitoring services in 2024, the continuous operation cycle has been extended to 18 months with zero unplanned downtime. Customer feedback indicates a 70% reduction in maintenance workload and a significant boost in product ROI.

Maintenance Workload  
 ↓ **70%**

Continuous Operation Cycle  
 ↑ **18** Months

## Frequently Asked Questions ?

### Q1: What is the minimum area of thickness change that can be identified?

With a device scanning frequency of 80Hz and a belt speed of 3m/s, thickness changes within a 50mm range on the belt can be detected.

### Q2: What type of sensor is used?

3D Laser Camera

# Wireless Temperature Monitoring System

This system is oriented towards key equipment in steel mills, power plants, terminals, and mines (such as fans, crushers, compressors, large motors, and power units). It provides real-time monitoring and smart warnings. Traditional sensors collect running status data, and the system combines built-in algorithms to identify abnormal fluctuations, helping prevent equipment failure and major losses. Compared with manual inspections, the system significantly reduces labor input, lowers maintenance costs, enhances the intelligent level of equipment operation, and provides reliable health management solutions for enterprises.



## Product Features

### ▶ All-weather Temperature Monitoring

Collects 24-hour temperature data and displays it on the server side.

### ▶ Flexible Deployment

Wireless communication is flexible and reliable, with a communication range up to 900m (line of sight, unobstructed). Each wireless communication gateway can simultaneously connect up to 128 wireless temperature sensors.

### ▶ Smart Anomaly Alarm

Automatically determines the operating status based on temperature anomalies and issues alarm signals, reminding users to check the alarm value.

### ▶ Battery Monitoring

The sensor has a self-check function and sends the remaining battery power. It issues an alarm when the battery voltage falls below a preset minimum level, reminding the user to replace the battery.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
Temperature Range	-25°C~125°C	Lifespan	2Years@25°C
Communication Range	900m (Unobstructed)	Operating Temperature	-20°C~85°C
Temperature Measurement Accuracy	±1°C	Protection Level	IP66
Power Supply Method	Battery		

## Return on Investment (ROI) Analysis

【\*Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.】

### Steel Plant Application

Taking a steel plant as a benchmark, with 50 conveyor belts and approximately 400 inspection points across motors, reducers, and bearings. Traditional manual inspection requires an estimated 6–8 personnel. Assuming a standard annual labor cost index of 15 per person, the total annual expenditure is approximately 100\*. Furthermore, manual methods cannot achieve real-time temperature monitoring. By deploying the BOTON Wireless Temperature Monitoring System, the required personnel can be reduced to 3–4, while simultaneously preventing losses caused by equipment damage.

Labor Cost Reduction

↓ ~50%

## Case Study / Application of Wireless Temperature Monitoring System in a Large-Scale Mining Plant

### ○ Project Background

A large mining enterprise faced frequent failures in its traditional conveyor systems. Each conveyor line suffered an average of 25 hours of unplanned downtime annually, resulting in a direct loss index of approximately 120\*. This also led to a 15% drop in downstream mineral processing efficiency.

### Implementation Solution

- **Sensing Layer:** 173 temperature sensors covering critical locations such as drive pulleys and bend pulleys.
- **Transmission Layer:** LoRaWAN gateways with a single-point coverage radius of up to 1.2 km.
- **Platform Layer:** Intelligent diagnostic algorithms enabling multi-dimensional early warnings.

Direct Loss Mitigation

↓ 120\*

Efficiency Enhancement

↑ 15%

### Operational Results

The system ran stably for 12 months; maintenance workload decreased by 50% year-on-year, and the proportion of preventive maintenance increased to 85%.

Maintenance Workload Reduction

↓ 50%

Preventive Maintenance Proportion

↑ 85%

## Frequently Asked Questions ?

### Q1: Which equipment can temperature monitoring be applied to?

Mainly monitors temperature changes in large equipment, such as motors, reducers, and bearings.

### Q2: What type of wireless communication is used?

LoRa (Long Range) wireless communication technology is used.

### Q3: How long is the battery life?

2years@25°C.

# Cleaning & Recycling System

The Intelligent Water Washing System is universally suitable for industries such as mining, ports, thermal power, and electricity. Installed below the conveyor drive head, the system uses high-pressure water to deeply clean the conveyor belt, combined with water and high pressure air cleaning. It achieves thorough removal of carryback, eliminates static electricity, and prevents dust propagation. It features self-cleaning, intelligent control, and remote alarm functions. Its benefits include reducing labor costs, lowering consumption, extending belt and equipment lifespan, improving operational efficiency, and enhancing safety.



## Product Features

### ▶ Deep Cleaning

Uses high-pressure water combined with multiple dust and high pressure air removal devices. Achieves deep surface cleaning, ensuring no residue, no static electricity, and thorough removal of carryback.

### ▶ Customizable

Can be configured according to different working conditions and dust levels. Multiple models (A/B/C) are available.

### ▶ Intelligent Control

Composed of a cleaning host and control cabinet. Realizes integrated control of water pressure, flow, purification, and cleaning fluid. Supports remote monitoring and platform linkage.

### ▶ Anti-clogging Self-cleaning Design

Uses patented water knife self-cleaning technology. Ensures system continuity and maintainability.

### ▶ Reduce Labor Intensity

Reduces manual clearing of accumulated material and dust protection work. Lowers occupational health risks for workers.

### ▶ Extend Equipment Lifespan

Effectively protects the conveyor belt, rollers, and related equipment, extending their service cycle.

## Technical Specifications

Parameter	Indicator	Parameter	Indicator
Applicable Belt Width	650–2400mm (Recommended width≤1400)	Consumption Flow	2t/h
Applicable Belt Speed	≤5.5m/s	Voltage Level	380V(Three-phase five-wire)
High-Pressure Water System Pressur	0.5–3.5MP(Customizable)	System Power	Average operating power 11KW (Customizable with auxiliary devices)

## Return on Investment (ROI) Analysis

【\*Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.】

### ▶ Reducing Belt and Equipment Costs

Deep cleaning mitigates belt aging, cracking, and slippage, avoiding the hidden damage caused by traditional rigid cleaning methods and extending service life. Based on a single belt value index of 200\* and a 5-year lifespan, estimated savings range from 20 to 40\* (multiplied by the number of conveyors). Simultaneously, the system provides indirect protection for pulleys and bearings, reducing component replacement and manual maintenance expenses.

### ▶ Reduce Labor Costs, Ensure Worker Health

Thoroughly removes sticky material and eliminates static electricity, making the belt and equipment cleaner. Lowers equipment cleaning costs. Reduces the risk of dust-related illnesses. Reduces manual intervention and operational accidents, lowering risk to personnel and assets.

### ▶ Reduce Environmental Compliance Costs

Follow environmental requirements, reduce environmental pollution, and lower losses from fines and production shutdowns caused by non-compliance.

### ▶ Reduce Water Resource Costs

Adopt water recycling and reuse to reduce water consumption, optimize the conveying process, and lower loss costs caused by secondary dust and material pulverization.

## Case Study / Scenario Applications of the Conveyor Belt Intelligent Water Washing System

### ○ Project Background / Port Terminal

The conveyor belt at this port terminal has a width of 1400mm and runs at a speed of 4.5m/s. It primarily transports sand, gravel, and powders. Long-term accumulation of carryback and dust accumulation increase the equipment load, leading to high maintenance costs.

#### Operational Results

##### 2023 Deployment

- Deep cleaning, thoroughly removing carryback.
- Belt is dry after cleaning, with no secondary dust carryback or electrostatic adsorption.
- Water mist effectively suppresses dust at the chute and head covers.
- Belt surface is scratch-free, with no slippage during traction.
- Reduced labor input and maintenance costs, with estimated annual savings exceeding 100\*.

### ○ Project Background / Steel Mill

This steel plant's conveyor belt has a width of 1800mm and primarily transports high-temperature pig iron material. Adhering carryback and prominent dust accumulation affect the production environment and safety, and simultaneously increase pressure.

#### Operational Results

##### 2023 Deployment

- Effectively removes carryback, lowering dust levels.
- Improved production environment and enhanced operational safety.
- Reduced manual cleaning burden, optimized maintenance efficiency, and ensured stable operation of the conveying system.

## Frequently Asked Questions ?

### Q1: Water knife head clogging issue?

Water knife anti-clogging and self-maintenance function.

### Q2: Cleaning material recovery issue?

Can be integrated with a belt scraper or a customized washing box to achieve automatic material recovery.

### Q3: Belt dewatering issue?

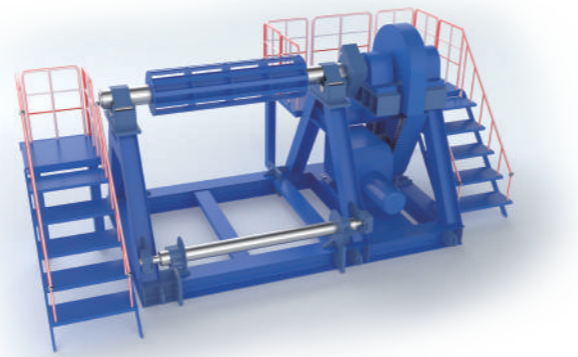
Dewatering and air drying of the belt using air blades.

### Q4: Washing wastewater issue?

The wastewater can enter the downstream belt with the material, be separately collected for sedimentation, or realize purified water circulation.

# Belt Winder

The BOTON Belt Winder is suitable for mining, open-pit mining, metallurgy, coal washing, thermal power, port terminals, and other areas where conveyor belts require frequent replacement or maintenance. It addresses pain points such as high labor intensity in manual belt re-reeling, low efficiency, long downtime, and high material costs. This product uses a self-developed servo motor + PLC intelligent control system to achieve real-time control of belt re-reeling and recovery, significantly reducing labor intensity, improving production efficiency, ensuring equipment operation is safe and reliable, working smoothly, and being practical—it is the ideal choice for belt re-reeling operations.



## Product Features

### ▶ Continuous Production Guarantee

Speeds up belt re-reeling and replacement, shortening traditional manual downtime from tens of hours to hours (e.g., in a mine, replacing a belt over 100 meters per hour), significantly reducing production losses caused by downtime.

### ▶ Full Cycle Cost Reduction

Automatically reduces labor costs and material losses. For example, in a mine with an annual output of 10 million tons, annual savings exceed 500\*. Modular design is convenient for replacing faulty/damaged parts (e.g., motor, reducer can be replaced separately), reducing the equipment replacement cost by 40%. Spare parts inventory is reduced by 30%.

### ▶ Automated Loss Reduction and Efficiency Improvement

Controlled by PLC, the reeling process is activated with one button, allowing instant operation. It replaces traditional manual traction and reeling, reducing labor intensity by over 80%.

### ▶ Flexible Adaptation to Multiple Conditions

The Belt Reeler uses automation technology to achieve complex multi-job adaptation, ensuring equipment safety, simultaneously improving production efficiency and operational flexibility.

## Technical Specifications

Reeler Model	Max Belt Width (mm)	Tractive Force (KN)	Reel Diameter (D)m	Max Output Torque (kN.m)	Max Linear Speed (m/s)	Voltage (V)	Recommended Motor Power(Kw)
15T	1400	30	3	45	0.6	380	22.0
30T	3048	33.1	3.3	54.62	0.67	380	30
40T	1829	30.1	5	75.25	1	380	37
50T	2000	38	5.2	98.8	0.9	400	37.0

The above are standard products, and customization can be requested according to customer needs.

## Return on Investment (ROI) Analysis

【\*Benchmark values only. Actual results vary by region. Contact BOTON for localized Cost-Benefit Analysis.】

### ▶ Core ROI Conclusions

In material handling scenarios, the BOTON Belt Winder typically achieves a payback period of 1–2 years, with an annualized ROI exceeding 100%. The primary sources of revenue are the reduction of downtime losses and the replacement of high manual labor costs.

#### Case Study: Aramid Belt Joint Breakage in a Coal Mine

A port enterprise invested 120\* in a belt winder. With a belt replacement frequency of 6 times per year, and taking into account labor costs and a production value index of 8\* per hour, the actual payback period was approximately 7 months.

ROI = **171%**

## Case Study / Application of the Belt Reeler in a Power Plant Scenario in Southern Jiangsu

### ○ Project Background

A power plant in Southern Jiangsu introduced the BOTON Belt Reeler when replacing steel cord conveyor belts. Traditional replacement operations relied on winches and manual handling, which involved high labor intensity, high safety risks, and issues like low efficiency and poor standardization.

#### Operational Results

After the BOTON Belt Reeler was put into use, only a few personnel were needed to easily complete the entire operating procedure, achieving efficient linkage between belt replacement and recovery. The operation time was compressed from the original 10 days to less than 3 days, significantly reducing labor costs and safety risks.

Labor Efficiency Improvement

↑ **233%**

## Frequently Asked Questions ?

### Q1: What components make up the Belt Reeler?

This device consists of a frame, variable frequency motor, reducer, drive assembly, sliding bearing assembly, reel shaft, pressure roller assembly, lifting ring, ladder, electric control system, toolbox, protective railings, etc.

### Q2: Is the reeling speed adjustable?

Yes, it can be adjusted. The speed can be adjusted according to the belt diameter, making the process controllable and highly efficient.