

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

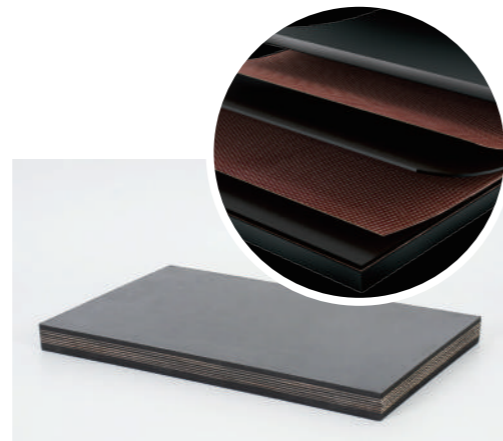
Carcass

Within the overall structure of a conveyor belt, the carcass layer is the key factor determining performance, durability, and safety. To meet different conveying distances, operating conditions, load requirements, and environments, BOTON offers five carcass solutions. These solutions flexibly address a wide range of conveying challenges—from light-load short-distance to heavy-load long-distance applications, and from standard operations to extreme environments—helping customers to achieve or achieving efficient, stable, and low-maintenance conveying.

- ① Fabric Carcass
- ② Aramid Carcass
- ③ Steel Cord Carcass
- ④ Solid Woven Carcass
- ⑤ Sustainable Core™ Carcass

01 Fabric Carcass

As one of the most widely used carcass structures in industrial conveying systems, fabric conveyor belts (mainly polyester, Nylon EP(PN), and Nylon NN) are favored for their excellent troughability, flexibility, and cost-effectiveness. They are the preferred solution for light- to medium-load, short- to medium-distance conveying and are widely applied across mining, building materials, ports, power, and metallurgical industries.



Key Features

► Flexible — Excellent Troughability and Adaptability

The fabric carcass structure is soft, making it suitable for conveyor systems with frequent bending or compact equipment layouts.

- Excellent troughability enhances material stability and conveying efficiency.
- Particularly suitable for short-distance conveying, heavy impact loading, and frequent start-stop conditions.
- Different constructions, such as EP(PN) (Polyester/Nylon) or NN (Nylon/Nylon), can be selected according to specific requirements.

► Stable — Low Elongation for Smoother Operation

EP(PN) fabric carcass feature high strength and low elongation, effectively controlling tension travel and system deformation.

- The belt remains stable during operation and is less prone to tracking issues.
- Optimized tensioning device design reduces maintenance frequency and adjustment complexity.

► Durable — Combining Flexibility and Fatigue Resistance

Nylon yarn is resistant to bending and impact, making it suitable for conditions with frequent load changes, while polyester fibers offer superior acid and alkali resistance, ideal for harsh environments.

- Effectively absorbs and evenly distributes material impact, protecting the conveyor belt structure.
- Can be flexibly combined based on the conveyed material and environmental conditions to extend service life.

► Cost-Effective — A High Value Choice

Fabric conveyor belts have relatively low manufacturing costs, a well-established structure, and strong adaptability.

- Widely compatible with various cover rubber grades (abrasion-resistant, fire-resistant, heat-resistant, etc.) to meet diverse application needs.
- Delivers good overall performance while meeting medium- to low-strength requirements.

► Customizable — Wide Range of Plies and Strength Options

BOTON offers standard fabric core constructions with 2 to 6 plies, and up to 12 plies can be customized for special requirements.

- Tensile strength ranges from 300 N/mm to 3150 N/mm, meeting diverse conveying requirements.
- Supports customized options such as splice bonding structures, weather resistance, and anti-tear reinforcement designs.

[Heat-Resistant: P26](#)

[Surface Fire-Resistant Series: P35](#)

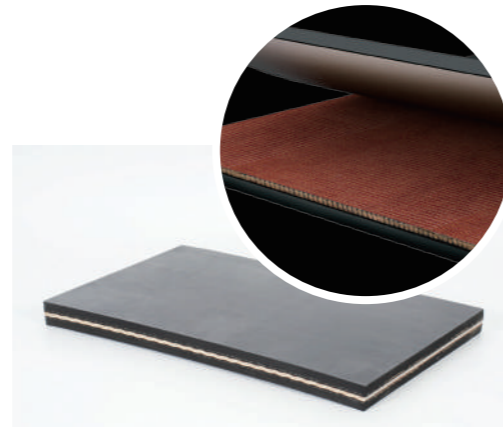
[Underground Fire-Resistant Series: P42](#)

[Impact-Resistant and Anti-Tear Series: P59](#)



02 Aramid Carcass

When handling high-strength, long-distance conveying tasks with steep inclines and complex terrains, traditional conveyor belts face challenges such as heavy belt weight, high energy consumption, susceptible to corrosion, and belt rip. As a new generation of high-performance carcass, aramid offers unique physical and structural advantages, making it an ideal choice for industrial conveying systems.



Honors



(1) (2) (3) (4)

- (1) Second Prize of the National Science and Technology Progress Award
The Only National-Level Award in the Industry
- (2) First Prize of the China Coal Industry Science and Technology Award
China Coal Industry Association
- (3) First Prize for Scientific and Technological Progress
China Petroleum and Chemical Industry Federation
- (4) First-Level Catalog of Coal Science and Technology Innovation Achievement Transfer and Transformation Projects
China Coal Industry Association

Key Features

► Lightweight — Reduces Energy Consumption and Improves Efficiency

Aramid has only one-fifth the density of steel. Achieving the same strength, it significantly reduces the conveyor belt's own weight, effectively lowering equipment load and energy consumption.

- Reducing the conveyor belt's own weight can lower the required lift tension by up to 20%, which is especially beneficial in underground and long-distance conveying.
- With the same roll diameter, aramid belts offer longer roll lengths, reducing the number of splices required and lowering operational resistance.
- Actual tests show energy savings of over 10%, with even more significant advantages in the later stages of operation.

► Tough — Durable, Safe, and Reliable

Aramid offers excellent corrosion and fatigue resistance, remaining rust- and mold-free in humid, acidic or alkaline, and high-salinity environments.

- Tear and puncture resistance far exceed that of steel cords, significantly reducing the risk of longitudinal tearing caused by foreign object penetration.
- Excellent flexibility and compression fatigue resistance, extend the overall service life of the conveyor belt.
- Uniform pressure distribution during operation, minimizes internal belt stress concentration and prevents cover cracking.

► Stable — Fire and Corrosion-Resistant, High-Temperature Tolerant

Aramid inherently possesses excellent fire resistance and heat tolerance, remaining resistant to aging and deformation in high-temperature environments.

- With an oxygen index above 28%, aramid exhibits good self-extinguishing properties and resists flame propagation during operation.
- It maintains structural stability even in high-temperature and high-humidity environments, making it particularly suitable for underground mining, metallurgy, and power industries.

► Flexible — Smooth Over Pulleys, Enhanced Adaptability

Thanks to aramid's unique woven structure and moderate modulus, aramid conveyor belts offer greater flexibility and superior bending ability during operation.

- Easier to adapt to small-diameter pulleys and complex concave-convex curves without major adjustments to conveyor parameters.
- Enhanced troughability and conformity reduce slippage and off-tracking during no-load operation.

► Durable — Higher Cover Rubber Utilization

Thanks to the belt's flexibility and uniform pressure distribution, aramid conveyor belts experience more even wear on the top and bottom cover rubber, resulting in a longer service life.

- With no risk of steel cord protrusion, the cover rubber can be worn down to a thinner limit.
- Stable structure and corrosion-free properties reduce premature damage caused by carcass failure.

Energy-Saving Series: P20

Heat-Resistant: P26

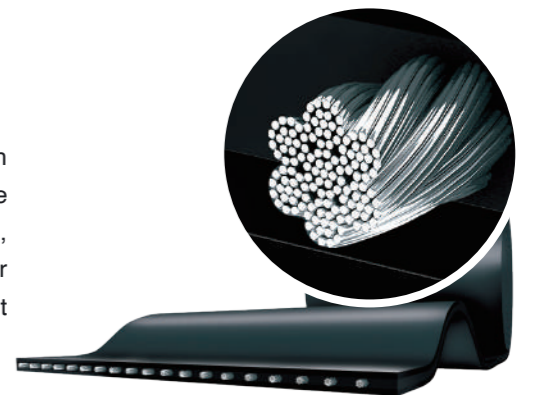
Surface Fire-Resistant Series: P35

Underground Fire-Resistant Series: P42



03 Steel Cord Carcass

For demanding conveying tasks involving ultra-long distances, high loads, and extreme environments, steel cord conveyor belts are the preferred choice in large- and medium-sized mines, power plants, ports, cement, and metallurgical industries, thanks to their exceptional load-bearing capacity, very low elongation, and excellent structural stability.



Key Features

► Powerful — High Strength, Long Spans

Steel cord conveyor belts use galvanized high-strength steel wires, with each cord providing excellent tensile strength and fatigue resistance.

- Tensile strength ranges from ST500 to ST10000, suitable for continuous conveying over distances of several kilometers.
- Capable of withstanding extremely high dynamic tension and concentrated load impacts, making it the primary choice of carcass material for long-distance bulk material transport.

▶ Stable — Extremely Low Operational Elongation

The steel cord carcass provides a stable belt structure that resists deformation over long-term operation, helping maintain uniform belt tension distribution.

- Tension travel is controllable, making system adjustment and maintenance easier.
- Maintains good operational stability even in high-temperature, humid, and highly corrosive environments.

▶ Reliable — Impact-Resistant, Tear-Resistant, Highly Safe

- The belt's dense internal structure can be combined with anti-tear fabric breaker and various high-performance cover rubbers to enhance overall safety.
- Suitable for complex layouts, such as concave-convex curves, steep inclines, and high-lift conveyor systems.
- Particularly ideal for underground coal mines, open-pit mines, and heavy-duty metallurgical systems where conveying stability is critical.

▶ Durable — Long Service Life

Under proper installation and appropriate loading conditions, steel cord conveyor belts can operate stably for many years, reducing replacement frequency.

- Optimized steel cord structure and core rubber formulation enhances fatigue and corrosion resistance.
- Top and bottom cover rubber thickness can be customized to improve structural protection and wear life.

Energy-Saving Series: P20 ↗

Heat-Resistant: P26 ↗

Impact-Resistant and Anti-Tear Series: P59 ↗



Galvanized Steel Cord + Multi-Strand Construction

Galvanized steel cords with high strength, impact resistance, and fatigue-resistant multi-strand construction ensure the conveyor belt's flexibility and excellent fatigue performance.



Ultra-Low Elongation

Suitable for long-distance conveying or stacker-reclaimer applications that require high tension travel.

Industry-Leading
Low Elongation

BOTON
Standard Elongation
0.2%

0.25%

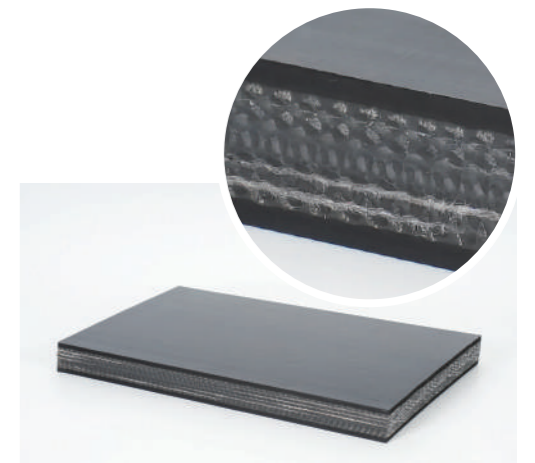
BOTON steel cord series exhibits an elongation of just 0.2% at 15% of the nominal tensile strength.

Benefits of Low Elongation

During operation, the belt resists noticeable deformation, effectively reducing take-up travel and the requirement for frequent adjustments, ensuring stability in long-distance, high-capacity, or steep-incline conveying conditions. At the same time, stress is distributed more evenly across the belt and splices, extending service life and reducing downtime for maintenance, thereby significantly lowering overall operating costs.

04 Solid Woven Carcass

The solid woven carcass (full-core conveyor belt) is formed by interweaving polyester and nylon fibers, with a tight bond between the belt core and cover layers. It offers high strength, low elongation, impact and tear resistance, as well as excellent fire and anti-static performance, making it ideal for high-strength, safety-critical conveying environments such as underground mines.



Key Features

▶ Enhanced Toughness — Solid Woven Carcass for Balanced Load Distribution

Uses a high-strength polyester fiber weaving process, tightly bonding the belt core and cover layers to form a robust solid woven carcass.

- High load-bearing capacity, suitable for heavy-duty, long-duration underground operation.
- Flexible structure with excellent troughability, reducing spillage and improving conveying efficiency.
- Outstanding resistance to lateral tearing and impact, ideal for conveying abrasive materials such as coal, salt, and potash.

▶ Safer — Fire and Anti-Static, Compliant with International Standards

- Available in PVC and PVG options, both offering excellent fire resistance and anti-static performance.
- Meets multiple international standards, including Australia AS4606, China MT914, and Germany DIN 22102.
- PVC type provides good moisture and chemical resistance; PVG type maintains fire resistance while offering superior wear resistance and outstanding low-temperature performance.

▶ More Stable — Low Elongation, Smooth Operation

- Polyester fiber carcass exhibits low elongation, ensuring uniform belt tension and reducing off-tracking and slippage.
- Short take-up travel makes daily maintenance and system adjustments easier.
- Performs stably in special environments with high humidity and high salinity.

▶ More Economical: Durability Meets Low Operating Cost

- Wear-resistant cover compounds extend service life and reduce replacement frequency.
- PVC type serves as an economical alternative to rubber conveyor belts, suitable for short to medium haulage distances.
- PVG type is ideal for medium-to-high tension, long-distance, and continuous operation scenarios, lowering total life cycle cost.

Underground Fire-Resistant Series: P42 ↗

05 Sustainable Core™ Sustainable Carcass

Under the background of the global "dual carbon" strategy advancement, BOTON has proactively deployed green material innovation with a forward-looking perspective, launching the Sustainable Core™ sustainable carcass solution. It has respectively delivered the world's first carbon-neutral conveyor belt and the world's first bio-based conveyor belt to globally renowned enterprises.



This product line features natural rubber, bio-based polyester/nylon fabric, and bio-based additives as core components, integrating environmental sustainability and high performance. It serves as a robust enabler for low-carbon bulk material transportation. With over 72% of its composition derived from renewable or sustainable sources, the Sustainable Core™ conveyor belt reduces carbon footprint by 20-30% across its entire lifecycle. It caters to large-scale global mining, metallurgy, and port customers with explicit requirements for carbon emission reduction and ESG performance.

Sustainable Core™ does not force a trade-off between sustainability and performance. Instead, through innovations in material systems and manufacturing processes, it achieves both—providing solid support for the green transition of the global bulk material transportation industry.

Key Features

▶ Sustainability – Sustainable Carcass for Low-Carbon Bulk Handling

- Rubber: Natural Rubber + Bio-based Itaconic Ester Rubber
- Carcass Fabric: Bio-based Polyester, Bio-based Nylon
- Reinforcing Fillers: Rice Husk Silica, Recycled Carbon Black, Bio-based Resin
- Additives: Green Modifying Components such as Bio-based Aromatic Oil

▶ High Performance – Exceptional Tensile Strength & Cut Resistance

- The bio-based polyester and nylon carcass fabric layers offer Carcass Fabric exceptional tensile strength, impact resistance, and tear resistance.
- Suitable for conveying high-impact, large-particle materials such as ores.
- Compatible with various working conditions including high load, long distance, and large inclination angle.

▶ Durability – Both Functional Excellence and Environmental Sustainability

- The cover rubber can be combined with functional formulations such as wear resistance, flame retardancy, and energy efficiency as required.
- It maintains stable conveying capacity without compromising service life or performance.
- Suitable for high-temperature, high-humidity, and harsh climatic conditions.



SUAR™

Ultra-Wear-Resistant Series

In the bulk material handling industry, wear resistance is a critical property for all conveyor belts. Wear not only determines belt lifespan but also directly affects production stability and operating costs.

However, as operating conditions in mines, ports, and power plants become increasingly demanding, conventional wear resistance is no longer sufficient for high-intensity operations.



SUAR™ Ultra-Wear-Resistant Series

BOTON introduces the SUAR™ Ultra-Wear-Resistant Series — offering wear performance far beyond the strictest international DIN W standards, maintaining exceptional performance even under extreme conditions. Whether facing intense abrasion at high impact loading points, continuous friction during long-distance conveying, or all-weather operation in harsh open-pit mines, SUAR™ delivers longer service life and more stable performance, helping customers significantly reduce replacement and downtime costs. SUAR™ Ultra-Wear-Resistant — not just durable, but built for extremes.

Key Features

Wear-Resistant

Excellent wear resistance, with flagship models exhibiting lower abrasion than domestic standards.

Tear- and Impact-Resistant

The cover rubber offers excellent wear resistance, with strong tear and impact resistance.

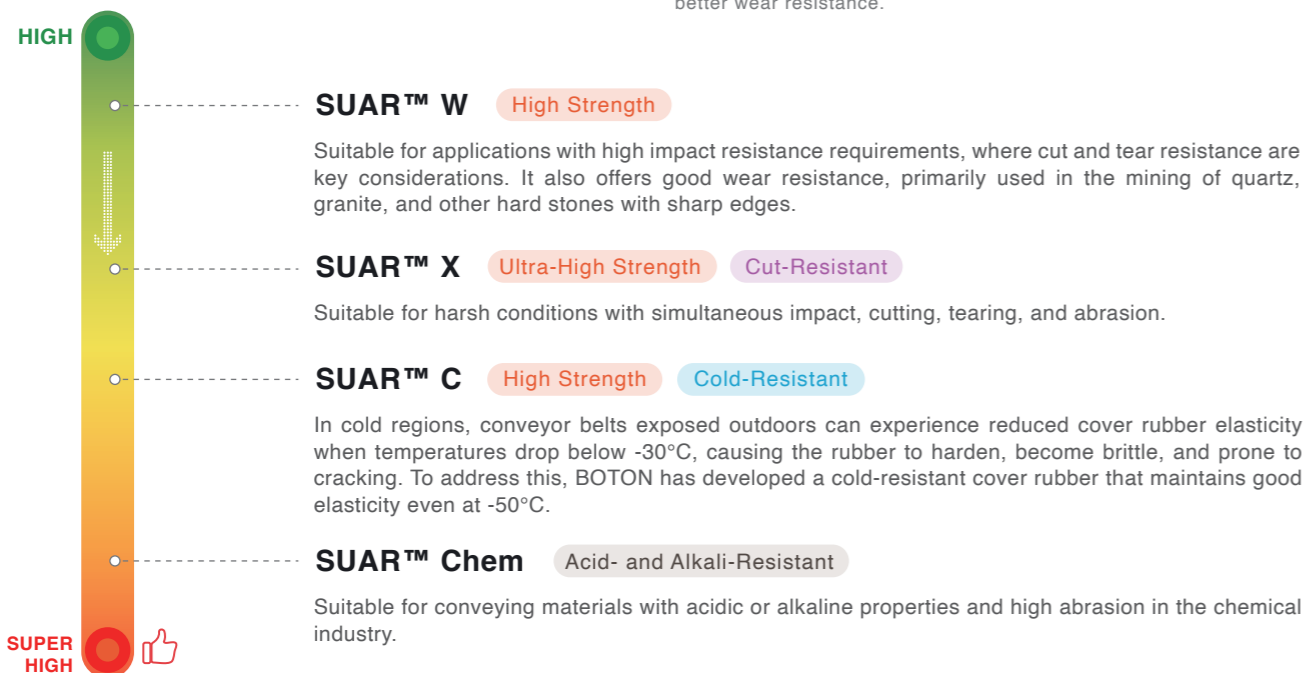
Excellent Adhesion

Strong interlayer adhesion prevents delamination, with resistance to weathering, ozone, and UV exposure.

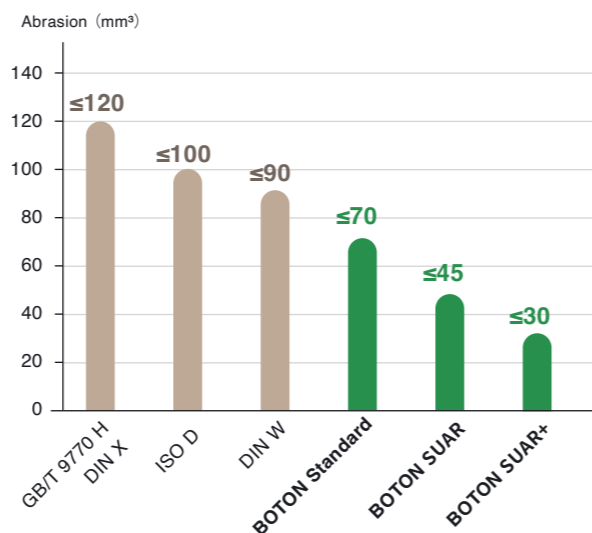
Low Elongation

Excellent performance with low elongation, suitable for conveyor systems with short take-up travel.

Wear Resistance



Cover Rubber Performance



Note:
 ①DIN standards are widely used in Europe, especially in Germany.
 ②ISO standards are set by the International Organization for Standardization.
 ③Abrasion: In standard wear tests for conveyor belt cover rubber, the lower the abrasion value, the less rubber is worn, indicating better wear resistance.

SUAR™ Ultra-Wear-Resistant Series

Case Study / Application of SUAR™ Ultra-Wear-Resistant Conveyor Belts in Port Stockyard Reclaimer Systems

Project Background

Global mining giant's iron ore port project in Western Australia: In October 2018, BOTON deployed conveyor belts with SUAR™ ultra-wear-resistant cover rubber for high-intensity, high-frequency reclaimer operations.

Project Objectives: Extend belt service life, reduce splice failure risks, and control replacement frequency and inventory costs.

Challenges:

- High dust levels and severe material abrasion in the port environment
- Short conveyor belt replacement cycles; frequent splice issues pose safety risks and increase downtime losses

Operational Results

- In third-party testing, BOTON samples were selected among global suppliers for outstanding abrasion performance, being the only Chinese manufacturer to win the bid.
- Field data shows that the cover rubber on SUAR™ conveyor belts exhibits significantly lower wear per million tons of iron ore compared to international competitors.

- Wear Rate Reduced By ↓ 27% & 25%
- Extended Conveyor Belt Service Life ↑ 50%
- Annual replacement frequency reduced from **3** times to **2** ↓, lowering safety risks during splicing ↓ 33%
- Inventory and Procurement Costs ↓ 25%

Customer Feedback

"...The service cycle target has been successfully met and even exceeded. SUAR™ conveyor belts show lower wear and stable performance over the same period, making them our current top choice."



Case Study / Application of SUAR™ Ultra-Wear-Resistant Conveyor Belts on Reclaimer Booms

200%+
Extended
Service Life

Project Background

In actual operation of a reclaimer boom conveyor belt at a well-known Australian mining company, the belt's cover rubber wore out too quickly to meet expectations. BOTON's SUAR™ Ultra-Wear-Resistant series was used as a replacement.

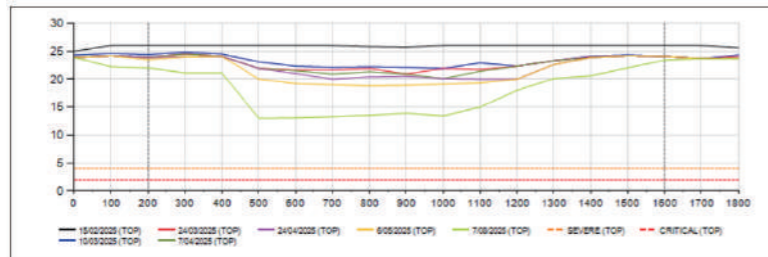
Challenges:

- Production schedules and downtime were disrupted
- Increased conveyor belt costs (minimum \$120K per replacement, including materials and labor)
- Conveyor belt life ended prematurely, failing to meet expectations
- Higher safety risks with frequent downtime interventions



Operational Results

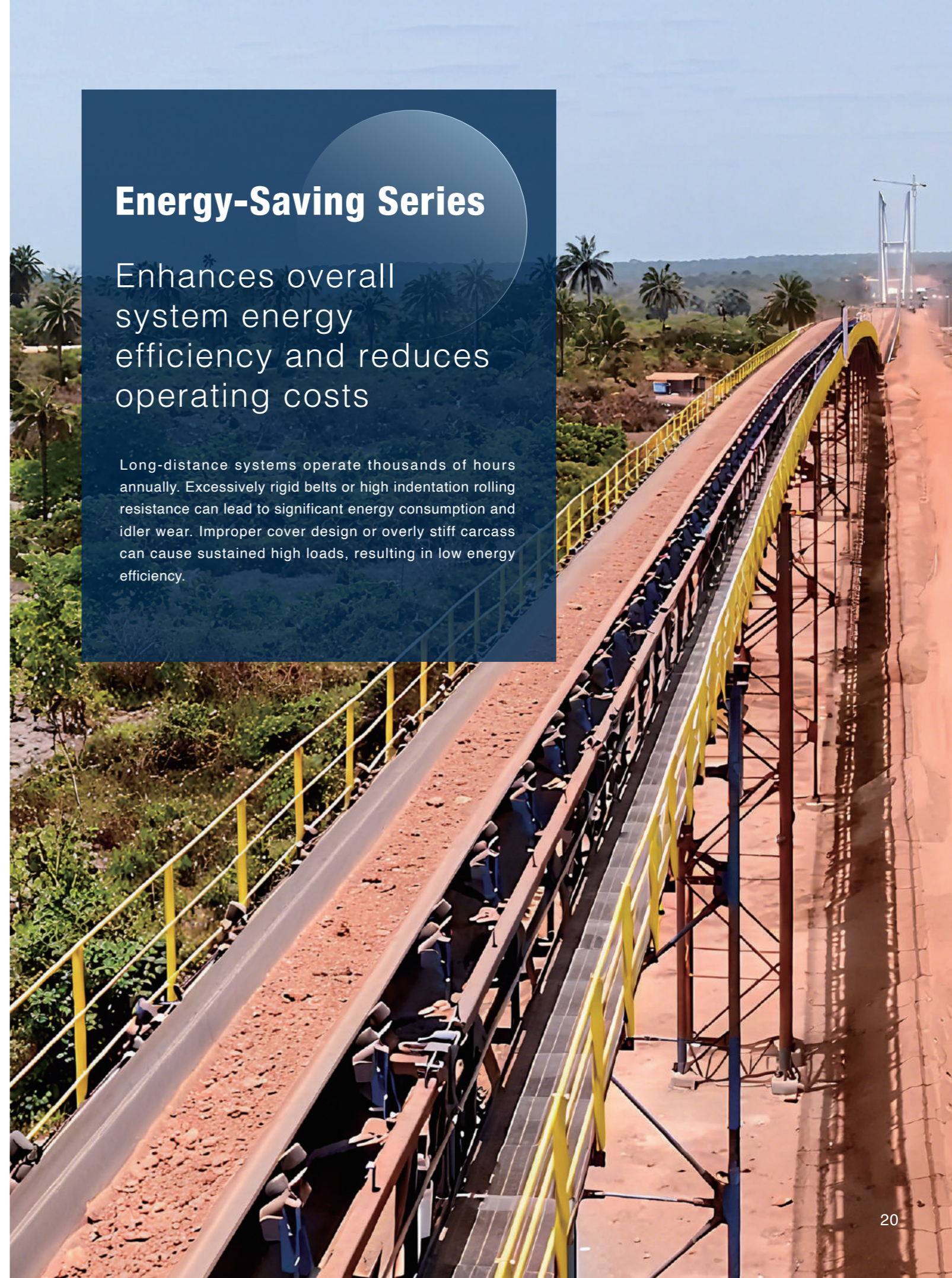
- BOTON SUAR™ conveyor belts deliver stable and reliable performance, meeting and exceeding customer requirements, with extended service life. **200%+**
- For every 1 mm of conveyor belt wear, handling capacity increased to **780KT**, higher than the previous level. **47%**
- Effectively reduces downtime interventions and improves safety during maintenance, giving operators more time and space to focus on other critical tasks.



Energy-Saving Series

Enhances overall system energy efficiency and reduces operating costs

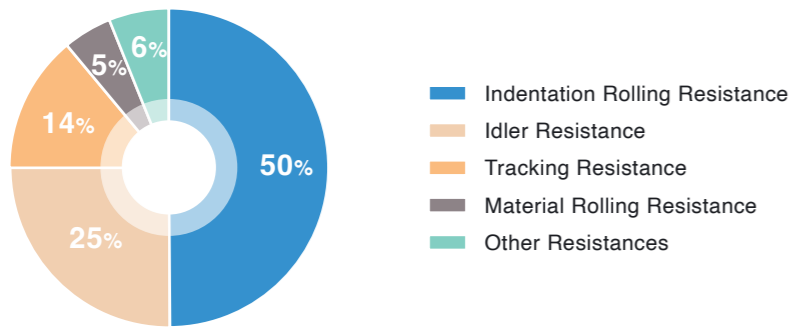
Long-distance systems operate thousands of hours annually. Excessively rigid belts or high indentation rolling resistance can lead to significant energy consumption and idler wear. Improper cover design or overly stiff carcass can cause sustained high loads, resulting in low energy efficiency.



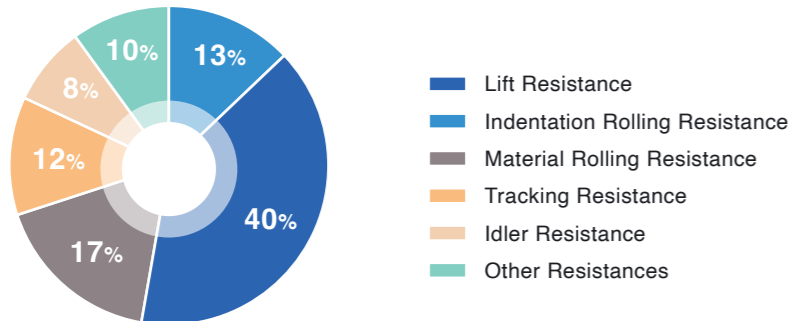
Energy-Saving Requirements for Long-Distance Conveyor Belts

In horizontal conveying, indentation rolling resistance can account for over 50% of the conveyor system's total energy consumption; in inclined conveying, the lifting resistance represents about 40% of energy use, while troughing roll resistance can still reaches 13%. Therefore, reducing the conveyor belt's weight and the indentation rolling resistance of the bottom rubber under load is key to improving energy efficiency and lowering energy costs. Traditional steel cord belts are rigid and heavy, which not only increases deformation losses but also drives higher power consumption. Conventional rubber compounds also consume more energy, leading to higher operational and maintenance costs over time.

Energy Consumption of Horizontal Conveyor Systems



Energy Consumption of Inclined Conveyor Systems



Solutions and Selection Recommendations

✓ Lightweight carcass + energy-saving bottom cover

Lighter belt body reduces driving resistance; combined with the new low indentation rolling resistance cover rubber, overall energy savings can reach 10-25%, especially suitable for long-distance systems with continuous operation, high energy cost sensitivity, and strict green certification requirements.

✓ Steel cord belts can also be paired with energy-saving cover rubber.

Reduce frictional resistance while maintaining cost efficiency.

Aramid Energy-Saving Cord

DPP Energy-Saving Long-Distance Critical-Task Lines Heavy-Duty / High-Lift

Aramid belts leverage its lightweight, high-strength, low-indentation resistance, and corrosion-resistant properties to deliver outstanding energy efficiency and durability in long-distance, heavy-duty, high-lift, and continuous operation scenarios. Compared with conventional steel cord belts, aramid belts are lighter and therefore operate under lower tension. When paired with high-performance cover compounds, they significantly reduce system indentation resistance, achieving energy savings of over 15%. Additionally, they offer excellent tear resistance and flex-fatigue performance, making them ideal for high-intensity, high-frequency critical conveyor lines—providing an efficient, reliable, and cost-effective solution.



Key Features

Lightweight and high-strength, significantly reducing operating tension

Aramid offers strength beyond that of steel cord while maintaining a fabric-like low density. Compared with steel cord belts, the belt weight can be reduced by over 20%. In high-lift and long-distance conveying conditions, the lighter belt significantly reduces operating tension and take-up caused by its own weight, lowering overall system energy consumption.

Low elastic modulus, reducing indentation energy loss

The aramid fabric structure is flexible and uniform, providing even roller contact pressure. Compared with steel cord belts, it exhibits lower indentation deformation and significantly reduced indentation resistance per unit area. When paired with the EcoTrans™ energy-saving cover rubber, rolling resistance between idlers is further reduced, achieving energy savings of over 15%.

Higher cover rubber utilization, reducing wear and maintenance energy consumption

Aramid carcass belts have no risk of steel cord pull-out, allowing safe operation with a thinner bottom cover, extending belt life, reducing downtime for replacements, and thereby lowering indirect energy consumption.

Fewer splices, improving operational efficiency

Due to the thinner overall thickness of aramid belts, a single roll can be longer at the same roll diameter, reducing the number of splices by approximately 10-20%, lowering installation costs, and improving operational efficiency.

Excellent bending fatigue resistance, suitable for smaller pulley configurations

A smaller bending radius allows the use of smaller pulleys and drive systems, indirectly saving on equipment investment and drive energy, especially suitable for conveyors with limited installation space or multiple incline sections.

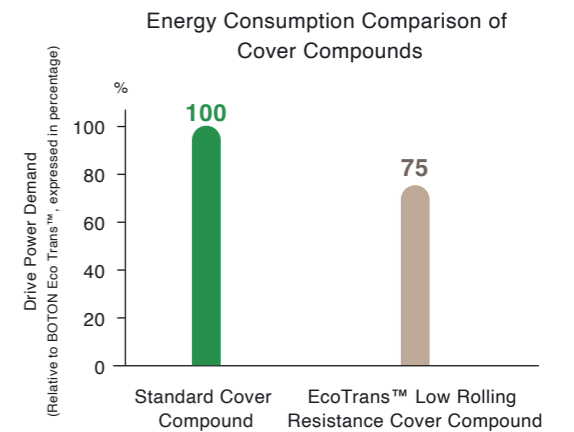
Increase throughput or reduce belt strength grade to achieve system-level energy savings

By reducing operating tension and belt weight without modifying the drive system, it is possible to either: increase throughput by up to 20% at the same belt strength, improving system energy efficiency per unit; or lower the belt strength rating (e.g., using DPP2000 instead of ST3150), achieving savings in both raw materials and manufacturing energy consumption.

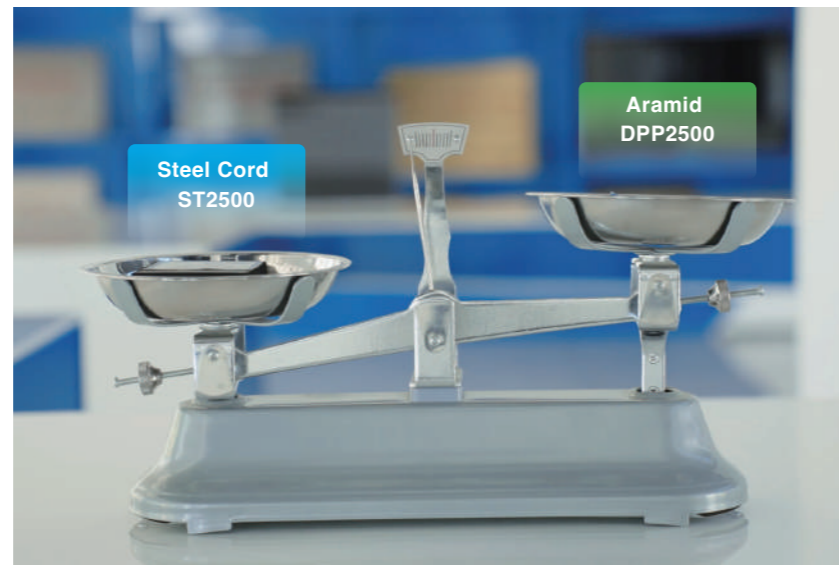
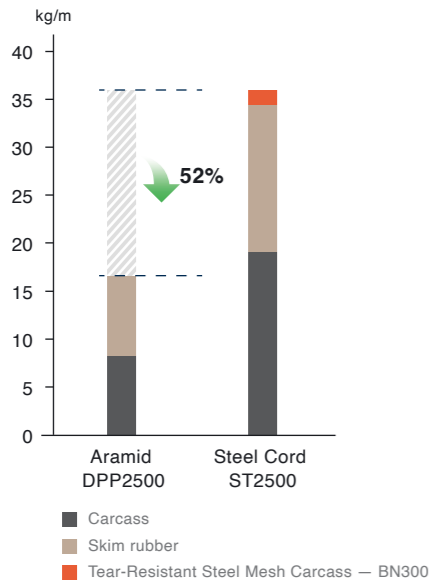
EcoTrans™ Low-Rolling-Resistance Covering Rubber

Bottom Cover Rubber Reduce Energy Consumption Compatible with Fire Resistance

EcoTrans™ is BOTON' s energy-saving bottom cover rubber, specially developed for long-distance and high-frequency conveying systems. Its core advantage lies in reducing idler compression rolling resistance, thereby significantly lowering system energy consumption. It effectively minimizes energy loss caused by rubber deformation during belt operation. This technology is compatible with both steel cord and fabric carcass belts, and can be flexibly applied in fire-resistant or standard setups. EcoTrans™ seamlessly combines energy saving and system optimization, making it particularly suitable for long horizontal conveying applications, where it delivers up to approximately 25% energy efficiency improvement while ensuring safe and stable operation.



Weight Comparison of Aramid vs. Steel Cord at the Same Strength



The aramid carcass achieves a 52% reduction in carcass weight, resulting in an overall 26% decrease in total belt weight.

【Comparison based on equivalent tensile strength of 2500 N/mm and belt width of 1800 mm: Aramid DPP2500 vs. Steel Cord ST2500】

	Steel Cord ST2500	Aramid DPP2500	
Theoretical Strength (kn/m)	2680	3100	↑ 13.5%
Carcass Weight(kg/m)	36	17.1	↓ 52.5%
Total Belt Weight(kg/m)	73.6	54.5	↓ 26.0%

Note: Calculation for steel cord: 0.167kg/m × 114 cords ≈ 19kg/m

Key Features

Significant energy savings, reduced operating costs

- Based on research findings from Leibniz Universität Hannover, indentation rolling resistance can account for 50% of the total energy consumption in general conveyor systems.
- EcoTrans™ effectively reduces rolling indentation resistance and minimizes rubber deformation hysteresis loss(tan δ), reducing power demand at the source.
- Field tests have shown energy savings of approximately 10-25%, with even better performance in long-distance/high-frequency operation scenarios. When combined with aramid conveyor belts, it can achieve maximum energy-saving effects and reduce energy consumption.

Lightweight belt structure, lower initial investment

Lower tension requirements mean thinner and lighter conveyor belts can be selected, paired with smaller-power drive systems and reduced drive pulley sizes, comprehensively lowering the initial equipment investment.

Compatible with multiple carcass types, adaptable to various applications

It is suitable for various conventional carcass structures such as steel cord and fabric, and can also be used in conjunction with special products like flame-retardant conveyor belts and pipe conveyor belts.



Case Study / Based on EcoTrans™ Technology

Energy-Saving Optimization of the Conveyor System at an African Bauxite Mine

Project Background

In an African bauxite mine conveyor system, BOTON was responsible for the R&D, design, manufacturing, and technical support of all conveyor belts required for the long-distance belt system. The route traverses mangroves, roads, waterways, gullies, and open-air rock formations, with dramatic terrain changes and multiple horizontal and vertical curves. The harsh natural conditions demanded exceptionally high performance in belt weather resistance, strength, and energy efficiency.



Operational Results

To tackle the challenges posed by ultra-long distances and complex terrain, BOTON fully implemented its self-developed, US CDI-certified ultra-low rolling resistance conveyor belt technology in this project. This technology specifically addresses the energy loss caused by idler indentation rolling resistance. By using an optimized bottom cover compound, it effectively reduces the required belt tension and drive power, achieving the following key results:

- The conveyor belt specifications were optimized from the original ST3500/4000 to ST2000/2500, significantly reducing structural strength requirements and procurement costs while maintaining performance.
- Operating energy consumption decreased by over 15%, effectively alleviating the operational pressure caused by limited power resources in Guinea.
- For the critical sections of the conveyor system (C06, C07, C08) totaling 45.2 km, the energy-saving belts enabled long-term, efficient, and stable operation.
- Motor design power was reduced by 40%

15%+ Energy Saving

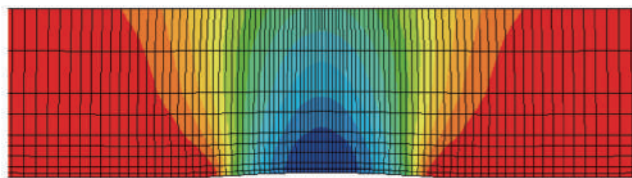


Figure 5. Stress field perpendicular to the belt surface (S22 in figure 1) in a rubber belt indented by a solid roller

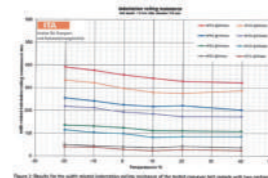


Figure 6. Results for the earth transportation rolling resistance of the belt cover with length and wear parts

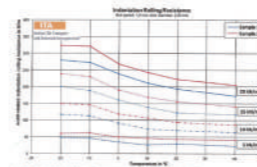
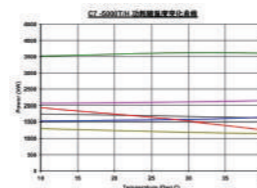


Figure 7. Results for the earth transportation rolling resistance of the belt cover with length and wear parts



	Percent Newmaterial 电机功率百分 分比 (%) 对比 旧RR	电机功率 占比 (%) 对比
Fully Loaded - Normal Friction 满载 - 正常摩擦	46.1%	49.8%
Fully Loaded - High Friction 满载 - 高摩擦	60.5%	47.7%
Fully Loaded - Low Friction 满载 - 低摩擦	26.4%	29.3%
Empty - Normal Friction 空载 - 正常摩擦	30.0%	33.9%
Deceleration Loaded - Low Friction 1/2 空-低摩擦	-11.9%	-12.9%
Increase Loaded - High Friction 1/2 空-高摩擦	89.8%	76.5%

- ✓ Set the record for the “Longest Single Conveyor Belt in Africa”
- ✓ Achieved world-leading operational efficiency with the “Lowest Energy Consumption per Ton of Material”

Heat and High Temperature Resistant Series

For high-temperature material conveying in steel, cement, metallurgy, glass, and similar industries, the heat resistance of conveyor belts directly affects operational safety and service life. BOTON's Heat-Resistant & High-Temperature Series belts use high-performance heat-resistant compounds and heat-tolerant carcass materials, delivering exceptional high-temperature performance while meeting national and international standards, thus extending equipment service cycles.

BOTON's high-temperature belts are available in various carcass and cover compound combinations, allowing customized selection according to operating temperature, material characteristics, and conveying method. Carcass options include steel cords, EP(PN) fabric, and aramid. Notably, BOTON's PX high-temperature belts are specially developed for extreme high-temperature conditions, offering strong stability, low elongation, excellent flexibility, and resistance to delamination.

BOTON has also developed a range of heat-resistant cover compounds with excellent thermal stability, wear resistance, crack resistance, and mechanical strength, suitable for continuous or intermittent conveying across different temperature zones.

- ✓ Delamination-resistant
- ✓ Excellent flexibility
- ✓ Heat-resistant
- ✓ Crack-resistant and High mechanical strength
- ✓ Low elongation
- ✓ High stability
- ✓ Abrasion resistant

*Note: All BOTON heat-resistant and high-temperature series products meet these requirements.

- CN GB/T20021 HG/T4732
- INT ISO4195

CN Standard for Heat and High Temperature Resistant Conveyor Belts

[Chinese National Standard GB/T 20021 Requirements]

When conveyor belts operate for extended periods in high-temperature environments, the rubber undergoes accelerated thermo-oxidative aging, leading to hardening, cracking, and even delamination between the cover layer and carcass. This can result in a reduction of tensile strength by up to 80% and a decrease in wear resistance by more than 40%.

To address this, BOTON has fully optimized both material and structural design, developing specialized rubber compounds and modular composite structures for high-temperature applications, significantly improving thermal stability and service life. BOTON high-temperature conveyor belts can withstand continuous operation at 100-350 ° C and instantaneous thermal shocks up to 500 ° C. Even after the ISO 4195 accelerated aging test (7 days at 150 ° C), they maintain excellent physical properties and adhesion strength, offering a clear advantage in high-temperature conveying conditions.

100-350°C
Continuous high-temperature operation

500°C
Instantaneous Thermal Shock

Physical Performance Indicators

Item		Permissible Range of Change			
		T1 (≤100°C)	T2 (≤125°C)	T3 (≤150°C)	T4 (≤180°C)
Hardness (IRHD)	Difference after aging and before aging	+20	+20	+20	+20
	Maximum value after aging	85	85	85	85
Tensile Strength (N/mm ²)	Performance change rate	-25	-30	-40	-40
	Minimum value after aging	12	10	5	5
Elongation at Break (%)	Change rate after aging	-50	-50	-55	-55
	Minimum value after aging	200	200	180	180



PX Heat-Resistant Conveyor Belt

PX Low Elongation High Ply Adhesion

PX is a blended heat-resistant carcass material. BOTON PX heat-resistant conveyor belt delivers longer service life and higher safety under harsh conditions, suitable for conveying systems requiring superior heat resistance and durability.



- ✓ Model : PX150 - PX200
- ✓ Width : 800 - 3000mm
- ✓ Thickness : 10 - 50mm

Key Features

Low Elongation

Fully utilizes the high modulus of polyester, characterized by low creep and stretch at high temperatures.

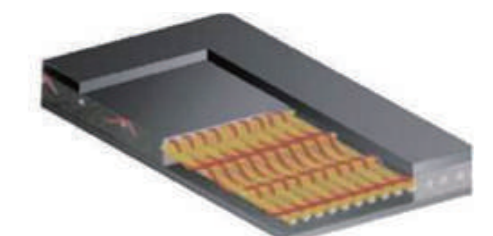
High Ply Adhesion

Highly resistant to damage from amine substances in rubber, characterized by excellent bonding performance.

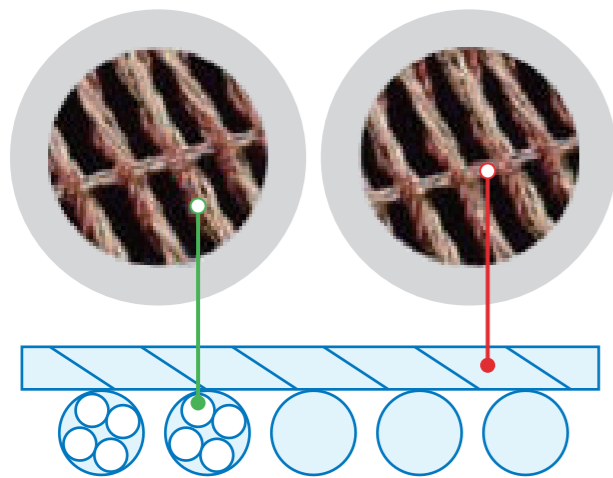
IW Impact-Resistant and Heat-Resistant Steel Mesh Conveyor Belt

IW Impact Resistance Low Deformation

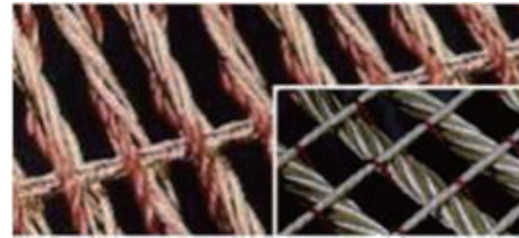
IW (Impact-resistant Wire mesh) is a steel mesh woven with steel cord in wrap and weft direction constructed using a unique method, offering excellent tear resistance, heat resistance, and impact resistance. It is especially suitable for operations where sharp materials and impurities are present, where the localized material temperatures are high and standard heat-resistant belts are prone to heat damage. IW conveyor belts have strength ratings ranging from IW500 to IW2000, and are widely used in high-impact applications such as quarrying, mining, and primary crushing, as well as industries with high heat resistance requirements like cement and steel.



- ✓ Model : IW500 - IW2000
- ✓ Width : 800 - 1600mm
- ✓ Thickness : 10 - 30mm



Penetrating Steel Cord
Warp Steel Cord (Figure 1)



Weft Cord Located Above the Warp Steel Cord
Flexible Cord Ensures Conveyor Belt Troughability
Weft Cord (Figure 2)



Impact and Tear Resistance

Transverse (Weft) reinforced steel cords effectively prevent longitudinal (Warp) cutting. If one side of the belt is pulled off and foreign objects slip out, it prevents the entire conveyor belt from being torn.



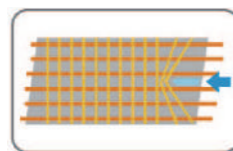
Impact Resistance

The warp penetrating steel cord acts like a spring within the rubber, allowing external impact energy to be effectively absorbed.



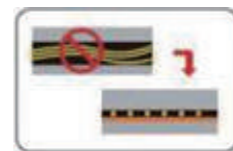
High-Temperature Resistance

The steel mesh carcass can withstand high temperatures and will not burn through; its mesh-distributed steel material also aids in heat dissipation.



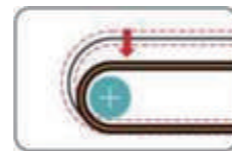
Tear Resistance

The transversely reinforced steel cord is integrated with and woven above the longitudinal carcass, making longitudinal tearing virtually impossible.



No Delamination Failure

The crisscross woven steel mesh carcass forms a single, integrated structure, preventing the delamination failure that can occur in multi-ply belts like EP belts.



Smaller Pulley Diameter Significantly Reduces Energy Consumption

The warp penetrating steel cord possesses special extensibility. Compared to conveyor belts with standard steel cord cores, the pulley diameter can be reduced by 25-40%.

Selection Recommendations

Pulley Diameter (mm)	IW350	IW500	IW630	IW800	IW1000	IW1250	IW1600	IW1800	IW2000
Drive Pulley	355	355	355	500	500	630	630	800	800
Bend Pulley	315	315	315	400	400	500	500	630	630
Snub Pulley	250	250	250	315	315	400	400	500	500

EP Polyester Heat-Resistant Conveyor Belt

EP Below 175°C Resistant to deformation

- BOTON EP Polyester heat-resistant conveyor belts are primarily used in steel, cement, electric power, chemical, and port industries for conveying high-temperature materials such as sintered ore, coke, cement clinker, blast furnace slag, and castings. The products have passed the MNS Carrier Combustion Test and LL Low-Temperature Flexing Test, and have obtained MSHA flame retardant certification, allowing for stable material transport under high-temperature operating conditions.
- The product is divided into four heat resistance grades: T1, T2, T3, and T4, covering T1 ($\leq 100^\circ\text{C}$), T2 ($\leq 125^\circ\text{C}$), T3 ($\leq 150^\circ\text{C}$), and T4 ($\leq 180^\circ\text{C}$), to meet the conveying needs of various high-temperature materials.
- Customization services for special properties such as flame retardancy and anti-static are available to adapt to various special working conditions.



- ✓ Model : EP100 - EP500
- ✓ Width : 500 - 3000mm
- ✓ Thickness : 10 - 50mm



Steel Cord Heat-Resistant Conveyor Belt

Cord Below 220°C Long Distance

- The heat-resistant steel cord conveyor belt is suitable for the long-distance conveying of higher temperature materials such as sintered ore, coking coal, and cement clinker in industries like metallurgy, building materials, and cement, especially for elevated conveying applications in the cement industry.
- Steel cord carcass features high resistance to damage, delamination, and high splice strength.



- ✓ Model : ST500 - ST3150
- ✓ Width : 800 - 2800mm
- ✓ Thickness : 10 - 50mm

Aramid Heat-Resistant Conveyor Belt

Heat Resistance Carcass → Impact Resistance

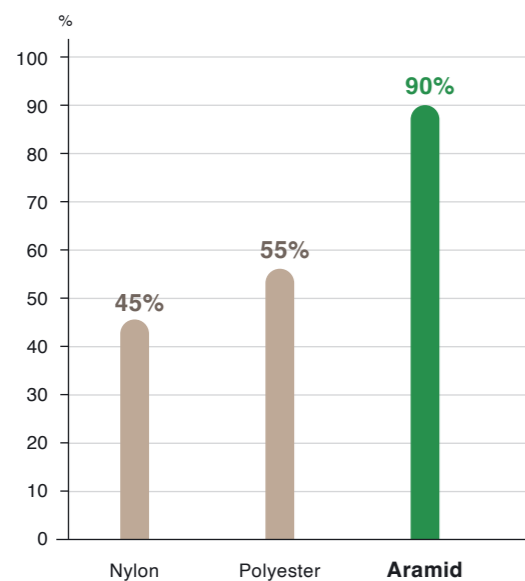
When conveying high-temperature materials such as sintered ore, slag, and coal ash that have not fully cooled and are still red-hot, conventional conveyor belts are highly susceptible to damage from high-temperature burning. Aramid fiber, as the core carcass material, fully utilizes its thermoset characteristics and excellent thermal stability. The thermal decomposition temperature of Aramid is up to 500 ° C, and it will not melt in high-temperature environments below 350 ° C, maintaining structural stability. It provides robust thermal protection for the conveying system and represents a new generation of high-performance heat-resistant carcass materials.



Thanks to the Aramid fiber's thermoset characteristic, its strength, modulus, and elongation remain almost consistent with ambient temperature conditions in high-temperature environments below **350°C**.

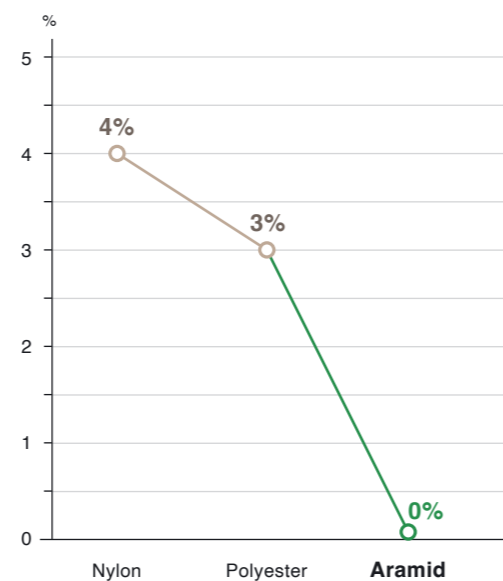
It is unaffected by amine substances in the rubber, and its adhesion performance remains excellent.

Heat Resistance Performance



Heat Resistance Retention Rate (%) is the test result after 48 hours at 200°C

Thermal Shrinkage Rate



Thermal Shrinkage Rate (%) is the test result at 160°C

How to Select the Optimal Heat-Resistant Conveyor Belt?

01 Select the Correct Cover Rubber

The heat resistance performance of a conveyor belt is not solely determined by the material temperature, but also depends on the rate and mode of heat transfer.

Even with the same rubber compound formulation, different material particle sizes result in different temperature tolerance ranges.

✓ BOTON Products

To address these variations, we employ a special rubber compound formulation, incorporating reinforcing fibers, crack-resistant components, and a heat insulation layer to form a multi-layer cover system. This product series has passed the 7-day aging test specified in ISO4195 Class 3 (150 ° C), demonstrating the ability to withstand a continuous temperature of 160 ° C and a peak temperature of 180 ° C, comprehensively enhancing the heat-resistant belt's aging resistance and service life.

02 Select the Carcass According to Different Working Conditions

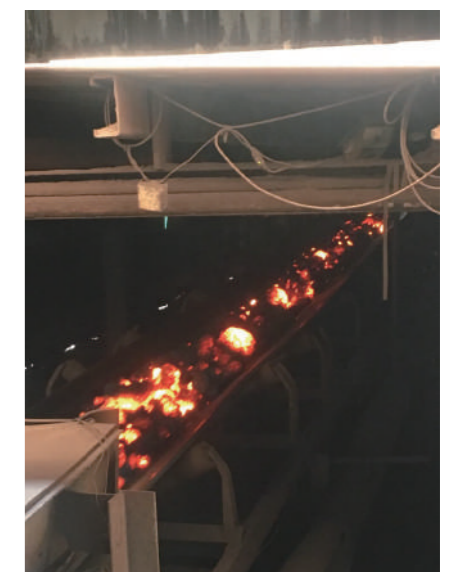
During the continuous conveying of high-temperature materials, the carcass material of the conveyor belt directly determines its heat resistance limit and structural stability.

▶ Heat Resistance Limit is Restricted

Common fabric carcass materials like EP (Polyester) and NN (Nylon) have restricted heat resistance limits: the softening point is around 230°C and the melting point is approximately 260°C, thus the recommended working temperature for the carcass should not exceed 200°C. Once this temperature is exceeded, these carcass materials may degrade due to chemical attack from rubber additives, leading to issues like delamination, breakage, and cover-carcass separation.

▶ Effect of Conveying Conditions on the Heating of the Belt Carcass

The smaller the particle size, the slower the conveying speed, and the longer the conveying distance, the easier it is for heat to accumulate, leading to a rapid rise in carcass temperature. If high-temperature material remains on the belt surface when the system shuts down, heat is directly transferred to the carcass ply, which can cause irreversible thermal damage. In applications where the conveyor belt has poor heat dissipation and heat accumulation is imminent, a cover rubber with a higher heat resistance grade should be selected.



It is clear that the selection of conveyor belts for high-temperature applications needs to consider factors such as material temperature, material particle size, and conveying speed. Based on the technical characteristics of EP polyester belts, Aramid belts, and steel cord belts, BOTON recommends selecting the EP polyester belt for optimal cost-effectiveness when the conveyed material temperature is below 200 ° C and the material particle size is large, making heat accumulation unlikely.

When the material temperature exceeds 200 ° C, or when small material particle size and slow conveying speed cause the belt body temperature to rise rapidly and heat accumulation is likely, the Aramid belt or the steel cord belt, which offer superior thermal stability, should be selected to ensure the reliability of the conveying system.



03 Engineered for extreme high-temperature environments

For ultra-short-distance transport or sudden high-heat bursts, such as steel-plant discharge sections, we provide a ceramic-composite conveyor belt engineered for extreme temperatures.

✓ Ceramic Composite High-Temperature Conveyor Belt

The ceramic top layer delivers extreme hardness and wear resistance at temperatures above 500° C, while the insulated rubber layer maintains flexibility. A specialized bonding process secures both layers, ensuring stable performance and significantly extending belt service life.

Key Performance Advantages of the Ceramic Layer:

- ✓ Ultra-high hardness
 - ✓ Wear resistance
- Surface Temperature Resistance **500°C +**

Inner Cover Rubber Possesses Excellent Properties:

- ✓ Heat Insulation
 - ✓ Flexibility
- Extended Service Life ↑
Reduced Replacement Frequency ↓



04 Addressing High-Temperature and Harsh Working Conditions with Extreme Impact Resistance

IW Steel Wire Mesh Fabric serves as a specialized carcass material, utilizing a steel cord structure with high elongation, low modulus, and low creep, specifically designed for impact-resistant applications. Its combination of excellent mechanical properties and heat resistance makes it highly suitable for conveying scenarios in industries like cement and steel, where material temperatures are high and impact intensity is severe. Especially when localized high temperatures are concentrated, it effectively prevents the risk of conveyor belt perforation caused by the fabric melting through.



Parameters	Steel Cord	Aramid	PX	IW Steel Mesh	EP	Ceramic
Scenario	Long-Distance Heat-Resistant Conveying	Complex Path High-Temperature Conveying	Harsh Condition Conveying	Extreme Impact Localized High Temperature	Standard High-Temperature Conveying	Extreme High-Temperature Material Conveying
Material	Steel Cord (ST)	Aramid (DPP)	Polyester +Nylon (EP+PX)	Galvanized Steel Mesh(ST)	Polyester(EP)	/
Maximum Temperature Resistance (°C)	125	250	170	N/A	170	500
Single Ply Strength Rating (N/mm)	800-2500	630-2500	100-300	500 - 1250	100-300	500-2000
Number of Plies	1-Ply	1-Ply	Multi-Ply	1-Ply	Multi-Ply	1-Ply

Note: The heat resistance of the IW Steel Mesh Belt depends on the cover rubber type; please refer to the performance of the specific rubber compound.

Recommended Cover Rubber	Recommended Carcass	Applicable Temperature									
		50°C	100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C	
Abrasion and Heat Resistant	EP/PX	≤100°C									
Heat Resistant	EP/PX	≤120°C									
High-Temperature Resistant	EP/PX	≤250°C									
Abrasion and High-Temperature Resistant	DPP/IW	≥300°C									
High-Temperature Resistant	IW	≥400°C									

Surface

Fire Resistance and Anti-Static Series

For industries such as electric power, chemical, metallurgy, and port facilities that require fire resistance or anti-static properties, the fire resistance properties of conveyor belts are particularly important. BOTON's fire resistance series conveyor belts adopt stringent standards and can provide better fire resistance effects while meeting the requirements of relevant national or international standards. The fire resistance series conveyor belts produced by BOTON include various carcasses and cover rubbers, allowing for customized conveyor belts according to scene requirements. Carcass materials include steel cord, Aramid, and fabric core belts, suitable for a range of applications. In addition to fire resistance properties, the cover rubber also possesses superior performance characteristics such as good load-bearing capacity, flexibility, high strength, impact resistance, and abrasion resistance, ensuring long-lasting durability. For specific application scenarios, relevant customized applications can also be provided; please contact a BOTON service engineer for details.

- Fire resistance
- Load-bearing capacity
- Impact resistance
- Flexibility
- Abrasion resistance
- High strength

*Note: For the BOTON Surface Fire Resistance Conveying Series, all products satisfy

- CN GB/T10822 HG/T3973
- INT ISO340/12882
- AU AS1333/1332
- EU EN14937 EN12882
- DE DIN22102
- JP JISK6324/6369



Fire Resistance Performance Grades for Surface Applications

[Compliant with ISO 340 and EN 14937]

For surface transport and industrial applications, BOTON conveyor belts are classified into performance grades based on the required fire risk mitigation and application severity. All grades listed below comply with international standards for flame propagation, self-extinguishing properties, and electrical conductivity (e.g., ISO 340, EN 14937).

Performance Grade (Based on Risk)

- K1** : Highest fire resistance performance, suitable for high fire risk areas or flammable materials.
- K2** : Suitable for conveying environments with general fire resistance requirements.
- K3** : Suitable for general working conditions with lower fire risk, satisfying basic fire resistance needs.

Compliance and Safety Performance Requirements

Item	Performance Grade		
	K1	K2	K3
Duration of Flame	Total duration of flame for 3 covered and 3 bare samples must not exceed 45s. Single value for covered sample must not exceed 15s. Single value for bare sample must not exceed 20s.	Total duration of flame for 6 covered samples must not exceed 45s. Any single value must not exceed 15s.	Average duration of flame for 3 covered samples must not exceed 60s.
Electrical Conductivity	Must not exceed $3 \times 10^8 \Omega$		
Re-ignition	No re-ignition of flame shall occur on any sample.		



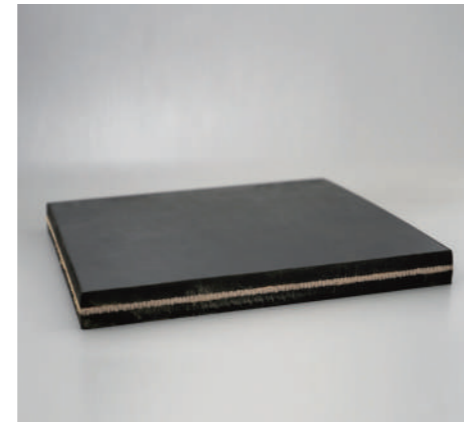
Surface Aramid Fire Resistance Conveyor Belt

DPP Higher Cost-Performance Ratio Low Energy Consumption

Key Features

Fire Resistance and Anti-Static Properties

Aramid is a high-performance synthetic fiber composed of aromatic polyamides. Thanks to its highly stable aromatic molecular structure, Aramid itself does not contain combustible groups and will not melt or drip when burned, possessing natural fire resistance and excellent self-extinguishing properties. This means that in high-temperature or open flame environments, Aramid conveyor belts can effectively suppress flame spread, extinguish immediately upon contact with fire, and significantly reduce the risk of fire propagation. For surface conveying systems, especially those involving flammable or spontaneously combustible materials (such as coal, fertilizer, biomass, etc.), Aramid conveyor belts can substantially lower the risk of flame spread, enhancing the overall safety and continuity of conveying operations.



- ✓ Model : DPP500 - DPP5000
- ✓ Width: 500 - 2400mm
- ✓ Thickness : 15 - 60mm

[Learn more about Aramid carcass material: P11](#)

Low Energy Consumption

Aramid conveyor belts feature lightweight characteristics, which can effectively reduce equipment energy consumption and help customers save on operating costs significantly.

Higher Cost-Performance Ratio

Relying on excellent abrasion resistance and stability, Aramid conveyor belts are not only durable but also achieve superior total lifecycle cost-effectiveness with lower energy consumption.

High Performance

The specially developed cover rubber by BOTON ensures fire resistance while also offering multiple properties such as abrasion resistance/oil resistance/impact resistance, providing the conveyor belt with multiple protective capabilities. Low Energy Consumption Aramid conveyor belts feature lightweight characteristics, which can effectively reduce equipment energy consumption and help customers save on operating costs significantly.

Surface Aramid Fire Resistance Conveyor Belt

Case Study / Power Plant Stacker-Reclaimer Replaces Steel Cord with Aramid Fire Resistance Conveyor Belt

Project Background

The original conveyor line for a stacker-reclaimer at a power plant in Fujian Province used steel cord conveyor belts, which led to high weight, energy consumption, short service life, and frequent maintenance. To meet the demands for improved system efficiency, the steel cord belt was replaced with an Aramid belt. This successful upgrade resulted in a 30% reduction in the conveying system's weight and extended the service life from 1.5 years to 4 years.



Operational Results

	Before	After
Belt Strength	ST1250	DPP1000
Top Cover Thickness(mm)	10	12 ▲ 20%
Conveyor Belt Weight per Unit Transport Area	/	/ ▼ 30%
Service Life	Approx. 1.5 years	Approx. 4 years
Power Consumption	/	/ ▼ 13%

Note: In the table, "-" indicates that the specific data is confidential internal information. The shown increase/decrease margins are relative reference values used to reflect the performance difference before and after the replacement.



Surface Steel Cord Fire Resistance Conveyor Belt

ST Excellent Troughability Long Distance High Capacity High Strength

Key Features

Fire Resistance and Anti-Static Properties

According to actual standard requirements, the product's fire resistance performance can meet K2 and K3 fire resistance requirements. For conditions prone to slippage, the risk of slippage and burning is avoided by optimizing the drum's friction characteristics.

Versatility

Steel cord conveyor belts possess high strength and low elongation, making them highly suitable for long-distance, high-capacity material conveying.

Troughability

The belt body is soft and highly pliable, providing stable support and quickly forming the ideal trough shape, ensuring efficient and stable material conveying while minimizing spillage and belt deviation.



- ✓ Model : ST/S630 - ST/S10000
- ✓ Width : 800 - 2800mm
- ✓ Thickness : 10 - 60mm

[Learn more about steel cord carcass material:P12](#)

Surface Fabric Ply Fire Resistance Conveyor Belt

EP Economical and Practical

Key Features

Fire Resistance and Anti-Static Properties

According to actual standard requirements, the product's fire resistance performance can meet K1, K2, and K3 fire resistance requirements. For conditions prone to slippage, the risk of friction and burning can be avoided by optimizing the drum's friction characteristics.

Economical

Achieve safe, reliable, and economical fire resistance conveying results at a lower cost.



- ✓ Model : EP100 - EP3500
- ✓ Width : 500 - 3000mm
- ✓ Thickness : 10 - 60mm

[Learn more about fabric ply carcass material:P09](#)

How to Select the Appropriate Surface Fire Resistance Conveyor Belt?

01 "Fire Resistance" is not the end goal; self-extinguishing is the minimum requirement for fire prevention.

Once a conveyor belt catches fire, it may not only cause casualties but also lead to asset losses and prolonged recovery work.

02 Easily Overlooked Factor: Anti-Static Performance

In flammable and explosive environments (such as coal mines, chemical plants), static electricity accumulated during conveyor belt operation can reach thousands of volts. If discharged, it can trigger dust explosions or gas combustion.

03 Targeted Selection of Conveyor Belts for Different Materials

In the industrial conveying field, there is no such thing as a "universal" fire resistance conveyor belt. Fire risks, material characteristics, and wear levels vary significantly under different working conditions, which necessitates the use of targeted fire resistance solutions.

In surface conveying environments, working conditions are diverse, commonly found in coal storage yards, ports, fertilizer plants, grain processing facilities, and other scenarios. They involve transporting flammable materials (such as coal, sulfur, biomass), which possess a tendency for spontaneous combustion. While the fire risk is relatively controllable, compliance with safety regulations is still necessary.

For surface applications, BOTON can provide multiple grades of fire resistance conveyor belts, ranging from economical to high-end models, tailored to material characteristics and fire prevention needs. These include various customized solutions such as halogen-free and environmentally friendly types, as well as abrasion-resistant types. This ensures compliance with basic fire resistance requirements while also balancing cost-effectiveness and environmental considerations, helping customers fulfill social responsibility while maintaining safe production.





Quick Selection Guide for Surface Fire Resistance and Anti-Static Series

Parameters	Surface Aramid Fire Resistance Conveyor Belt	Surface Steel Cord Fire Resistance Conveyor Belt	Surface Fabric Ply Fire Resistance Conveyor Belt
Scenario	Flammable Material Yards / Port Transfer	Long-Distance Trunk Lines / High-Load Continuous Transport	Short-Distance Transfer / Power Plant Transport
Carcass Material	Aramid Composite Fabric	Galvanized Steel Cord	Fire Resistance Composite Fabric
Tensile Strength	500-5000 N/mm	630-10000 N/mm	100-3500 N/mm
Corrosion Resistance	★★★★★★	★★★★	★★★★★
Impact Resistance	★★★★★	★★★★★	★★★★
Troughability	Excellent	Excellent	Good
Splicing Method	Hot Vulcanization/Mechanical Splice	Hot Vulcanization	Hot Vulcanization/Mechanical Splice
Max Inclination Angle	≤30°	≤30°	≤30°
Applicable Environment	General Use in Harsh Environments	General Use	General Use
Energy Efficiency	Excellent	Good	Excellent
Weight	Light	Heavy	Medium
Sample Images			

Underground Fire Resistance and Self-Extinguishing Series

For underground scenarios in coal mines or other types of mines where a higher level of fire resistance is required, the fire resistance performance of conveyor belts is particularly important. BOTON's Fire Resistance and Self-Extinguishing Series conveyor belts adopt stringent standards and can provide superior fire resistance effects while meeting the requirements of relevant national or international standards. The fire resistance series conveyor belts produced by BOTON include various carcasses and cover rubbers, allowing for customized conveyor belts according to scene requirements.

These include Aramid belts, steel cord belts, fabric ply belts, solid woven belts, etc., suitable for a range of applications. In addition to fire resistance properties, the cover rubber also possesses superior performance characteristics such as good load-bearing capacity, flexibility, high strength, impact resistance, and abrasion resistance, ensuring long-lasting durability. For specific application scenarios, relevant customized applications can also be provided; please contact a BOTON service engineer for details.

- Fire resistance
- Impact resistance
- Abrasion resistance
- Load-bearing capacity
- Flexibility
- High strength

*Note: For the BOTON Underground Fire Resistance Conveying Series, all products satisfy the following standards.

- CN MT/T668 MT/T914
- AU AS1333/1332/4606
- DE DIN22102/22109
- EU EN14973
- INT ISO340/14973
- JP JISK6324/6369
- US MSHA



National Standard for Underground Steel Cord Fire Resistance Conveyor Belts

[e.g., MSHA, EN 14973, ISO 340]

MT/T668 HG/T6090 standard is China's mandatory safety requirement for steel cord fire resistance conveyor belts in underground environments, explicitly defining key fire resistance performance requirements for high-risk settings. BOTON's underground fire resistance conveyor belts adhere to internal control standards that are stricter than national (and equivalent international) requirements, aiming to maximally prevent major safety accidents such as fires and explosions:

National Standard Parameters ST630~ST4000

Item	ST630	ST800	ST1000	ST1250	ST1600	ST2000	ST2500	ST2800	ST3150	ST3500	ST4000
Tensile Strength (N/mm)	630	800	1000	1250	1600	2000	2500	2800	3150	3500	4000
Maximum Nominal Diameter (mm)	3.0	3.5	4.0	4.5	5.0	6.0	7.2	7.5	8.1	8.6	8.9
Steel Cord Spacing (mm±1.5)	10	10	12	12	12	12	15	15	15	15	15
Top/Bottom Cover Thickness (≥mm) *	5+5	5+5	6+6	6+6	6+6	8+8	8+8	8+8	8+8	8+8	8+8
Conveyor Belt Thickness (≥mm) *	12.8	13.0	15.6	16	16.4	21.0	22.6	22.9	23.3	23.7	24.2
Conveyor Belt Reference Mass (Kg/m ²) *	19.0	19.5	23.0	24.5	27.0	35.0	40.5	42.5	43.0	45.0	47.0
Width (mm)	Number of Steel Cords										
800	75	75	63	63	63	63	50	50	50	50	-
1000	95	95	79	79	79	79	64	64	64	64	64
1200	113	113	94	94	94	94	76	76	76	76	76
1400	133	133	111	111	111	111	89	89	89	89	89
1600	151	151	126	126	126	126	101	101	101	101	101
1800	171	171	143	143	143	143	114	114	114	114	114
2000	196	196	159	159	159	159	128	128	128	128	128
2200	216	216	176	176	176	176	141	141	141	141	141
2400	236	236	193	193	193	193	155	155	155	155	155
2600	256	256	209	209	209	209	168	168	168	168	168
2800	276	276	230	230	230	230	184	184	184	184	184
3000	296	296	247	247	247	247	198	198	198	198	198
3200	316	316	264	264	264	264	211	211	211	211	211

National Standard Parameters ST4500~ST7500

Item	ST4500	ST5000	ST5400	ST6300	ST7000	ST7500
Tensile Strength (N/mm)	4500	5000	5400	6300	7000	7500
Maximum Nominal Diameter (mm)	9.7	10.9	11.3	12.8	13.5	15.0
Steel Cord Spacing (mm±1.5)	16	17	17	20	19	21
Top/Bottom Cover Thickness (≥mm) *	8+8	8.5+8.5	9+9	10+10	10+10	10+10
Conveyor Belt Thickness (≥mm) *	25.0	26.8	28.2	32.4	32.8	33.2
Conveyor Belt Reference Mass (Kg/m ²) *	49.5	53.4	55.6	67.5	73.2	78.9
Width (mm)	Number of Steel Cords					
800	-	-	-	-	-	-
1000	59	55	55	48	49	45
1200	71	66	66	58	59	54
1400	84	78	78	68	69	63
1600	96	90	90	78	80	72
1800	109	102	102	88	90	82
2000	121	113	113	98	101	91
2200	134	125	125	108	111	100
2400	146	137	137	118	121	109
2600	159	149	149	128	131	119
2800	171	161	161	138	142	129
3000	185	174	174	148	152	138
3200	198	186	186	158	162	147

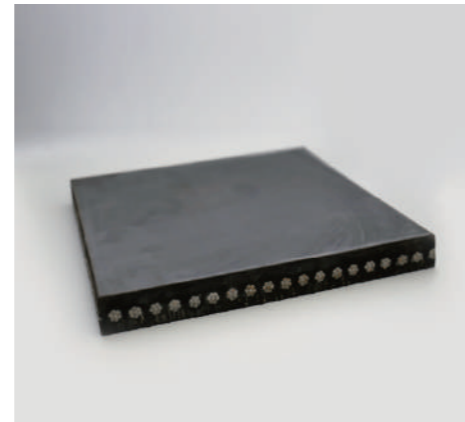
* Note: The above thicknesses are standard recommended values. If selecting other thicknesses, please contact a BOTON service engineer.



Underground Steel Cord Fire Resistance Conveyor Belt

ST Excellent Troughability Long Distance High Capacity

- Steel cord conveyor belts offer the advantages of high strength, long distance, and high-capacity material conveying. Combined with BOTON's specially developed fire resistance cover rubber, they ensure fire resistance while safely, reliably, and efficiently transporting various bulk materials under harsh working conditions, ensuring the conveyor belt's service life and reducing operating costs.
- They possess good versatility and cost-effectiveness.



✓ Model : ST/S630-ST/S10000
✓ Width : 800 - 2800mm
✓ Thickness : 10 - 60mm

[Learn more about steel cord carcass material:P12](#)



Underground Aramid/Ply Fabric Fire Resistance Conveyor Belt

【MT/T914 HG/T6091 Fire Resistance Standard Requirements】

MT/T914 HG/T6091 is China's mandatory safety standard for steel cord fire resistance conveyor belts designed for underground environments, which explicitly specifies key requirements for the belt's fire resistance performance in high-risk settings. BOTON's underground fire resistance conveyor belts comply with internal control standards that are stricter than the national standard, aimed at maximally preventing major safety accidents such as fires and explosions.

MT/T914 Standard Cover Rubber Performance Grades

Item	Tensile Strength (MPa)	Elongation at Break (%)	Abrasion Loss (mm ³)
MT/T914	≥15	≥350	≤200
BOTON Standard	≥18	≥450	≤150
BOTON Standard	≥20	≥450	≤150

Adhesion Strength

Unit: Newton per millimeter

Item	Adhesion Strength Between Plies	Adhesion Strength Between Cover and Carcass	
		Cover Thickness≤1.5mm	Cover Thickness≤1.5mm
Average Value	≥3.50	≥3.50	≥3.90
Minimum Value	≥3.25	≥2.60	≥2.60
BOTON Aramid Belt	/	≥10	

Note: The Aramid belt requires single ply strength assessment.

Troughability for Ply/Aramid Belts

Item	Troughability								
	20°	25°	30°	35°	40°	45°	50°	55°	60°
Carrier Roller Troughing Angle									
Troughability	≥0.08	≥0.10	≥0.12	≥0.14	≥0.16	≥0.18	≥0.20	≥0.23	≥0.26



Underground Aramid Fire Resistance Conveyor Belt

DPP Energy Saving Cut Resistance Corrosion Resistance

The Aramid fire resistance conveyor belt is the flagship product of BOTON's fire resistance series of carcass materials. Its warp yarns are woven from high-strength Aramid continuous filaments, and the weft yarns use high-strength nylon industrial filaments, employing a special fabric structure called Straight Warp (SW) construction. Aramid itself possesses excellent fire resistance properties, and combined with the robust SW structure, this conveyor belt features superb fire resistance, energy efficiency, cut resistance, and corrosion resistance.



✓ Width: 600 – 2400mm
 ✓ Strength: 800 – 5000N/mm

[Learn more about Aramid carcass material: P11](#)



Structure Type

SW

This structure features extremely strong impact resistance and tear resistance. The impact resistance is more than 1 time that of ordinary plain weave fabric, and the tear resistance is 4 times that of ordinary plain weave fabric. It possesses excellent load-bearing capacity and is widely used in various severe working conditions, especially in short-distance conveying scenarios to replace steel cord conveyor belts.

Key Features

Fire Resistance

Due to its special molecular structure, it possesses good fire resistance and self-extinguishing properties, making it an excellent fire resistance material.

Lightweight

Aramid possesses the same strength as steel cord, while its density is less than 20% of steel cord. This provides significant energy efficiency benefits on inclined conveying lines with large dip angles.

Stability

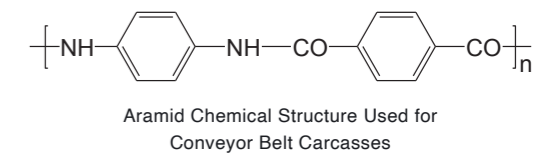
Aramid has excellent chemical resistance, making it more suitable for underground use in severe and corrosive working conditions.

Impact Resistance and Cut Resistance

The SW structure features excellent impact resistance, tear resistance, and cut resistance, which can effectively prevent damage from foreign objects and long-distance tearing.

Excellent Fire Resistance

Due to its special aromatic polyamide molecular structure, it possesses excellent fire resistance and self-extinguishing properties, as well as high temperature resistance and low toxicity, making it an excellent fire resistance material.



Intrinsic Fire Resistance, Longer Lasting Performance

Aramid requires no added flame retardants; it possesses excellent anti-combustion capability, self-extinguishes immediately when removed from fire, offers long-term stability, and is suitable for harsh underground environments.

Limiting Oxygen Index (LOI) 28%, Far Exceeding Conventional Materials

Cannot sustain combustion in normal air, effectively preventing the spread of fire, and meeting or exceeding fire resistance standards.

High Temperature Resistance, No Deformation

Decomposition temperature exceeds 500 ° C, does not soften or drip at high temperatures, maintaining the integrity of the conveyor belt structure.

Low Smoke and Low Toxicity, Greater Safety

Combustion is halogen-free with low smoke, significantly reducing the risk of smoke poisoning during underground operations.



Material Type	Limiting Oxygen Index(LOI)	Combustion Products	Fire Resistance Rating and Applicable Scenarios
Aramid	≥ 28%	Halogen-free, Low Smoke, Low Toxicity	High Gas, High Temperature, High Dust Underground Environments
Steel Cord	N/A	Rubber cover may produce toxic smoke	Long-distance, Heavy-load Underground Transportation
PVG Solid Woven	23–26%	Moderate smoke, contains chlorides	Underground Environments with Medium to High Fire Resistance Requirements
PVC Solid Woven	18–22%	High smoke, toxic gases	Underground Environments with General Fire Resistance Requirements

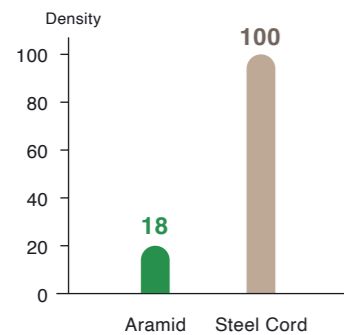
Lightweight for Energy Saving and Consumption Reduction

Aramid possesses the same strength as steel cord but its density is less than 20% of steel cord, resulting in a significantly lower dead weight.

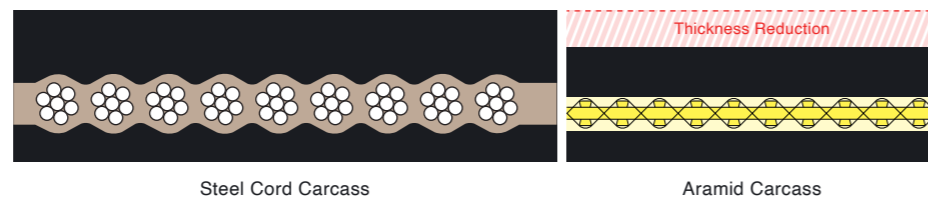
In ultra-high lift applications exceeding 200 meters underground, conventional steel cord conveyor belts often result in excessively high operating tension due to their heavy dead weight. Thanks to its low mass, the Aramid conveyor belt can effectively reduce the required total tension and decrease equipment load. For underground scenarios involving steep inclinations and high lifting heights, this property leads to substantial energy savings and enhances overall profitability.



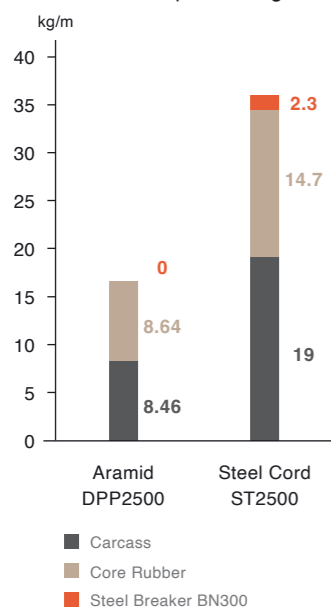
Comparison of Aramid and Steel Cord Density at Equal Strength



Same Strength, Aramid Conveyor Belt is Overall Thinner and Lighter



Weight Comparison of Aramid and Steel Cord at Equal Strength



**Aramid Conveyor Belt Carcass Weight Reduced by 52%,
Total Conveyor Belt Weight Reduced by 26%**

【Based on a comparison of Aramid DPP 2500 vs Steel Cord ST 2500 at equal strength 2500, with a belt width of 1800mm】

Item	Steel Cord ST2500	Aramid DPP2500	Change
Theoretical Strength (kN/m)	2680	3100	↑ 13.5%
Carcass(kg/m)	19	8.46	↓ 42.5%
Core/Skim Rubber(kg/m)	14.7	8.64	↓ 52.5%
Anti-Tear Breaker Mesh BN300(kg/m)	2.3	0	↓ 52.5%
Total Carcass Weight(kg/m)	36	17.1	↓ 35.1%
Total Conveyor Belt Weight(kg/m)	73.6	54.5	↓ 35.1%

Note: The steel cord weight is calculated as: 0.167kg/m × 114 cords = 19kg/m

Low Maintenance Cost

Fast Splicing, Easy Maintenance

Aramid fire-resistant conveyor belts have good adaptability to splicing processes. Splices are easy to make and dimensionally stable, compatible with both traditional vulcanization and various fast splicing technologies, significantly shortening the installation cycle and reducing maintenance workload and downtime.

Stable Operation, Reduced Failure Rate

Aramid material relies on its excellent impact and tear resistance, superior strength, and outstanding fatigue performance. Even under complex conditions such as heavy load, long distances, and multiple start points, it maintains long-term stable operation, reducing the risk of unplanned downtime and frequent repairs.

Underground Aramid Fire Resistance Conveyor Belt

Case Study / Underground Coal Mine Ultra-Long Distance Aramid Conveying System Project

Project Background

BOTON completed an upgrade project for an underground coal mine in Inner Mongolia, replacing a steel cord conveyor belt with an 11-kilometer Aramid conveyor belt system and simultaneously optimizing the conveyor system structure. Following the upgrade, the overall dead weight of the conveyor belt was significantly reduced, energy efficiency was improved, and operation became more stable and efficient. As the world's longest application of an Aramid conveyor belt in an underground coal mine to date, this project holds prominent demonstrative significance for energy conservation, consumption reduction, and the development of green mines.



Operating Results

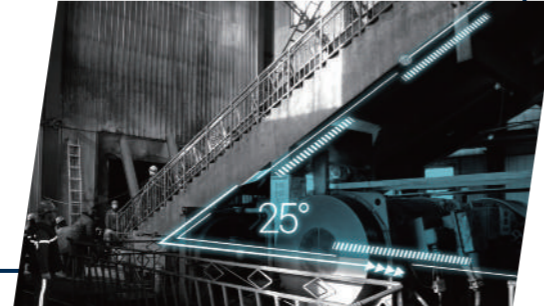
Key Indicator	Performance Metrics
Conveyor Belt Dead Weight	/ ↓ 23.6% 【Compared to the original steel cord dead weight】
Average Current Drop(A)	67 ↓ 16.8%
Daily Electricity Savings(kWh)	7,075
Annual Electricity Savings(MWh)	2,120 【Annual electricity calculated based on 300 days】
Annual Standard Coal Savings(t)	849 【Annual electricity calculated based on 300 days】
Annual CO2 Emission Reduction(t)	2,116

Underground Aramid Fire Resistance Conveyor Belt

Case Study / Replacement of Steel Cord Belt with 25° Steep Incline Aramid Conveyor Belt in Main Coal Mine Slope

Project Background

In early 2021, a coal mine in the Northwest region decided to fully replace the existing steel cord conveyor belt in its main slope with BOTON's fire-resistant Aramid conveyor belt for coal mines, aiming to improve conveying efficiency, reduce energy consumption, and enhance safety.



Operating Results

Key Indicator	Performance Metrics
Transportation Efficiency Improvement	Shortened single-day production time by 2hours ▲ 23.8%
Number of Splices Reduced(each)	Reduced from 23 to 10 ▼ 56.5%
Weight per Unit Transportation Area Reduced	/ ▼ 30%
Electricity Consumption per Ton of Coal Reduced(kWh/t)	Reduced from 2.33 to 1.82 ▼ 21.9%
Annual Standard Coal Savings(t)	420
Annual CO ₂ Emission Reduction(t)	1,047



Fire Resistant Fabric Conveyor Belt for Underground Coal Mine

FRS ● Excellent Troughability ✕ Abrasion Resistant ▲ Corrosion Resistant ❄ Cold Resistant

The BOTON Fire Resistant Fabric Conveyor Belt for Underground Coal Mine (FRS) is the flagship product among BOTON's flame-retardant carcass materials, and its performance not only fills the gap for fabric-ply fire-resistant belts in domestic coal mines but also achieves an international leading standard. The product passed the scientific and technological achievement appraisal organized by the China Petroleum and Chemical Industry Federation (CPCIF) and is an excellent carcass material for replacing PVC solid woven conveyor belts.



- ✓ Model : 1000SD - 3150SD
- ✓ Width : 500 - 3000mm
- ✓ Thickness : 10 - 20mm

Structure Type

FRS

- FRS is a BOTON original and uniquely structured material where fire-resistant rubber is permeated between the fabric plies, effectively achieving flame resistance, better troughability, and durability.
- It utilizes high-performance flame-retardant synthetic fibers, specifically a blend of meta-aramid or polyimide fibers with conventional polyester and nylon fibers. During a fire, the rubber tightly adheres to the non-burning and non-melting meta-aramid or polyimide fibers in the carcass. Even after the rubber turns into char (carbonized), it remains adhered to the belt surface without separating or falling off, which prevents the carcass structure from being directly exposed to the air and rapid combustion.
- Thanks to the use of rubber, the FRS offers excellent troughability, a soft body, and good slip/wet performance. The absence of cotton plies gives it significantly better corrosion resistance and a longer service life compared to solid woven belts.

Flex-Trough Fire Resistant Fabric Conveyor Belt

The BOTON Flex-Trough Fire Resistant Fabric Conveyor Belt is specially designed to adapt to complex roadways, multiple turns, and space-constrained transport conditions in coal mines.

Adapted for Curved and Complex Roadways:The ply structure combined with a special rubber compound allows the conveyor belt to maintain excellent operation even with small turning radii, multiple turns, and in complex roadways, offering outstanding belt body flexibility. The product features superior flexibility and good troughing capability.



Key Features

Durability

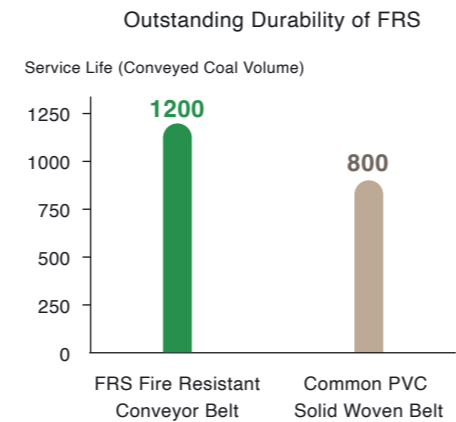
Matched with BOTON's specially developed ultra-abrasion-resistant cover rubber, the service life can reach 8 to 15 million tons of conveyed coal, which is 1.5 to 2 times that of PVC solid woven belts.

Troughability

As a rubber conveyor belt, it offers excellent troughing capability. The belt body is soft, has good slip/wet performance, and does not contain cotton plies. The ply fire-resistant conveyor belt therefore has far better corrosion resistance and a longer service life than solid woven belts.

Anti-Deviation

It adopts the same edge protection structure as surface polyester (EP) or nylon (NN) belts, which effectively enhances the abrasion resistance and damage resistance of the belt edge. This prevents the middle rubber layer from being rolled up or worn down after long-term use, which could lead to belt misalignment. This better protects the edges and ensures stable and efficient operation of the conveyor belt.



Cold Resistance

Under operating conditions down to minus 20 ° C, solid woven belts will harden and become brittle, whereas the FRS for underground applications remains soft and serviceable.

Underground Solid Woven Fabric Fire-Resistant Conveyor Belt

【Compliant with MT/T914 Fire Resistance Standard】

Product Specification Naming Convention

PVC/G 3100/1 - 1200 - 2+2

- Top and bottom cover rubber: 2mm each
- Belt width: 1200mm
- Carcass is a solid woven ply, with a longitudinal tensile strength of: 3100N/mm
- Cover Rubber Types

Solid Woven Belt Adhesion Strength

Unit: Newtons per Millimeter(N/mm)

Item	Cover-to-Carcass Adhesion(N/mm)	Internal Carcass Adhesion(N/mm)
Average Value	≥4.00	-
Minimum Value	≥3.25	≥6.5
BOTON Product	≥5	-

Technical Reference Chart

Classification	Belt Tensile Strength (N/mm)		Recommended Cover Thickness (mm)				Belt Carcass Width
	Warp≥	Weft≥	Coated PVC	Extruded PVC	Vulcanized PVG	Extruded PVG	
680S/Grade 4	680	265	1.0+1.0	1.5+1.5	1.5+1.5	1.5+1.5	500~2000
800S/Grade 5	800	280	1.0+1.0	1.5+1.5	1.5+1.5	1.5+1.5	
1000S/Grade 6	1000	300	1.0+1.0	1.5+1.5	1.5+1.5	1.5+1.5	
1250S/Grade 7	1250	350	1.0+1.0	2.0+1.5	2.5+1.5	2.0+1.5	
1400S/Grade 8	1400	350	1.0+1.0	2.5+1.5	2.5+1.5	2.5+1.5	
1600S/Grade 9	1600	400	1.0+1.0	2.5+1.5	3.0+2.0	2.5+1.5	
1800S/Grade 10	1800	400	1.0+1.0	3.0+2.0	3.0+2.0	3.0+2.0	
2000S/Grade 11	2000	400	1.0+1.0	3.0+3.0	3.0+3.0	3.0+3.0	
2240S/Grade 12	2240	450	/	/	3.0+3.0	3.0+3.0	
2500S/Grade 13	2500	450	/	/	5.0+3.0	5.0+3.0	
2800S/Grade 14	2800	450	/	/	5.0+3.0	5.0+3.0	
3100S/Grade 15	3100	450	/	/	5.0+3.0	5.0+3.0	

Minimum Pulley Diameter Recommendation

Strength Specification (According to Chinese Standard)	680/1	800/1	1000/1	1250/1	1400/1	1600/1	1800/1	2000/1	2240/1	2500/1	2800/1	3100/1	3400/1
T4	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16
Main Drive Pulley Diameter (mm)	400	500	630	750	750	800	800	1000	1250	1250	1500	1500	1600

Note: Production can be organized according to standards such as MT/T914, SANS971, AS4606, BS3289, and BC158

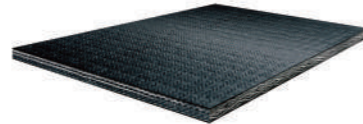
It is recommended to use molded PVC (PVG) instead of ordinary PVC belts due to longer service life and better mechanical splice strength.

Solid Woven Fire Resistant Conveyor Belt

PVG / PVC ⇒ Impact Resistant 🛡️ Tear Resistant

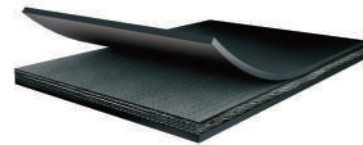
PVG Solid Woven Fire Resistant Conveyor Belt: This includes Plastic Cover PVC fire-resistant conveyor belts and Rubber Cover PVG fire-resistant conveyor belts. The products feature good overall performance, impact resistance, tear resistance, abrasion resistance, and light weight. They possess excellent fire resistance and anti-static properties, and can meet the requirements for high-capacity and long-distance material transport.

PVC

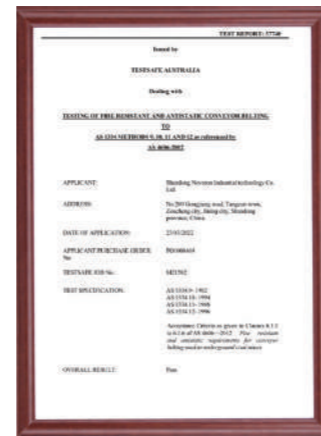


- Applied using a PVC paste coating process.
- The belt body is fire-resistant, anti-static, impact-resistant, and tear-resistant.
- Suitable for material conveying on inclines of 16° or less.

PVG



- Manufactured using NBR (Nitrile Butadiene Rubber) through extrusion, calendaring, and vulcanization.
- The belt body is fire-resistant, anti-static, impact-resistant, and tear-resistant.
- Suitable for material conveying on inclines of 22° or less. (PVG Solid Woven Fire Resistant Pattern Conveyor Belt is suitable for material conveying on inclines of 22° or less.)



PVC Solid Woven Belt

Case Study / Fire Resistant Solid Woven Belts Serving Key Australian Coal Mine Projects

Over 50,000 meters Exported

Project Background

BOTON has supplied PVC and PVG series solid woven fire-resistant conveyor belts to key Australian coal mine projects. To date, the cumulative export length has reached 59,072 meters. The product performance is stable with excellent customer feedback.



Conveyor Belt Type	Cumulative Length	Typical Model
PVC Solid Woven Fire Resistant Belt	15km	SW10000-1050 (3+2) mm SW12000-1600 (5+3) mm
PVG Solid Woven Fire Resistant Belt	4km	SW10000-1600 (2+2) mm SW6500-1500 (2+2) mm

Total Cumulative Export Volume (m) 59,072

PVG Solid Woven Belt

Case Study / PVG Fire Resistant Conveyor Belt for High-Capacity Fully Mechanized Face Gate Roadway Conveying System in Coal Mine

Project Background

A fully mechanized face gate roadway conveying system in a Shaanxi coal mine has an annual raw coal output of up to 35 million tons, and the high conveying strength and operating load pose severe challenges to equipment stability. After adopting the BOTON PVG solid woven fire-resistant conveyor belt in this project, the belt speed stably reached 4.5 m/s. The product demonstrated excellent durability under high-strength conditions, and the measured service life exceeded the industry average by 1.5 times, significantly improving the system's operational efficiency and reliability.



Key Indicators	Performance Metrics
Operating Speed	Belt speed reached 4.5 m/s, efficiently supporting ultra-high capacity of 3500 t/h ↑
Operating Status	The conveyor belt is operating well to date, with no structural damage or frequent maintenance
Service Life	Based on usage comparison, the product life is more than 1.5 times the industry average ↑
Downtime Risk	Maintenance frequency is greatly reduced, effectively mitigating the production impact of sudden downtime ↓
Operating Condition Validation	The project is a world-leading intelligent mine, and the product has undergone long-term validation under extre

How to Select the Appropriate Fire Resistant Conveyor Belt for Underground Use?

01 More Stringent Fire Resistance Testing

In underground operating environments, the combination of confined spaces, limited ventilation, and high dust concentrations makes the fire risk more severe. Therefore, underground fire-resistant conveyor belts must meet stricter fire resistance ratings and smoke toxicity requirements, and they must maintain their flame-retardant properties over the long term, even under high abrasion and high tension.

BOTON provides high-end solutions for underground conveying systems, including Aramid Fire Resistant products, Ply Fire Resistant products, and Snake Belts. Even if the top and bottom cover rubbers are severely worn, the core structure can still pass stringent fire resistance tests, minimizing the risk of underground fire and flame propagation, and ensuring personnel and equipment safety.

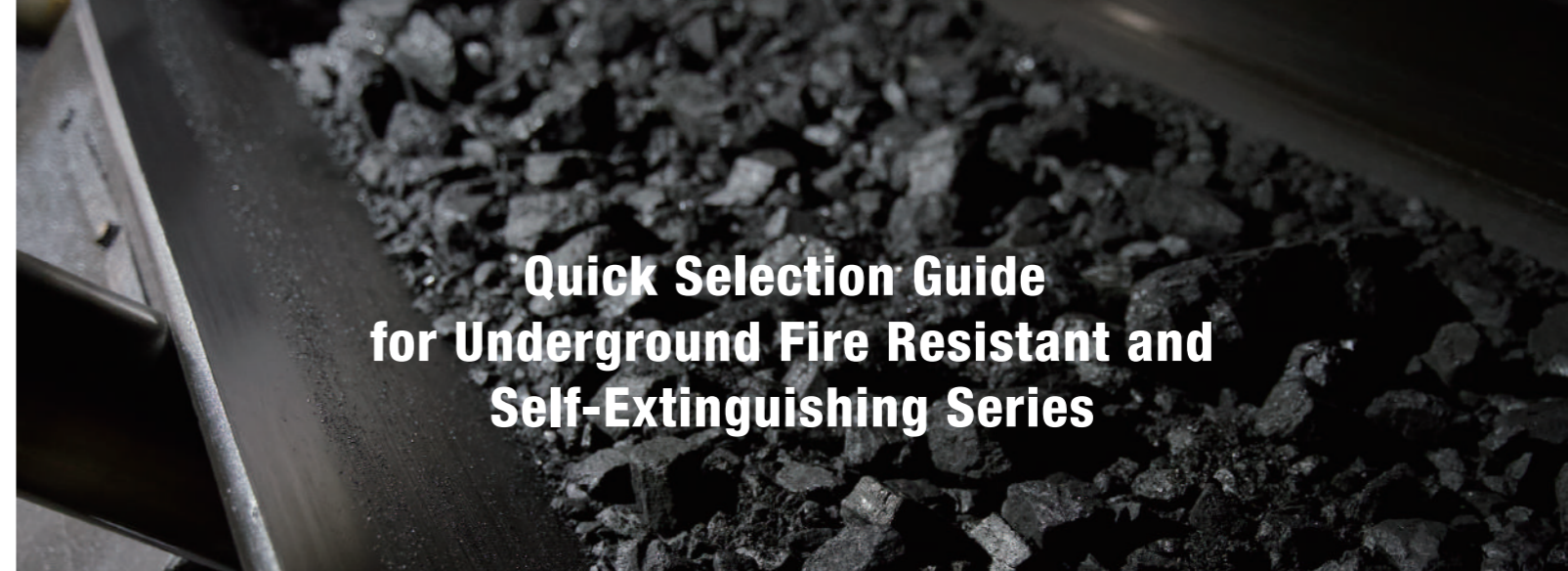
BOTON provides high-end solutions:

- ✓ **Aramid Fire Resistant Products**
- ✓ **Ply Fire Resistant Products**
- ✓ **Snake Belts**

02 Electrostatic Discharge is the Real Trigger for Explosions

In flammable and explosive environments (such as coal mines and chemical plants), the accumulation of static electricity generated by the conveyor belt's operation can reach several thousand volts, and once discharged, it can trigger dust explosions or gas deflagration.

BOTON products comply with relevant conductivity standards, with a surface resistance of $\leq 1 \times 10^9$ (far lower than the industry standard of $\leq 3 \times 10^9 \Omega$), which can effectively eliminate static electricity accumulation. This makes them suitable for high-risk areas such as coal mines, chemical plants, and grain processing, ensuring the conveying process is free from the hazard of electrostatic sparks.



Quick Selection Guide for Underground Fire Resistant and Self-Extinguishing Series

Parameter	Aramid Fire Resistant Belt	Steel Cord Fire Resistant Belt	FRS Ply Fire Resistant Belt	Solid Woven Fire Resistant Belt PVC/PVG
Application Scenario	General Purpose	General Purpose	General Purpose	Roadway / Wet Roadways
Carcass	Aramid Composite Fabric	Galvanized Steel Cord	Fire Resistant Polyester Dipped Fabric	Cotton Polyester / Polyester Cotton Woven Ply
Tensile Strength	500-5000 N/mm	500-10000 N/mm	100-3150 N/mm	≤ 3100 N/mm
Corrosion Resistance	★★★★★★	★★★	★★★★★★	★★★★
Impact Resistance	★★★★★★	★★★★	★★★★	★★★★★★
Troughability	★★★★★★	★★★★★★	★★★★★★	★★★
Splicing Method	Hot Vulcanization / Mechanical Splice	Hot Vulcanization	Hot Vulcanization / Mechanical Splice	Hot Vulcanization / Mechanical Splice
Energy Efficiency	★★★★★★	★★★★	★★★★★★	★★★★
Weight	Light	Heavy	Medium	Medium
Maximum Applicable Incline	$\leq 30^\circ$	$\leq 30^\circ$	$\leq 25^\circ$	$\leq 20^\circ$
Sample Images				

Anti-Impact and Anti-Tear Series for Severe Operating Conditions

Impact and Tear Resistant conveyor belts provide reliable protection, extend service life, and reduce downtime risk in mineral crushing sections, high drop material transfer points, and other high-impact operating conditions. This series utilizes a specialized high impact and tear resistant compound in the cover rubber, effectively protecting the belt surface.

Anti-Tear Capability Standard [HG/T3646]

HG/T3646-2014 Technical Specification for Anti-Tear Conveyor Belts systematically evaluates the conveyor belt's resistance to damage under complex working conditions from two dimensions: cut resistance and impact penetration strength.

- The cut resistance index is determined by a standard blade cutting test, simulating the material's ability to resist crack propagation when subjected to slitting or cutting by foreign objects.
- The impact penetration strength index is determined by a falling mass impact test, reflecting the material's ability to resist damage or penetration of the carcass caused by sudden external impact while the belt is under tension.

Both tests set detailed requirements for sample preparation, testing equipment, operating procedures, and data processing. For example, the specimen length must meet a 400 mm effective section, the cutting tool must match the belt carcass reinforcement material, the falling mass impact energy covers the 100 to 3000 N·m range to encompass common operating conditions, and a force-time curve must be recorded to assist in determining if internal damage has occurred.

By comparing the measurement results from these two dimensions, users can gain a more comprehensive understanding of the conveyor belt's safety performance and service life in high-impact and high-slitting-risk scenarios such as mines, ports, and bulk material transport, serving as an important basis for selection, acceptance, and quality control.



Item	HG/T3646 Standard	
	A	B
Cut Resistance/kN	≥3.0	≥10.0
Impact Penetration Strength/N·m	≥400.0	≥1000.0

Diverse reinforcement solutions are offered for the carcass structure:

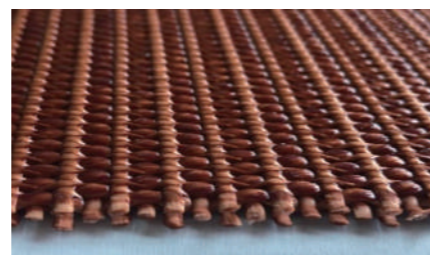
- High-Density Fabric Carcass** Transverse strength is enhanced through special weaves such as BTW, XP, and CFW, to better dissipate impact forces.
- Steel Cord Carcass** Adding a high-strength fabric anti-tear layer compensates for the weakness of easy penetration, absorbs impact, and prevents tear propagation.
- Integrated Steel Mesh Carcass** Using transverse steel cords further strengthens anti-penetration and anti-tear capabilities.

The diversified combination of carcass and cover rubber allows the conveyor belt to achieve tougher and longer-lasting protection under various severe operating conditions.

BTW Impact Resistant Conveyor Belt

BTW → Impact Resistance → Excellent Elasticity

The BTW super heavy-duty carcass uses high-strength polyester and nylon as base materials, employing BOTON's independently developed BTW Triple Weave structure. It features both high elasticity and high strength, which significantly enhances the belt body's ability to absorb and disperse impact while improving transverse tear resistance. It is an anti-damage fabric carcass customized for high-impact conveying environments.



Structure Type

BTW

Unique Triple Weave structure utilizes high-strength polyester warp and nylon weft yarns. The upper and lower weft layers are woven into bundles with the main warp yarns, enhancing the carcass ply consistency and compressive elasticity. Characterized by high fabric density and strong adaptability, the conveyor belt consists of no more than 3 plies and is compatible with single or double-layer finger splicing as well as mechanical fasteners.

Key Features

Impact Resistance

The BTW fabric carcass has a tight structure and features a triple weft layer structure. It has excellent elasticity and high-efficiency impact absorption capability, significantly reducing damage such as carcass rupture or breakage caused by materials dropping onto pulleys during loading or reclaiming.

Flexibility

Reduced number of plies avoids stress concentration issues during installation.

Tear Resistance

The tightly woven structure strengthens transverse support, enhancing overall tear resistance and effectively suppressing structural damage caused by sharp material impact.

Compatibility

The BTW fabric has a low modulus and good elasticity, allowing for smooth replacement of traditional multi-ply fabric conveyor belts. It supports quick mechanical splicing, with a splice strength retention rate of over 70%, facilitating on-site maintenance and system upgrades.

✓ Fabric Strength Rating: **BTW400 - BTW1000**

Classification	Belt Breaking Strength (Warp/Longitudinal)	Adhesion Strength	Thickness
	N/mm	mm	mm
BTW400	/	12	2.2
BTW500	≥550	≥14	2.4
BTW630	≥700	≥14	2.95
BTW800	≥850	≥14	3.5
BTW1000	≥1050	≥14	4.5

BTW Impact Resistant Conveyor Belt

Case Study / Replacement of BTW Impact Resistant Conveyor Belt in Heavy-Duty Cantilever Conveying System

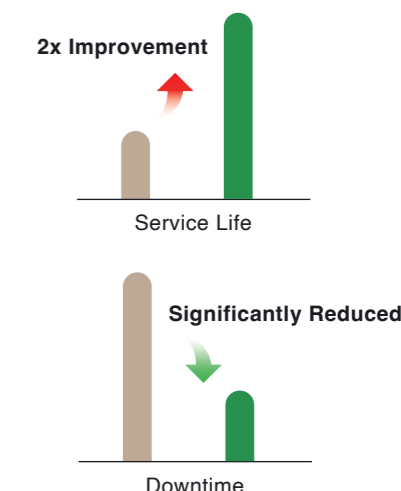
Project Background

A cantilever belt conveyor at a certain stockyard had been using a standard EP fabric carcass conveyor belt for a long time. Due to complex operating conditions on-site, including wide belt width, large troughing angle, and frequent heavy material impact, the conveyor belt frequently experienced issues such as inter-ply delamination, premature fatigue cracking, and troughing deformation. The actual service life was less than half of the design expectation, resulting in high belt replacement frequency, significantly increased maintenance costs, and multiple unplanned downtimes severely affecting system continuity and production efficiency. The customer urgently required a customized solution specifically designed for cantilever systems, featuring high impact resistance and stable troughing capability.



Operating Results

Dimension	Standard Conveyor Belt	BTW Conveyor Belt
Downtime Frequency	Frequent downtime, frequent maintenance	Unscheduled downtime significantly reduced
Adaptability	Vulnerable to bending, limited curvature	Good small curvature adaptation, no large bending fatigue
Impact Resistance	High-speed material drop easily damages carcass	Good impact absorption, more durable structure
Troughing and Tracking	Prone to tracking deviation, poor stability	Excellent troughing capability, smoother conveying
Annual Operation and Maintenance Cost	High O&M costs, large downtime losses	O&M costs significantly reduced, system operates continuously



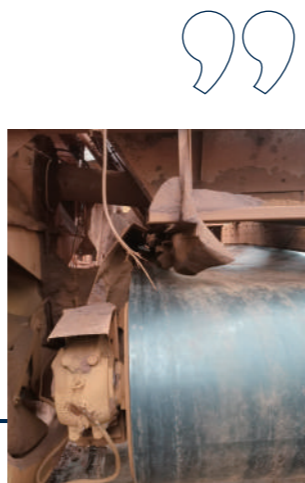
BTW Impact Resistant Conveyor Belt

Case Study / Replacement of BTW Impact and Tear Resistant Conveyor Belt in Mine Crushing Section

Project Background

A mine project belonging to a leading SOE group in China's steel and metallurgy industry requires that, after mining, large blocks of ore undergo a crushing process. These ore pieces, which are often >300mm, typically drop onto the conveyor belt from a height of 4-6 meters, generating enormous instantaneous impact force that can easily puncture or tear the conveyor belt.

To address the characteristics of high-impact materials at the site, BOTON provided the BTW Impact Resistant Conveyor Belt, which features excellent cushioning performance and superior impact resistance, effectively extending the service life in this critical process. In this project, the customer's original 8-ply NN300 conveyor belt was typically punctured by the high-velocity impacting ore within 5-7 months. After switching to BOTON's 2-ply BTW Impact Resistant Fabric, the conveyor belt's service life was extended to more than 18 months, achieving significant results and substantially reducing maintenance costs.



Operating Results

Application Scenario	Original Solution (NN300 8-ply)	Improved Solution (BTW Impact Resistant Fabric)
Large Particle Size Ore Conveying 4-6 meter Drop Height	Service Life: 5-7 months Prone to Puncture	Service Life: Over 18 months Significantly Impact Resistant, Anti-Puncture

3X the service life

was successfully achieved by the BTW Conveyor Belt over the original solution.



Anti-Impact Ply / Anti-Tear Breaker

Anti-Impact Ply

Characteristics	BS Steel Cord Anti-Impact Ply	HC Fabric Carcass Anti-Impact Ply
Scenarios	High abrasion and high impact resistance, suitable for severe operating conditions	Hard rock mining, port terminals, steel/metallurgy, cement, salt, power plants, etc.
Features	Moderate to heavy impact scenarios	Light impact scenarios
Core Features	Efficiently disperses peak impact energy, high longitudinal and transverse strength, exceptionally tight structure	Enhanced impact resistance of cover rubber, ensuring fabric is not exposed
Composition	Nylon Dipped Fabric (Twill Weave)	Nylon/Polyester Dipped Fabric
Strength Rating	BS400 - BS630	BP100-BP600

Anti-Tear Breaker

Characteristics	IW Impact Resistant Heat Resistant Steel Mesh	BF Steel Cord Anti-Tear Breaker	BP Nylon Anti-Tear Fabric	BD Aramid Anti-Tear Fabric
Scenarios	IW: Both impact and heat resistant, ideal for localized high-temperature use	General purpose, light anti-tear requirement		
Features	High elongation, low modulus, low creep special steel wire mesh	Balanced impact/tear resistance	Light anti-tear requirement	Used for applications like steel cord conveyor belts requiring transverse reinforcement to prevent longitudinal tearing
Core Features	Excellent impact resistance, also possesses good heat resistance	High transverse strength, effectively prevents longitudinal tearing, not easily severed/broken	Used for severe applications like steel cord conveyor belts requiring transverse reinforcement	Aramid anti-tear fabric has high strength, tear resistance, and no electromagnetic interference
Composition	Copper Plated Steel Mesh	High Elongation Steel Cord Anti-Tear Fabric (Transverse Steel Cord)	Nylon Fabric	Aramid Fabric
Fabric Strength Rating	IW500 - IW1250	BF200 - BF630	BP40 - BP300	BD200 - BD630

Problems to be Solved in Severe High-Impact Operating Conditions

01 Avoid Damage to the Conveyor Belt Carcass Structure Caused by Large, Hard Materials

In industries such as mining, steel, and building materials, conveying systems frequently face repeated impact from large, heavy objects or sharp materials. If the carcass structure strength is insufficient, the following problems can easily occur:

- The surface rubber is punctured/broken through, directly exposing the carcass
- The weft yarns are torn by cutting forces, forming penetrating cracks
- Continuous impact leads to carcass fatigue rupture and a sharp reduction in service life

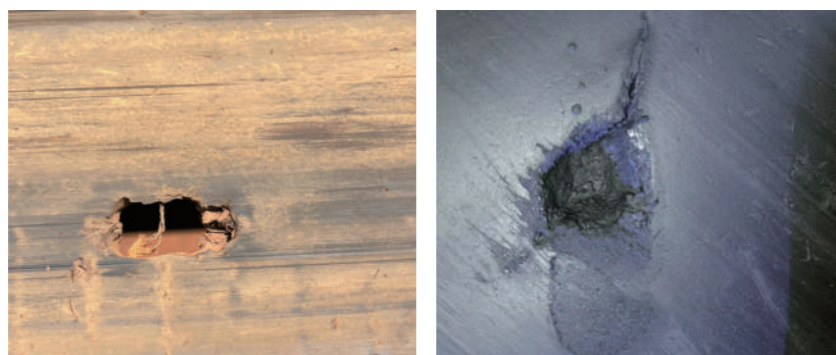
✓ Solution Strategy and Selection Recommendation

Priority should be given to selecting a fabric carcass structure featuring enhanced design for transverse tear resistance and anti-puncture performance. Refer to the table for the impact resistant series fabric carcass weave structure for details.



02 Preventing Cover Rubber Stripping or Localized Punctures Caused by Impact

Under frequent impact or the action of sharp materials, the cover rubber layer can be broken through, leading to carcass exposure, rubber layer peeling (stripping), or even the formation of penetrating holes under heavy pressure.



✓ Solution Strategy and Selection Recommendation

The selection of cover rubber specially designed for enhanced toughness can effectively improve the conveyor belt's resistance to cutting.

How to Handle Severe Operating Conditions such as High Impact/Tearing?

01 Impact Resistant Series Fabric Carcass Weaves

To cope with this type of damage risk, BOTON has developed and designed two types of anti-impact/anti-tear plies, including the fabric anti-tear ply and the steel cord anti-tear ply.

▶ Fabric Anti-Tear Ply

The fabric anti-tear ply includes lightweight polyester/nylon structures for absorbing impact energy, and high-strength nylon structures for active tear prevention.

▶ Steel Cord Anti-Tear Ply

The steel cord anti-tear ply is composed of transverse steel cords and longitudinal tie wires, with strength determined by the steel cord diameter and spacing. Although seemingly stronger, the steel cords are non-stretchable and cannot gather to form a thick barrier like the fabric structure, thus their actual tear resistance may not necessarily be superior to the nylon ply. The appropriate protection ply should be selected based on the specific site conditions during the design process.

[【See Impact Resistant Series Fabric Carcass Weave Structure Table P61 for details】](#)

02 Dual Defense

To further address severe operating conditions such as high impact and tearing, BOTON has also developed high-performance cover rubber compounds specifically designed for harsh impact environments. These compounds strengthen surface resistance to impact and cutting, forming a dual defense with the carcass structure.

✓ RockArmour™ X Series

Features "Ultra-High Impact Resistance + Anti-Cutting" performance, suitable for extremely severe scenarios with high drop height, highly sharp materials, impact and cutting. Its high elongation at break and tear strength can significantly mitigate impact peaks and effectively prevent crack propagation.

✓ RockArmour™ Plus Series

While maintaining extremely strong impact resistance, it enhances abrasion resistance. It is suitable for long-distance, heavy-duty conveying systems where impact damage is the primary mode of failure, and it is particularly adept at absorbing intermittent strong impacts, slowing down surface aging and peeling.

Both products maintain stable and strong performance across a temperature range of -40°C to 70°C through special rubber compounds and reinforcement systems. They feature extremely low abrasion loss rates and are widely used in high-intensity mining operations such as iron ore, copper ore, and quarries, providing customers with lower maintenance frequency and greater economic assurance.

03 Intelligent Conveying Products

BOTON has also developed and applied an embedded RFID chip + intelligent monitoring system within the belt carcass. This system, paired with a belt tear monitoring system, enables continuous, accurate, and automated management of the conveyor belt's tear status.

[【See Intelligent Conveying Products P81 for details】](#)

Impact-Resistant Series Fabric Core Woven Structure

Characteristics	BTW	XP	DW	CFW	EPP
Main Applicable Scenarios/ Advantages	Stacker-reclaimers, main conveyor lines, crushers, etc., where high transverse tear resistance and high risk of material spillage are required.		Extra heavy-duty, high-impact applications, such as hard rock mining, port terminals, iron and steel metallurgy, cement, etc.; suitable for mechanical fastener splicing.	General impact resistance applications, such as hard rock mining, port terminals, iron and steel metallurgy, cement, etc.	Short-distance conveying applications
Structure	BTW	XP	DW	CFW	SW
Core Impact Resistance Features	Ultra-high strength, excellent transverse tear resistance, protection against material piercing damage	High strength, extremely tight fabric structure, can effectively resist the impact and cutting of sharp ores	Tight structure, not easily cut punctured, extremely high impact resistance	High weft strength, high longitudinal tear strength, good impact resistance performance	Compared with steel cord conveyor belts, EPP fabric conveyor belts have better impact resistance and tear resistance.
Warp Tear Strength (N/cm)	≥630~≥1000 (Single ply)	≥6000~≥11000	≥2800~≥6600	≥2400~≥6700	≥4200~≥16500 (Single ply) ≥4900~≥14800 (Double ply)
Weft Tear Strength (N/cm)	Extremely high transverse tear resistance performance	≥3500~≥6000	≥1400~≥3100	≥1200~≥1800	≥1200~≥2400 ≥1350~≥2200
Thickness Range (mm)	Recommended number of plies does not exceed 2, bottom cover thickness ≤ 3mm (if there is a risk of material spillage)	2.9~5.0	1.05~2.52	1.0~2.5	2.0~5.5 (Single ply) 2.20~4.70 (Double ply)
Applicable Temperature Range (°C)	Not explicitly stated, can be improved when combined with cover rubber	-60~60	-40~150	-60~60	-60~60
Fabric Strength	BTW400~ BTW1000	XP500~ XP1000	DW500~ DW1000	CFW500~ CFW1000	EPP400~ EPP1600

Complex Line Series Pipe Belts

In industries such as mining, ports, power plants, metallurgy, and cement, there are often situations with high requirements for environmental cleanliness, limited space, or complex conveying lines. Addressing these needs, BOTON recommends using the tubular conveyor belt as a specialized complement to traditional conveyor belts. It can utilize various cores—aramid, steel cord, fabric—based on different operating conditions, taking into account properties like heat resistance, flame retardance, oil resistance, and acid-alkali resistance, to meet diversified conveying requirements.

This type of product can effectively handle the challenges presented by complex terrain and limited space: In areas intermingled with plant grounds, hills, or water, traditional belt conveyors struggle with straight-line layout. They must adapt to large-radius curves, steep slopes, and limited space crossings, demanding higher requirements for the flexibility and structural design of the conveying line. Concurrently, the enclosed structure reduces risks such as material dusting, scattering, and moisture contamination, making it particularly suitable for urban factory areas and ecologically sensitive regions, meeting higher environmental protection and safety production standards.

- Heat Resistant
- Flame Retardant
- Oil Resistant
- Acid-Alkali Resistant

*Note: For BOTON's complex line series pipe belt, the products meet:

- China Chemical Industry Standard HG/T4224
- China Machinery Industry Standard JB/T10380

Pipe Belt

【ChinaChemicalIndustryStandard HG/T4224】

【China Machinery Industry Standard JB/T10380】

For continuous conveying over ultra-long distances, multiple curves, and undulating terrain, operational stability is also a core consideration:

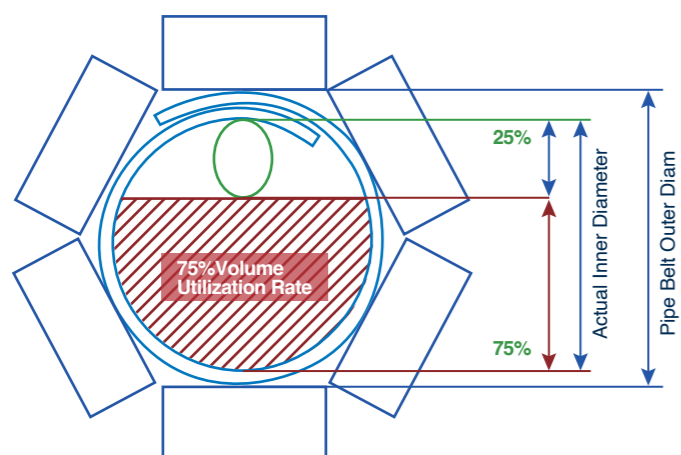
Traditional Conveyor Belt

- Prone to deviation due to uneven tension or eccentric loading in high-load or complex routes
- Risks include material spillage, belt damage, and system downtime



Pipe Belt and Pre-Trough Conveyor Belt

- Through optimized structure and automatic self-correction design, the risk of deviation can be significantly reduced
- Enhances long-term stable operational capability
- Reduces manual intervention, helping customers achieve efficient, safe, and sustainable conveying operations



Pipe Belt

Pipe Complex Terrain Reduces Dust Prevents Spillage Low Noise Protects Material

The tubular conveyor belt is suitable for various complex terrains, narrow spaces, environmentally sensitive areas, and special materials like powder and paste, due to its sealed environmental protection and flexible path characteristics. It can also be used in special scenarios such as high temperatures.

Compared with traditional trough conveyors, the BOTON tubular belt series can effectively prevent dust spillage, material leakage, and material contamination during conveyance. BOTON offers a variety of carcass structure options (steel cord, aramid, fabric core, steel wire mesh) for different conveying needs. BOTON has established good research and cooperative relationships in the field of tubular conveying technology with renowned German and Italian university conveying laboratories, as well as world-famous multinational groups.



Key Features

Shortens Conveying Line, Saves Civil Engineering and O&M Costs

The conveyor turning angle can reach over 65°, and the flexible layout ability reduces intermediate transfer points and civil investment, optimizes plant layout, and improves overall economic benefits.

Good Longitudinal Flexibility, Small Radius Bending

A small bending radius can handle working conditions with multiple turns, undulations, and limited space.

Excellent Resistance to Lateral Fatigue

The pipe shape can still be stably maintained under high-load, continuous operation, reducing the frequency of downtime.

Low Noise, Environmentally Friendly

The sealed structure effectively reduces operating noise, making it suitable for environmentally sensitive areas or residential vicinities.

Strong Lateral Rigidity and Pipe Shape Retention

The BOTON tubular conveyor belt can stably maintain its pipe shape during long-term operation, preventing twisting and material leakage, leading to a longer belt service life. The conveyor belt has good lateral rigidity and pipe shape retention; it is also highly resistant to lateral rigidity fatigue.

Sealed Conveyance, No Leakage, Resistance to Extreme Environments

Effectively prevents material spillage and scattering, and also prevents interference from rain/snow and odor diffusion, meeting high environmental protection standards.

Large Angle and Low Running Resistance

Supports a conveyor belt inclination angle of ≥ 35°, and can be optionally equipped with low-rolling-resistance rubber, effectively reducing the running resistance and energy consumption of the conveyor belt.

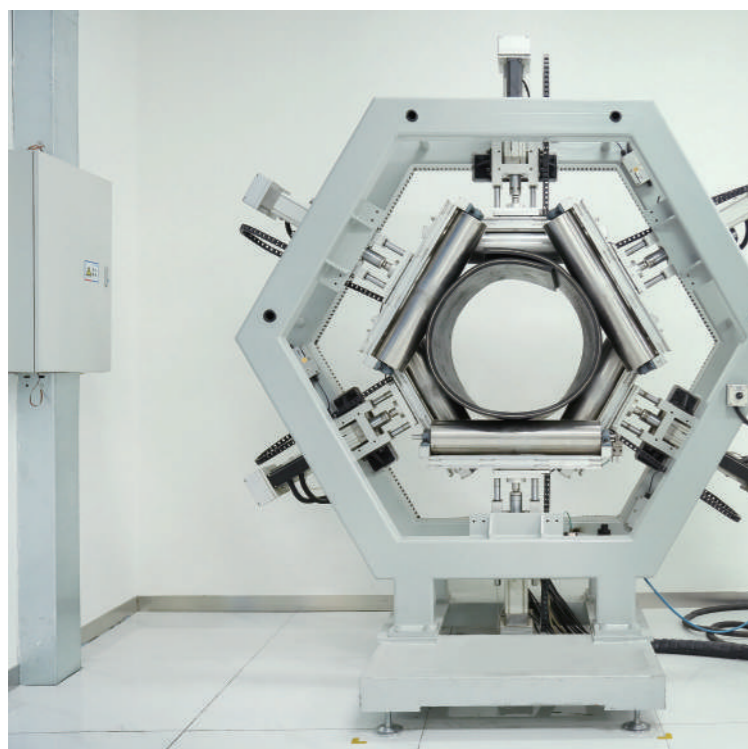
Pipe Belt Outer Diameter(mm)	150	200	250	300	350	400	500	600	700
Belt Width(mm)	600	800	1000	1100	1300	1600	1950	2250	2450



China's First Pipe Conveyor Belt Bending Fatigue Tester

Used to simulate the pipe belt's bending fatigue performance during actual operation, especially under certain pressure or displacement. It compares and optimizes design structures through hundreds of thousands of simulation tests. This is of great significance for testing the pipe retention rate (pipe forming stability) of pipe conveyor belts.

Pipe Conveyor Belt Transverse Stiffness Tester



The transverse stiffness test for pipe conveyor belts primarily evaluates their transverse bending stiffness. This indicator is crucial for determining whether the pipe conveyor belt can maintain a stable tubular shape: insufficient stiffness can lead to pipe collapse, arching, edge misalignment, or twisting, while excessive stiffness can increase rolling resistance and energy consumption (a balance is required).

Furthermore, sufficient transverse stiffness helps reduce lateral vibration and resonance risks, improves system stability and service life, and guides the optimization of belt material design (such as width, thickness, and structure). By utilizing six displacement sensors to encircle the fixed shape of the tubular sample, and applying pressure with a mechanical structure to measure the stiffness value, we can simultaneously and automatically collect and generate curve data showing stiffness changes over time, providing customers with pipe conveyor belts of excellent performance.

Pipe Belt

Case Study / Long-Distance Energy-Saving Model: Aramid + Pipe Belt, 600mm Large Diameter, 5m/s High Belt Speed

Project Background

The coal conveying system of a large coastal power generation enterprise faced complex conditions including long distances, high volume, large curves, and enclosed conveying. This was undertaken to mitigate the risks caused by the instability of the original imported product supply.

BOTON Technology first applied high-strength aramid material to the design of large-diameter pipe conveyor belts, effectively meeting the demand for long-distance, high-speed, and low-energy consumption green conveying.

Key Indicator	Parameter
Horizontal Conveying Distance	1500m
Lifting Height	23.8m
Pipe Diameter	600mm
Designed Belt Speed	5m/s
Designed Conveying Volume	3250t/h
Designed Service Life	10year



Pipe Belt

Case Study / Large-Diameter Lifting Project: Stable and Efficient Coal Conveying Solution

Project Background

A coal conveying line for a large group enterprise in Henan features significant height and long conveying distance, involving large-diameter coal transport. The project demanded high standards for system stability, efficiency, and safety, requiring a reliable and efficient conveying solution to meet the enterprise's production needs. To this end, BOTON customized and supplied this high-lift, large-diameter pipe conveyor belt for the project.

Key Indicator	Parameter
Horizontal Conveying Distance	1600m
Lifting Height	55.6m
Pipe Diameter	600mm
Designed Belt Speed	4.5m/s
Material Conveyed	coal

Case Study / Heat-Resistant Pipe Conveyor Coke System: 2x+ Lifespan, 5 Years of Continuous Operation

Project Background

A large-scale integrated steel enterprise in Jiangsu relies on its coking plant's coke conveying system as a key link between the coke oven and blast furnace production. This project has a total conveying length of 4,950 meters and requires stable transport of high-temperature coke, imposing strict demands on the belt's heat resistance, structural strength, and operational stability. The line is designed as a pipe conveyor belt system, presenting integrated technical challenges including large diameter, sharp curves, long distance, continuous climbing, and turning operations. The original belt used on this line had a service life of 1.5 to 2.5 years, and frequent replacements placed significant pressure on production continuity and equipment maintenance.

To improve system operational reliability and reduce maintenance costs, the project was upgraded in 2014 to a heat-resistant steel cord pipe conveyor belt supplied by BOTON (Model: ST1600 B1600 structure 10+6, heat resistance 125°C).



Operating Results

Strong High-Temperature Adaptability

Uses a heat-resistant cover rubber formula that effectively resists coke heat radiation and corrosion, ensuring the long-term stability of the rubber compound's performance.

Adaptable to Complex Routes

Good flexibility and durability meet the demands of turning and steep slope operations on the route.

Structural Reinforcement Design

The steel cord carcass, combined with thick cover rubber, enhances the overall belt body strength and fatigue resistance, suitable for continuous operation.

High System Stability

No major tearing, collapsing, twisting, or structural damage occurred during operation, ensuring safe and reliable running.



The actual operating time of this conveyor belt has exceeded 5 years, which is 2 to 3 times the original service life, far surpassing the user's expectations.

Patterned Conveyor Belt

Incline Angle 18°~40° Chevron Pattern Sidewall Cleated Sidewall

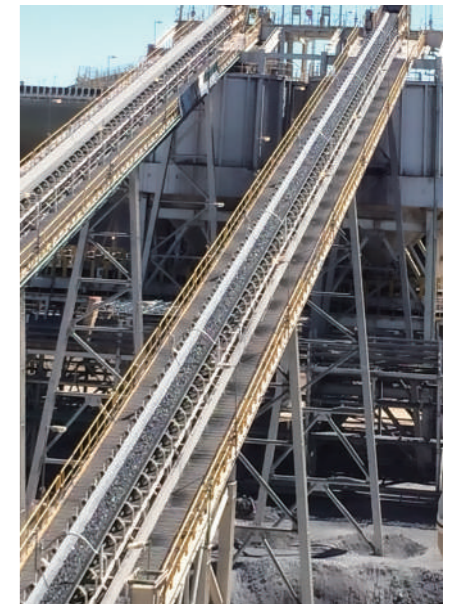


Large-incline conveyor belts are suitable for conveying materials at larger angles (generally exceeding 18°), sometimes exceeding 30° or even 40°, or even near-vertical conditions, and are widely used in mining, ports, construction materials, metallurgy, and other industries. This product series, through a special belt surface structure and auxiliary design, significantly enhances the material's ability to resist sliding, maintain direction, and prevent spillage, ensuring safe and efficient conveying.

Key Features

Patterned Conveyor Belt

- Features a soft and highly regular pattern that increases friction and cushioning performance. Chevron patterns promote material concentration toward the center of the belt, reducing side spillage and slippage, and improving conveying stability.
- The pattern cleats on the rubber surface and the cover rubber on the belt body are molded and vulcanized simultaneously, ensuring the product's long-lasting durability.
- The pattern alters the transverse stiffness of the conveyor belt, allowing its troughability to meet the requirements for large trough-angle three, four, or five idler configuration used on large-incline conveyors.
- Can be customized for different applications as needed, such as: flame retardancy, high temperature resistance, cold resistance, wear resistance, oil resistance, acid and alkali resistance, etc.
- Maximum conveying angle can reach 28°-40°.
- Pattern size and shape can be customized according to the usage scenario and specific requirements.



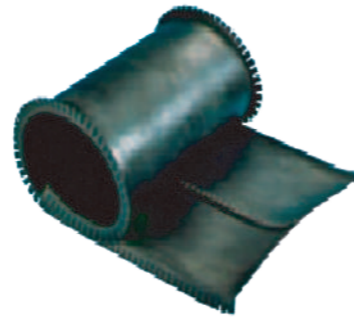
Typical Pattern Designs

Type	Closed Chevron Pattern	Open Eight-Shape Pattern	Multi-Pedestrian Chevron Pattern
Open Edge Type			
Closed Edge Type			

Sidewall Conveyor Belt

Incline Angle 18°~90°  Chevron  Pattern  Sidewall  Cleated Sidewall

Large-incline conveyor belts are suitable for conveying materials at larger angles (generally exceeding 18 °), even up to near-vertical working conditions, and are widely used in mining, ports, construction materials, metallurgy, and other industries. This product series, through special belt surface structure and auxiliary design, significantly enhances the material's ability to resist sliding, maintain direction, and prevent spillage, ensuring safe and efficient conveying.



Key Features

▶ Sidewall Conveyor Belt

- Raised design on both sides effectively prevents spillage of powder and lump material from the side, reducing operational loss.
- Adjustable sidewall size enhances the system's adaptability and protective capability.
- Suitable for medium to high-angle conveying, balancing environmental protection and material integrity.

▶ Cleated Sidewall Conveyor Belt (Large-Incline Model)

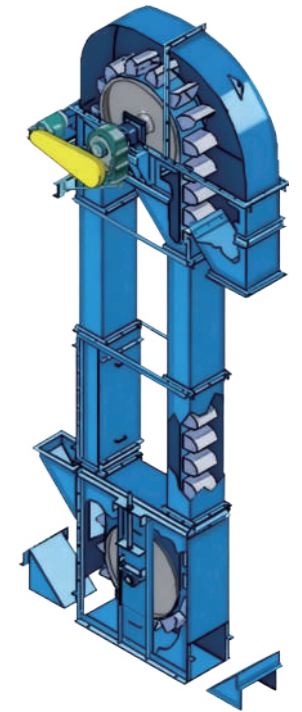
- Combining a sidewall with a transverse cleat structure, it can withstand heavy loads and achieve near-90 ° vertical conveying.
- Eliminates the need for side plate protection, reducing wear and maintenance costs.
- Significantly saves conveyor footprint space, suitable for vertical shafts, compact layouts, and other complex operating scenarios.



Elevator Conveyor Belt

Incline Angle 90°  SW  XP  Steel Cord

Elevator conveyor belts are designed specifically for vertical or near-vertical bulk material transport and are widely used in the cement, mining, metallurgy, and construction materials industries. This series employs various carcass structures, such as steel cord and fabric core, according to different working conditions, ensuring secure bucket fixing and safe, stable operation under high intensity, high temperature, and heavy load conditions.



Key Features

Steel Cord Carcass Structure

Versatile structure, widely used across multiple industries.

- Uses high-strength steel cord carcass, offering excellent carrying capacity and low elongation characteristics.
- Excellent fatigue resistance ensures the buckets are firmly fixed and prevents detachment.

XP Heavy-Duty Fabric Carcass Structure

Suitable for vertical conveying environments requiring high bucket fixing strength but moderate heat resistance.

- Excellent longitudinal pull-out resistance: uses specially dipped canvas with a tight fabric structure.
- Adaptable to smaller pulley diameters: utilizes good flexibility to accommodate smaller pulley diameters.

SW Steel Cord Mesh Structure

Suitable for high temperature, heavy load, and harsh working conditions, particularly for cement plants.

- Combines heat resistance and high bolt pull-out resistance: meets the demands of high-load, high-temperature working conditions.
- High-strength longitudinal steel cords, combined with transverse steel wire fabric, enhance transverse strength and fatigue resistance.
- Superior joint fatigue resistance enhances the stability and security of bucket.



BoClean™ Anti-Adhesion Conveyor Belt

The anti-adhesion technology is compatible with most BOTON products, supporting cleaner production.

The BoClean™ Anti-Adhesion Conveyor Belt is a high-performance anti-adhesion solution developed by BOTON to address typical problems such as material adhesion, difficult cleaning, and severe pollution during the conveying process. It is compatible with most BOTON products and can be used additively.

The product effectively prevents material adhesion to the belt surface by building a low-surface energy, low-friction, and anti-static anti-adhesion layer on the belt surface. It is widely applicable for conveying complex materials with high viscosity, caking tendencies, or fine particle wet materials, such as clay, wet gypsum, quicklime, wet pulverized coal, wet iron ore fines, silicon dioxide, titanium oxide, titanium dioxide, bauxite, phosphate rock, pyrite, and compost.

Industry Pain Points

In typical working conditions such as coal mines, cement plants, and ports, the following problems are widespread:

- Overcomes static and moisture to prevent material adherence after unloading.
- Eliminates material shedding and equipment clogging during the return run.
- Prevents buildup on idlers and pulleys to extend the lifespan of the entire system.
- Drastically reduces manual cleaning and unplanned downtime for higher O&M efficiency.



Key Features

▶ BoClean™ UPE

The anti-adhesion cover rubber uses advanced surface coating technology, applying a 0.5~1mm high-tech composite material layer on the surface of the standard cover rubber, featuring: low surface energy, excellent anti-fouling and low-temperature resistance, anti-icing, wear resistance, chemical corrosion resistance, oil resistance, and UV resistance, making it especially suitable for conveying wet materials in extremely cold or icy environments.

▶ BoClean™ OAM

The anti-adhesion cover rubber incorporates a continuously exuding release agent within the cover rubber to form an "invisible anti-adhesion layer" during transportation. This achieves automatic isolation between sticky materials and the belt surface without affecting the original conveyor belt structural integrity, maintaining stable performance, simple maintenance, and strong adaptability.

Advantage

Description

Reduces material adhesion	Significantly reduces material adhesion and residue, making cleaning easier.
Reduces dust and pollution	Alleviates site contamination caused by material falling off during the return journey.
Extends system service Life	Reduces wear on idlers and cleaners, protecting the main conveyor belt carcass.
Reduces cleaning costs	Reduces frequency of manual maintenance and minimizes unscheduled downtime.
Improves operational efficiency	Maintains equipment cleanliness for more efficient operation.

☐ Usage Note: The friction coefficient of BoClean UPE cover rubber is low, therefore it is not recommended for use in high-angle conveying systems to avoid material slippage.

BoClean™ Anti-Adhesion Conveyor Belt

Case Study / Application of BoClean™ Anti-Cold Anti-Adhesion Conveyor Belt in an Inner Mongolia Open-pit Coal Mine

○ Project Background

- Material Name: **Lignite**
- Maximum Temperature: **38°C**
- Minimum Temperature: **-40°C**
- Material Moisture Content: **Approximately 36%**
- Belt Width: **2000MM**
- Specification: DPP1250Wear-resistant, Flame-retardant, Anti-cold, Anti-adhesion Conveyor Belt B2000*1 (8+6)

Carry-back **50%**



Operating Results



A route with identical operating conditions and length was selected for on-site comparison. The carry-back results during low night temperatures are as follows:



For other conventional products requiring cleaning, please refer to the Conveyor Belt Intelligent Self-Correction System on P99.



Self-Correcting Carcass

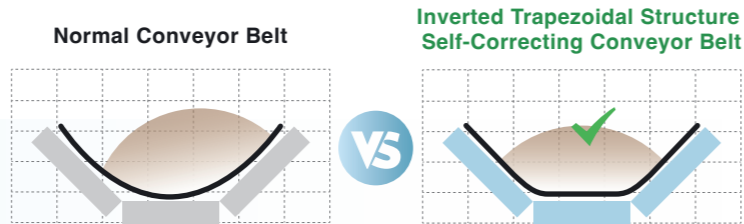
Automatic self-correction ensures stable operation of the conveying system and reduces downtime frequency. In conveying systems with uneven loading or multi-curve layouts, the belt is prone to deviation due to factors like uneven tension, eccentric loading, and idler misalignment. If not corrected promptly, this can lead to abnormal wear of the conveyor belt, severe material spillage, frequent equipment failures, and may also result in high maintenance costs due to frequent shutdown and adjustment, seriously affecting production schedules and system availability.



Product Cross-sectional View

Industry Pain Points

In mining operations, it is difficult to maintain conveyor belt tracking straight and stable over long period of operation occurs, it requires bottom or manual intervention for immediate response and adjustment, leading to significant wear on the bottom surface, idler failure, or even safety hazards. Traditional conveyor belt construction uses a circular arc design; when subjected to off-center loading or uneven tension, the belt easily scrapes the side idlers and lacks "self-correction capability."



Solution Strategy and Selection Recommendation

✓ Inverted Trapezoidal Structure Self-Correcting Conveyor Belt

By optimizing the belt cross-sectional design, it forms a clear inverted trapezoidal shape during the troughing process. When the conveyor belt drifts or track-off, its own gravity and the weight of the material prompt it to return naturally to the center of the idler sets, effectively achieving "self-correction" and significantly improving system operational stability.

Key Features

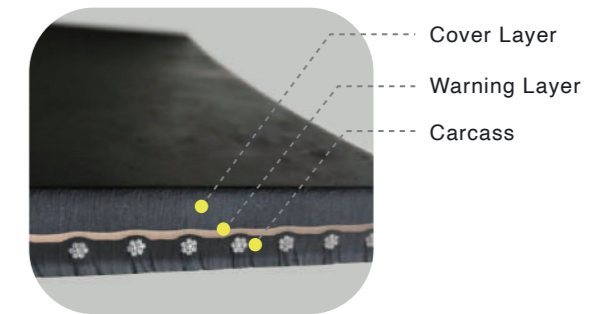
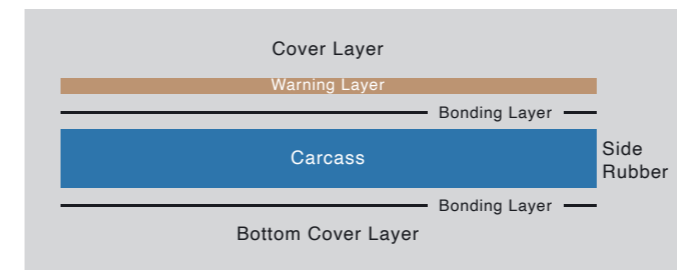
- ▶ **Automatic Self-Correction**
Reduces abnormal wear, tearing, and equipment interference issues caused by deviation.
- ▶ **Improved Transport Efficiency**
Supports appropriately widened conveyor belts, with transport capacity potentially increased by 10%~20%.
- ▶ **Better Protection for Non-Working Surface**
Better contact between the bottom and the idlers, avoiding slippage or premature wear of the non-working surface.
- ▶ **Reduced Maintenance Costs**
Reduces frequency of shutdown and adjustment, extending the service life of the conveyor belt and key components.
- ▶ **Excellent Cornering Adaptability**
The structure possesses stronger horizontal curving capability, suitable for deployment in turning sections.

For other conventional products requiring automatic self-correction, please refer to the Conveyor Belt Intelligent Self-Correction System on P93. ➔

BoAlert™ Cover Wear Warning Conveyor Belt

The BOTON cover wear warning conveyor belt features a distinctly colored "warning layer" embedded between the cover rubber and the carcass, providing users with intuitive and timely wear warning signals. It is compatible with most BOTON products and can be used additively.

When the conveyor belt approaches its service limit, the wear of the cover rubber exposes the warning layer, clearly alerting the user to avoid safety incidents caused by overuse, or resource waste due to premature replacement. This function is flexibly applicable to all types of BOTON conveyor belt products, covering various working condition requirements (such as heat resistance, flame retardancy, and impact resistance), making it an ideal choice for enhancing equipment safety and system O&M efficiency.



Key Features

- ▶ **Visualized Warning Design**
Uses high-contrast colors for a clear display effect, facilitating quick on-site identification of the belt's remaining service life.
- ▶ **Reduce Unnecessary Replacement**
Prevents conveyor belts from being scrapped prematurely due to inaccurate assessment, saving operational costs and optimizing O&M planning.
- ▶ **Strong Adaptability**
Can be integrated into all major BOTON product series without affecting the original conveyor belt performance.
- ▶ **Enhanced Safety Assurance**
Effectively prevents safety hazards such as belt breakage and tearing caused by excessive wear, enhancing operational reliability.
- ▶ **Optimized Formula, Wear-resistant and Durable**
The warning layer utilizes a non-carbon black polymer formula design, balancing visual recognition with mechanical performance. It possesses excellent wear resistance and strength, providing a reasonable buffer replacement cycle.

