

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.



Key Features

Low Elongation

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

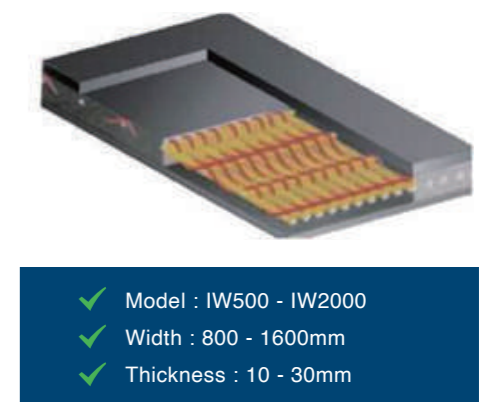
High Ply Adhesion

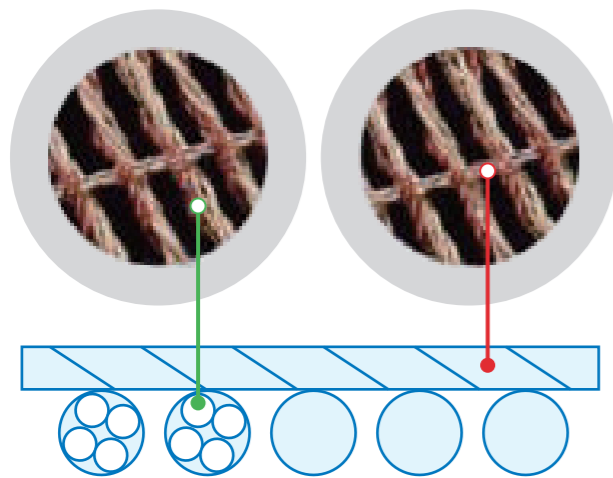
Highly resistant to damage from amine substances in rubber, characterized by excellent bonding performance.

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

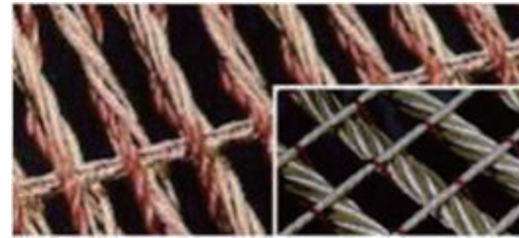
IW Impact Resistance Low Deformation

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.





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.



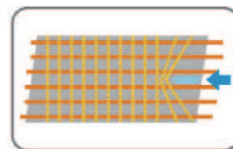
Impact Resistance

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



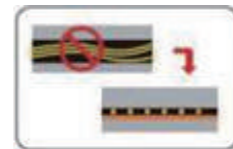
High-Temperature Resistance

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



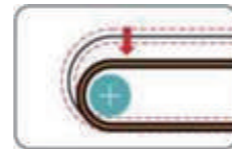
Tear Resistance

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.



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.



Aramid Heat-Resistant Conveyor Belt

Heat Resistance Carcass → Impact Resistance

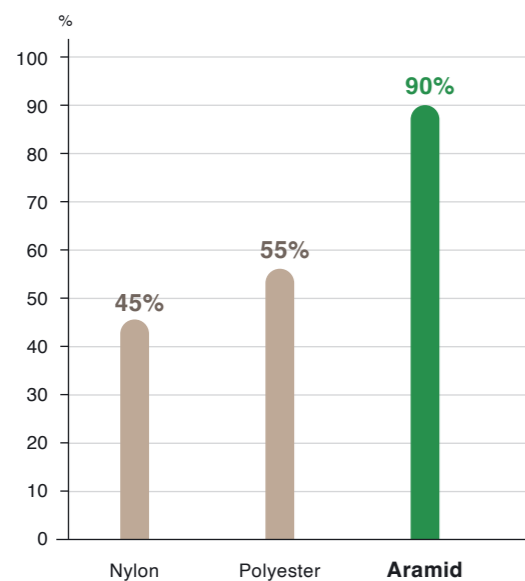
When conveying high-temperature materials such as sintered ore, slag, and coal ash that have not fully cooled and are still red-hot, conventional conveyor belts are highly susceptible to damage from high-temperature burning. Aramid fiber, as the core carcass material, fully utilizes its thermoset characteristics 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**.

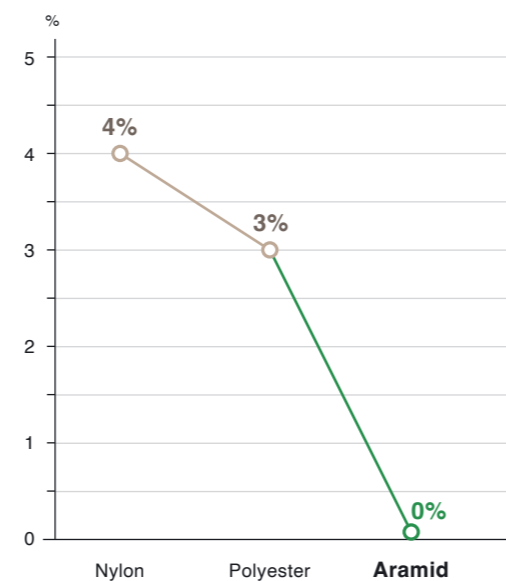
It is unaffected by amine substances in the rubber, and its adhesion performance remains excellent.

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									