berndorf BAND GROUP

STEEL BELTS FOR FOOD & BAKING PROCESSES

STEEL BELTS FOR BAKERS PRODUCTS & FOOD

Food production processes place special demands on production facilities. Berndorf Band Group Steel Belts withstand these enormous mechanical and thermal stresses during the various processing steps. Subjected to frequent temperature fluctuations and high load cycles, our Steel Belts stand out with precise belt geometry and an extended lifespan, made possible by high-quality materials and superior production performance. Berndorf Band Group Steel Belts are inspected for food compliance in accordance with current standards (EG) No. 1935/2004 and (EG) No. 2023/2006. Their smooth, abrasion-resistant surface meets the highest hygiene requirements essential for food production. This design allows for easy removal of product and grease residues, saving time and costs while maximizing production efficiency.

ELEVATING PRODUCTION EFFICIENCY: YOUR COMPLETE SOLUTION PROVIDER

Our Steel Belts are suitable for a variety of production processes, including cooling, freezing, baking, steaming, drying, and transporting. We also offer 24/7 service to ensure prompt assistance during production downtimes. In addition to Steel Belts, we provide equipment to streamline production processes, and manufacture Conveyor Systems. Our Steel Belts and equipment are supported by round-the-clock service to meet all your production needs. Regardless of temperature fluctuations, Berndorf Band Group's Steel Belts maintain their shape and flatness, ensuring reliable performance with every use.

OUR EXPERTISE

- LONG STEEL BELT LIFE
- EFFORTLESS BELT CLEANING
- PERFECT BELT GEOMETRY
- CONSITENTLY HIGH PRODUCT QUALITY
- EXCELLENT CONDUCTIVITY OF TEMPERATURES

GLOBAL SERVICE THAT NEVER STOPS

To maximize your operational productivity, the Berndorf Band Group offers extensive services and pioneering service equipment centered around Steel Belts and Belt Systems. From installation management to commissioning, we offer expert guidance to help you optimize your machine's performance. With our highly skilled service technicians and innovative methods, we ensure customer satisfaction worldwide.

- SPARE & WEAR PART MANAGEMENT
- RETROFITTING: UPGRADES & UPDATES
- REMOTE SUPPORT
- TRAINING FOR YOUR IN-HOUSE TECHNICIANS
- INNOVATIVE WELDING & REPAIR TECHNOLOGIES, PATENTED EQUIPMENT
- INSPECTION & MAINTENANCE TO ELIMINATE BELT TRACKING ISSUES

EXPLORING STEEL BELT APPLICATIONS: TYPICAL PROCESSES & END PRODUCTS

BAKING

CARBO 13 has proven to be the ideal material for the baking industry due to its exceptional properties. Withstanding frequent temperature fluctuations and numerous load cycles, it ensures a Steel Belt that maintains perfect shape over time. The dark surface of our CARBO 13 Steel Belts facilitates optimal heat transfer, ensuring consistent product quality. The average oven temperature during a baking process is 250 °C | 482 °F.

Our CARBO 13 Steel Belts can withstand temperatures of up to 400 °C | 750 °F, making them suitable for any production requirement in this application. Depending on the product, perforated Steel Belts can also be used in the baking industry.

Typical products:

» Sponge cake
» Cookies
» Gingerbread
» Pizza

Perforations
Perforated Steel Belts ensure high quality and are primarily used in drying and baking processes. They are essential when air needs to circulate around the product or when vapor must be released, especially from the bottom side of the customer's baked goods. To maintain the strength of the Steel Belt, both the edge areas and cross-welding seam are left unperforated. Perforations are generally possible for belt thicknesses ranging from 0.6 to 1.6 mm | 0.024 to 0.063 in. Typical products for perforated Steel Belts include crackers, hard cookies, and tortillas.

Perforations*	Hole diameter	Triangular pitch	Open area
Standard 1	2.5 mm | 0.098 in	5.0 mm | 0.197 in	22.68 %
Standard 2	3.0 mm | 0.118 in	6.5 mm | 0.256 in	19.32 %
Standard 3	3.1 mm | 0.122 in	5.0 mm | 0.197 in	34.87 %

*Further perforations available on request.

COOLING

To facilitate the transport and further processing of food in a molten state, it is solidified during the cooling process. Berndorf Band Group Steel Belts offer ideal properties for these applications, including easy cleaning, perfect belt geometry, and excellent running characteristics. Our Cooling Systems can further enhance your process, making it more efficient for the future.

Typical products:

» Candy
» Chocolate pastilles
» Cheese

DRYING

Berndorf Band Group Steel Belts are also suitable for drying processes. Depending on the end product, either a smooth or perforated surface is used to achieve optimal results. Our portfolio includes a range of perforation options and Steel Belt materials specifically designed for drying applications.

Typical products:

» Fruits
» Tea
» Tobacco filler

FREEZING & FREEZE-DRYING

Berndorf Band Group relies on NICRO Steel Belts for freezing and freeze-drying processes. Our team of experts and engineers selects the appropriate belt material based on the specific application. All our Steel Belts comply with FDA standards making them ideal for the food industry. Their dimensional stability and flatness, even in processes with low temperatures as low as -70 °C | -94 °F, provide a key advantage in food production.

Typical products:

» Vegetables
» Meat and fish
» Coffee

STEAMING

NICRO 12.1, 22 and 31 are primarily used in continuous steaming processes. Their excellent thermal conductivity and flatness make them ideal for this application. The smooth surface of the NICRO Steel Belt ensures that steamed products can be easily removed at the end of the process.

Typical products:

» Pet food
» Surimi
» Tobacco wraps

TRANSPORTING

For specialized food conveying applications, we use durable stainless Steel Belts with low wear properties. Berndorf Band Group Steel Belts are designed to operate safely at both low and high conveying speeds. Additionally, components such as vee-ropes and product retaining strips can be bonded to the Steel Belt as needed.

Typical products:

» Cocoa
» Meat
» Sugar

COMPONENTS FOR A PERFECT BELT RUN

FIND OUT MORE

VEE-ROPES & RETAINING STRIPS

Steel Belts can be equipped with vee-ropes and/or product retaining strips, bonded with a specialized food-safe adhesive for enduring attachment, even under demanding production conditions. For high-temperature processes, silicone rubber retaining strips are used.

Vee-rope-material	Operating temperatures
Nitrile rubber	-20 °C to +100 °C | -4 °F to +212 °F
Natural rubber	-60 °C to +60 °C | -76 °F to +140 °F
Stainless steel spiral Vee-rope	up to the max. permissible operating temperature of the respective belt material

Retaining strip-material	Operating temperatures
Nitrile rubber	-20 °C to +100 °C | -4 °F to +212 °F
Natural rubber	-60 °C to +60 °C | -76 °F to +140 °F
Silicon rubber	-80 °C to +300 °C | -112 °F to +572 °F

BELT TENSIONING & TRACKING SYSTEMS

Consider Berndorf Band Group's engineered belt tensioning and tracking systems for precise and reliable belt running. Choose between the BernMatic® tensioning and tracking System and the BernTrack® pure belt tracking system. Following inspection by our experts, we'll recommend the best option. Production takes just a few weeks, with on-site installation completed in hours to days.

SKID & GRAPHITE BARS

Skid and graphite bars are essential in baking, ensuring smooth and frictionless movement of the Steel Belt through the heating zone. Our skid bars, made from special gray cast iron with graphite, support the Steel Belt, while graphite bars lubricate the belt during installation. Both bars can be customized with specific profiles. To maintain optimal sliding properties and extend the lifespan of the Steel Belt, it is important to replace skid and graphite bars when changing the belt.

GUIDING & SUPPORTING SHEAVES

As a cost-efficient alternative to steel drums, Berndorf Band Group also manufactures guiding and supporting sheaves made of casted aluminum. Customers can choose from a wide range of different guiding and supporting sheaves with diameters ranging from 600 to 1,000 mm | 23.7 to 3.4 in.

CONVEYORS

Berndorf Band Group offers fully customizable Conveyor Systems in various lengths and widths. The systems feature a welded frame made from carbon or stainless steel profiled tubes and include customizable interfaces for integration with baking ovens, freezing tunnels, and similar equipment. Together with other available components, Berndorf Band Group delivers a complete solution tailored to the production needs of the baking and food industry.

STEEL BELTS

PHYSICAL & MECHANICAL PROPERTIES – TYPICAL VALUES

Material			Nicro 12.1	Nicro 22	Nicro 31	Nicro 52	Nicro 52.6	Nicro 85	Nicro 94	Carbo 13	Carbo 32
Type			CrNi 17 7	CrNiMo 17 12 2	CrNiTi 13 4	CrNiCuTi 15 7	CrNiCuTi 15 7	CrNiCuTi 25 7 4	CrNiMoN 22 5 3	Ck 67	
Similar material		DIN AISI	1.4310 301	1.4401 316	1.4313			1.4410	1.4462	1.1231	
Tensile strength	at 20 °C at 68 °F	N/mm² psi	1,150 166,800	1,100 159,500	1,080 156,600	1,150 166,800	1,550 224,800	1,350 195,800	1,400 203,100	1,200 174,000	1,280 185,600
0.2 %-offset yield strength	at 20 °C at 68 °F	N/mm² psi	950 137,800	970 140,700	1,050 152,300	1,100 159,500	1,500 217,600	1,250 181,300	1,050 152,300	970 140,700	1,220 177,700
Hardness		Rockwell HRC Vickers HV 10	37.0 360	33.0 330	33.0 330	37.0 360	48.0 480	39.0 380	36.0 350	36.0 350	42 410
Elongation 50 mm | 1.97 in		%	18	12	5	8	6	6	9.5	8	5
Welding factor			0.70	0.65	0.95	0.95	0.80	0.70	0.65	0.80	0.80
Fatigue strength under reversed bending stress*	at 20 °C at 68 °F	N/mm² psi	480 69,600	440 63,800	480 69,600	500 72,500	700 101,500	385 55,900	450 65,300	450 65,300	550 79,800
Modulus of elasticity	at 20 °C at 200 °C at 68 °F at 392 °F	N/mm² N/mm² ksi ksi	200,000 180,000 29,000 26,100	200,000 180,000 29,000 26,100	205,000 29,700	200,000 188,000 29,000 27,300	200,000 188,000 29,000 27,300	200,000 186,000 29,000 27,000	200,000 184,000 29,000 26,700	210,000 30,500	205,000 29,700
Density		kg/dm³ lb/in³	7.90 0.29	7.95 0.29	7.70 0.28	7.74 0.28	7.74 0.28	7.80 0.28	7.80 0.28	7.85 0.28	7.82 0.28
Mean coefficient of thermal expansion	20-100 °C 20-200 °C 20-300 °C 20-400 °C 68-212 °F 68-392 °F 68-572 °F 68-752 °F	10⁻⁶m/m°C 10⁻⁶m/m°C 10⁻⁶m/m°C 10⁻⁶m/m°C 10⁻⁶in/in°F 10⁻⁶in/in°F 10⁻⁶in/in°F 10⁻⁶in/in°F	16.0 17.0 8.9 9.4	16.5 17.5 9.2 9.7	10.8 11.2 11.7 6.0 6.2 6.5	10.9 11.5 11.7 6.1 6.4 6.5	10.9 11.5 11.7 6.1 6.4 6.5	13.0 13.5 14.0 7.2 7.5 7.8	13.3 13.8 14.2 7.4 7.7 7.9	11.1 11.9 12.5 12.9 6.2 6.6 6.9 7.2	11.8 12.4 12.6 12.9 6.6 6.9 7.0 7.2
Specific heat		J/g°C BTU/lb°F	0.50 0.12	0.50 0.12	0.46 0.11	0.50 0.12	0.50 0.12	0.50 0.12	0.50 0.12	0.46 0.11	0.46 0.11
Thermal conductivity	at 20 °C at 68 °F	W/m°C BTU/lb°F	15 8.7	15 8.7	21 12.1	16 9.3	16 9.3	15 8.7	15 8.7	46 26.6	38 21,8
Specific electric resistance	at 20 °C at 68 °F	Ω mm²/m µΩ in	0.73 28.74	0.75 29.53	0.60 23.62	0.80 31.50	0.80 31.50	0.80 31.50	0.80 31.50	0.13 5.12	0.20 7.87
Min. permissible operating temperature		°C °F	-196 -321	-196 -321				-50 -58	-50 -58		
Max. permissible operating temperature		°C °F	250 482	250 482	350 662	350 662	350 662	250 482	250 482	400 752	350 662
Tensile strength at max. permissible operating temp.		N/mm² psi	940 136,300	870 126,200	970 140,700	900 130,500	1,250 181,300	1,070 155,200	1,130 163,900	850 123,300	1,100 159,500
0.2 %-offset yield strength at max. permissible oper. temp.		N/mm² psi	770 111,700	770 111,700	930 134,900	830 120,400	1,180 171,100	1,020 147,900	990 143,600	720 104,400	1,050 152,300

*Default values. More details and bigger dimensions on request.

Special materials available upon request.

*50% of the test specimens withstand 2,000,000 load cycles. If not otherwise specified, the values given apply at room temperature. Subject to change due to technological progress. Errors and omissions excepted.

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