

## **CONTI Vacuum Filter Belts**



# Vacuum Filter Belts – more than just a conveyor belt with grooves and holes

Filter and transport in one operation – Continental's vacuum filter belts have been developed to do just that. Not only can they bring suspensions from A to B, they are simultaneously capable of splitting these suspensions up into their two phases: solid and liquid. Water or wash solvent is extracted as the vacuum filter belt is moving along, with the filter cake being discharged at the head of the unit. The technology is suited to all areas in which large amounts of material have to be separated into fluid and solid components, then washed or dried.

Vacuum filter belts are extremely sturdy; they require only a reasonable investment and little in the way of servicing costs. For this reason they are used in particular wherever units have to withstand high mechanical or chemical loads. This is the case, for example, in primary raw material extraction – in the washing of coal and ore in mining operations.

Conveyed by the filter belt, a filter cloth functions as a filter medium, as does the filter cake itself, in which case grain size depends on the filter cloth pores and the thickness of the filter cake. Fluid drawn through the blanket by means of vacuum suction, is collected in the filter belt's grooves and channeled off. To get it done the grooves themselves have drainage holes that lead to a collecting duct. From there the extracted air-fluid mixture is fed into the gas-liquid separation systems further downline of Horizontal Vacuum Belt Filter (HVBF) system. Other special-purpose constructions are likewise possible – atmospherically encapsulated systems, for instance, that prevent any contact between the filtered material and the ambient air.

**There is no getting by in the following application areas without the use of an HVBF system and by doing so vacuum filter belts:**

## **Drying of concentrate and processing tailings**

- › The cleaning of coal/coal dust in the course of raw material extraction
- › Copper, zinc, lead and nickel beneficiation
- › Phosphate beneficiation (dy- and hemihydrates)
- › Flue gas desulphurisation

## **Drying heavy and coarse materials and ores in mining operations**

- › Sand
- › Ores, e.g. ilmenite, rutile, chrome, iron and tin
- › Suspension separation in the potash and salt industry (raw material extraction)
- › Processing of residual slag in the aluminum industry
- › Iron recovery

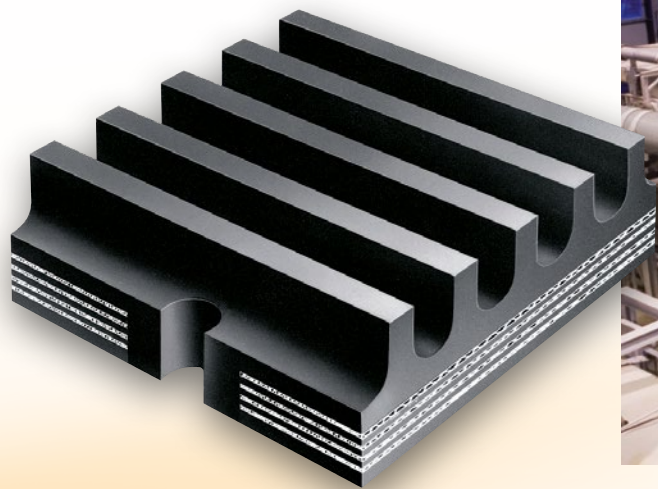


Photo: © LAROX







# Vacuum Filter Belts – filtering and transport in one operation

## Design

Continental vacuum filter belts are designed and manufactured for specific operating conditions. High-quality materials and modern manufacturing processes provide good dimensional retention and the requisite application-specific chemical, thermal and mechanical resistance. When dealing with high chemical and thermal loads it is important that the tensile fabric be embedded in rubber on all sides, even after drainage holes are made in the belt. For that reason all Continental vacuum filter belts have a fabric-free suction zone. The traverse grooves are cut to the customers' geometrical/hydraulic specification to suit the intended application. Continental vacuum filter belts are available with different designs of edge profiles and different compound qualities to meet a wide range of customer requirements.

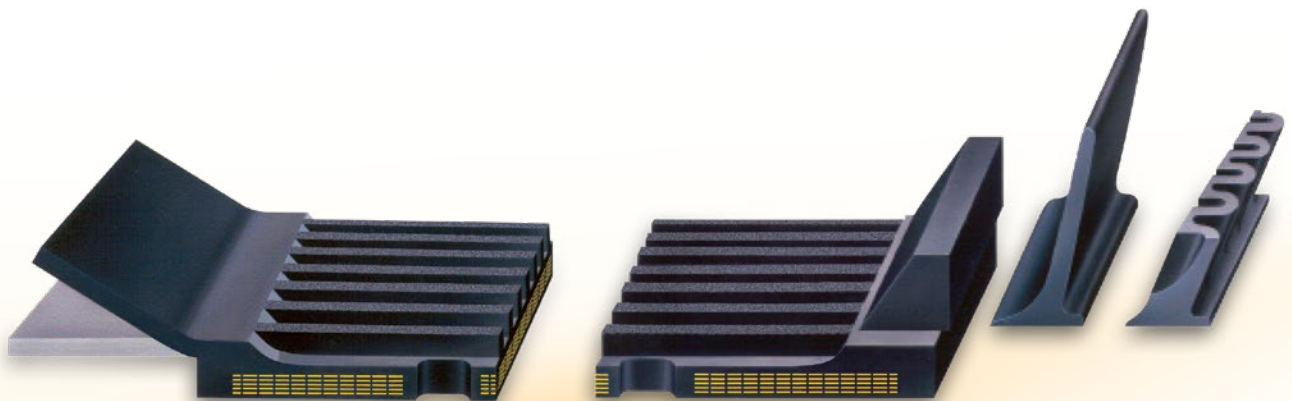
## Structure of the belt

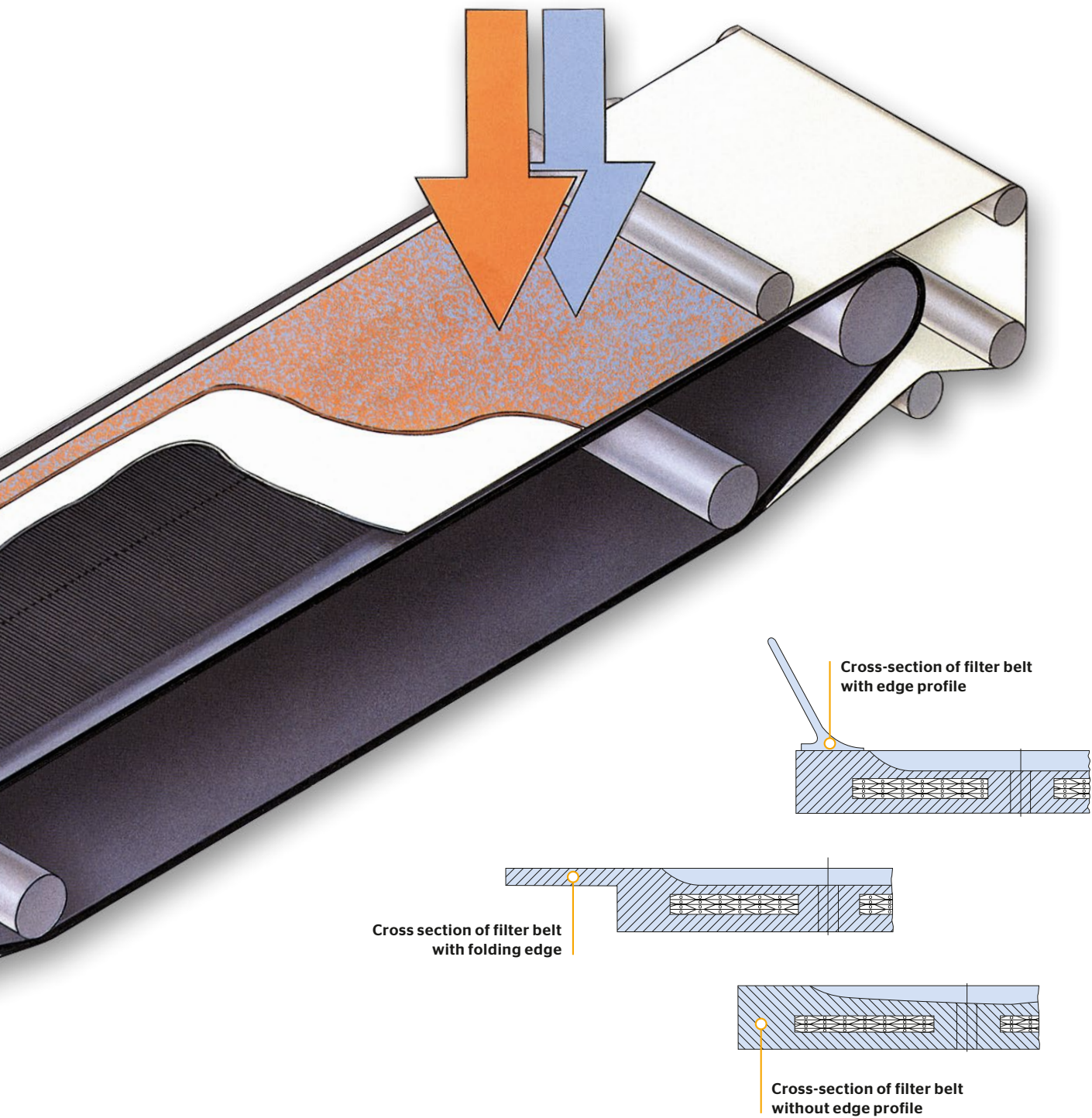
- › The fabric-free central zone for the drainage holes ensures that the textile carcass is not exposed to the damaging effects of aggressive material.
- › The edges of the filter belt are either factory trimmed or executed in accordance with Continental's own "ultraflat-carcass design". This simultaneously guarantees parallel edges, dimensional accuracy and straightness.
- › It is recommended that the edges of wide and long filter belts be cut to the nominal belt width on the filter unit after the belt has been broken in.
- › Filter belt edging (flanges/curbing) can be vulcanized onto the belt at the Continental plant or, depending on the dimensions of the belts and the on-site conditions, be vulcanized on - hot or cold - at the location of the conveyor unit by Continental fitters using the corresponding special vulcanizing equipment.

## Advantages of Conti vacuum filter belts

- › Widest portfolio of filter belts on the market with belt width up to 6,5 m
- › Technical knowhow and support related to OEM systems and filtering applications
- › Worldwide service and installation capabilities on site
- › Belts can be delivered out of production as endless or open

**CONTI vacuum filter belts are in service on vacuum belt filter units used in the processing of minerals, ores, chemicals, dyes, foodstuffs, coal and paper as well as in flue-gas desulfurization systems and in fertilizer production etc.**







# Vacuum Filter Belts – for horizontal filter units

## Construction and properties

### 1 Cover stock compound

- › Good chemical resistance
- › High temperature stability
- › Good aging and sun-cracking-resistance (UV resistance)

### 2 Cut traverse unnotched groove surface, inclined and non-inclined traverse grooves

- › Smooth, unnotched groove surface
- › Many different groove geometries possible

### 3 Crosspiece surface/strands with fine cloth profiling

- › The profiled surface that the filter cloth rests on prevents it from sticking to the crosspiece/strands

### 4 Layer of 100% polyester plain-weave (as standard, alternative designs according to customer demand possible)

- › High-strength
- › Low-elongation
- › Laterally stable

### 5 Adhesive rubber compounds matched up with respective cover stock compound

- › High adhesive values

### 6 Non-textile suction zone made of cover stock compound

- › Same resistance properties as cover stock
- › Punching/drilling of center holes does not result in exposed fabric

### 7 Rubber edge made of cover stock compound

- › Same resistance properties as cover stock
- › Good lateral stability when guide rollers are used

### 8 Zone without traverse grooves

- › Suitable for subsequently bonding or vulcanizing on rubber edge strips/curbing

### 9 Upward folding edge zone

- › Edge zone can be folded up to any side containment height desired
- › No need for additional rubber sheeting which needs to be applied to the belt
- › No need for attachment of profiles to unit
- › Drive and tail pulley diameters required are small, as the belt alone, without an edge profile, is relevant for design size
- › Required belt coil diameter is small

### 10 Seamless, stepless transition between belt and side containment

- › Smooth lay of filter cloth

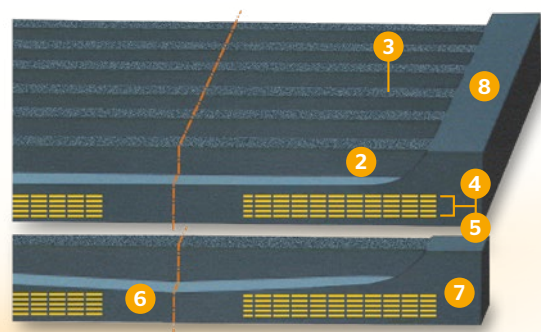
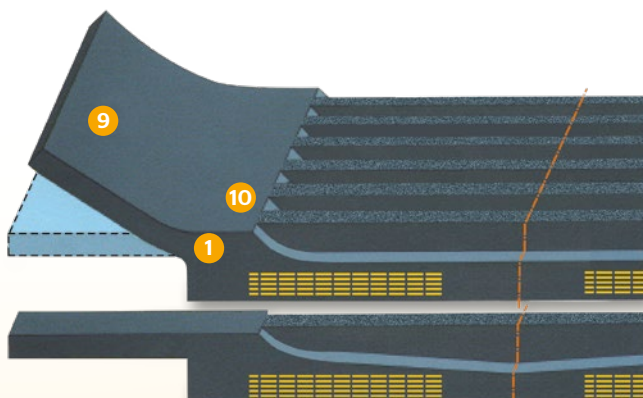
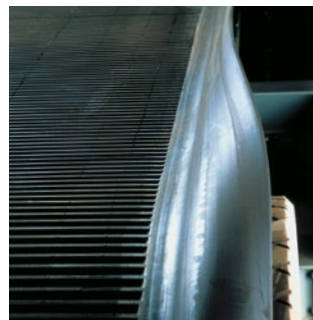




Photo: © Delkor UK

### Rubber material resistant table

Filter medium - main components	Acid / base concentration			Temperature in °C			Material used					
	low	middle	high	0-50	50-90	90-110	NR	SBR	SBR-LT	CR	NBR	EPDM
phosphate ore, water	—	—	—	×			●	●	●			
iron ore, water	—	—	—		×			●	∅			
zinc ore, sulfuric acid		×			×			●	∅			
gypsum, sulfuric, hydrochloric and phosphoric acid			×		×		●		∅			
phosphoric fertilizer, gypsum			×		×	×	○	∅	○			●
cellulose, nitric acid, sulfuric acid			×	×	○	○	○	○	○			●
potassium chloride, sodium chloride, water	—	—	—	×			●	●	●			
sodium-chloride, cobalt chloride, water	—	—	—			×						●
sodium-chloride, potassium chloride, oils, acetic acid	×			×							●	
fats and oils	—	—	—		×					∅	●	
hydrocarbons, salts, sulfuric acids	×			×						●		
aluminum hydroxide, sodium hydroxide solution	×				×			●	●			●

○ not resistant    ∅ conditionally resistant    ● resistant    × tested    — not available

ContiTech can provide additional swelling test under different temperature conditions for any specific filter media.

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