

One Source

# EIMCO® Extractor Horizontal Belt Filter



# Applications of Horizontal Belt Filters

## Horizontal Belt Filters Should Be Used When:

Thorough cake washing is required with

- Free settling solids
- Complete processing of feed materials
- Maximum product recovery
- Minimum operating cost

A flexible range of operating conditions is required

Simplicity of operation and maintenance are required

Process contact requires exotic construction materials

## EIMCO's Experience

Since 1961, when the first EIMCO Extractor® Horizontal Belt Filters were built, EIMCO has supplied more than 700 units worldwide, far more than any other manufacturer. EIMCO not only offers process expertise in a wide variety of applications, but also provides more elastomer choices for drainage belts than any other horizontal belt filter supplier.

## Applications of Horizontal Belt Filters

EIMCO Extractor filters can be applied to many different slurries, including fibrous materials, fine slimes, and coarse granular solids. They provide high extraction efficiency, low cake moisture, increased production and reduced operating costs while achieving maximum filtration area in comparison to other filter options. EIMCO Extractor filters maximize cake purity at a minimum cost per pound of product.

EIMCO Extractor filters are especially suited for applications requiring low cake moisture and multi-stage washing. Low energy consumption and high filtration rate make EIMCO Extractor filters an excellent choice for a wide range of processes, including:

- Minerals processing
- Metallurgical ores
- Chemical Processing
- Power wastes
- Industrial waste
- Food processing
- Pulp washing



# Principles of Operation

A. Feed slurry is uniformly distributed over the full width of the filter by a top feed arrangement. This eliminates cake formation problems associated with fast settling material. Gravity helps reduce vacuum energy and cake formation time. Several types of feed box arrangements are available, tailored to the process requirement.

B. Cake travels with the filter media which is supported by the rubber drainage belt. Dewatering is accomplished by applying vacuum to the bottom of the drainage belt.

C. Differential pressure draws slurry liquor through the filter cloth, along

channels in the support belt to drain holes centered over the vacuum pan. Channels and drains must be carefully sized to accommodate the hydraulic and pneumatic flows required for efficient filtration.

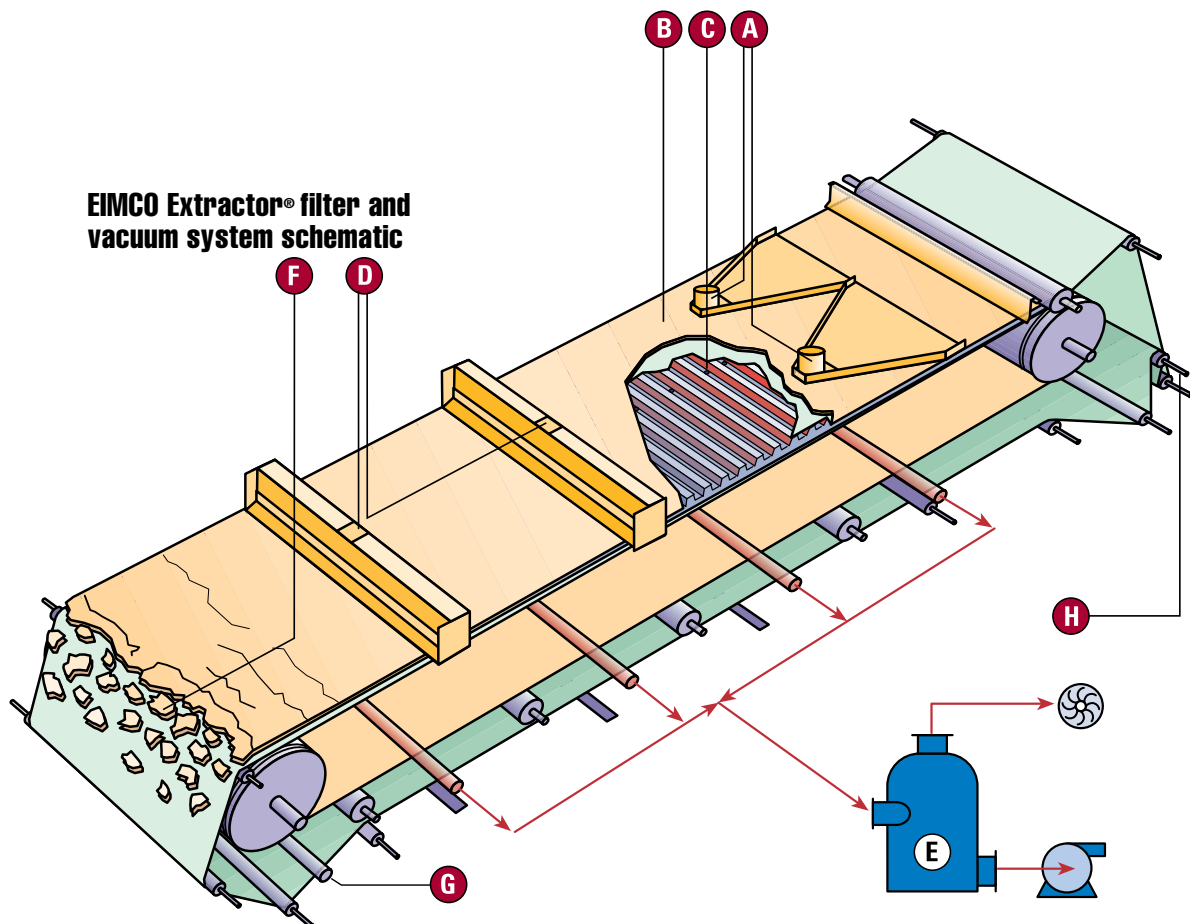
D. Co-current or counter current wash systems are designed to meet the specific process requirement, employing one or more independent washing zones to optimize product recoveries.

E. Filtrate and air enter the vacuum receiver(s) where the liquid drops out and is pumped away. Air exits at the top of the receiver due to the negative pressure developed by the vacuum pump.

F. Cake is discharged as the filter media travels around a small roller after separating from the drainage belt.

G. Multiple wash sprays clean the drainage belt and filter media independently to extend the service life of both.

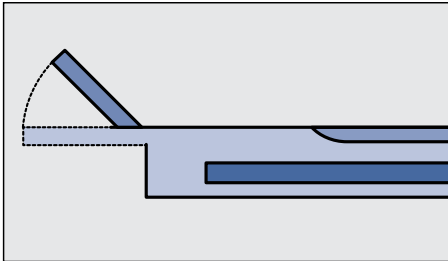
H. Continuous tension is maintained on the belt and filter media. Positive, automatic tracking and alignment of the filter media is controlled by sensors. Cleaning, tensioning, alignment, and support from the drainage belt contribute to an improved filter media life.



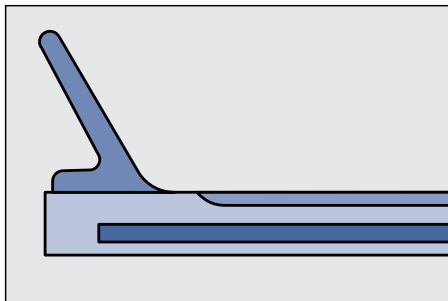


# Features & Benefits

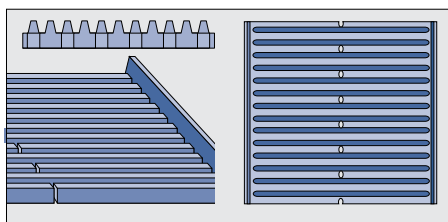
## FLSmith utilizes two designs for the belt-edge seal:



- 1. Flexible flanges fold down when passing over the pulleys. Both flanges are vulcanized to the edge of the drainage belt.**



- 2. Elastomer lips are raised in the filtration zone and may be supplemented by static-sideboard seals.**



## Belt speeds up to 200 feet per minute.

Fast filtration cycles minimize cake thickness for maximum production, and cake washing efficiency and drying. By controlling the speed of the filter and process conditions, cake thickness can be varied from 1/16 of an inch to 8 inches.

## Low maintenance

Heavy duty construction meets and exceeds special demands of 24 hour continuous operation. To minimize corrosion, frames are available in stainless steel as well as carbon steel. Wetted parts can be supplied in a variety of stainless steels and other specialty metals as required for process conditions. The filter cloth is continuously washed to prevent blinding. Cloth changes are accomplished quickly and easily. Minimal Operation Attention  
Filtration surfaces are visible at all times. Normally, only a periodic operator check is required. Alarm instrumentation can be supplied for control room reporting.

## Low Installation Cost

EIMCO Extractor filters, including all auxiliaries, can be located on one floor, saving on plant space and construction costs. Filters up to 512 ft<sup>2</sup> (47 m<sup>2</sup>) have been shipped fully assembled.

## Drainage Belts

The most important component of the EIMCO Extractor filter is the drainage belt. Drainage belts are uniquely designed for each



application to suit the process and environment. Important characteristics of the belt are:

- Uniform filtration
- Mechanical strength
- Chemical resistance

Years of belt manufacturing and product research have provided our engineers with expertise in vulcanization, drainage profile, and carcass and elastomer selection. Drainage belt carcasses are totally encapsulated in the elastomer to protect against chemical attack and carcass delamination. Carcass and elastomer selection are based on standard testing procedures and empirical data.

Drainage belts are available in natural rubber, SBR, EPDM, Neoprene, Hypalon, and Butyl. All belt splices are hot vulcanized to maximize the strength of the splice and insure carcass protection. Standard belt widths range from one to ten feet (0.3 to 3.2 meters).



# Manufacturing

All phases of design and manufacturing are closely monitored according to strict, documented quality control procedures. Customers are invited to witness the factory test prior to shipment. Because most units are shipped fully assembled, installation costs are minimal. Often, all that is required at the installation site are basic foundation preparation and necessary hookups. Our team can also size and provide all necessary vacuum accessories for a complete turn-key system.

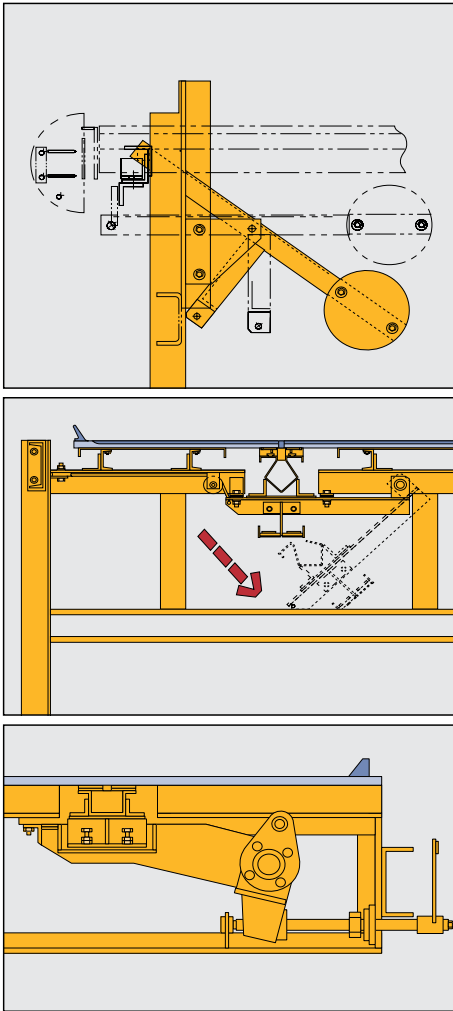
## Parts Service

the FLSmidth Minerals Customer Services department is dedicated to keeping units functioning at peak performance. Critical replacement items are inventoried for quick response to the customers' needs. Preventive measures should not be ignored however, and our service and parts experts will recommend standard replacement parts.

- All materials of construction are determined by the operating conditions
- Belt deck support is either water-lubricated or air supported
- Several feed mechanism designs are available
- Several cake wash distributor designs are available
- Various filter media weaves, fabrics and widths can be supplied
- Media wash sprays clean both sides of the media to prevent blinding
- All drainage belt carcasses are totally encapsulated
- Support frame and cross supports are of heavy-duty structural steel



# Vacuum Pan and Lowering Mechanism



(Top) Counter weighted lowering mechanism  
 (Middle) Hinged lowering mechanism  
 (Bottom) Pivoting mechanism

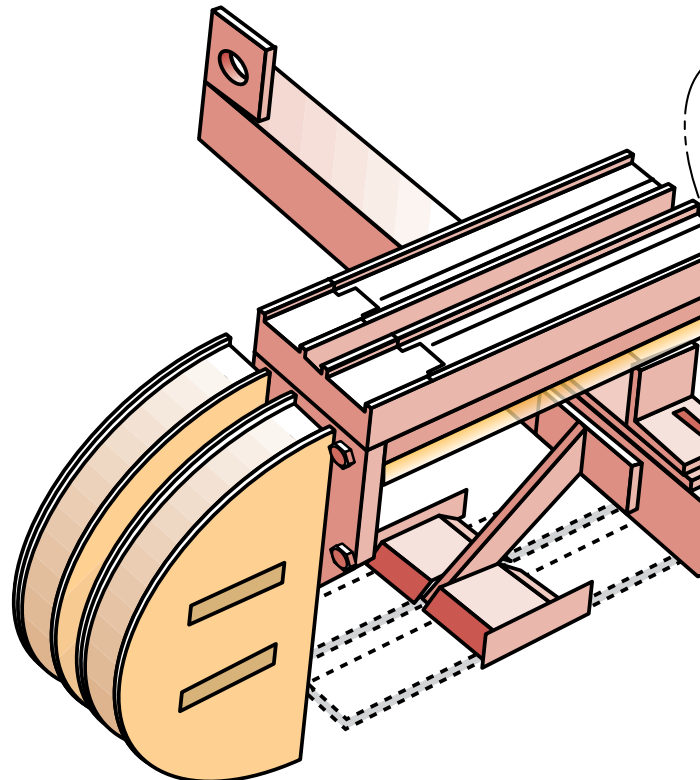
## Lowering Mechanism

A pan located beneath the support belt drain holes serves as a vacuum manifold and filtrate collection chamber. On larger filters (4600 series and above) a lowering mechanism is provided to simplify vacuum pan inspection and maintenance. On large, severe duty filters, a counterweighted system is required to lower the pan vertically. By maintaining a parallel orientation to the filter surface during travel, this arrangement eliminates realignment difficulties and assures positive reseating.

A hinged cable and capstan arrangement and mechanical pivot system are also available.

## Vacuum Sealing systems

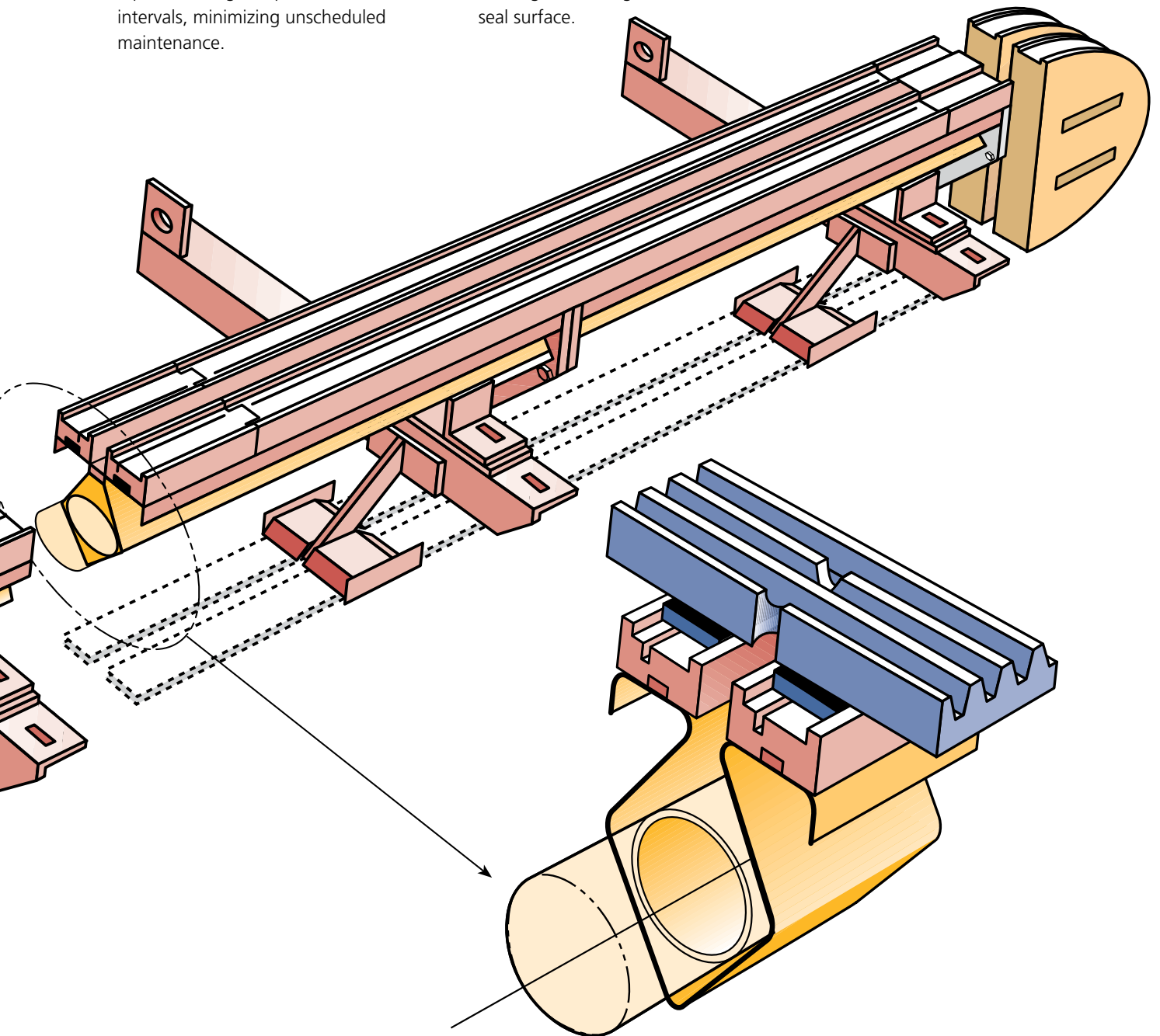
EIMCO Extractor filters are equipped with a vacuum seal that prevents vacuum loss between the moving drainage belt and the stationary vacuum pan. Two types of seal systems are available. Traveling seals are independent of the drainage belt and move relative to the top of the vacuum pan. Most of the wear occurs on the traveling seals which are easily replaced.

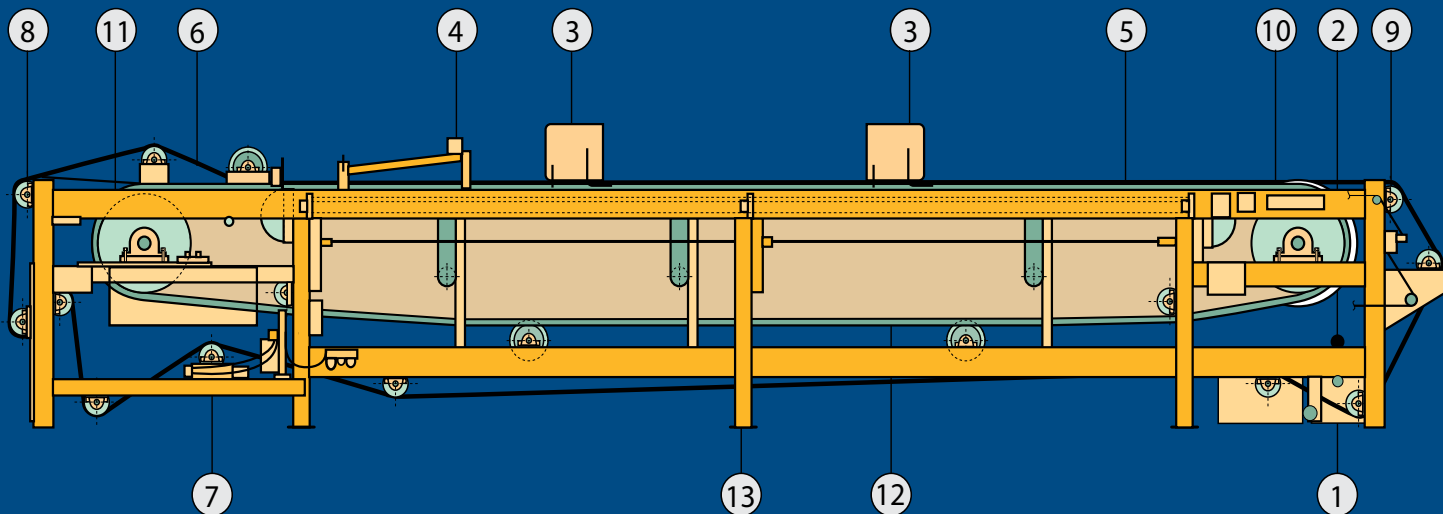




Fixed-seal systems incorporate a center rib vulcanized to the drainage belt and a slide strip attached to the vacuum pan. Most of the wear occurs on the slide strip material which can be replaced at regular, predictable intervals, minimizing unscheduled maintenance.

Both systems are equipped with liquid lubrication on the slide material, with injection points at regular intervals along the length of the filter. In addition to lubricating the surfaces, the liquid seals against air ingress and cleans the seal surface.





1. Filter Cloth Wash
2. Drainage Belt Wash
3. Cake Wash Box
4. Feed Box
5. Drainage Belt
6. Filter Cloth
7. Filter Cloth Aligning Mechanism

8. Filter Cloth Take-Up
9. Discharge Roll
10. Drive Pulley
11. Take-Up Pulley
12. Vacuum Pan
13. Filter Support Frame

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