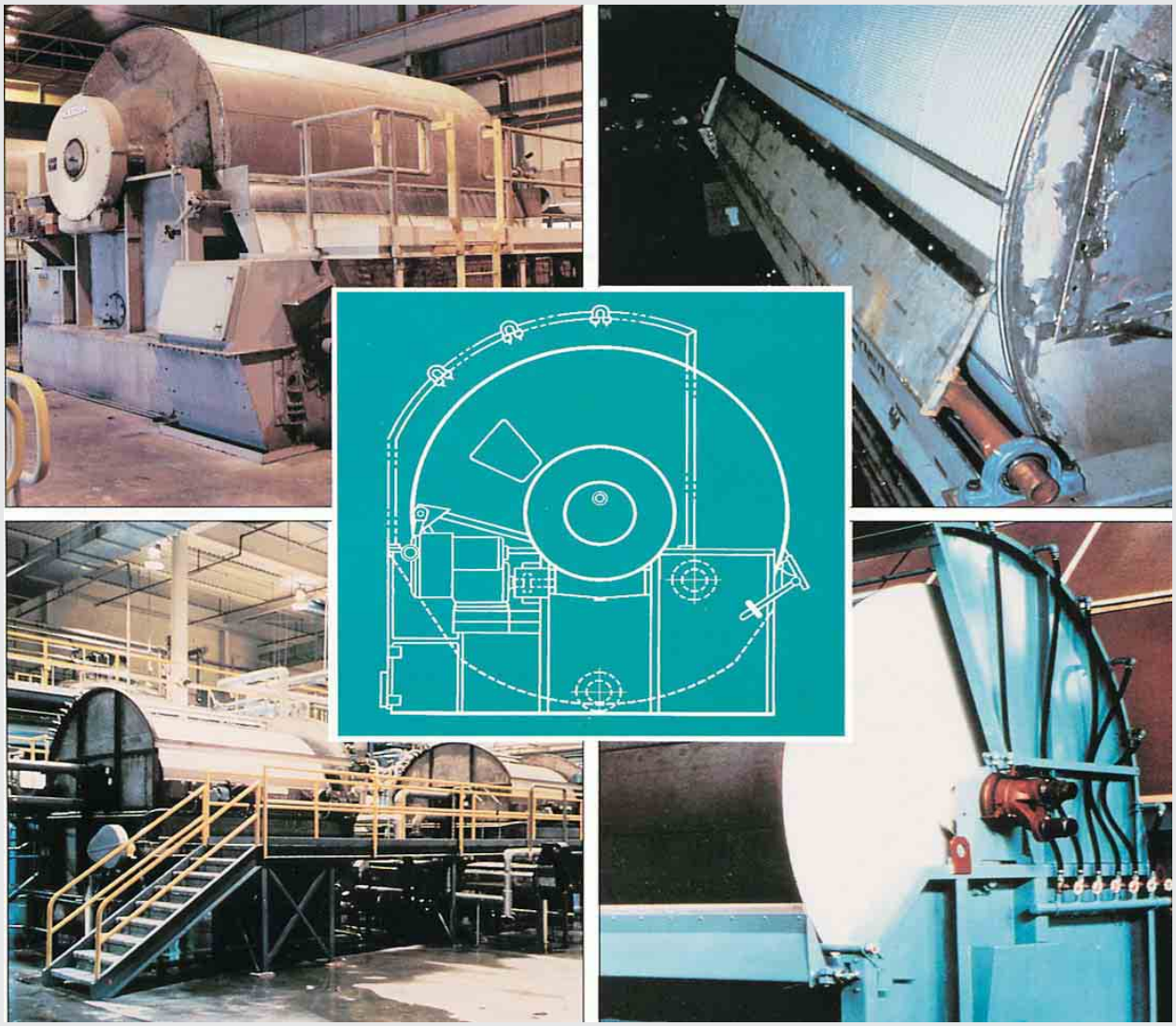
# Dorr-Oliver Eimco
# Drum Filters

*Standard or Custom-Engineered Designs for Dewatering, Washing & Clarification*



DORR-OLIVER EIMCO

A GL&V COMPANY

# *Dorr-Oliver Eimco Drum Filters*

## Drum Filter Capabilities

The unique capabilities of drum filters provide the widest application range of any continuous vacuum filter. Drum Filters have an operating flexibility to handle either dewatering, washing, or clarification applications.

With increased emphasis on reducing capital, operating and maintenance costs, and improving productivity, it is important to understand the opportunities for enhanced dewatering, washing, and clarification presented by different filter designs.

## Design Experience

Not all filters are equal for every set of conditions.

Our engineers have experience with all filter types and have been designing drum filters, which provide high production rates at low operating and maintenance costs. Also, because the basic configurations of drum filters have man interchangeable components, units can be tailored to meet individual needs at lower capital costs and still maintain custom-designed equipment for a particular application.

## Advanced Technology

Drum filters frequently appear to be similar. One of the most important criteria in selecting a proper filter is the knowledge and expertise of the manufacturer.

We are highly qualified to recommend effective solutions for exacting liquid-solids separation requirements. Highly skilled research engineers have excellent laboratory facilities available for leaf testing of any process stream, or pilot plants are available for testing in your facility. Confidential reports will outline specific needs for your individual application and recommend solutions.

# *Dorr-Oliver Eimco Drum Filters*

## Operating Benefits and Advantages

### High Capacity

Continuous high production for maximum filtering capacity - wide latitude in productivity per unit area.

### Low Labor Cost

Minimum operator attention reduces operating cost.

### Simple Operation

Simplicity of design utilizing uncomplicated controls assures accurate, easy operation.

### Positive Cloth Alignment

Filter cloth position on continuous belt discharge filters is maintained by simple, reliable Edge Track® alignment mechanisms. Other drum filters use caulking and division strips to maintain cloth position.

### Efficient Vacuum Use

High operating Vacuums with complete seals on all operating sections and minimum atmospheric air leakage deliver dryer cake at lower vacuum cost.

### Positive Cake Discharge

Reduced solids recycle.

### Flexibility

Ability to handle wide fluctuations in feed.

### Excellent Filtrate Clarity

Drum Filters frequently produce solids as low as 100 PPM. Precoat designs can achieve concentrations of 10 PPM or less.

### Effective Cake Washing

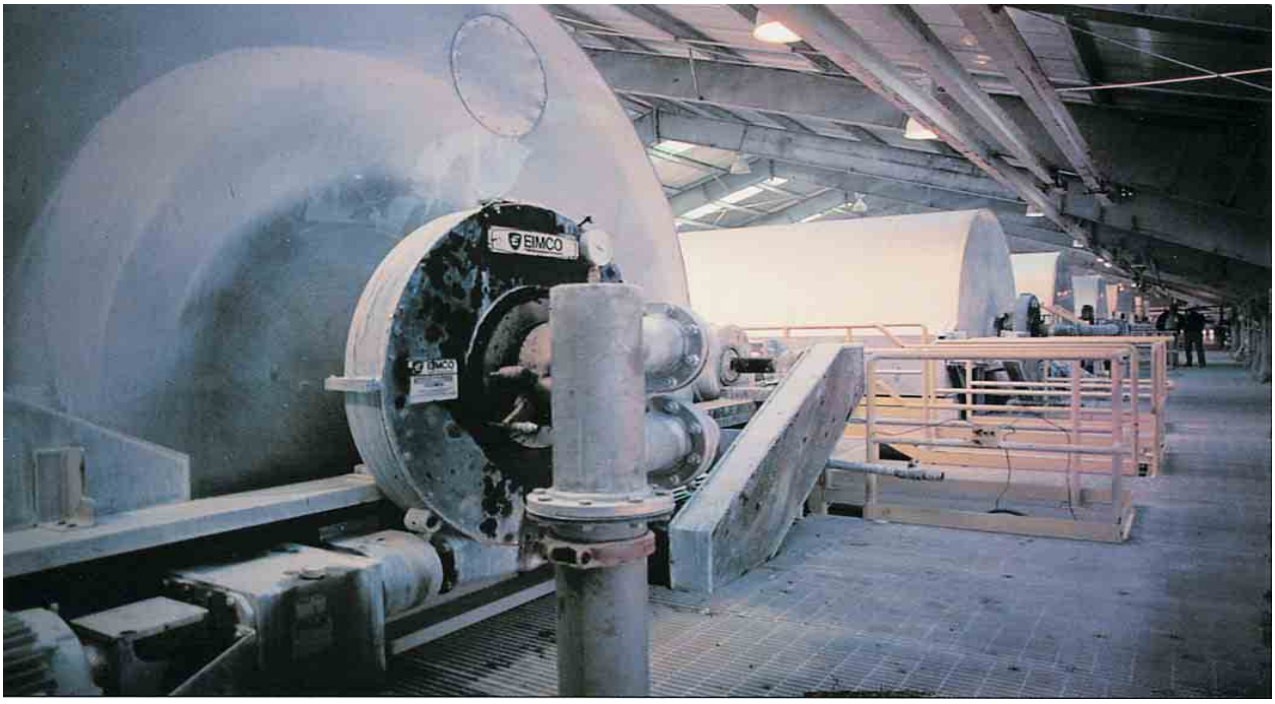
High purity of valuable product can be achieved with cake washing.

## Continuous Vacuum Filtering

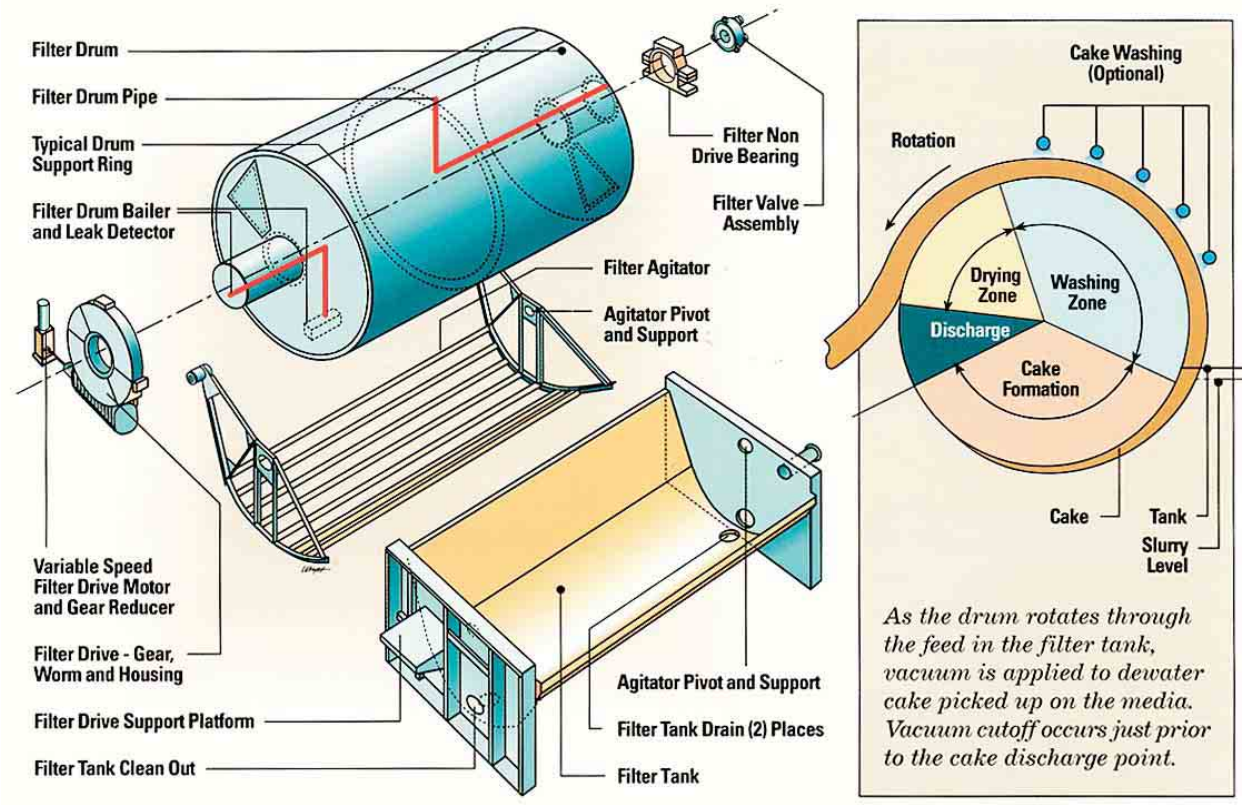
Our continuous vacuum drum filters are designed to handle the broadest range of slurries of any filter. This permits drum filters to be used in a variety of applications.

In order to minimize energy consumption, feed should be concentrated as much as possible prior to filtration. Pretreatment by flocculation in many industrial applications prevents media blinding by fine solids and improves production rate.

Continuous vacuum filters allow a more complete separation of solids from liquids than other mechanical dewatering filters. Vacuum filters are not as dependent on specific gravity differentials for the degree of clarity, nor are they subject to upset due to variation in the process.



# *Dorr-Oliver Eimco Drum Filters*




Our Drum Filters provide high filtration rates and have excellent washing characteristics. Wide variations are possible in cycle time to ensure optimum cake formation, dewatering and washing on any flowsheet. Our drum filters are ideally suited for filtering solids when a uniform deposit of cake on the media is desired, or when the cake is difficult to discharge.

## Operating Design Features

The drum is mounted to rotate through the slurry in the filter tank where cake or sludge is picked up on the media for ultimate discharge. The drum is of rigid box and gusset construction, with unitized end plates for maximum strength. Weight of the drum is carried by fabricated steel trunnions which are an integral part of the drum head. The drum head is reinforced with internal gussets. Drum heads and division strips are completely sealed to prevent liquor infiltration or air leakage.

Manholes are provided to facilitate inspection and routine maintenance. The deck of the drum is constructed of a series of grids to permit rapid unobstructed filtrate removal. The drum shell is supported by accurately machined annular gusset rings to enhance trueness of surface and assure even rotation.

The drum is rotated by a worm gear drive ideally suited for heavy-duty applications and when high-speed operation is required.

For standard applications, a molded EIMCOMET® thermoplastic valve is employed. An optional rubber-lined valve is available if required. EIMCO® Hyflow valves feature large diameter ports to ensure maximum hydraulic flow.

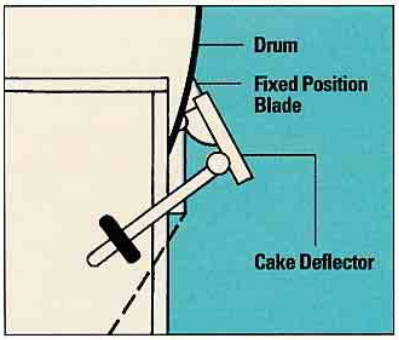
All filtrate pipes and connections are fabricated from large diameter tubing to reduce pressure drop, minimize turbulence and eliminate moisture entrapment during operation. Vapor-retaining hoods are available for all our drum filters.

## Materials of Construction

Dorr-Oliver Eimco drum filters are fabricated from metal parts for standard applications. When required, rubber coverings and linings are available. For handling acids and other corrosive materials, stainless steels of various grades, Hastelloy® and titanium can be used in fabrication. We also have available drum filters fabricated from molded EIMCOMET® polypropylene components.

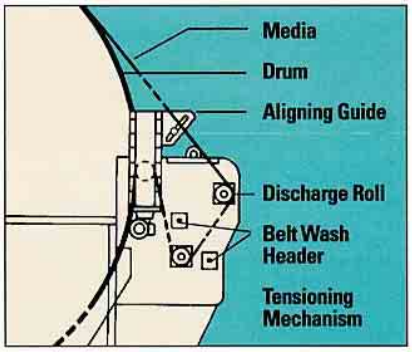
# *Discharge Mechanisms*

All our drum filters incorporate the basic unit features described in the "Operating Design Features" section of this brochure. However, five different discharge mechanisms are available, and characteristics of each type are described below.



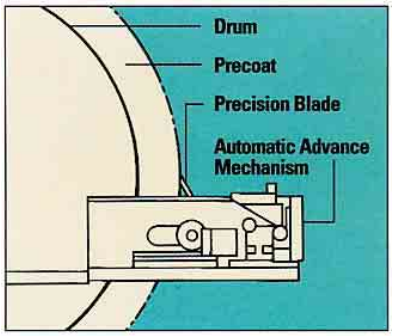

## Scraper Discharge

Scraper discharge drum filters employ a fixed-position blade that is easily retracted for routine cleaning, maintenance, or media changes. This design is the simplest, most basic configuration. The cake discharge can be assisted by a continuous flow of air which acts as a cake deflector in conjunction with the plastic scraper blade. This results in less wear, longer life of the media and reduced maintenance.




## Belt Discharge

During each cycle of an EIMCOBELT® discharge drum filter, the belt travels off the drum to a small-diameter discharge roll. The abrupt change in the radius of the curvature causes the cake to cleanly break free, deflecting it onto the cake conveying system. Cake as thin as 1/16 inch can be satisfactorily discharged on a continuous basis. After discharge, but prior to returning to the drum, the cloth can be cleaned on both sides by high-impact wash sprays to prevent subsequent blinding and assure continued high productivity and full filtering. The wash is performed away from the drum and discharge points to prevent contamination. Blinding by fines in the interstices of the cloth is prevented because suspended solids are cleanly removed from the media, reducing any tendency for plugging. An acid wash system is also available to handle carbonaceous materials.

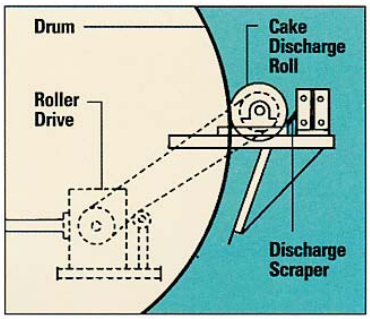



## Precoat Discharge

Precoat drum filters are coated with a bed of diatomaceous earth or similar material. During cycling, a clear filtrate is obtained because the liquid is drawn through the precoat material. Solids deposited in the precoat surface are removed along with a thin portion of the precoat by advancing the scraper blade as the drum revolves. The blade operates independently of the drive to provide a "precision lathe" movement. Depending on the movement of the blade, the drum can cycle up to a week without retracting the blade to apply a new precoat bed.

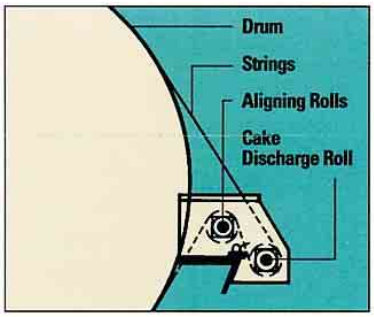
Precoat filters are recommended when small amounts of solids are to be removed from large volumes of liquids, for clarification or polishing of effluent, or for the filtration of material that produces slimy or sticky solids. They provide high clarity of filtrate when the filtrate is the valuable product and the cake is to be discarded.

Continuous cycling with precoat discharge mechanisms reduces the cost of solids removal as compared to batch press-type mechanisms.




## Roller Discharge

Roll discharge drum filters employ a roller to pick up cake deposited on the media and discharge it. Roll discharge is used for thin, sticky, difficult cakes that are hard to remove by blow discharge or that adhere firmly to the belt. This type of discharge system increases cloth life and permits use of lightweight media.




## String Discharge

String discharge mechanisms are applied on a drum on which a cloth medium is caulked onto the drum. The strings leave the drum and travel over a small diameter discharge roll where the abrupt change in axis discharges the cake. The strings then go through a comb mechanism and are guided back onto the drum.

# *Dorr-Oliver Eimco Drum Filters*

| Design Features | Benefits |
|---|---|
| 1. Standardized tank and drum design | • Lower capital costs |
| 2. Worm gear drive | • For heavy-duty service application<br>• Reliable high-speed operation on large filters<br>• Dual-drive - (Drum and discharge roll) for optimum cake removal on roll discharge filters |
| 3. Large EIMCOMET® thermoplastic wear plate | • Low coefficient of friction<br>• Lightweight for ease of handling<br>• Corrosion resistant<br>• Increases hydraulic and pneumatic flows and reduces pressure drop |
| 4. Discharge options<br>a) Scraper<br>b) EimcoBelt®<br>c) Precoat<br>d) Roll<br>e) String | • Optimized solids discharge<br>• Continuous media cleaning if required (EimcoBelt) |
| 5 Deep drum deck sections | • Improved hydraulic and pneumatic flows<br>• Drier cake |
| 6. Reinforced machined heads, trunnions and rings | • Assures drum roundness<br>• More uniform cake<br>• Better cake discharge |
| 7. Positive seals on drum ends and between drum compartments | • No vacuum loss between sections<br>• No slurry infiltration at drum ends |
| 8. Three different cloth aligning systems are available | • Positive filter cloth alignment |

## Standard Sizes

| Diameter of Drum (Feet) | Filter Face Length (Feet) | Approx. Area (Square Feet) |
|---|---|---|
| 6 | 3 | 56 |
| | 4 | 75 |
| | 6 | 113 |
| | 8 | 150 |
| | 10 | 188 |
| 8 | 6 | 150 |
| | 8 | 200 |
| | 10 | 250 |
| | 12 | 300 |
| | 14 | 350 |
| | 16 | 400 |
| 10 | 8 | 251 |
| | 10 | 314 |
| | 12 | 376 |
| | 14 | 439 |
| | 16 | 502 |
| | 18 | 565 |
| 12 | 10 | 376 |
| | 12 | 452 |
| | 14 | 527 |
| | 16 | 603 |
| | 18 | 678 |
| | 20 | 753 |

**Special, customized drum filter designs are available in sizes up to 13-1/2 feet in diameter and 36 feet in face length.**

### Options and Accessories

For specialized requirements, we offer variations to the standard design. Specialized construction materials, alternate cake washing methods, compression rollers, and vapor hoods can be provided as needed. If you require a customized design, we have the technical experience and knowledge to solve your filtration problem economically.

# *Dorr-Oliver Eimco Drum Filters*

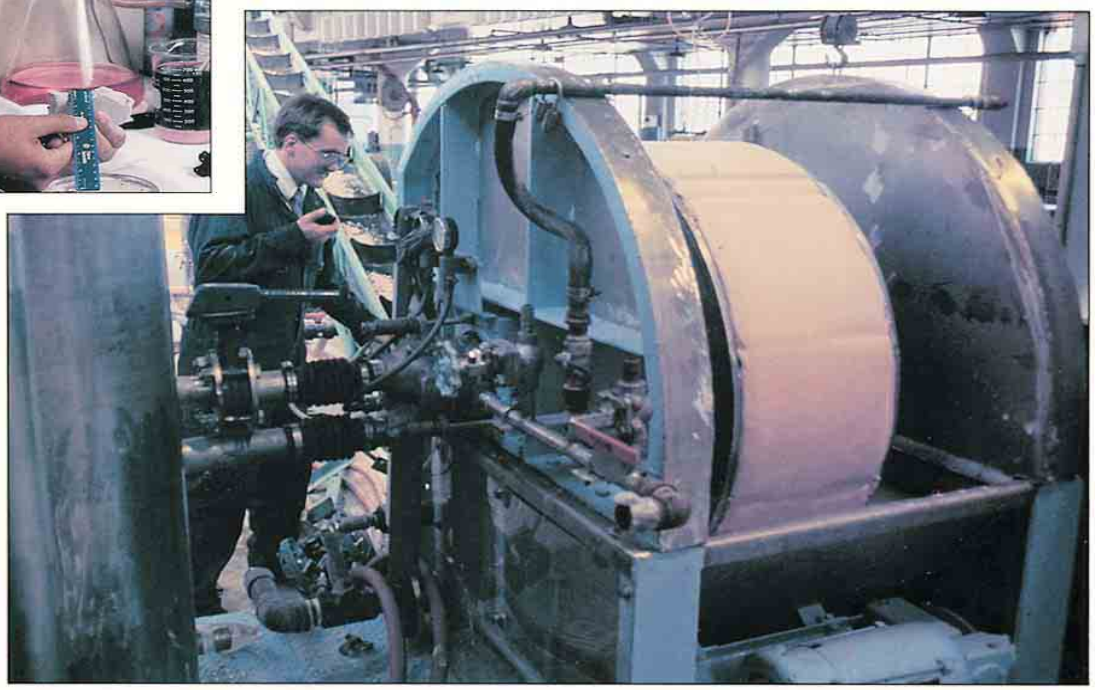
## Testing and Pilot Plant Studies

We have extensive facilities for testing and evaluating the most cost effective approach to filtration problems. The most accurate methods for determining the proper filter type and size involve bench scale or pilot plant testing. When testing is not feasible, the only adequate substitute is the engineering knowledge and experience of the manufacturer.

## Application Experience

We are one of the pioneers in drum filter design and have extensive experience with almost every possible application, including:

- **Clay**
- **Chemical processing**
- **Coal preparation plants**
- **Automotive plating wastes**
- **$SO_2$ scrubber sludges**
- **Steel mill wastes**
- **Food Processing**
- **Water Softening**
- **Tanning**
- **Foundry Waste**
- **Red Mud**
- **Leach residues**
- **Mineral Concentrates**
- **Titanium dioxide**
- **Distillery wastes**
- **Organic sludges (primary,digested,activated)**
- **Dairies**
- **Pharmaceuticals and drugs**
- **Iron ore processing**
- **Wet-air oxidation**
- **Alumina**
- **Sodium bicarbonate**
- **Citric acid**
- **Solvent oil dewaxing**
- **Corn wetmilling**
- **Juice clarification**
- **Winery operations**



## Technical Services

The services of our technology team are available to assist in any process problem involving continuous vacuum filtration for liquid -solids separation.

Our technical staff includes chemical and mechanical engineers. Modern, computerized data processing services are used to optimize research work. More than 2,500 vacuum filtration investigations have been conducted by our technicians. A working knowledge of over a hundred types of cloth and wire media enable our technicians to recommend the one which will best suit your application. Our media department maintains a stock for most types of media and provides close quality control.

A complete stock of drum filters is also available for rental to meet immediate testing and service requirements.

# *Capabilities*

**Full Equipment Life-Cycle Support**

**Parts • Rebuilds • Service • Filter Media**

Global reach, local expertise • Innovative designs and solutions
Service and technical support before, during and after delivery

In addition to providing a complete line of process equipment, Dorr-Oliver Eimco is your source for everything necessary to meet the total needs of a project from inception to start-up and beyond.

## Flowsheet Capabilities

Dorr-Oliver Eimco engineers can help you with the design of your total flowsheet, ensuring that all your equipment will work together for optimal performance and ease of operation.

## Tankage and Erection

Dorr-Oliver Eimco can take the stress out of coordinating an independent contractor who may not be familiar with all the details necessary to install your drum filters. Our experienced construction crews can save you money and stress by doing all your field work and turning over to you a trouble-free machine.

## Upgrades and Retrofits

Filtration technology is constantly advancing. Let us show you how you can incorporate state-of-the-art design improvements into your existing equipment. Many upgrades can pay for themselves in a matter of months and help increase capacity as well as improve performance.

## Service

Our staff of skilled mechanical and process engineers can keep your Dorr-Oliver Eimco equipment in top condition and help you avoid costly unscheduled interruptions.

Dorr-Oliver Eimco is here to help you with all your solid/liquid separation needs. Please call us to find out more about how Dorr-Oliver Eimco technology can improve your productivity. In the U.S., please call 1.801.526.2000 and in Canada, call 1.705.325.6181. For a complete listing of our worldwide locations and regional phone numbers, visit www.glv.com.

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