

PLEATED BELT FILTER SYSTEM



DRY FILTRATION
WET SCRUBBERS
CYCLONES
WET ELECTROSTATIC
PRECIPITATORS

MIKROPUL PLEATED BELT FILTER

A Breakthrough In Filtration Technology

The MikroPul Pleated Belt Filter (PBF) is a patented, revolutionary design that combines high capacity pleated media with high efficiency suction cleaning. The result is a high efficiency self-cleaning filter offering more capacity for its size than any filter on the market.

Unlike filters that rely on building a fiber mat to retain small dust particles, the PBF does not. And unlike felt bag or cartridge filters, it doesn't blow or pulse dust back into the air stream.

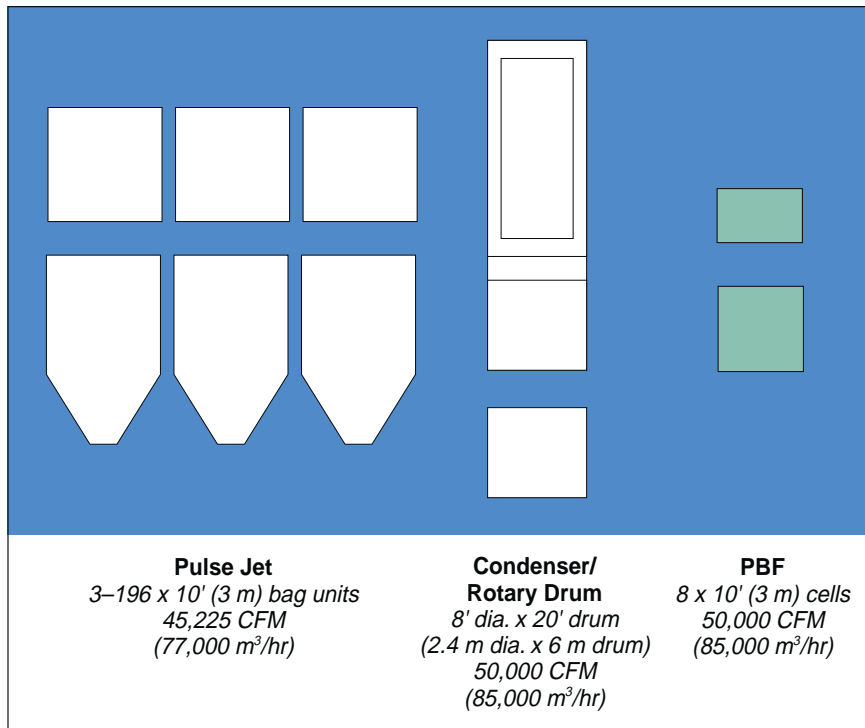
For the first time, thorough automatic cleaning of agglomerated fibers and dust out of dense pleated high efficiency filter media is possible.

Features and Benefits

- High filtration efficiency. The media is optimized for fibrous dust filtration.
- High media cleaning efficiency. Fiber and dust are suctioned away out of the air stream (off-line cleaning).
- Compact size—a 50,000 CFM (85,000 m³/hr) filter is 10' high x 11.3' wide x 6.3' deep (3 m high x 3.5 m wide x 1.9 m deep).
- Saves money—In many cases, the PBF does the work of tandem filters. Also, cleaner air requires less air turnover and improves air conditioning system efficiency.
- Installation is simple, quick, and economical—The PBF is pre-assembled on a steel base and prewired, including controls. It does not require a smooth floor or elaborate leveling.
- The PBF is mechanically very simple, each filter cell being basically a conveyor. No moving parts (except for the media itself) are on the dirty side of the filter.

How the PBF Compares

Traditional surface loading filters	Mat building filters	PBF: combines advantages of both
<ul style="list-style-type: none"> ■ High efficiency filtration ■ Low efficiency backflush media cleaning pushes dust back into air stream ■ Large size <p><i>Examples: Bag filters using dense felt media, pleated cartridge filters, HEPA, membrane filters</i></p>	<ul style="list-style-type: none"> ■ High efficiency filtration, once fiber mat is built up ■ High capacity for filter size ■ High efficiency suction media cleaning ■ Allows particles to pass through just-cleaned areas ■ Often requires a prefilter <p><i>Examples: Condensers, rotary drums, paper roll-ups, rotary discs, "V" cell type filters</i></p>	<ul style="list-style-type: none"> ■ High efficiency filtration ■ Very high capacity for filter size ■ High efficiency off-line suction cleaning



- The cleaning mechanism never touches the media—no nozzles to adjust and wear out or rub holes in the media.
- Long lasting media—in normal operation, the PBF requires little or no attention for about two years, on average.

Space Comparison

The diagram above represents space requirements (front and top views shown) of different filter types for filtering approximately 50,000 CFM (85,000 m³/hr). As you can see, the space savings can be dramatic, which can save construction costs.

How The PBF Works

The PBF consists of a number of filter cells. Each cell is comprised of an endless pleated media belt looped between two pulleys.

Unfiltered air enters the unit parallel to the filter cells and passes through the straight sections of the belt loop. Larger fibers collect on the outer edges of the pleat and smaller particles build up on the media surfaces between pleats. The cleaned air flows between the two sides of the cell into a plenum in back of the filter and then exits.

Pressure drop across the media is constantly monitored by a dual setpoint pressure gauge. When the high point is reached for a given cell, that cell's belt begins rotating around the pulleys. At the same time, a stationary suction plenum underneath the cell is activated and air jets located in the floor and lower pulley's hollow shaft are pulsed with low pressure compressed air. As the belt moves around the lower pulley, the pleats open up and air flow through the media is blocked, allowing the pleats to be easily vacuumed and pulsed clean.

Applications

The PBF provides outstanding filtration performance for any air stream containing fiber and dust. Applications include:

- Textiles
- Non-wovens
- Pulp and paper
- Wood products

To determine if the PBF is suitable for your application, MikroPul maintains a full scale test facility at our plant in Charlotte. Contact your MikroPul representative for a performance test on your dust.

40,000 CFM (68,000 m³/hr)
filter depicted

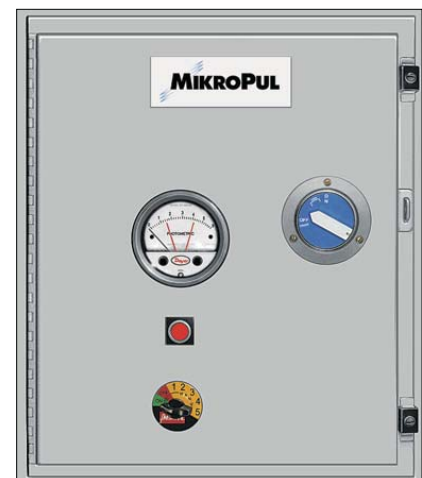


The patented media is a significant new design that is central to the PBF achieving its unique capabilities. The pleats are tightly spaced for filtration purposes and open up around the lower pulley for cleaning purposes.

Operation and Maintenance

The PBF is automatically controlled and normally does not require operator intervention. In the unlikely event of a controller failure, a manual override mode allows operation by hand.

No tools are required for media changeouts. The filter cells are held in place with toggle clamps and the media is attached via velcro strips.



Controls are simple and user friendly

PBF SYSTEM DESIGN

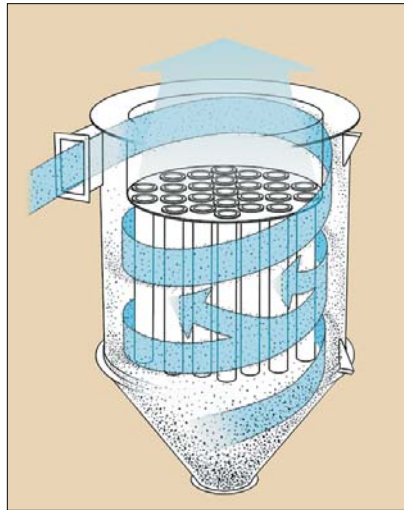
The PBF is the heart of a system that provides efficient removal of fibrous dust from plant air streams. A MikroPul Pleated Belt Filter System consists of the following:

- The main PBF unit sized for the air volume and dust loading required.
- A small collector to collect the dust stripped from the PBF media.
- Appropriately sized fans for the PBF and small collector.
- If necessary, a prefilter or cyclone is used to remove larger fibers from the air stream.

MikroPul can engineer, supply, and install the complete system, including airlocks and ductwork, from the plant air inlets to the clean air exhaust.



MikroPul can provide all system components, including airlocks

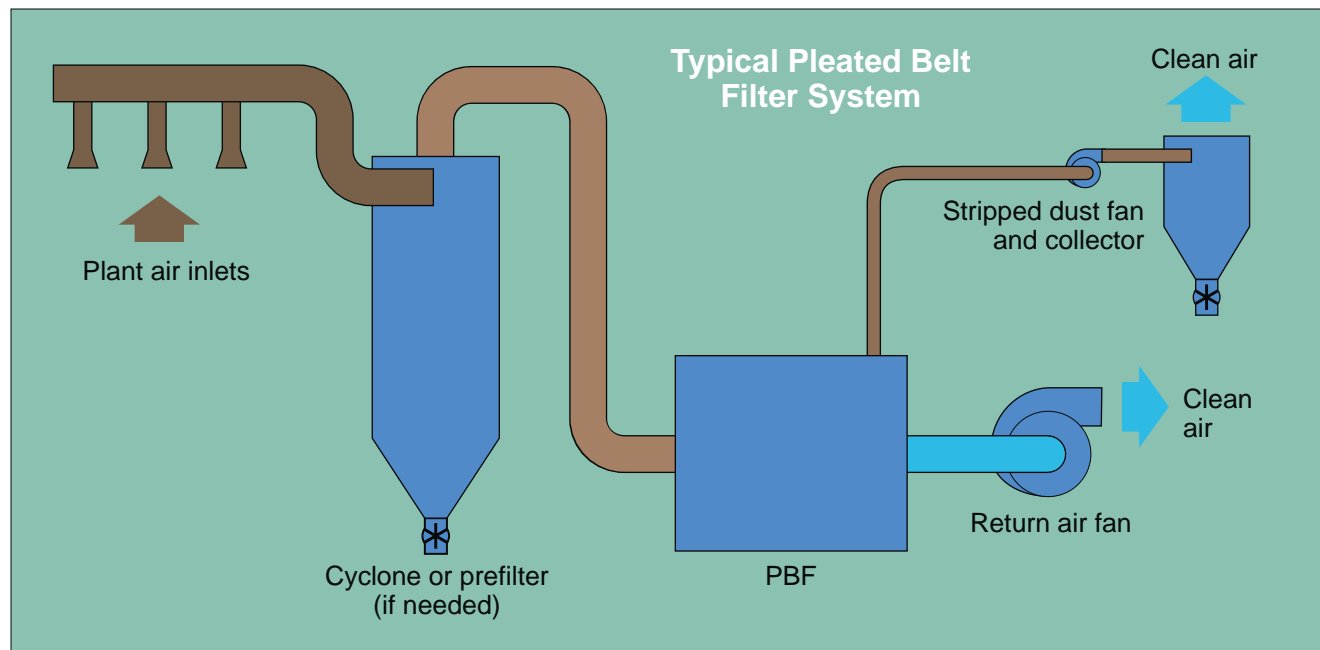


Stripped dust collector

Stripped Dust Collector

Dust stripped from the PBF's media is carried away in a relatively low volume air stream. Because of the lower air quantity, the dust can be efficiently collected in a specially designed pulse-jet collector.

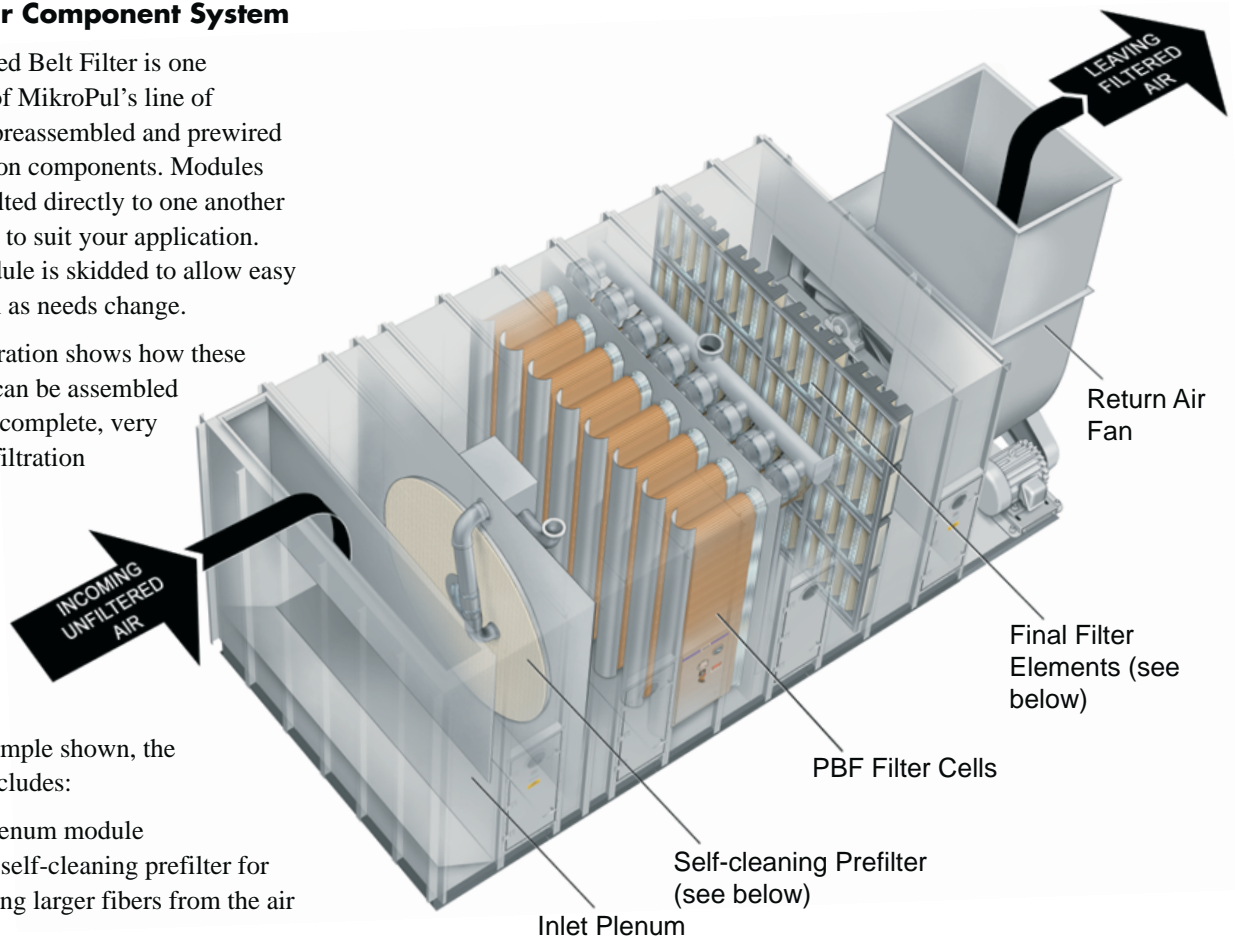
As shown in the drawing, dust laden air enters the unit through a tangential inlet. An inner cylinder induces cyclonic flow, causing larger particles to separate from the air stream and fall into the hopper. The remaining fine particles collect on the filter bags, which are cleaned through periodical back-pulses.



Modular Component System

The Pleated Belt Filter is one member of MikroPul's line of modular preassembled and prewired air filtration components. Modules can be bolted directly to one another as needed to suit your application. Each module is skidded to allow easy relocation as needs change.

The illustration shows how these modules can be assembled to form a complete, very compact filtration system.



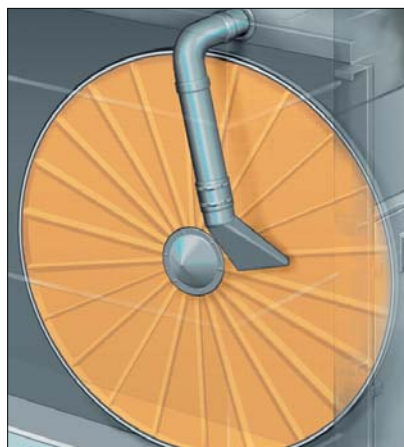
In the example shown, the system includes:

- Inlet plenum module
- Rotary self-cleaning prefilter for removing larger fibers from the air stream
- PBF module
- Final filter module
- Fan module

The entire system is only 24 ft (7.3 m) in length. As shown, this system can filter up to 43,300 CFM (73,600 m³/hr) and can be configured to filter up to 60,000 CFM (102,000 m³/hr).

MikroPul can also provide other modules for air conditioning, including:

- Chilled water coils
- Fogging manifold
- Eliminator blades



Self-cleaning Prefilter

Compact design features a rotating disk-shaped screen which captures coarse dust and fiber. An oscillating suction arm cleans the screen, sending the dust to the stripped dust collector. By reducing the load on the primary filter, the prefilter increases overall system efficiency.



Final Filter

These sturdy filter elements are available in a wide range of filtering efficiencies, including two HEPA grades. The glass fiber paper, mini-pleated into mats, provides high volumetric airflow and low operating pressure drop.

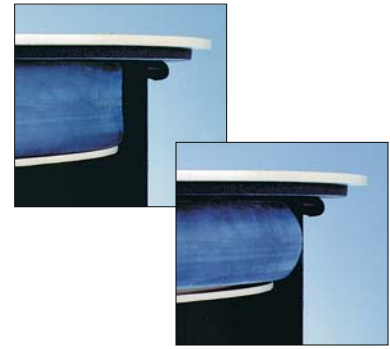
OPTIONS

MikroPul offers a number of options for the PBF and system components to tailor the system to meet your requirements.

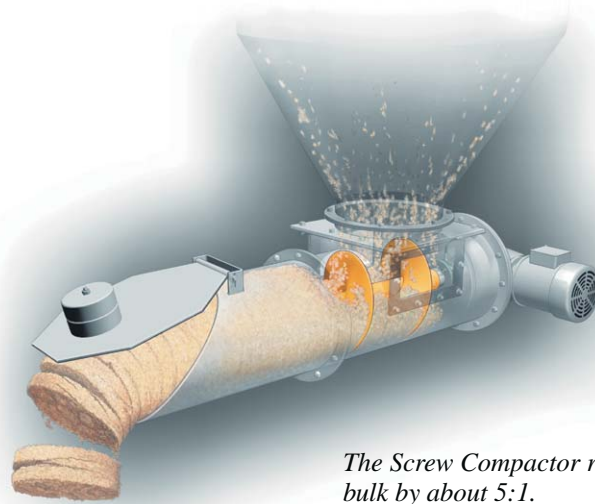
- PTFE membrane media, providing 99.97% efficiency, 0.5 micron and larger (standard spun bond media provides 95% efficiency).
- Weatherproof PBF housing for outside installation.
- PLC-based controller for interfacing with central monitoring stations.
- Controller with timer for timed cycle media cleaning.
- Various methods for handling dust at discharge points.
- The *Pneumatically Sealed Drum Cover* provides a simple solution to a common problem—leaks that occur when discharging into drums. It features an inflatable bladder that creates an airtight seal even with out-of-round or dented drums.
- A *Screw Compactor* containing a helical screw conveyor designed to compact fibrous dust. This simple, effective device achieves about 5:1 compaction and can handle about 400 lb/hr (180 kg/hr) of stripped dust.
- Our *Briquetter* provides a simple, clean and efficient way to dispose of your dust. It compresses fibrous dust into compact, easy to handle briquettes. They can be used or sold as fuel, and eliminate the need for plastic bags or special disposal arrangements.



Pneumatically sealed drum cover.



When inflated, the seal conforms to the inside surface of the drum.

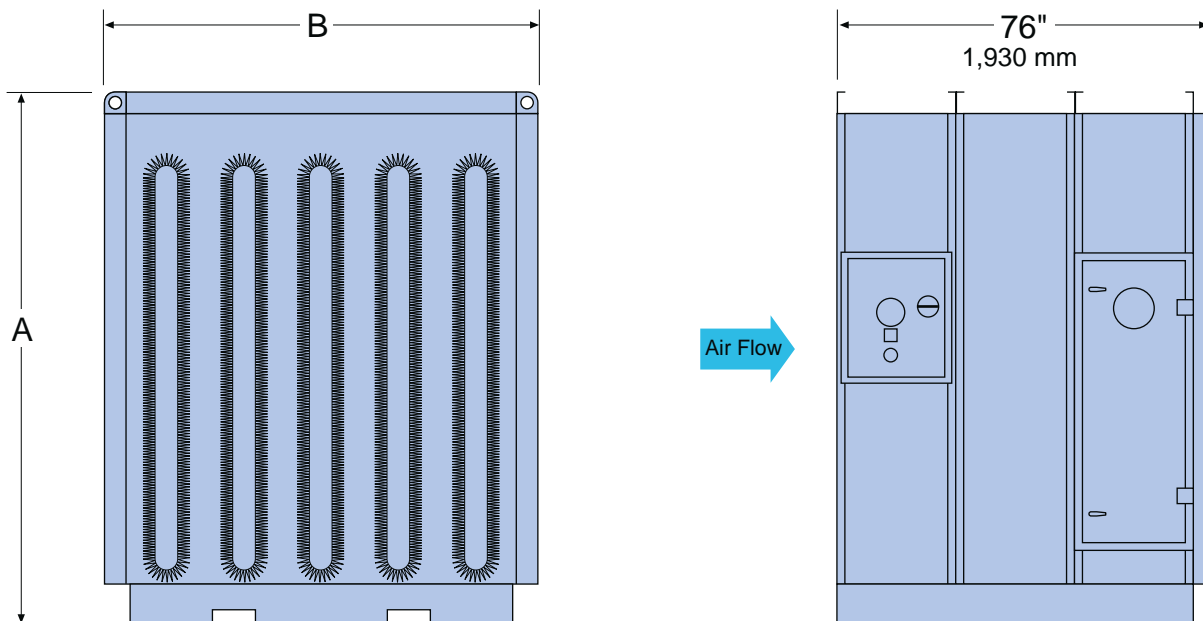


The Screw Compactor reduces waste bulk by about 5:1.



The Briquetter will compact the pile of dust shown above into the high density briquette in the foreground.

TECHNICAL DATA



Model <i>Height (ft) x # cells</i>	Nom. Capacity @ 12:1 A:M		A		B		Weight	
	CFM	m ³ /hr	in	mm	in	mm	lb	kg
7 x 3	11,124	18,908	84	2,137	56	1,422	2,313	1,049
7 x 4	14,832	25,210	84	2,137	72	1,829	2,759	1,252
7 x 5	18,540	31,513	84	2,137	88	2,235	3,206	1,454
7 x 6	22,248	37,815	84	2,137	104	2,642	3,630	1,647
7 x 7	25,956	44,118	84	2,137	120	3,048	4,077	1,849
7 x 8	29,664	50,420	84	2,137	136	3,454	4,524	2,052
7 x 9	33,372	56,723	84	2,137	152	3,861	4,971	2,255
9 x 4	19,632	33,369	108	2,743	72	1,829	3,151	1,429
9 x 5	24,540	41,711	108	2,743	88	2,235	3,660	1,660
9 x 6	29,448	50,053	108	2,743	104	2,642	4,142	1,879
9 x 7	34,356	58,395	108	2,743	120	3,048	4,656	2,112
9 x 8	39,264	66,738	108	2,743	136	3,454	5,169	2,345
9 x 9	44,172	75,080	108	2,743	152	3,861	5,656	2,567
10 x 5	29,520	50,176	120	3,048	88	2,235	3,782	1,716
10 x 6	35,424	60,211	120	3,048	104	2,642	4,419	2,005
10 x 7	41,328	70,246	120	3,048	120	3,048	4,965	2,252
10 x 8	47,232	80,281	120	3,048	136	3,454	5,520	2,504
10 x 9	53,136	90,316	120	3,048	152	3,861	6,029	2,735
11 x 6	43,200	73,428	132	3,353	104	2,642	4,742	2,151
11 x 7	50,400	85,665	132	3,353	120	3,048	5,323	2,415
11 x 8	57,600	97,904	132	3,353	136	3,454	5,905	2,679
11 x 9	64,800	110,142	132	3,353	152	3,861	6,476	2,938

Electrical requirements: 380, 460 or 575 VAC, 3 phase, 50 or 60 Hz

Compressed air requirements: 15 psig (1 bar)

The PBF and its media are protected by U.S., Canadian, Mexican, and European Community patents.

MIKROPUL SUPPORT

Maintenance

MikroPul backs up our products and systems with worldwide customer support. Contact us any time you need help.

Spare parts

MikroPul systems are known for long lasting, reliable operation. Using original MikroPul spare parts ensures that your plant always operates with maximum performance. We supply a full line of parts, from gaskets, filter bags and hinges or timers and differential pressure gauges to major components, for all our products. High wear items are kept in stock for immediate shipment.

Service

MikroPul provides an array of services to help you select, install, operate, and maximize your equipment investment. If your collector needs upgrading to meet increased demands or process changes, our engineering and service staffs are here to help you.

Services include:

- Process analysis
- Inspections of plants and components
- Converting old equipment to new technology
- Conversions/Replacements
- Maintenance seminars
- Technical trainings



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