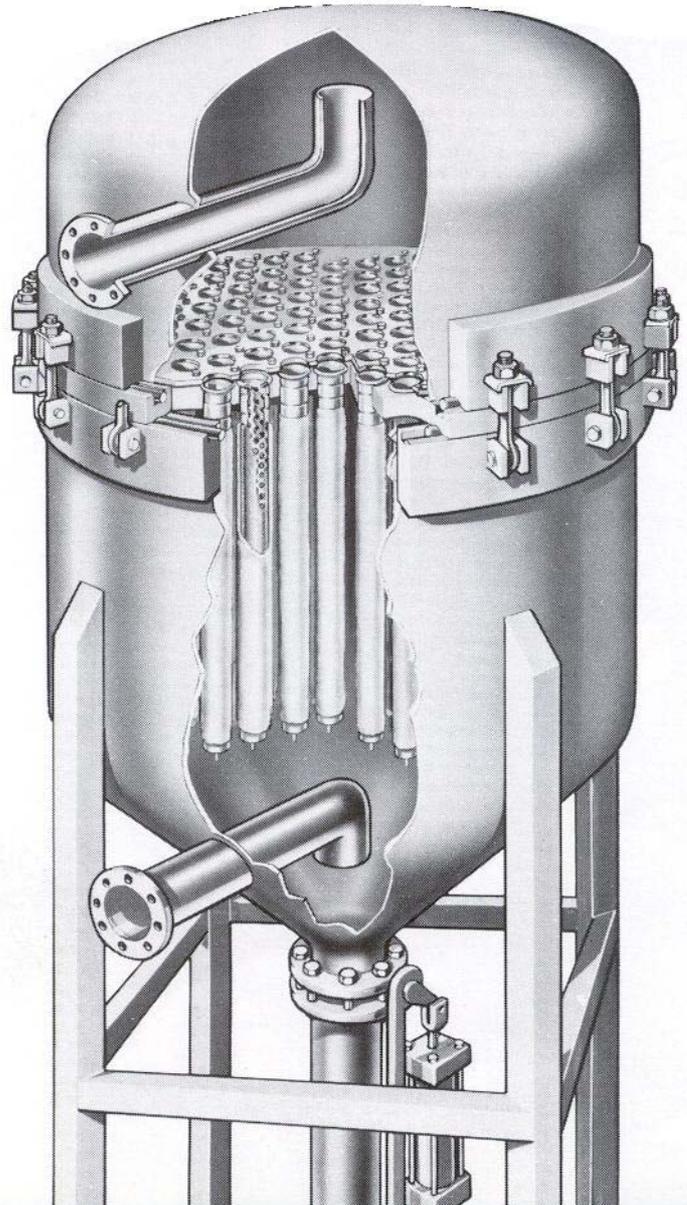
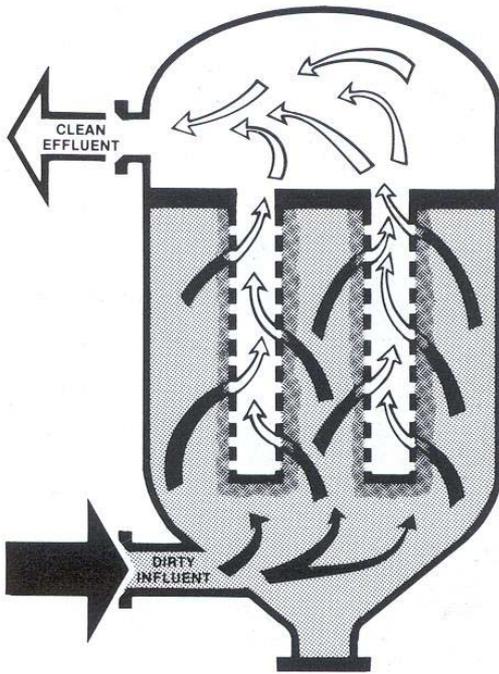


W.A.M.T.

WATER AND MECHANICAL TECHNOLOGY S.R.L.



PRE COAT FILTER

The W.M.T. Pre-Coat Filter is primarily a coded pressure vessel containing a multitude of mesh-covered perforated tubes.

The tubes are septum upon which fine diatomaceous earth powder is deposited in a thin layer forming a filter cake that permits removal of solid contaminant particles as small as 0,5 µm.

The Pre-Coat Filter is completely automatic and will operate on low to high viscosity liquids of varying temperature. The filter is available as a complete packaged unit or can be incorporated into a centralized recirculating system designed for any flow requirement. The filter uses a slurry feeder and a Liquid Vacuum secondary recovery filter to concentrate and remove the dirty-laden pre-coat powder after each filtration cycle.

DESCRIPTION

The basic components of the W.M.T. Pre-Coat Filter are shown in the sideways flow diagrams. The system consist primarily of the Pre-Coat Filter Vessel, a Slurry Tank, the Secondary Liquid Vacuum Filter, and a Main System Liquid Reservoir.

THE PRIMARY FILTER is a coded pressure vessel containing a multitude of wire-mesh-covered perforated tubes. The tubes hang from a special platethat is secured at the flange. These tubes serve as septums upon which the diatomite powder is deposited. The filtered liquid flows vertically up through the pre-coated tubes, into the pressure vessel dome, and is recirculated o the system.

THE SLURRY TANK is usually a rectangular steel reservoir used to store clean liquid which is used in a slurry with the diatomaceous earth to pre-coat the tubes. The pre-coat powder storage hopper and feeder is mounted on the slurry tank.

THE SECONADARY FILTER is generally a Liquid Vacuum Filter. However, a Flat Bed pressure filter may also be used on special application. The Liquid Vacuum unit concentrates and removes the dirty-laden pre-coat powder following each filtration cycle. A small pump, mounted on the Liquid Vacuum, is used to create the necessary vacuum.

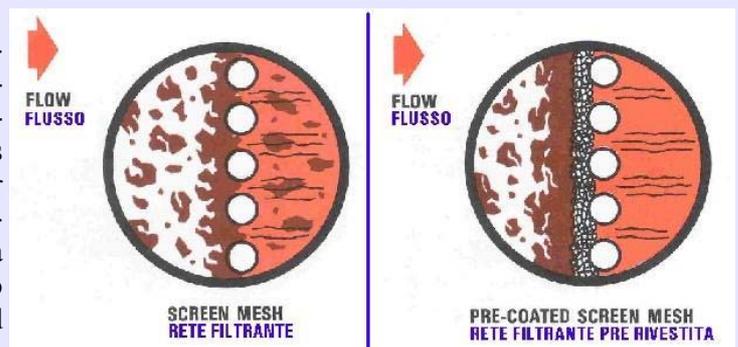
THE MAIN SYSTEM RESERVOIR is a divided tank. One compartment holds dirty liquid discharged from the operation; the other holds clean filtered liquid to be recirculated. The tank may be equipped with a ramp and drag conveyor, if the liquid contains solids that can be readily removed bu settling. The reservoir may also be a simple vertical-sided tank, for systems requiring the removal of only fine particles.

THE CODED PRESSURE VESSEL is designed and fabricated to withstand the highest expected pressure it will encounter with a safety factor of three.

THE PRE-COAT STORAGE HOPPER is desigend to accurately meter a hygroscopic powder, ike diatomaceous earth, regardless of humidity levels. Our feeder was developed over years of research and field testing. Many succesful applications have proven it to be the most efficient feeder available.

PRE-COAT FILTRATION

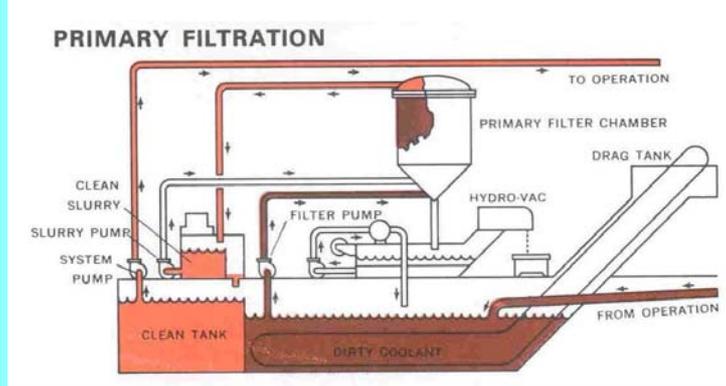
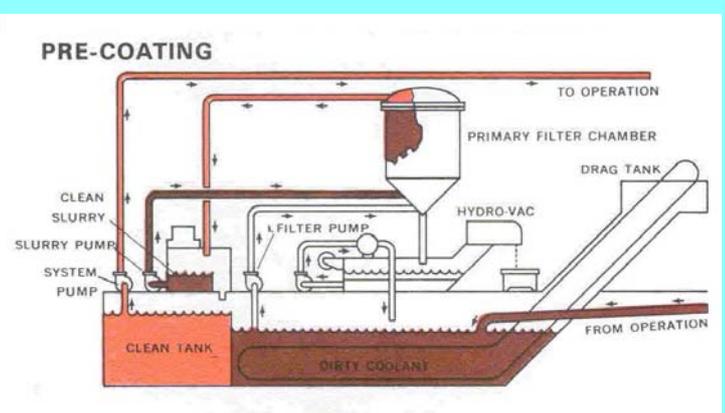
The technique of removing suspended solids from liquids by the use of a fine mesh medium is many centuries old, but the heory of using a mesh to retain another medium did not achieve practicality until this century. When diatomaceous earth, a fine powder consisteng of fossil-like skeletons of microscopic water organism, is caked on a colse mesh, it becomes a porous filter mediumm which permits the liqui dto flow only through small, devious passageways around and between the individual diatoms.



CYCLE FLOW

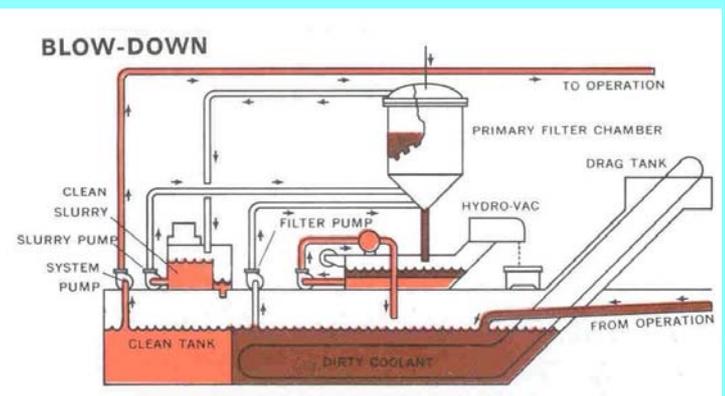
Pre coating. The primary filter vessel is empty and the tubes are clean when pre-coating begins. The hopper meters powder into the slurry tank as the slurry pump starts. The pre-coat powder in the clean liquid creates a slurry which is pumped into the bottom of the primary filter, then flows up through the tubes and back to the slurry tank. Recirculating the slurry results in full deposit of all pre-coat powder on the outside of the filter tubes. During the filtration cycle, the system pump supplies clean liquid to the operation from the clean reservoir.

Primary filtration. When the tubes are pre-coated, the filter automatically begins the primary filtration cycle. The filter pump feeds



dirty liquid to the primary filter. Simultaneously, the slurry pump is stopped and the slurry feed valve is closed. The coolant flows through the intricate passages of the pre-coat cake where all the particles larger than 1/2 micron and many smaller particles are retained. Filtered liquid passes up the inside of the filter tubes and is deposited in the clean reservoir. The flow rate during filtration is greater than the system requires, permitting the filter to keep the clean tank constantly full. As dirt builds up on the filter cake, pressure increases in the primary filter vessel. When the pressure reaches a pre-set value, it triggers the blow-down cycle.

Blow-down. When blow-down pressure is reached, all feed and discharge valves automatically close and the dump valve opens. Compressed air is admitted to the dome and filtered liquid is forced down and out through the tubes under pressure. The large dump valve and line to the secondary filter permits minimum restriction of flow. All liquid, pre-coat powder and contaminants are dumped in approximately 12 seconds. The primary filter is now empty, all tubes are clean, and the filter automatically begins the pre-coating cycle.

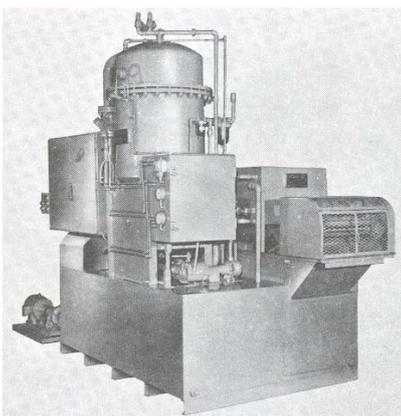


Secondary filtration. At the beginning of the primary filtration cycle, the secondary Liquid Vacuum Filter automatically reclaims the liquid purged from the primary vessel and returns it to the dirty tank. The used pre-coat powder is ejected into a waste hopper for disposal.

The Recovery Filter creates a negative pressure in the Liquid Vacuum vacuum chamber, drawing the liquid down through the filter cloth, where the pre-coat powder and dirt are deposited. Reclaimed liquid is delivered to the dirty liquid reservoir. The Liquid Vacuum Filter operates until all liquid has been removed from it and all used pre-coat powder and dirt are deposited in a hopper. The secondary filter then shuts down until the next blow-down cycle.

All operations are automatically handled by PLC.

When low flow rates (up to 300l/min) are encountered, it is easy to combine the basic pre-coat filter components into an integral assembly (see left sideways picture).



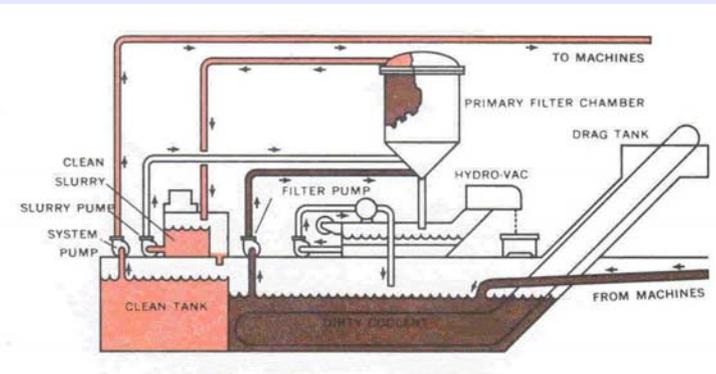
For filtering system with high flow rates, W.M.T. has combined as many as three primary filters with a single slurry tank and secondary filter. The electrical control circuit is designed to automatically alternate the start-up and blow-down cycles of the primary filter to keep a minimum of two unit filtering continuously (the unit show on the right sideways is operating on a 3.600 l/min filtering system).



TYPICAL APPLICATIONS

Firm engaged in high-production metalworking comprise the largest group of W.M.T. equipment users. Our filtration expert work closely with plant layout and engineering personnel to design and supply complete recirculating filtration system. Providing the experience of the specialist, they use modern technology and the latest equipment to aid the customer in gaining greater productivity from this operation.

W.M.T. has supply automatic pre-coat filtration system for costumers requiring extremely fine liquid clarity. We have also provided many systema for high-viscosity oils which require the larger filtration area our Pre-Coat filter provides. Pre-Coat filtera are currently operating on the following applications: Machining; Grinding; Lapping; Honing; Waste disposal; Polishing; Gun Drilling; Wire drawing; Rolling mills; >Hot test oils; Electrolytic baths; Phpsphating; Test stands; Spray booths; Flushing.

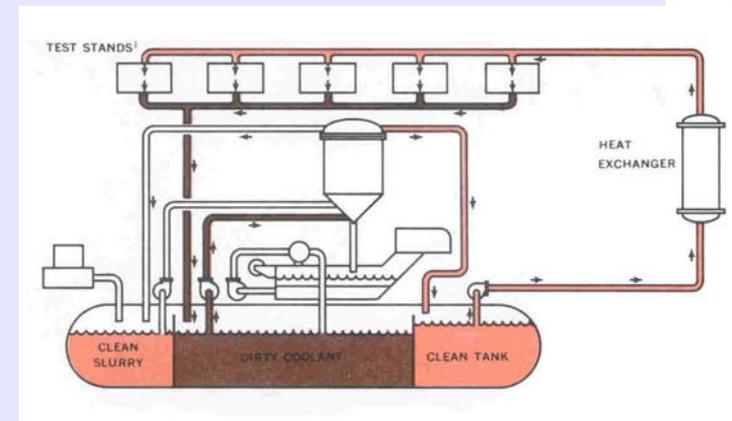
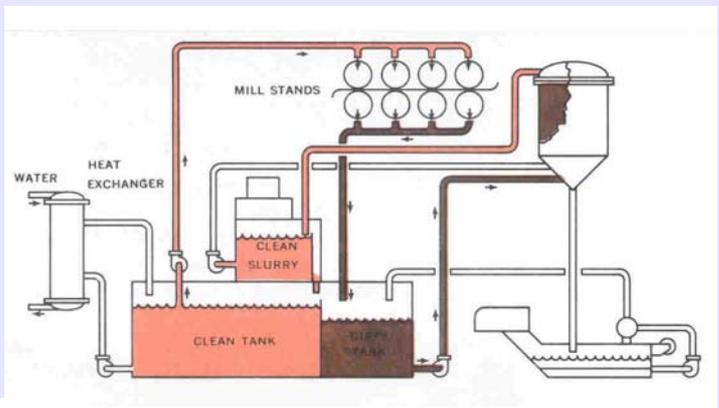


MACHINE TOOL SYSTEM

A typical system uses a conveyORIZED tank as the main system reservoir. Velocity flumes carry the dirty liquid, from the operation, to the dirty section of the tank where heavy particles are settled and removed by the conveyor. Dirty liquid, containing fine suspended particles, is pumped through the Pre-Coat filter and deposited in the clean tank for recirculation.

ROLLING MILL SYSTEM

This typical Pre-Coat filtration system, on a 4 stand cold rolling operation, is installed below the mill floor. The rolling lubricant, and often the bearing lubricant, is piped to the main system tank, then filtered. A heat exchanger, used to cool the lubricant before its return to the mill, is incorporated into the system.



HOT TEST STAND OIL SYSTEM

Clean and dirty tanks are typically installed below the floor, with the filter on the operating floor level. These systems can operate at temperature up to 120°C producing clarity below 1.0 mg/l of suspended solids. The ultraclean oil is used for the production testing of transmissions and other highly precise assemblies.

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