



Steadfast Equipment
"Creativity is our Cornerstone"

Disposable Rotary Drum Filter

Protected under US patent 6,336,561

New Method of Liquid-Solid Separations for Small Batch Operations

In the pharmaceutical, fine chemical, hazardous materials, and beverage industries, most of the production processes are batch in nature. This batch nature is due to the limited volume of the material to be processed, the need for traceable "lots" of material, and/or the high intrinsic value of the product. Processes in these industries frequently require equipment that performs efficient, clean, and reliable solid-liquid separations. Applications in these industries could range from:

1. Initial clarification of fermentor
2. Removal of solids from an intermediate reaction product
3. Final collection of a product from suspension
4. Clarification of beverages
5. Enhancing field testing capabilities

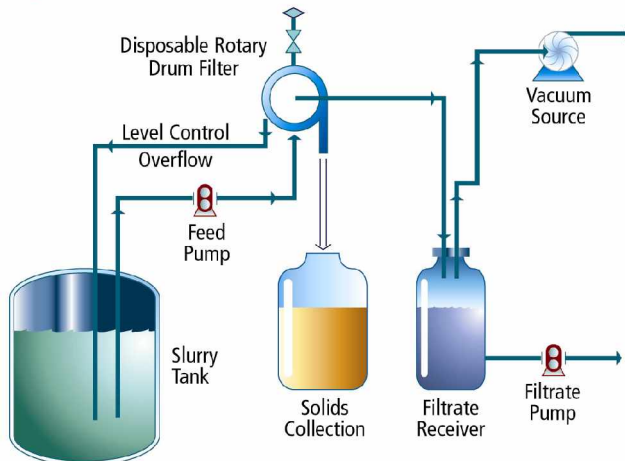
Currently, these batch solid-liquid separations are carried out using centrifuges and/or batch filtration equipment like plate and frame or leaf filters. Although these types of traditional equipment have been used for years, they have inherent disadvantages, especially when applied to laboratory, pilot plant or other small capacity production applications. This traditional equipment also has disadvantages where time and resources are limited and it is critical that the materials be isolated from the outside environment.



Filter Assembly

The solution to this problem lies in adapting the primary solid-liquid separation device used in the Chemical Process Industries to pharmaceutical, fine chemical, food, beverage, and other low to medium volume applications. This device is the **Disposable Rotary Drum Filter**. The key importance of this device is that it can be run semi-continuously. Thus a batch of product is run through it for a period of time in a steady state fashion. This semi-continuous operation allows the equipment to be very small as compared to batch equipment that would handle the same amount of material. This reduction in size has distinct advantages, namely that the device is easily enclosed, enhancing its ability to resist potential contamination of the product or personnel. Also, because of its size the unit is made of plastic and is disposable.

Operational Flowsheet

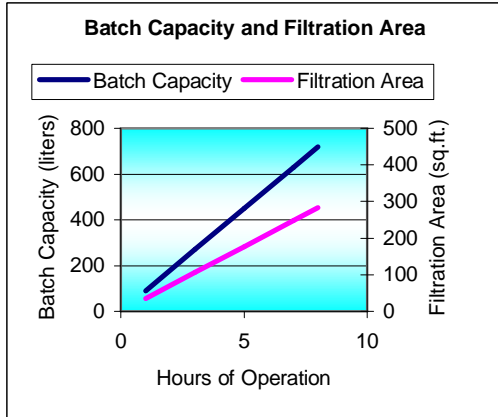


The operation of the **Disposable Rotary Drum Filter** is analogous to all vacuum drum filters. These filters are made up of an inner rotating drum encased in an outer cylinder or half-cylinder (trough). The entering slurry level is controlled so the inner drum's surface is 30% to 35% covered. The surface of the inner drum is covered with a filter fabric to retain solids. A vacuum is applied to the inside of the drum, drawing filtrate into the inside and depositing the solids onto the fabric. The filtrate is pulled into channels in the interior of the drum and routed out of the device. The system is made continuous by rotating the drum.

As the drum rotates out of the slurry, the solids start to dry as air passes through them via the vacuum on the drum. When the drum completes its revolution the surface comes in contact with a scraper blade, which removes the solids that have accumulated. The drum continues rotating back into the slurry and the process starts all over again. Once the device has reached steady state and the drum is fully covered with the solids cake for the first time, the device can operate for hours taking in slurry and discharging clarified filtrate and dried solids continuously.

The main advantage of this equipment over traditional batch operation is that large amounts of slurry can be processed in a small enclosed device; minimizing manpower, operating space, and HVAC resources. The disposable nature of this rotary drum filter relieves the operator of equipment cleaning and minimizes set up operations.

To evaluate the true potential of this device when used in traditionally "batch" applications, a meaningful way to compare capacities must be found. A batch device's capacity is usually determined by its total filtration surface area available. In the case of the Disposable Rotary Drum Filter, the actual surface area of the drum is very small, but since the unit operates continuously, the functioning surface area must be evaluated over its total operation time. As can be seen from the following chart, this small device has the equivalent filtration area of batch equipment many times its size.



Another measure of a filtration device is its batch processing capacity. Again, for the Disposable Rotary Drum Filter this measure is related to how long the device is operated to process a single batch of material. Other potential applications include: the use of the Disposable Rotary Drum Filter in series to enhance cake washing and filtrate recovery; activated carbon impregnated filter media to enhance material purification; use of a variety of pore sizes for the filter media; use of this device to simplify and enhance chromatography applications.

Why choose the Disposable Rotary Drum Filter for your process?

- This filter will help reduce capital and operating costs
- Eliminate high capital cost by reducing the need for plate & frame, leaf, or Nutsche filters and in some cases centrifugation processes
- Reduce operational labor costs by lowering clean up and set up costs
- This filter is scalable and can be used in the laboratory, pilot plant, and for small-scale manufacturing
- Separate solids from liquids for your high value products at a typical rate of one to three liters per minute



Industries Served:

Hazardous Waste Recycling, Waste Minimization

- Metal Finishing
- Metal Plating
- Inks and dyes, Printing facilities
- Scrubbers
- Dry Cleaners
- Paint
- Photo Processing
- Circuit Board manufacturing
- Hazardous waste minimization

Pharmaceutical / Biotech

- Continuous Chromatography
- Continuous Absorption
- DNA Purification
- Cell Lyses, Fermentation

Other Industrial Application

- Starch manufacture
- Fuel cells and batteries
- Wine and beverage

Ordering Number	Housing and Drum Material	Product
4001	Polycarbonate	Disposable Rotary Drum Filter Media: Ultra-high Molecular Weight Polyethylene Pore Size: Average 30 micron, Range 15-45 micron
4004	Polypropylene	
4003	Polycarbonate	Disposable Rotary Drum Filter Media: Ultra-high Molecular Weight Polyethylene Pore Size: Average 7 micron, Maximum 10 micron
4005	Polypropylene	
4002		Drive and Holder assembly 110 V, Single phase, 50/60 Hz

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