

# Closed System Filtration

A **Closed System** is a pressurized filtration system where the liquid is delivered through the inlet of a filter vessel into the top of a filter bag which is supported by a retainer basket.

The fluid then travels through the supported filter media, where the contaminant is entrapped while the cleaned filtrate exits an outlet connection.

The filter media is designed to trap particles of a particular micron size. Contaminant particles are retained inside the filter bag for ease of change-out and disposal.

### Advantages of a Filter Bag System:

- minimal initial pressure loss, providing extended service life
- filter bag surface area allows for high dirt loading
- quick and easy bag change-out, resulting in labour costs savings and reduced downtime
- cost effective filtration system tailored to suit your system parameters and
- minimal process fluid loss and reliable consistent performance



The goal of sizing a filter housing is to achieve minimal pressure loss ( $\Delta P$ ) across the clean filter while balancing process effluent cleanliness, maintenance and bag change-out requirements.

When sizing a vessel for a particular application many variables must be considered, some of which are: type and viscosity of processed fluid, operating pressure, temperature, flow rate and dirt load. The data collected is analyzed to determine the size and number of the filter bag(s) required.

Standard available options are listed on page 16 “Vessel Design Configuration”.

| VESSEL SIZE | BAG DIMENSION  | FLOWRATE IN USGPM |
|-------------|----------------|-------------------|
| 1           | 7" x 16.5" OAL | 80                |
| 2           | 7" x 32" OAL   | 150               |
| 3           | 4" x 8" OAL    | 25                |
| 4           | 4" x 14" OAL   | 50                |

This chart relates the size of vessel with the industry standard filter bag sizes and estimated flow rate capacity. The flow rate capacity is only a guideline and is dependent on process variables.

Pureworld Solutions Inc. offers a full line of quality liquid filter bag vessels, engineered in a variety of configurations, filtering capacities and materials of construction to suit your specific application.

## Filter Bag Vessels



**Bag filter vessels** may be used in a *side stream* system where only a portion of the process fluid is filtered or in a *full flow* filtration system where 100% of the fluid is processed.

The **single bag vessel** is ideal for low dirt load applications and rated to handle flow rates from 25 gpm to 150 gpm.

They are available in side or top entry configurations.

The most economical option is the side entry vessel.

The top-entry style is a superior option. It allows for easier bag change-out by avoiding the need to reach into the vessel and fluid to remove the filter bag.

A **duplex vessel** consists of two separate bag vessels that share the same inlet and outlet connections. This versatile arrangement offers the following benefits.

Double your filtration capacity by using both vessels simultaneously.

Isolate one housing for a bag change-out without interrupting the flow of fluid to the second vessel.



A **multi-bag filter vessel** is used in applications with high flow rates and/or heavy dirt load.

The size of the multi-bag filter vessel will be determined by the process parameters.

Standard multi-bag vessels are manufactured to hold size 2 filter bags and can range from 3 to 24 bags per vessel.

Whether you are replacing an aging vessel or designing a new filtration system, we deliver quality workmanship and reliable performance.

# Blueline PRO™ Polypropylene Filter Vessels



The BluelinePRO™ is a filtration system solution for food grade applications or harsh chemical environments. The housings are manufactured from 100% Polypropylene, with dual female NPT connections accepting both 1" & 1 ½" threaded fittings.

Available in two sizes with flow rate capacities of 25 gpm or 50 gpm, it is also an economical choice for low flow applications. Maximum working pressure is 125 psi. BluelinePRO™ housings provide all the advantages of bag filtration and are easily converted for cartridge use.

## COMPONENTS

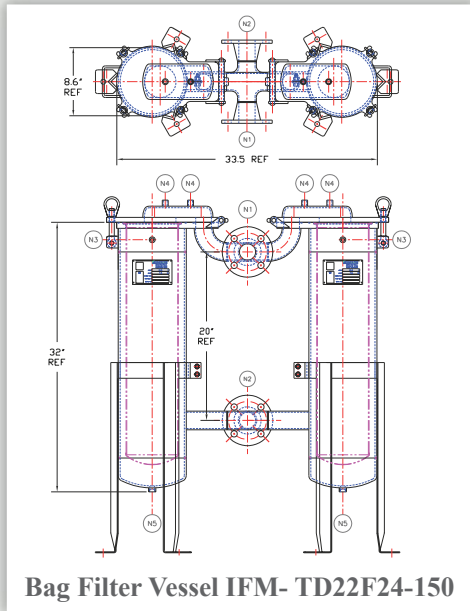
|                                |                                     |                     |
|--------------------------------|-------------------------------------|---------------------|
| a) Head                        | e) Bag retainer                     | i) Wrench           |
| b) Bowl                        | f) Mesh support basket              | j) Drain ball valve |
| c) Pressure Gauge              | g) "O" ring seal                    | k) Teflon tape      |
| d) Flow modifier/bag hold down | h) Gasket (Black EPDM or White FDA) | l) White Port Hole  |

## Accessories

From pressure gauges to displacement balloons, omega springs, and support baskets, Pureworld Solutions Inc. has all the accessories to keep your filter systems operating.



# Vessel Design Configuration



Common materials of construction:

- Carbon Steel
- .304 Stainless Steel
- .316 Stainless Steel

Exotic materials of construction:

- Titanium
- Hastelloys
- Alloy 20
- Monel

Fits filter bag sizes: 1, 2, 3 or 4

Multiple inlet and outlet configurations are available

U, UM and CRN stamps are available

Wide range of pressure and temperature capacities available

Finish: Blasted and Painted Carbon Steel or Glass Bead Stainless Steel

All housings come complete with a stainless steel perforated plate support basket

“O” ring materials suited to your application

# Vessel Nomenclature

Example of a Vessel Part Number: IFM-TB11N22-150

| FLUID ENTRY  | FLUID EXIT           | BAG SIZE                    | # OF BAGS | CONNECTION         | INLET/OUTLET SIZE | MATERIAL OF CONSTRUCTION        | PRESSURE RATING (PSI) |
|--|----------------------|-----------------------------|-----------|--------------------|-------------------|---------------------------------|-----------------------|
| <b>T</b>   | <b>B</b>             | <b>1</b>                    | <b>1</b>  | <b>N</b>           | <b>2</b>          | <b>2</b>                        | <b>150</b>            |
| <b>T</b> Top Entry                                 | <b>B</b> Bottom Exit | <b>1</b> - 7" D x 16.5" OAL |           | <b>N</b> - FNPT*   |                   | <b>2</b> - Carbon Steel         | <b>150**</b>          |
| <b>TD</b> Top Entry Duplex                         | <b>S</b> Side Exit   | <b>2</b> - 7" D x 32" OAL   |           | <b>F</b> - Flanged |                   | <b>4</b> - .304 Stainless Steel | <b>300</b>            |
| <b>TDV</b> Top Entry Duplex with Isolation Valves  |                      | <b>3</b> - 4" D x 8" OAL    |           |                    |                   | <b>6</b> - .316 Stainless Steel |                       |
| <b>S</b> Side Entry                                |                      | <b>4</b> - 4" D x 14" OAL   |           |                    |                   | <b>8</b> - Polypropylene        |                       |
| <b>SD</b> Side Entry Duplex                        |                      |                             |           |                    |                   |                                 |                       |
| <b>SDV</b> Side Entry Duplex with Isolation Valves |                      |                             |           |                    |                   |                                 |                       |
| <b>MB</b> Multi-bag Bottom Entry                   |                      |                             |           |                    |                   |                                 |                       |
| <b>MS</b> Multi-bag Side Entry                     |                      |                             |           |                    |                   |                                 |                       |

|           |  |            |   |
|-----------|--|------------|---|
| <b>BL</b> | <i>Blueline</i>                                | <b>410</b> | Fits a 4" diameter x 10" OAL filter bag |
| <b>BL</b> | <i>BluelinePro</i> Polypropylene Filter Vessel | <b>420</b> | Fits a 4" diameter x 20" OAL filter bag |

Note: Bottom Exit is standard unless specified otherwise.

\* Female National Pipe Thread Connection (FNPT) is standard – others are available upon request.

\*\* 150 pounds per square inch (PSI) is the standard for all sizes.

The code for modification – “M” can be added to the end of the vessel part number to symbolize a customized vessel.