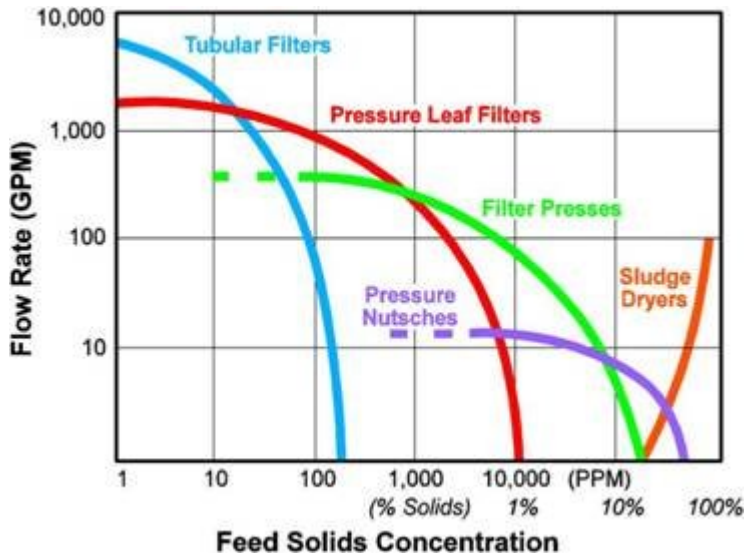


Durco TE Tubular Filter Systems Are Designed For:



- **Continuous Industrial & Municipal Filtration With Automatic Backwash Options At Flow Rates To 5,000gpm**
- **Continuous Filtering With <200ppm Solids Loadings Down To 1 Micron* Particle Retention**
- **Supreme Durability With Low Maintenance Operation In The Most Demanding Applications**
- **A Wide Range Of Tubular Filter Elements Support Your Specific Application Eliminating Cartridge & Operator Costs**

[*Durco PC Tubular Filters Enable Continuous Submicron Filtration](#)

Durco TE Tubular Backwash Continuous Filter Systems Guide:



1. Durco TE Automatic Tubular Filters
2. Durco TE Tubular Backwash Filters
3. TE Design Features & Advantages
4. Durco TE1, TE2 & TE3 Systems
5. Durco TE3 Backwash Options
6. Durco Continuous Filtration Tubular Backwash Filters Technical Data
7. Durco Industrial Filtration Products

Durco Is The Industry Leader For Ultra-Reliable Continuous Process Stream Filtration With High Flow Rate And Automatic Backwash Options

[Durco PTE Lined Tubular Filters For Continuous Filtration Of Highly Corrosive Liquids](#)
[Durco PVC Tubular Filters For Filtration Of Water & Mildly Aggressive Liquids](#)

Ascension Industries has purchased & owns all records, drawings, bills of materials and support data for existing: **Duriron (DURCO), Aquacare, FSD Filter Presses, Pressure Leaf Filters & Pressure Nutsches, Tubular Filters & Enviro-Dri Sludge Dryers.** Ascension is the only authorized supplier of certified DURCO OEM Filters & Filter Parts.



1. Durco TE Automatic Tubular Filter Systems

Durco TE Tubular Filter Systems can be supplied with full automation packages to permit unattended continuous operation of the tubular backwash filtration system.

Automation is ideal for filters in remote locations where it is inconvenient to provide operator attention and it assures backwash cleaning of the filters when and only when it is necessary. Since backwashing is controlled by differential pressure or time, and only occurs when needed, you are assured of a continuous flow of filtered liquid, yet minimum backwash losses and waste handling.

The typical automation package includes an adjustable differential pressure switch, pneumatic valve actuators, solenoid valves, and a Programmable Logic Controller (PLC). The standard control package has a NEMA 4X rating. Other NEMA ratings are available as options.

Automatic Backwash Operation

As solids collect on the filter elements, the flow of liquid through the element is restricted. This causes an increase in differential pressure across the element and therefore between the inlet and outlet of the filter system. When the differential pressure reaches a preset level (normally 10-20 psi), the differential pressure switch signals the PLC to begin the backwash cycle. The PLC actuates the necessary valves to take the first filter element off stream and through the backwash cycle. The backwash flow occurs for a pre-determined time (typically 5-30 seconds for each filter element). As soon as the first element is cleaned and returned on stream, each of the remaining filter elements are backwashed individually and consecutively until all of the filters have been cleaned. The PLC then resets until backwash is again needed.

Additional Process Control Features And Optional Designs

PLC control permits flexibility of operation. If desired, the interval between backwash cycles for the system may be actuated by an adjustable time setting which will override the differential pressure switch. This assures that backwashing will occur on a regular basis.

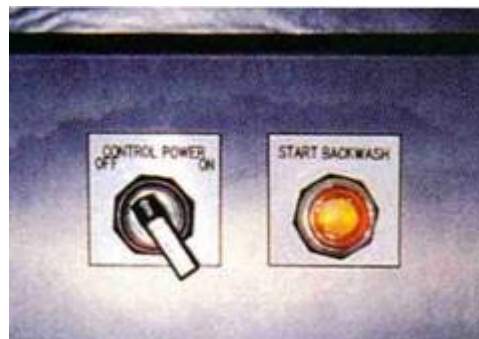
Each automatic backwash system is also equipped with a manual start switch which permits an operator to override the differential pressure switch or timer and start backwash at any time. Each unit is also furnished with a hand held programmer which allows you to adjust the backwash interval timer and backwash duration for each filter.

Backwash Automation Packages Can Be Provided With:

Terminal connections for interface with a Distributed Control System (DCS) or modification of the PLC program to interface with auxiliary equipment such as pumps, process valves, recorders, etc.

Also, our experienced automation engineers are well versed in programming of all major brands of PLC's, to accommodate Your specific preferences.

The standard automation package requires a 120 V/1 PH/60 Hz power supply (a step down transformer is an available option) and plant air supply of 80 psi for pneumatic actuators.



Programmable Logic Controller (PLC)
The standard control package has a NEMA 4X Rating.
Other NEMA Ratings available on request.

[Contact Durco Filtration Online](#)

2. Durco TE Tubular Backwash Filters

Providing Efficient, Low Cost Filtration

The Durco TE Tubular Filter Series is a family of tubular type, in-line pressure filters used for the separation of suspended solids from a liquid stream. The basic building block is the tubular filter which consists of two parts: the outer housing and a removable reusable filter element. TE Tubular Filters provide the flexibility to accommodate a wide variety of process filtration requirements.

Arrangements range from single tube, manually cleaned filters to multiple tubes connected to common manifolds for inlet, outlet, backwash and drain. Custom designs are available to meet your space, piping or process requirements. Multiple tube TE Filter Systems may be provided as a complete factory assembled package with PLC controlled operation of actuated valves to control backwashing of the system based on differential pressure or time. Durco TE Filters are available with wetted parts of T316 stainless steel as standard*.

*[Teflon Coated \(PTE\) Tubular Filters](#) are available for highly corrosive applications and [PVC Tubular Filters](#) are available for aqueous or mildly aggressive process streams. Other materials of construction are also available upon request. [Durco PC Tubular Filters enable submicron particle retention down to 0.1 micron.](#)

Typical Durco Tubular Filter Continuous Filtration Applications

Pulp & Paper: lean white water, starch, latex, coatings, transfer, ethanol, caustic, acids, bleaches, retention aids.

Oil & Gas: injection water, pump seal water, catalyst guard, completion fluids, MEA, DEA.

Utility: pump seal water, cooling tower, FGD.

Chemical: makeup water, transfer, product polish, guard, solvents, herbicides, pesticides.

Consumer Products: soaps, corn/fructose syrups, vegetable oils.

General Industry: cooling water, aqueous cleaners, acids, boiler feed, city water, well water, machine oil, coolants.

Common TE Tubular Filter Uses Include:

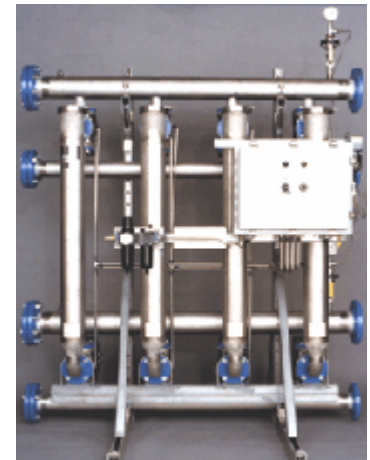
- Cooling liquid to protect spray nozzles.
- Pump seal water to extend seal life.
- Lean white water filtration for process reuse.
- Paper coating filtration to maintain finish quality.
- Protection from tramp solids during transfer of process liquids or finished liquids.
- Pre-filters to membrane filters.
- Produced and injection water in oil and gas drilling.

Reusable Elements Enhance Waste Minimization

- As the need to minimize liquid and solid waste grows, Durco TE Filter Systems provide solutions to several problems. The reusable filter elements and media are designed for long life.
- In many applications Durco TE Filters can replace expensive disposable cartridges and the solid waste they create.
- Adjustable automatic backwash cycles permit minimization of backwash losses.
- **The Durco Backwash Conservation System** (see page 7) permits recovery of valuable product and eliminates possible waste disposal problems.

Eliminate Expensive Cartridge & Operator Costs For High Flow Rate, Low Solids Loadings, Continuous Flow Applications

Contact Durco Filtration To Discuss Your Specific Application With An Engineer



Durco TE3 Tubular Filter with Automatic Backwash System



3. Durco TE Tubular Backwash Filters Design Features & Advantages

Easy Access

Quick opening top closure permits easy removal of filter element. No piping disconnections, no tools required.

Reusable Filter Elements

Durable, reusable tubular filter elements provide long term use resulting in lower overall operating cost, minimal handling and disposal problems. A wide variety of filter media is available to meet practically every requirement.

Positive Seal

O-ring seals have been incorporated into the TE Tubular Filter design at two critical points.

1. The top cover seal ensures leak proof sealing of the tubular filter vessel.
2. O-ring seal and metal to metal seat ensure positive element sealing and prevent bypass to 150 psi differential pressure.

Size and Capacity

The Durco TE Tubular Filter is available in 3", 4" and 6" diameters
Manifolding of filters together allows flow capacities from 1 to over 5,000 gpm.

Automatic Operation

Durco TE Tubular Filter Systems are available with state-of-the-art PLC automation or DCS interface
Automatic Backwash is initiated on pressure drop across filters, time or remote signal.

Continuous Uninterrupted Filtration

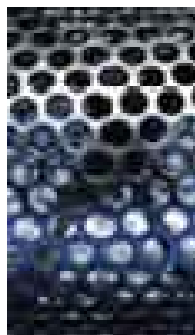
Durco TE Multiple Tubular Filter Systems can provide continuous, uninterrupted flow. Individual filter units can be isolated by valving to allow cleaning or inspection. Flow is maintained through other units.

Ultra-Reliable Continuous Filtration

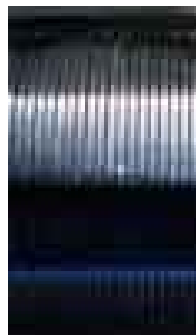
Durco TE tubular filters provide a truly industrial-duty tubular filter system made from corrosion resistant T316 stainless steel or optional T316L extra low carbon stainless steel. The 2-way and 3-way plug valves, or T316 inline full ported 3-way ball valves and the state-of-the-art automation package further assure optimal operating performance.

Typical Tubular Filter Element Types

Perforated



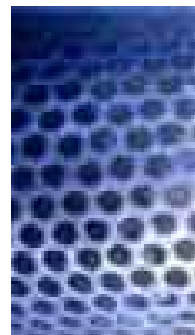
Slotted



Wire Mesh



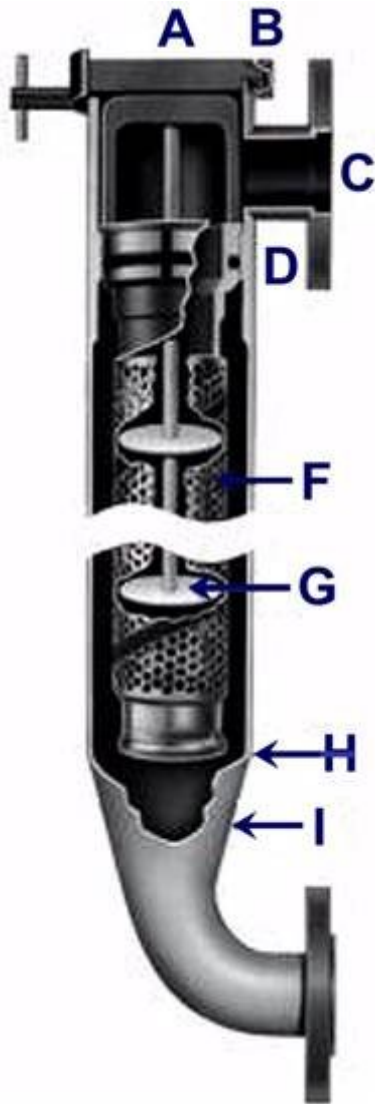
Fabric



Particle Retention From 3/16" Particle Size To 1 Micron (Nominal)

Durco PC Technology Enables Particle Retention To 0.1 Micron – Contact Durco For More Information

3. Durco Tubular Backwash Filters Design Features & Advantages (contd.)



A - Quick open V-band top closure for easy element removal. (See photos A 1, A2, A3 below)



ASME flanged top is available as option.

B - "O" Ring Seal assures a positive leak-proof seal.

C - 150 # ANSI flange is standard. Others available on request. Flanged, threaded or quick disconnect fittings are available at both inlet and outlet.

D - "O" ring seal assures no bypass to 150 psi differential pressure across unit.

E - Optional inlet and outlet pressure gauges. (not shown)

F - Reusable perforated base tubular filter element can be easily cleaned by standard backwashing, or manual cleaning.

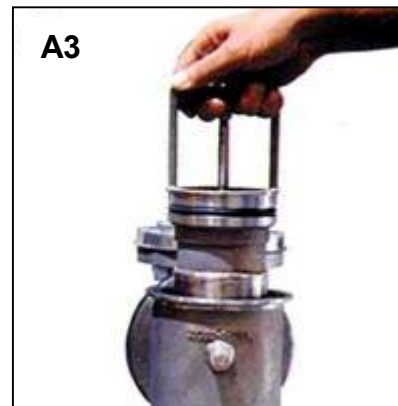
G - Optional diffuser for superior backwashing.

H - Corrosion resistant construction. T316 stainless steel or T316L extra low carbon stainless steel are standard materials. Others are available upon request.

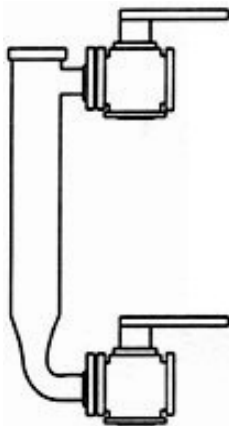
I - Standard unit is designed for 200 psi. Single filters available to 1,000 psi. Higher pressures available.



Note: Durco filter housing remains in the piping, no tools required.



4. Durco Tubular Backwash Filters TE1, TE2, & TE3 Tubular Filter Systems



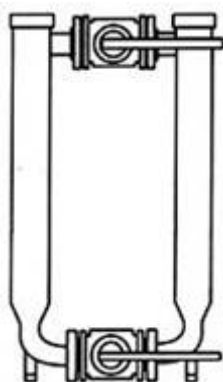
Durco TE1 Single Tube Tubular Filters

The Durco TE1 Single Tube Tubular Filter is ideal for a wide variety of industrial applications from straining to fine polish filtration.

The standard TE1 Single Tube Tubular Filter is available in a variety of sizes ranging from 85 to 594 in², to handle flow rates from under 1 to over 300 gpm.

A broad selection of tubular filter media is available to handle levels of separation from 3/16" particle size to 1 micron (nominal).

◀ TE1 Tubular Filter shown with optional recommended inlet and outlet valves.



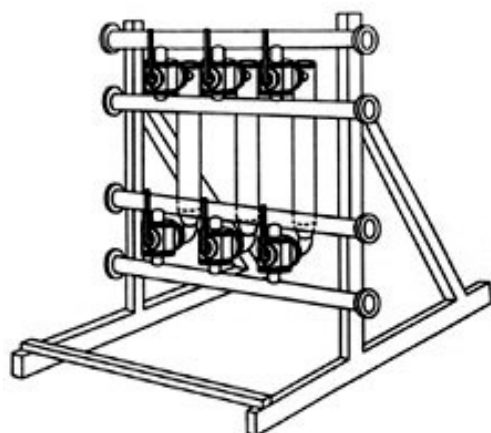
Durco TE2 Dual Tube Tubular Filter Systems

The Durco TE2 Dual Tube Tubular Filter System extends the role of the TE1 to permit continuous filtration.

The Durco TE2 Dual Tube Tubular Filter arrangement consists of two filter units connected valves. One filter unit operates (on stream), while the other unit is on standby, or off stream to allow cleaning or inspection.

The TE2 Dual Tube Tubular Filter System is typically rated for the same flow capacity as the TE1 Single Tube Filter, however, the capacity can be increased with optional valve arrangements.

◀ TE2 Tubular Filter units shown with optional drain connections.



Durco TE3 Multiple Tube Tubular Filter Systems

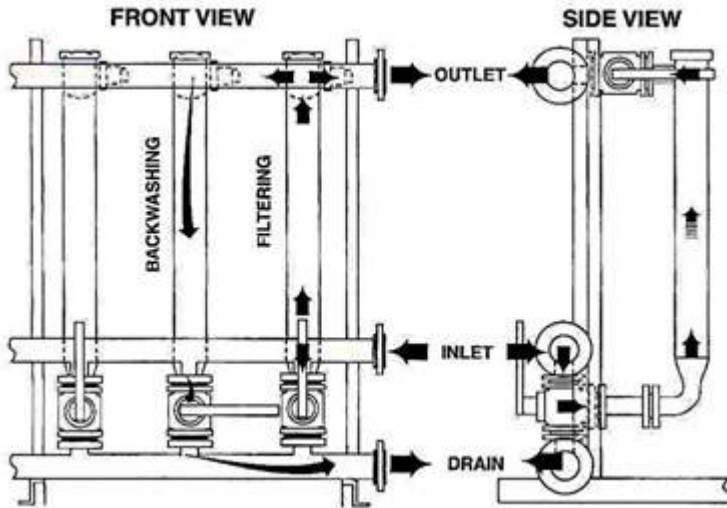
The Durco TE3 Multiple Tube Tubular Filter System offers flow capacities as high as 5,000 gpm by manifolding multiple filters together for parallel operation.

The TE3 Multiple Tube Tubular Filter System can provide continuous uninterrupted flow with automatic intermittent cleaning of the filter elements during backwashing.

Durco TE3 systems are sized to maintain flow capacity while one unit is off stream for backwashing.

Several manifolding arrangements are made to permit backwashing with the process stream (internal) and/or another stream (external). Backwash losses can be controlled by an optional reclaim arrangement referred to as the **Backwash Conservation System** (see page 7).

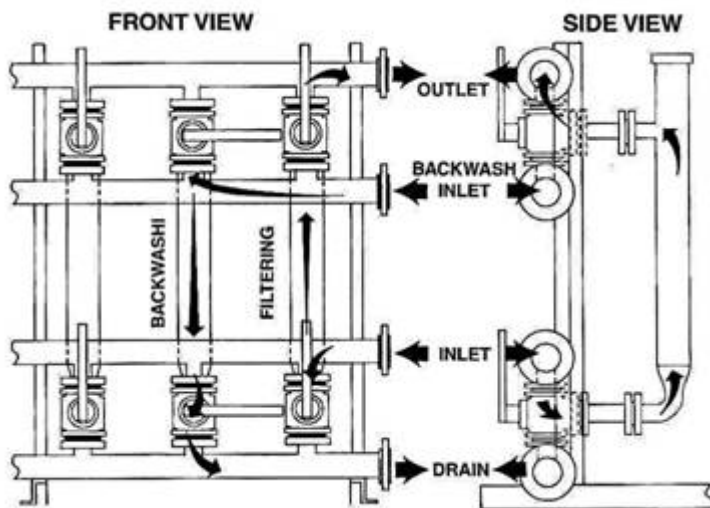
5. Durco TE Tubular Backwash Filters TE3 Filter System Backwash Options



Internal Backwash

Internal backwash utilizes the system's filtrate to clean the filter. By changing the lower valve from the inlet to the drain position on one filter unit, a portion of the filtrate from the remaining on-stream units flows in the reverse direction through the backwashing unit to dislodge collected solids. Each unit is backwashed in turn, individually and consecutively to return the system to a clean condition.

Internal backwash should be considered when the process stream is of sufficient flow and pressure to ensure an adequate backwash and when the process stream is inexpensive and does not create a disposal problem.



External Backwash

External Backwash uses a clean, secondary stream, typically plant water, supplied by an additional header to clean the filter. By rotating the upper valve to the backwash position and the lower valve to the drain position, the filter unit is cleaned by a reverse flow of the external stream.

During backwashing a continuous uninterrupted process flow can be maintained by the remaining on-stream units.

External backwash should be considered when the process stream is not of sufficient flow and pressure to assure an adequate internal backwash and/or when the process stream is valuable or creates a disposal problem.

Durco Backwash Conservation System

Durco TE Tubular Filter Systems equipped with the Backwash Conservation System recover a significant portion of the process liquid contained in the filter units which is normally consumed during backwashing.

How It Works

Before the tubular filter enters the backwash sequence, the process liquid in the filter unit is drained through an additional reuse header on the bottom of the filter and directed back to the feed tank or to a recovery tank.

The tubular filter unit is then backwashed, filled with process liquid and returned on stream before the sequence indexes to the next filter unit.

Contact Durco Filtration For Help In Designing Your Optimum Filtration System





6. Durco TE Tubular Backwash Filters Technical Data

FILTER MODEL	UNIT SIZE	UNIT INLET & OUTLET	SYSTEM INLET & OUTLET	NUMBER OF FILTER UNITS	FILTER ELEMENT DIMENSIONS (DIA.xL)	FILTER AREA
		inch (mm)	inch (mm)		inch (mm)	inch (mm)
MODEL TE1 SINGLE	3	1½ (40)	1½ (40)	1	2¼ x 12 (57 x 305)	85.0 (0.055)
	3	1½ (40)	1½ (40)	1	2¼ x 18 (57 x 457)	12.0 (0.077)
	3	1½ (40)	1½ (40)	1	2¼ x 24 (57 x 610)	169.8 (0.110)
	3	1½ (40)	1½ (40)	1	2¼ x 36 (57 x 914)	254.3 (0.164)
	4	2 (50)	2 (50)	1	3¼ x 18 (83 x 457)	183.3 (0.119)
	4	2 (50)	2 (50)	1	3¼ x 36 (83 x 914)	367.5 (0.237)
	4A*	3 (80)	3 (80)	1	3¼ x 18 (83 x 457)	183.8 (0.119)
	4A*	3 (80)	3 (80)	1	3¼ x 36 (83 x 914)	367.5 (0.237)
MODEL TE2 DUAL	6	3 (80)	3 (80)	1	5¼ x 36 (133 x 914)	594.0 (0.383)
	3	1½ (40)	1½ (40)	2	2¼ x 12 (57 x 305)	170.0 (0.110)
	3	1½ (40)	1½ (40)	2	2¼ x 18 (57 x 457)	240.0 (0.155)
	3	1½ (40)	1½ (40)	2	2¼ x 24 (57 x 610)	339.6 (0.219)
	3	1½ (40)	1½ (40)	2	2¼ x 36 (57 x 914)	508.6 (0.328)
	4	2 (50)	2 (50)	2	3¼ x 18 (83 x 457)	367.6 (0.237)
	4	2 (50)	2 (50)	2	3¼ x 36 (83 x 914)	735.0 (0.474)
MODEL TE3 MULTIPLE	6	3 (80)	3 (80)	2	5¼ x 36 (133 x 914)	1188.0 (0.766)
	4	2 (50)	4 (100)	2	3¼ x 36 (83 x 914)	735.0 (0.474)
	4	2 (50)	4 (100)	3	3¼ x 36 (83 x 914)	1102.5 (0.711)
	4	2 (50)	4 (100)	4	3¼ x 36 (83 x 914)	1470.0 (0.948)
	4	2 (50)	4 (100)	5	3¼ x 36 (83 x 914)	1837.5 (1.185)
	4	2 (50)	6 (160)	6	3¼ x 36 (83 x 914)	2205.0 (1.422)
	4	2 (50)	6 (160)	8	3¼ x 36 (83 x 914)	2940.0 (1.896)
	4	2 (50)	6 (160)	10	3¼ x 36 (83 x 914)	3675.0 (2.370)
	4	2 (50)	8 (200)	12	3¼ x 36 (83 x 914)	4410.0 (2.844)
	4	2 (50)	8 (200)	14	3¼ x 36 (83 x 914)	5145.0 (3.319)
	4	2 (50)	8 (200)	16	3¼ x 36 (83 x 914)	5880.0 (3.793)
	6	3 (80)	8 (200)	6	5¼ x 36 (133 x 914)	3564.0 (2.299)
	6	3 (80)	8 (200)	7	5¼ x 36 (133 x 914)	4158.0 (2.682)
	6	3 (80)	8 (200)	8	5¼ x 36 (133 x 914)	4752.0 (3.065)
	6	3 (80)	8 (200)	9	5¼ x 36 (133 x 914)	5346.0 (3.448)
	6	3 (80)	8 (200)	10	5¼ x 36 (133 x 914)	5940.0 (3.831)
	6	3 (80)	10 (254)	11	5¼ x 36 (133 x 914)	6534.0 (4.214)
6	3 (80)	10 (254)	12	5¼ x 36 (133 x 914)	7128.0 (4.598)	
6	3 (80)	10 (254)	13	5¼ x 36 (133 x 914)	7722.0 (4.985)	
6	3 (80)	10 (254)	14	5¼ x 36 (133 x 914)	8316.0 (5.364)	

* 3 inch inlet and outlet connections. Metric dimensions are approximate

To identify a filter use the Model Number, Body Size, Element Diameter x Length (i.e. TE1 3-2¼ x 12)

7. Durco Industrial Filtration Product Lines

[Pressure Leaf Filters](#)

[Tubular Backwashing Filters](#)

[Pressure Nutsches](#)

[Filter Presses](#)

[Sludge Dryers](#)