Flowplane™ Linear Filtration Technology

Enabling next-generation cleanliness and contamination control performance in advanced technology node applications

To meet industry demands to reduce defects, semiconductor fabs have historically had to trade off between small particle removal efficiency and high flow rate performance. This is no longer a problem with the introduction of Entegris' FlowPlane™ linear filtration technology. The ultra clean linear filter design enables faster start up times and reduced tool downtime. The unique rectangular form factor improves flow path, and the enhanced membrane ensures low on-wafer defect levels in critical cleaning processes.

Many advanced applications require a minimum flow rate to maintain maximum cleaning process performance. Traditional radial (round) filters with next-generation membranes inevitably can no longer meet those strict performance requirements. However, FlowPlane's design delivers up to 2X the flow rate performance of a similarly sized radial filter coupled with the best particle retention available.

FlowPlane is well suited for point-of-dispense (POD) applications (installed just before the nozzle) as well as outgassing applications that require space-constrained installation points. Moreover, the linear construction provides greater location flexibility within the tool. FlowPlane delivers the ultimate protection against particles and other defect-causing contaminants and an unparalleled level of contamination control performance.

Entegris

APPLICATIONS

- Sub-2X technology nodes
- Point of dispense/final filtration near the dispense head for next-generation processes
- Space-constrained environments requiring high-efficiency filtration performance

FEATURES & BENEFITS

|	
Optimized linear filter design	Up to 2X increase in flow rate compared to similar size devices
	Lowest hold up volume
	40% space savings compared to existing designs
Standard size and port configuration	Easy retrofit with existing device footprints
Enhanced filter cleanliness	Faster flush-up reduces tool downtime
	Reduced particle counts
Flexible installation orientation	U-line and in-line filter configurations
	Mount at any angle without compromising venting capability in outgassing applications
Compact device size for POD filtration	POD filtration reduces defects and improves yield

SPECIFICATIONS

FlowPlane Linear Technology

|		
Materials of construction	Membrane	Prewet, nondewetting PTFE
	Supports, shell	PFA
Retention rating	7 nm, 2 nm, and <1 nm	
Surface area	0.46 m² (4.00")	0.75 m² (6.00")
Maximum operating conditions	Maximum operating pressure: 0.58 MPa (5.8 bar, 84 psi) @ 25°C (77°F) 0.10 MPa (1.0 bar, 14 psi) @ 200°C (392°F)	
	Maximum operating temperature: 200°C (392°F)	
Clean	UCM-10: Metallic extractables, TOC, Cl, F, NVR	
	UCM-5SE: Metallic extractables, NVR	

Note: All FlowPlane product configurations are PFOA free.

## PERFORMANCE DATA

Torrento X 7 nm

4" Flowplane Curves

⅜" fitting

½" fitting

Differential Pressure (kPa)

Flow Rate (L/min) — 1 cP @ 25°C (77°F)

6" Flowplane Curves

⅜" fitting

½" fitting

Differential Pressure (kPa)

Flow Rate (L/min) — 1 cP @ 25°C (77°F)
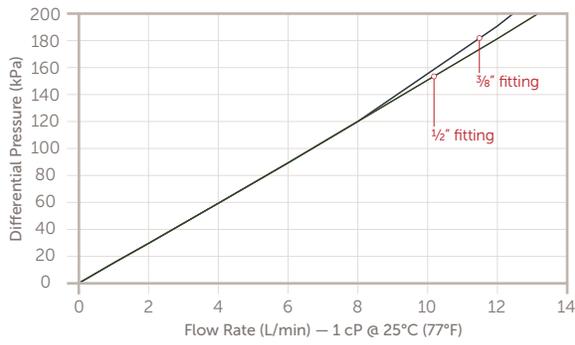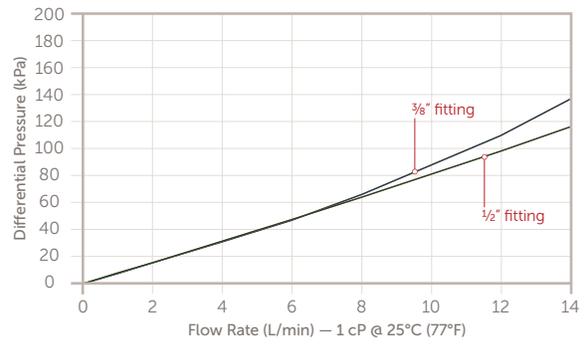
Torrento X 2 nm

4" Flowplane Curves

⅜" fitting

Differential Pressure (kPa)

Flow Rate (L/min) — 1 cP @ 25°C (77°F)

6" Flowplane Curves

⅜" fitting

Differential Pressure (kPa)

Flow Rate (L/min) — 1 cP @ 25°C (77°F)
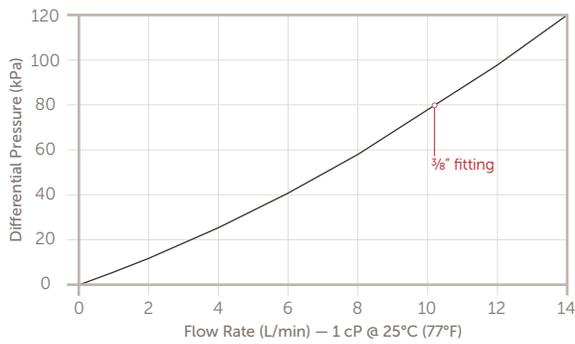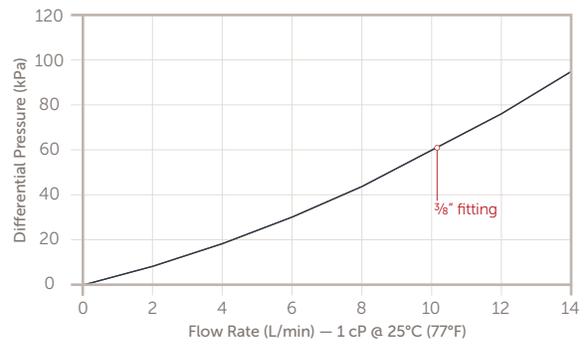
Torrento S <1 nm

6" Flowplane Curves

⅜" fitting

½" fitting

Differential Pressure (kPa)

Flow Rate (L/min) — 1 cP @ 25°C (77°F)
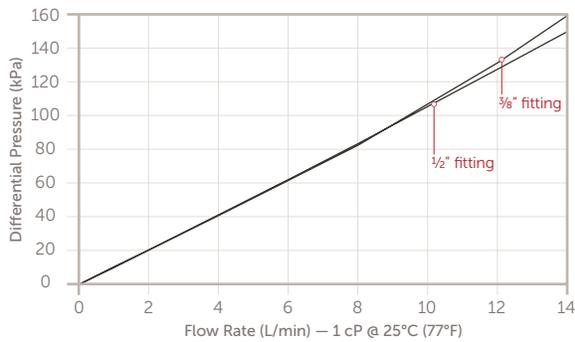
FlowPlane In-Line Filters

FlowPlane 4" In-Line Filter
1/2" S300 Inlet/Outlet and 1/4" S300 Vents
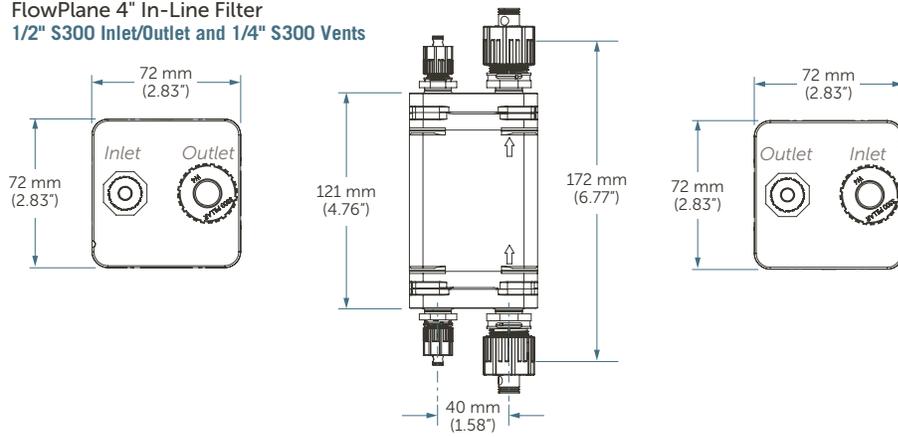
72 mm
(2.83")

72 mm
(2.83")

Inlet *Outlet*

121 mm
(4.76")

172 mm
(6.77")

40 mm
(1.58")

72 mm
(2.83")

72 mm
(2.83")

Outlet *Inlet*

FlowPlane 6" In-Line Filter
1/2" S300 Inlet/Outlet and 1/4" S300 Vents

72 mm
(2.83")

72 mm
(2.83")

Inlet *Outlet*

171 mm
(6.73")

222 mm
(8.74")

40 mm
(1.58")

72 mm
(2.83")

72 mm
(2.83")

Outlet *Inlet*

FlowPlane 4" In-Line Filter
3/8" S300 Inlet/Outlet and 1/4" S300 Vents

72 mm
(2.83")

72 mm
(2.83")

Inlet   *Outlet*

121 mm
(4.76")

167 mm
(6.58")

40 mm
(1.58")

72 mm
(2.83")

72 mm
(2.83")

Outlet   *Inlet*

FlowPlane 6" In-Line Filter
3/8" S300 Inlet/Outlet and 1/4" S300 Vents

72 mm
(2.83")

72 mm
(2.83")

Inlet   *Outlet*

171 mm
(6.73")

217 mm
(8.54")

40 mm
(1.58")

72 mm
(2.83")

72 mm
(2.83")
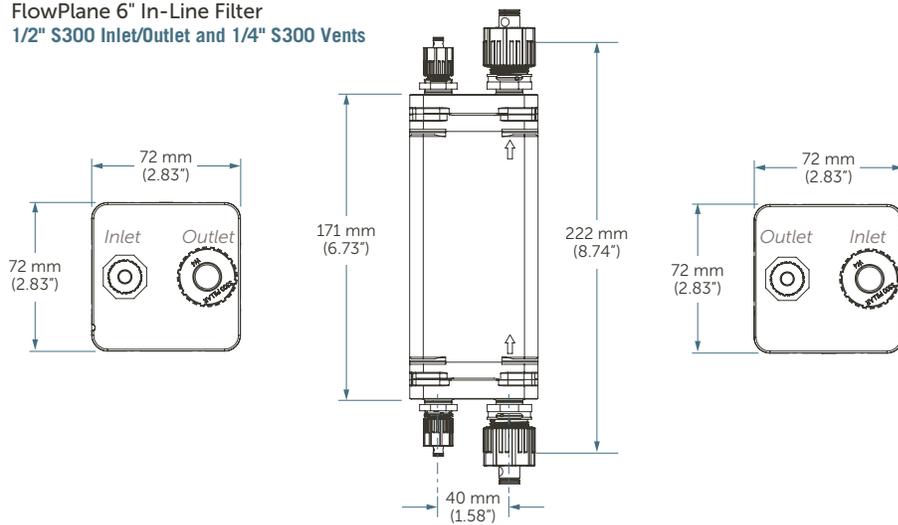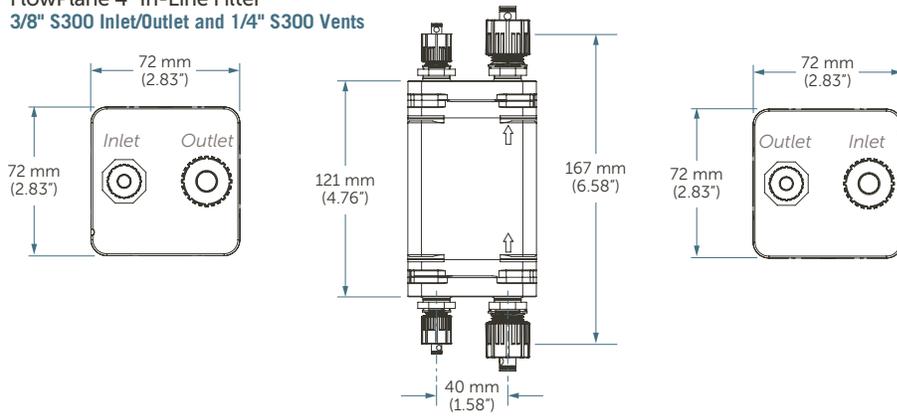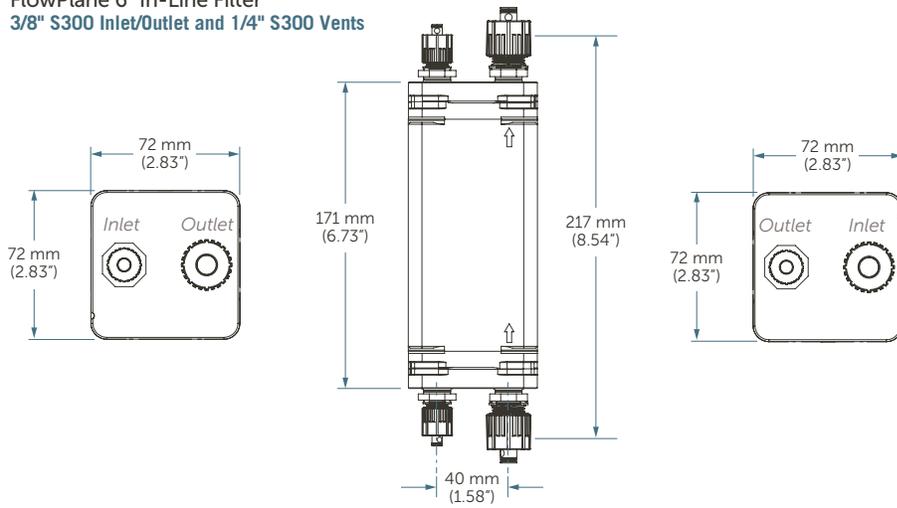
Outlet   *Inlet*

FlowPlane U-Line Filters

DIMENSIONS

FlowPlane 4" U-Line Filter
1/2" S300 Inlet/Outlet and 1/4" S300 Vents
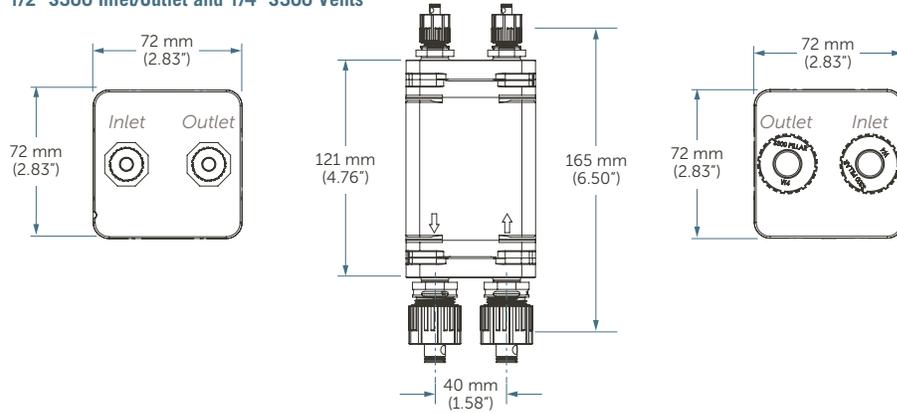
72 mm (2.83")	72 mm (2.83")
72 mm (2.83")	Inlet / Outlet
121 mm (4.76")	165 mm (6.50")
40 mm (1.58")	72 mm (2.83")
	Outlet / Inlet

FlowPlane 6" U-Line Filter
1/2" S300 Inlet/Outlet and 1/4" S300 Vents

72 mm (2.83")	72 mm (2.83")
72 mm (2.83")	Inlet / Outlet
171 mm (6.73")	215 mm (8.46")
40 mm (1.58")	72 mm (2.83")
	Outlet / Inlet

FlowPlane 4" U-Line Filter
3/8" S300 Inlet/Outlet and 1/4" S300 Vents

72 mm
(2.83")

72 mm
(2.83")

Inlet Outlet

121 mm
(4.76")

163 mm
(6.42")

40 mm
(1.58")

72 mm
(2.83")

72 mm
(2.83")
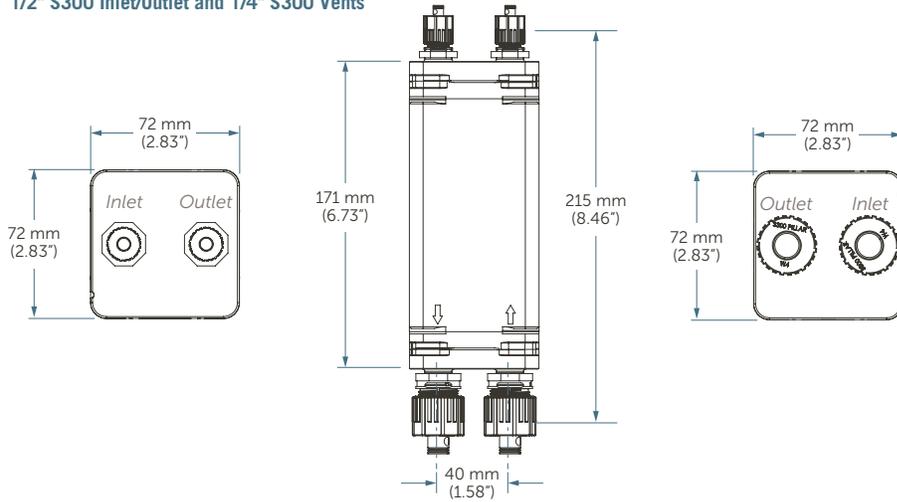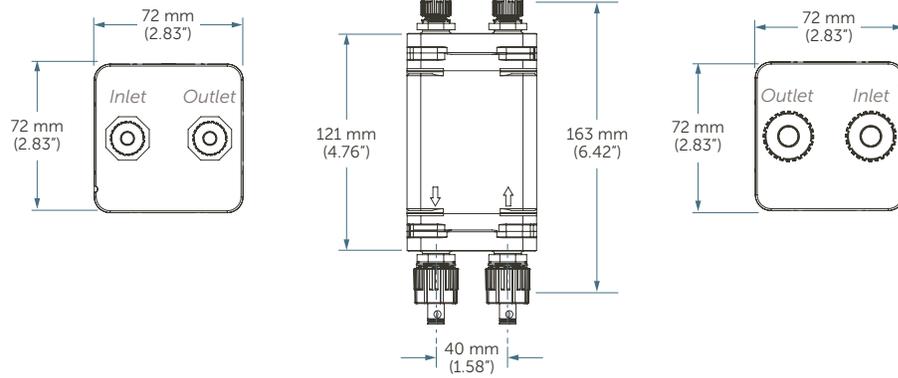
Outlet Inlet

FlowPlane 6" U-Line Filter
3/8" S300 Inlet/Outlet and 1/4" S300 Vents

72 mm
(2.83")

72 mm
(2.83")

Inlet Outlet

171 mm
(6.73")

213 mm
(8.39")

40 mm
(1.58")

72 mm
(2.83")

72 mm
(2.83")

Outlet Inlet
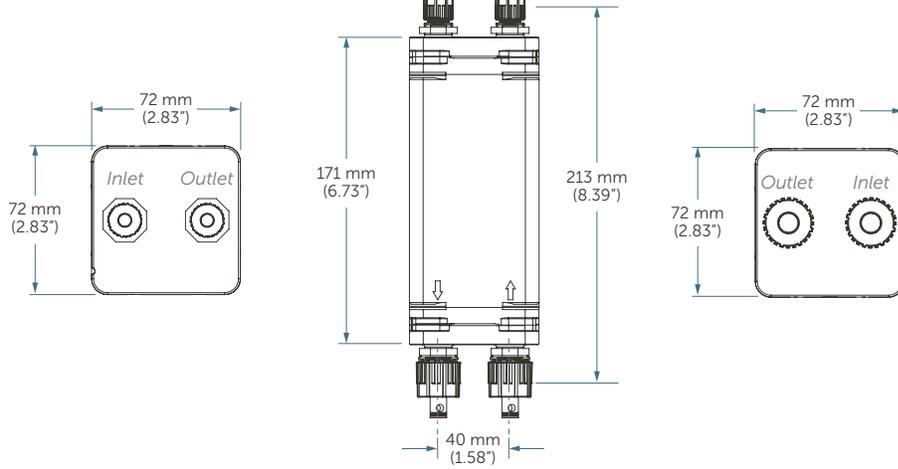
ORDERING INFORMATION

FlowPlane Linear Technology: part number

```
___ S ___ ___ ___ 0 0 ___ ___ ___ 1 S ___
```

Prewet option
P = DIW Prewet
B = IPA Prewet
D = Dry

Fitting type
S = Super 300
    Type Pillar®

Vent/drain fitting size
1 = ¼"

Inlet/outlet fitting size
1 = ¼"
2 = ½"
3 = ⅜"

Orientation
U = U-line
M = In-line male

Membrane area
P6 = 0.46 m²
P9 = 0.75 m²

Cleaning
E = UCM-10
G = UCM-5SE

Length
04 = 4" POD
06 = 6" POD

Retention rating
M = 7 nm
J = 2 nm
010 = Sub-1 nm

Size
S = POD

Membrane
TR = Torrento X
TS = Torrento S
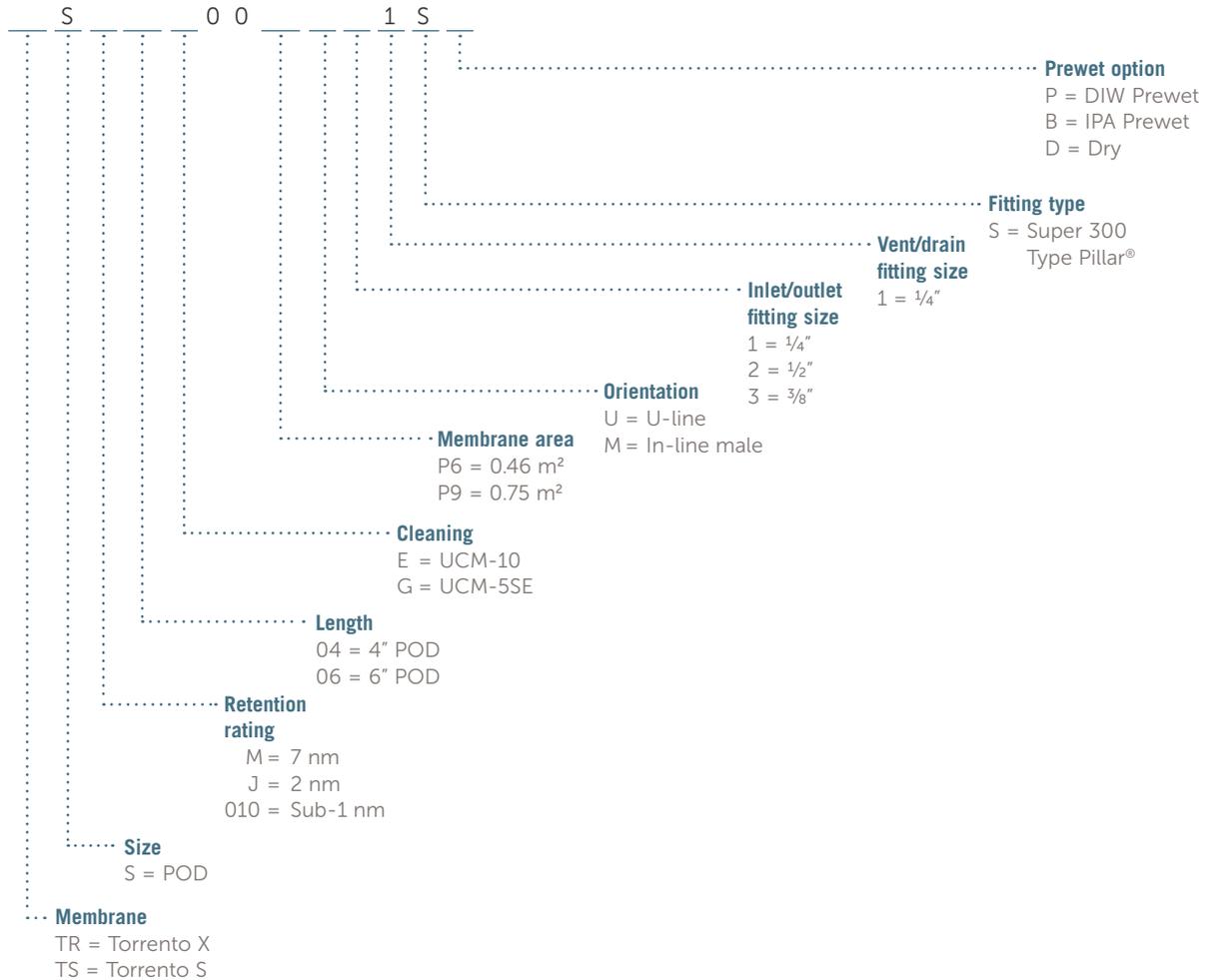
FOR MORE INFORMATION

Please call your Regional Customer Service Center today to learn what Entegris can do for you.
Visit entegris.com and select the Contact Us link to find the customer service center nearest you.

TERMS AND CONDITIONS OF SALE

All purchases are subject to Entegris' Terms and Conditions of Sale. To view and print this information, visit entegris.com and select the Terms & Conditions link in the footer.