



# TETPOR LIQUID Filters

- Liquid filters
- PTFE

TETPOR LIQUID filters are particularly suitable for sterilization and particulate removal from aggressive chemicals (including acids, bases and solvents) within a wide range of critical processing industries.

The superior performance, strength and durability of TETPOR LIQUID filters stems from the use of a single layer, high security PTFE membrane, which has a high dirt holding capacity due to its high voids volume. This results in low pressure drops and long service life.

High flow rates are achieved due to the optimized pleat pack density and the superior design construction of TETPOR LIQUID filters.

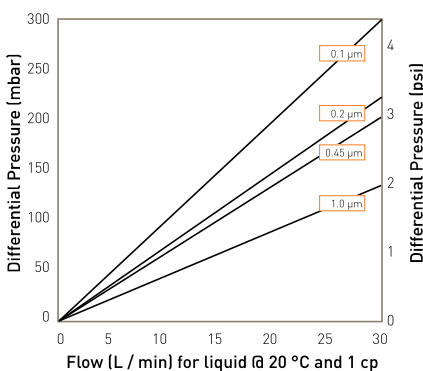
## Features and Benefits

- Superior chemical resistance of PTFE membrane combined with polypropylene hardware
- Integrity tested prior to despatch
- Validated to current ASTM F838 methodology
- Comprehensive range of end cap configurations for retrofitting

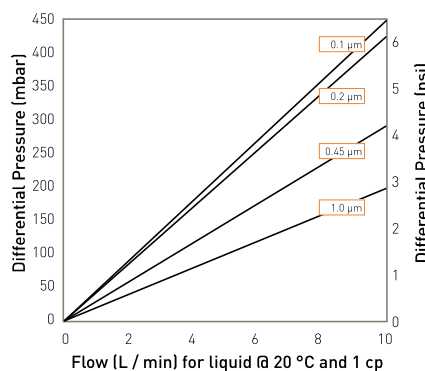


Note: TETPOR is a registered trademark of Parker Hannifin Corporation.

## Performance Characteristics



For K size for a given flow rate multiply 10" size differential pressure by 2



For A size for a given flow rate divide B size differential pressure by 2  
For E size for a given flow rate multiply B size differential pressure by 2

10" Size (250 mm) Cartridge

B Size (65 mm) Cartridge and Capsule

## Specifications

### Materials of Construction

- Filtration Membrane: PTFE
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene

#### Filter Cartridges

- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Caps Insert: 316L Stainless Steel
- \*Not available in B endcap variant
- Standard o-rings/gaskets: Viton

#### MURUS Disposable Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Standard o-rings/gaskets: Silicone
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone

#### DEMICAP Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps: Polypropylene
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone
- Filling Bell: Polycarbonate

### Recommended Operating Conditions

#### Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature		Max. Forward dP	
°C	°F	[bar]	[psi]
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.7	24.6

#### MURUS Disposable Filter Capsules

Up to 25 °C ( 77 °F) @ 5.5 barg (79.7 psig)  
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

*Parker Hannifin certify that this product complies with the current European Council Pressure Equipment Directive (PED) - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document. The Pressure Equipment Directive mandates that category SEP product cannot bear the CE mark.*

#### DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

### Effective Filtration Area (EFA)

10" (250 mm):	0.77 m <sup>2</sup>	(8.28 ft <sup>2</sup> )
K Size:	0.36 m <sup>2</sup>	(3.87 ft <sup>2</sup> )
A Size:	0.25 m <sup>2</sup>	(2.69 ft <sup>2</sup> )
B Size:	0.12 m <sup>2</sup>	(1.29 ft <sup>2</sup> )
E Size:	0.06 m <sup>2</sup>	(0.64 ft <sup>2</sup> )

### Sterilization

	Autoclave		Steam-in-Place	
	Cycles	Temp	Cycles	Temp
Cartridges	120	142 °C (287.6 °F)	120	142 °C (287.6 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	100	135 °C (275 °F)	-	-

TETPOR LIQUID filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker contact.

### Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

### Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

## Performance Characteristics

### TOC / Conductivity

The filtrate quality from a 10" (250 mm) TETPOR LIQUID conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity).

### Endotoxins

Aqueous extracts from the 10" (250 mm) TETPOR LIQUID contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

### Non-Volatile Extractables (NVE)

Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <5 mg.

### Pharmaceutical Validation

A full validation guide is available upon request from Laboratory Services Group (LSG).

### Oxidizable Substances

TETPOR LIQUID filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

### Integrity Test Data

All filters are integrity testable to the following limits when wet with 60 / 40 IPA / Water and using air as the test gas.

Micron Rating		0.1	0.2	0.45	1.0
<b>Filter Cartridges / MURUS / DEMICAP</b>					
Min. Bubble Point	(barg)	1.3	1.0	0.7	-
	(psig)	18.8	14.5	10.1	-
<b>Filter Cartridges / MURUS / DEMICAP</b>					
Diffusional Flow	(barg)	1.0	0.8	0.4	-
Test Pressure	(psig)	14.5	11.6	5.8	-
<b>Filter Cartridges / MURUS / DEMICAP</b>					
Max. Diffusional Flow (10") (ml / min)	(K)	27.0	18.0	18.0	-
	(A)	12.7	8.5	8.5	-
	(B)	9.0	6.0	6.0	-
	(E)	4.5	3.0	3.0	-
	(E)	2.3	1.5	1.5	-

### Retention Characteristics

TETPOR LIQUID filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838 methodology (10<sup>7</sup> organisms / cm<sup>2</sup> EFA minimum) with typical in-house challenge levels being 10<sup>11</sup> organisms per 10" (250 mm) filter cartridge.

## Ordering Information

### Cartridges

**ZCMT**  -

Code	Length (Nominal)	Code	Micron	Code	Endcap (10")	Code	Variant	Code	O-rings
B*	2.5" (65 mm)	010	0.1 µm	B*	dh DOE	L	Liquid	E	EPDM
A*	5" (125 mm)	020	0.2 µm	C	BF / 226 Bayonet	P	Pharmaceutical	P	PTFE Encapsulated Silicone
K	5" (125 mm)	045	0.45 µm	D	Fin / 222	S	Steam Sterilizable	S	Silicone
1	10" (250 mm)	100	1.0 µm	E	Flat Top / 222			V*	Viton
2	20" (500 mm)			G	Recess / 222				
3	30" (750 mm)			R	BF / 222 Bayonet				
4	40" (1000 mm)								

\* Supplied in packs of 3.

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

\* EPDM gaskets supplied as standard  
Note: Viton supplied as standard on all other endcap options.

\* Viton o-ring supplied as standard without having to specify the 'V' code.

### MURUS Capsules

**ZLMT**  -    -    -

Code	Length (Nominal)	Code	Micron	Code	Inlet Connection	Code	Outlet Connection	Code	Variant	Code	Grade	Code	Design	Code	O-rings
K	5" (125 mm)	010	0.1 µm	A	3/4" Tri-Clamp	A	3/4" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	L	In-Line	E	EPDM
1	10" (250 mm)	020	0.2 µm	B	1 1/2" Tri-Clamp	B	1 1/2" Tri-Clamp					T*	T-Port	S	Silicone
2	20" (500 mm)	045	0.45 µm	D	1" Hosebarb	D	1" Hosebarb					M**	Streamline Valve	V	Viton
3	30" (750 mm)	100	1.0 µm	T	1" Tri-Clamp	T	1" Tri-Clamp								
				H	1/2" Hosebarb	H	1/2" Hosebarb								

\* Only available with a 1" Tri-Clamp  
\*\* Not available with a 1" or 1.5" Tri-Clamp fittings

### DEMICALP Capsules

**ZEMT**  -    -

Code	Length (Nominal)	Code	Micron	Code	Inlet Connection	Code	Outlet Connection	Code	Variant	Code	Grade	Code	Pack N°	Code	Accessory
E	4.4" (113 mm)	010	0.1 µm	T	1" Tri-Clamp	T	1" Tri-Clamp	P	Pharmaceutical	N	Non-Sterile	3	Pack of 3	FB	Filling Bell
B	5.5" (140 mm)	020	0.2 µm	N	1/2" NPT Male	N	1/2" NPT Male								
A	7.9" (200 mm)	045	0.45 µm	H	1/2" Hosebarb	H	1/2" Hosebarb								
		100	1.0 µm	G	Stepped Hosebarb	G	Stepped Hosebarb								
				M	1/4" NPT Male	M	1/4" NPT Male								
				Q	Walther QC	Q	Walther QC								
				R	Grommel / QC	R	Grommel / QC								
				V	3/8" NPT Female	V	3/8" NPT Female								

E & B-Size  
G & H connections only