Industrial filtration

Metal Ion Purifier cartridges and disks

Thermo Scientific™ Metal Ion Purifier Cartridges and Disks are designed to reduce metal ions in high purity solvent systems to the sub 50 ppt level. Utilizing immobilized particle technology, which is comprised of either a strong acid cation exchange resin or a chelating ion exchange resin in a polyethylene matrix, Thermo Scientific metal ion purifiers provide effective, single pass reduction of metal ions from high and low viscosity resins and solvents, such as PGMEA, TMAH, BARC, and other lithography chemistries.

Applications in the microelectronics industry

- High purity chemicals
- Photolithography chemicals—solvents, resins, polymers

Features and benefits

Immobilized particle technology

- Effective reduction of metal ions to <50 ppt
- Higher capacity when compared to membrane purifiers

Long path length

- Tortuous path with high internal surface area
- Depth of the purification media provides increased residence time of fluid to ion exchange as compared to membrane purifiers

Fixed media matrix

- Eliminating channel formation associated with loose ion exchange media
- Efficient reduction of metal ions



Figure 1. Thermo Scientific™ Metal Ion Purifier APP Cartridges and Disks.



Figure 2. Thermo Scientific™ Metal Ion Purifier SCP Cartridges and Disks.

Thermo Scientific™ Metal Ion Purifier Cartridges water flow rate

Figure 3. Thermo Scientific™ Metal Ion Purifier (MIP): Water flow vs. differential pressure

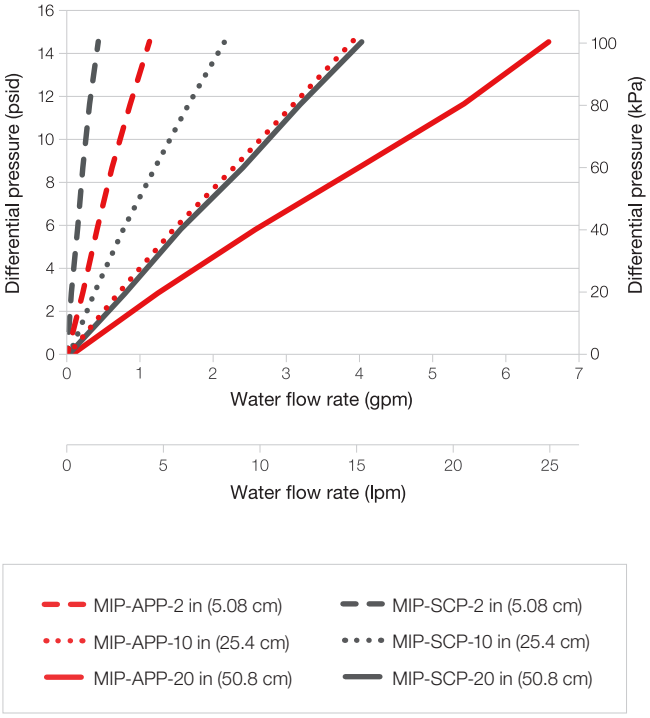
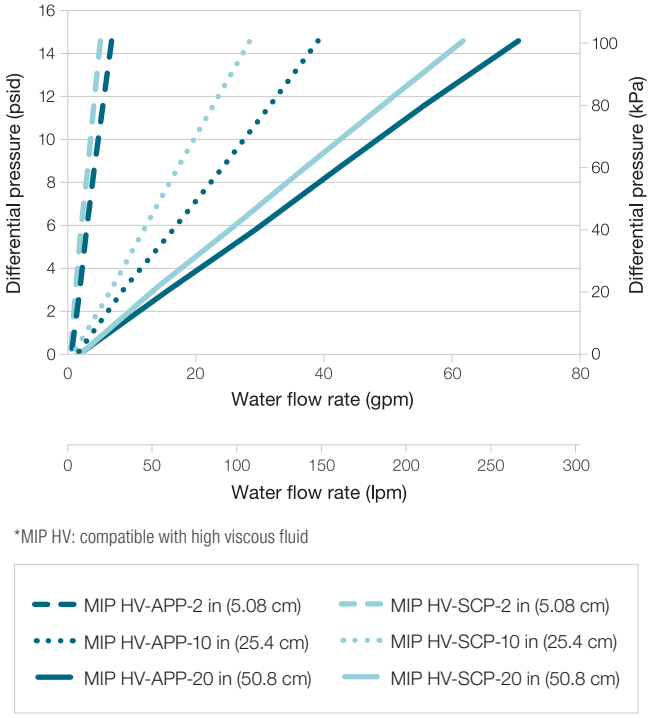


Figure 4. Thermo Scientific™ Metal Ion Purifier (MIP HV)*: Water flow vs. differential pressure



*MIP HV: compatible with high viscous fluid

Specifications

10 in (25.4 cm) cartridge	Thermo Scientific™ Metal Ion Purifier (MIP)		Thermo Scientific™ Metal Ion Purifier (MIP HV)*	
	SCP	APP	SCP	APP
Materials of construction				
Binder resin	Ultrahigh molecular weight polyethylene (UHMWPE)			
End caps	High density polyethylene (HDPE)			
O-rings	PTFE encapsulated fluoropolymer			
Ion exchange	Strong acid cation exchange resin	Chelating resin amino phosphate	Strong acid cation exchange resin	Chelating resin amino phosphate
Operating conditions				
Maximum forward differential pressure	40 psid (2.8 bar; 275.8 kPa)			
Maximum operating temperature	140°F (60°C)			
Recommended flow rate per 10 in (25.4 cm): 1 cP = 0.001 Pa.s fluid				
@ 2.9 psid (20 kPa)	0.9 gpm (3.5 lpm)		6.6 gpm (25 lpm)	
Typical metal ion exchange (mEQ) capacity (static method)				
47 mm disk	8.2	11	3.9	4.7
2 in (5.08 cm) cartridge	100	130	39	46
10 in (25.4 cm) cartridge	510	710	190	237
20 in (50.8 cm) cartridge	960	1300	367	454
Metal reduction				
Effective reduction of metal ions to	<50 ppt		<1000 ppt	

* HV—high viscosity compatible grade

Thermo Scientific™ Metal Ion Purifier Cartridges cross sections

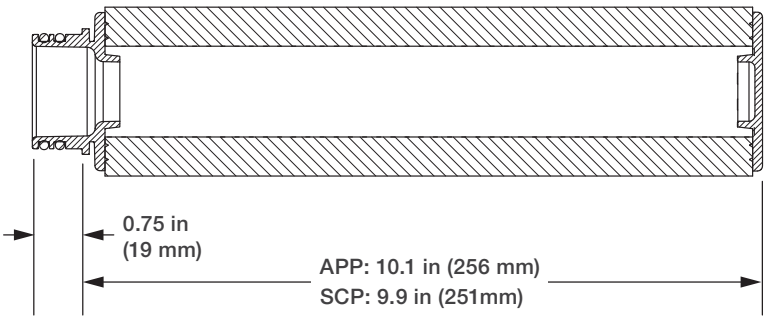


Figure 5. 10 in (25.4 cm) cartridge.

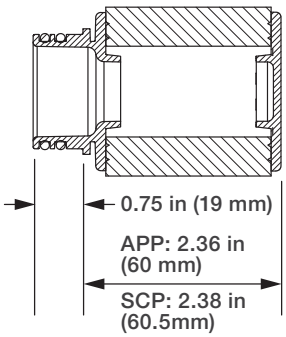


Figure 6. 2 in (5.08 cm) cartridge.

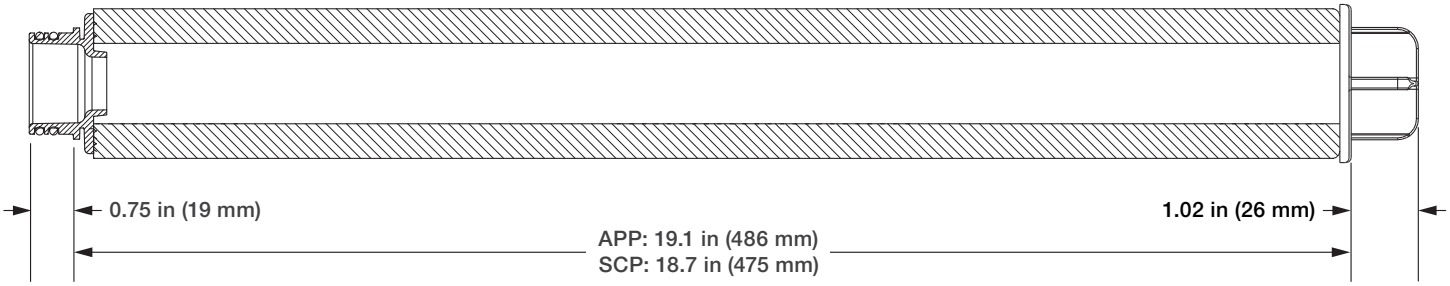


Figure 7. 20 in (50.8 cm) cartridge.

Ordering information

Grade	Product code	Cartridge size		End modification		Gasket/O-ring		Media type	
		Code	Length	Code	Connection	Code	Material	Code	Media
Ultra high purity grade	MIR	DA47	47 mm*					APPD	Amino phosphoric
	MIRE	0020	2 in (5.08 cm)	F	222 O-ring and flat cap	K	PTFE encapsulated fluoropolymer	SCPD	Strong acid cation
		0100	10 in (25.4 cm)						
		0200	20 in (50.8 cm)	H**	222 O-ring and spear cap				
High purity grade for high viscous fluid	MIRHV	DA47	47 mm*					APPD	Amino phosphoric
	MIREHV	0020	2 in (5.08 cm)	F	222 O-ring and flat cap	K	PTFE encapsulated fluoropolymer	SCPD	Strong acid cation
		0100	10 in (25.4 cm)						
		0200	20 in (50.8 cm)	H**	222 O-ring and spear cap				

* 47 mm disks are sold in three in a box ** Only available in 20 in (50.8 cm)

Ordering examples:

- **MIRDA47APPD:** 47 mm Thermo Scientific™ Metal Ion Purifier APP Media Disks
- **MIRHVDA47APPD:** 47 mm Thermo Scientific™ Metal Ion Purifier APP Media Disks suitable for high viscous fluid
- **MIRE0020FKSCPD:** 2 in (5.08 cm) Thermo Scientific™ Metal Ion Purifier SCP Cartridges with 222 connector, flat cap and PTFE encapsulated fluoropolymer
- **MIRE0100FKAPPD:** 10 in (25.4 cm) Thermo Scientific™ Metal Ion Purifier APP Cartridges with 222 connector, flat cap and PTFE encapsulated fluoropolymer
- **MIREHV0200HKSCPD:** 20 in (50.8 cm) Thermo Scientific™ Metal Ion Purifier SCP Cartridges with 222 connector, spear cap and PTFE encapsulated fluoropolymer suitable for high viscous fluid

Thermo Scientific™ Lab Scale Filter Housing INLINE Series

47 mm and 2-inch PTFE filter housings are designed to meet the precise requirements of semiconductors and electronics applications for laboratory screening. All wetted surfaces are PTFE, ensuring wide thermal and chemical compatibility with photoresists, developers, acids, bases, and solvents. A low hold-up volume filter housing allows material suppliers and end users to assess parameters such as material compatibility, photo-speed, trace metals removal, extractables, and particle retention testing. The low hold-up volume also reduces chemical handling and hazardous waste disposal.

The housing's female NPT connections allow the end user to adapt to different fitting connections for ease of service in their system.



Specifications

Description	47 mm	2 in (52 mm)
Model number	**INLINE47-TE-T-U**	**1ZMRA02-TE-U**
Overall height	2 in (52 mm)	5.5 in (140 mm)
Diameter	3 in (75 mm)	4.7 in (120 mm)
Fitting connections	1/4 in (6.35 mm) FNPT	
Material construction	PTFE	
Maximum operating pressure	30 psig @ 122°F (200 kPa @ 50°C)	60 psig @ 122°F (410 kPa @ 50°C)
Maximum operating temperature	122°F (50°C)	
O-ring	PTFE	EPDM

Ordering information

Model number	Description
INLINE47-TE-T-U	Thermo Scientific™ Lab Scale Filter Housing INLINE Series, 47 mm PTFE with 1/4 in (6.35 mm) FNPT, 1 ea/case
1ZMRA02-TE-U	Thermo Scientific™ Lab Scale Filter Housing INLINE Series, 2 in (52 mm) PTFE with 1/4 in (6.35 mm) FNPT, 1 ea/case

Intended Use and Product Selection: Thermo Scientific Metal Ion Purifiers are intended for use in industrial purification applications of aqueous and non-aqueous fluids in accordance with the applicable product instructions and specifications and where materials of construction are compatible. Since there are many factors that can affect a product's use, the customer and user remain responsible for determining whether the Thermo Scientific product is suitable and appropriate for the user's specific application, including user conducting an appropriate risk assessment and evaluating the Thermo Scientific product in user's application.

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