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Betafine™ T Series Cartridge Filters

The Betafine T cartridge, formerly known as TSM, is a durable and versatile pleated media cartridge offering the ultimate in submicron filtration. Long life, high flow rates and excellent particle retention makes the Betafine T cartridge an excellent choice either for a prefilter to membrane filters or for final filtration.

Charge modification enhances the particle removal efficiency of the nominally rated Betafine T filter. Contaminants too small to be mechanically strained are electrokinetically adsorbed by the Betafine T media. Because it is a depth filter, the tortuous matrix allows for high contaminant loading capabilities.

Betafine T filter cartridges are available in two grades, 050TG and 100TG with particle retention ratings of 0.5 µm and 1.0 µm respectively based upon their mechanical straining efficiencies. The design of Betafine T filters provide excellent solutions for high performance removal of fine solids from high flowing liquids. Materials of construction provide broad chemical compatibility.



Applications

The Betafine T cartridge can be applied to many filtration applications. It can be used to solve numerous fluid contamination problems. Below is a partial listing of typical applications.

Beverages

- Final polishing of distilled spirits

Food Processing

- Catalyst and microbial removal, polishing filter prior to bottling

Cosmetics

- Perfumes and aftershave lotions, assuring stability and shelf life through removal of colloidal haze and bacteria

Chemical

- Catalyst removal, photographic solutions and magnetic tape coatings filtration

Air and Gas

- Air filtration and particle contamination removal from various gases

Fluid Power

- Hydraulic fluids

For more information contact:

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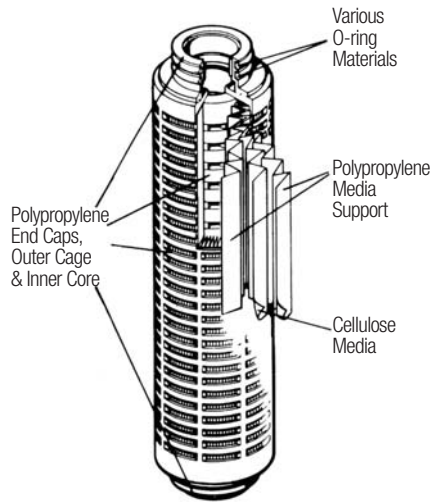
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The 3M logo, consisting of the letters '3', 'M', and 'M' in a bold, red, sans-serif font.

Standard Cartridge



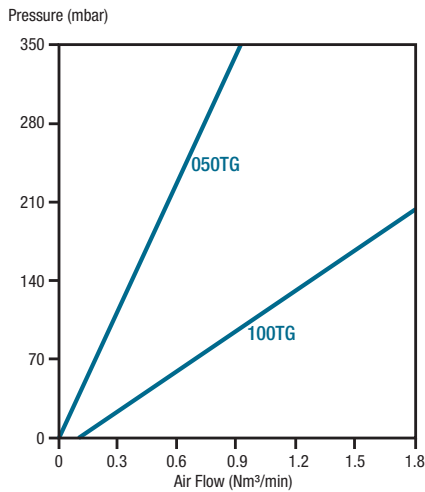
Cartridge Construction

The Betafine T cartridge is constructed with a pleated media composed of cellulose and inorganic filter aids completely free of asbestos or glass microfibers. Cartridges core, case, end caps and media support mesh materials are polypropylene.

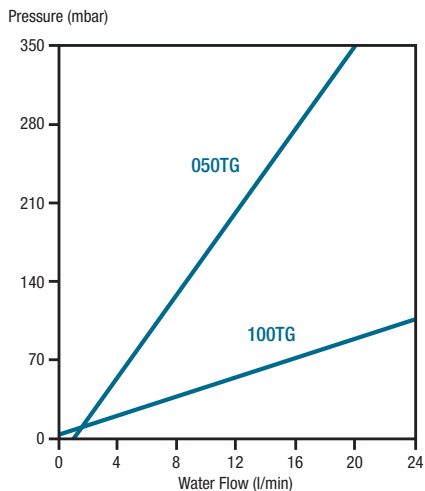
Multiple cartridge lengths of various end cap styles are produced by thermal bonding to eliminate the need for adapters. No adhesives are used in the cartridge assembly process. All materials used are FDA listed in the CFR 21 for food contact.

Operating Conditions	
Maximum Continuous Operating Temperature:	85 °C
Maximum Operating Differential Pressure:	3.5 bar at 25 °C
Sterilisation:	autoclaving (121 °C, 30 min.)
	in line steaming (126 °C, 30 min.)
	chemical sterilisation
Rinsing:	30 litres per 10" cartridge

Air Flow Rate Betafine T 050TG and 100TG Cartridges



Water Flow Rate Betafine T 050TG and 100TG Cartridges



Extractables

Inorganic and organic extractable levels for Betafine T cartridges are tabulated below. Cartridges were rinsed with 30 litres of deionized water and samples collected. Inorganic levels were determined by graphite furnace atomic absorption techniques and wet chemical analysis. Organic extractables were quantified by a low temperature carbon analyzer.

Inorganics	
Extractable levels	Substance
<1 ppb	Ca, Fe, Cr, Mn, Zn, Co, Al
<10 ppb	K, Ni, P04, NO3, F
<50 ppb	Si, Cu
<100 ppb	S04, HCO3
<500 ppb	Cl, Na
Organics	
Total Carbon and Total Organic Carbon	< 1.6 ppm
Purgeable Organic Carbon	< 1.0 ppb

Pyrogenicity

Testing by LAL Gel Clot methods after recommended rinsing procedures produce results of less than 1 EU/ml.

Maximum particle removal efficiency

The Betafine T cartridge is a highly efficient nominally rated filter. In addition to mechanical straining efficiencies, the Betafine T cartridge is charge modified to provide submicron filtration. Studies with AC Fine Test Dust have shown Betafine T cartridges will provide excellent particle retention and high contaminant-holding capacity. These results demonstrate the combined effects of electrokinetic and mechanical straining adsorption.

Test results						
Betafine T 100TG						
Flow Rate (l/min)	Pressure (bar)	Particle Removal Efficiency %				
		>0,5 µm	>1 µm	>10 µm	>20 µm	>25 µm
11.4	0.2	99.35	96.95	96.55	97.65	98.58
7.6	3.2	99.99	99.99	99.99	99.99	99.99
3.8	4.0	99.99	99.99	99.99	99.99	99.99
0.0	4.1	99.99	99.99	99.99	99.99	99.99
Betafine T 050TG						
Flow Rate (l/min)	Pressure (bar)	Particle Removal Efficiency %				
		>0,5 µm	>1 µm	>10 µm	>20 µm	>25 µm
11.4	0.3	99.64	99.89	99.95	99.98	99.99
7.6	2.3	99.99	99.99	99.99	99.99	99.99
3.8	3.7	99.99	99.99	99.99	99.99	99.99
0.0	4.1	99.99	99.99	99.99	99.99	99.99



Contaminant Holding Capacity per 10" element:

Betafine T 100TG – 225 grams

Betafine T 050TG – 260 grams

When used as a prefilter prior to membrane filtration, Betafine T cartridges can extend the useful life of the membrane significantly.

Betafine T 100TG is effective for prefiltration of 0.45 µm membrane and Betafine T 050TG is effective for prefiltration of 0.2 µm membrane.

Particulate matter

Betafine T cartridges have been examined for particulate matter that may be extracted during normal cartridge use. The test was designed using the USP XXI procedure for Particulate Matter in Injections as a guide. In all cases, the cartridges did not exceed the USP XXI limit of not greater than 50 particles per ml that are larger than or equal to 10 microns.

Cartridge specifications

Nominal filtration rate: 050TG = 0.5 µm
100TG = 1.0 µm

Filtration area: 0.56 m²

Betafine T media is manufactured according to the procedures described in 3M Purification's Drug Master Files on record at the National Center for Drugs and Biologics.

Betafine T media is non-toxic in accordance with USP Class VI systemic injection testing. Therefore, it is suitable for use as a prefilter in the processing of parenteral drug products in accordance with the FDA.

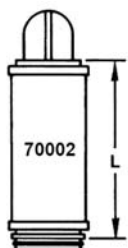
Basic Cartridge Design	Nominal Cartridge Length	Gasket or O-Ring Material*	Nominal Micron Rating	Formulation	Control Grade
70002	01	A - Silicone (MVQ)	050 -0,5 µm	T	G - General Purpose
70003	02	B - Fluorocarbon (FMP)	100 -1,0 µm		
70005	03	C - Ethylene Propylene (EPDM)			
70006	04	D - Nitrile (NBR)			
70012**					
70025					
70026					
70048***					

* ISO Designation

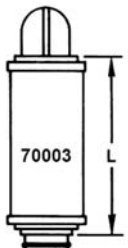
** Only in nominal lengths 01, 02 and 03

*** Only in nominal length 01 and 02

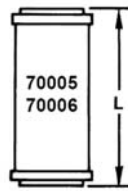
Note: Betafine T is new name for TSM.



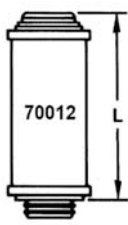
Single open end Code 7 (226) O-Ring Bayonet Lock Pall		
Nominal Ctg Length	70002	
	L (mm)	
01	259	
02	506	
03	754	
04	1002	



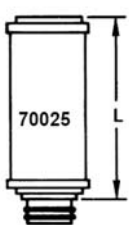
Single open end Code 8 (222) O-Ring 3M Purification & Pall		
Nominal Ctg Length	70003	
	L (mm)	
01	260	
02	507	
03	755	
04	1002	



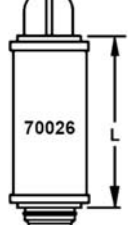
Double open end Flat Gasket Filterite & Pall (70005) Pall & Gelman (70006)			
Nominal Ctg Length	70005		70006
	L (mm)		L (mm)
01	254	248	
02	508	495	
03	762	743	
04	1016	991	



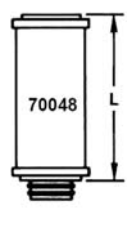
Single open end (222) O-Ring 3M Purification & Millipore		
Nominal Ctg Length	70012	
	L (mm)	
01	260	
02	559	
03	787	



Single open end Code 3 (222) O-Ring Pall		
Nominal Ctg Length	70025	
	L (mm)	
01	260	
02	507	
03	755	
04	1002	



Single open end (216) (218) O-Ring Sartorius		
Nominal Ctg Length	70026	
	L (mm)	
01	252	
02	500	
03	748	
04	995	



Single open end (222) O-Ring 3M Purification		
Nominal Ctg Length	70048	
	L (mm)	
01	253	
02	501	

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3M Purification warrants it this product to be free from defects in material and workmanship during normal use for a period of one (1) year from the date of shipment from the factory. If the Product(s) is (are) defective within this warranty period, your exclusive remedy and 3M Purification's sold obligations shall be, at 3M Purification's option, to replace or repair the Product(s) or refund the original purchase price of the Product(s) This warranty does not apply to failures that result from abuse, misuse, alternation or damage not caused by 3M Purification or failure to properly follow installation and use instructions.

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For more contact addresses visit our website www.3m.eu/filtration or www.3mpurification.com/international.

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The below 3M Cuno Betafine T-series cartridge filters are all the models that are potentially possible in all variations.

Please note that not all models are actually produced or on stock and some model numbers and names have become obsolete.

Nevertheless this should help as cross reference table chart for Cuno filters nomenclature.

Betafine T series

Table with 10 columns of alphanumeric model numbers (e.g., 7000201A050TG, 7000301A050TG, etc.) representing various filter models.