

LENNTECH

info@lennotech.com Tel. +31-152-610-900
www.lennotech.com Fax. +31-152-616-289

Micro-Klean™ RB Series

Premium resin-bonded filter cartridges

Micro-Klean™ RB Series cartridges - Better by design

The Micro-Klean™ RB series cartridge manufacturing process produces a rigid, resin bonded, graded porosity structure that reduces by-pass and avoids the unloading characteristics of soft and easily deformable competitive meltblown and stringwound filter cartridges. The design of Micro-Klean RB series cartridges provides a family of filter cartridges that offer distinct benefits:

- consistent particle reduction efficiencies,
- extended cartridge life,
- ability to withstand high temperatures and elevated differential pressures,
- broad chemical compatibility and
- consistent batch to batch filtration characteristics.

Construction

Micro-Klean RB series filter cartridges are the product of continuous refinement of manufacturing and fibre technologies. Available in both grooved and ungrooved versions, Micro-Klean RB series filters are ideal for a wide variety of applications. The grooving of the outer surface significantly increases the filter's effective surface area and increases the contaminant holding capacity. The ungrooved version of the Micro-Klean RB series cartridge is preferred for the reduction of gels and other deformable contaminants. To provide compatibility with a wide range of process fluids, Micro-Klean RB series cartridges are available in different combinations of fibre type and resin (see table 1).



Features and benefits

Graded porosity design

- Low pressure drop and long life for consistent filtration performance

Rigid resin-bonded structure

- No by-pass or unloading with high pressure drops or pressure surges

Grooved face

- 2.3 times the surface area of competitive ungrooved cartridges for greater dirt loading capacity

Broad chemical compatibility

- For chemically aggressive applications

148.8 °C acrylic cartridge multi-length option

- Ease of installation and removal in high temperature applications (Micro-Klean™ RB series High Temperature Cartridges only)

Broad range of ratings from 1 µm to 150 µm

- Wide range of effective applications

Disposal (Must comply with appropriate state and local regulations)

- No metal or plastic cores
- Shreddable
- Crushable
- Incinerable (8 000 btu/lb)

Environmental/energy advantage

- Formulation 8 Micro-Klean™ RB series filters with porosity between 1 µm and 75 µm are made from greater than 20% recycled material by weight.

LEED® claims: use of this product (1 - 75 micron 8 formulations only) may

- Help comply with LEED® EB v3.0 Prerequisite 1: Sustainable Purchasing Policy
- Help contribute to LEED® EB v3.0 MR Credit 1: Sustainable Purchasing - Ongoing Consumables or LEED® EB v3.0 MR Credit 2: Sustainable Purchasing - Durable Goods

Applications

Paints

Inks

Emulsions

Adhesives

Resins

Organic solvents

Coolants

Lube oils

Various chemicals

Pesticides

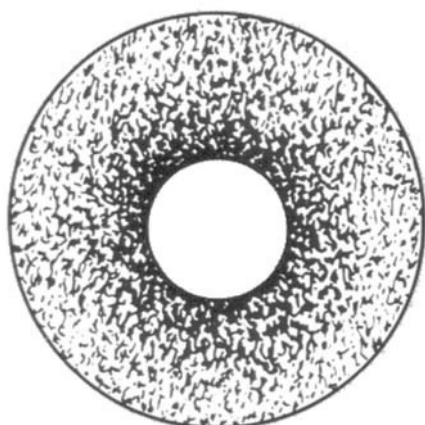
Fertilizers

Process water

General manufacture processes

* Micro-Klean™ RB series cartridges are not designed for and should not be used in food and beverage and pharmaceutical applications. Please contact 3M Purification for the appropriate filters for these applications.

3M



Picture 1
Micro-Klean™ RB Series cartridge cross-section showing true graded porosity design

Cartridge formulations

Table 1: Cartridge formulations		
Formulation	Fibre	Resin
2	Cellulose / glass*	Melamine
	Cellulose	Melamine
3	Cellulose / glass*	Phenolic
	Cellulose	Phenolic
8	Acrylic	Phenolic

*Available only as 1 and 3 micron rated cartridges

Operating data

Table 2: Micro-Klean™ RB Series cartridge product parameters	
Operating parameters	
Maximum operating temperature	Standard formulation: 121 °C With polyethylene foam flat gasket: 93 °C With polypropylene end modifications: 82 °C
High temperature option	With or without polyester end modifications: 149 °C
Maximum differential pressure	4.8 bar
Recommended change-out differential pressure	2.4 bar
Dimensions	
Length	9 3/4" to 40" (248 - 1016 mm)
Inside diameter	1 1/16" (26.9 mm)
Outside diameter	2 19/32" (65.9 mm)

The Micro-Klean™ RB series high temperature cartridge option is recommended for non-aqueous applications with operating temperatures from 82 °C to 149 °C. The high temperature cartridge is the standard acrylic fibre and phenolic resin formulation with multi-length bonding using a high temperature adhesive for durability in the installation and removal process. Any end treatment on a high temperature cartridge will be made of polyester.

Cartridge configurations

Standard Micro-Klean RB series filter cartridges are available in multiple lengths with or without various end treatments to fit most major manufacturer's cartridge housings (See ordering guide). Note that for applications with operating temperatures greater than 82 °C, use the Micro-Klean RB series high temperature cartridge formulation.

Performance

Micro-Klean RB series products combine the principles of surface and depth filtration in one cartridge to provide enhanced filter service life, particle removal efficiency and optimum flow characteristics.

Enhanced service life

Laboratory testing and extensive field experience has shown that, compared to competitive products of equally reported retention ratings, Micro-Klean RB series cartridges can hold up to 2 or more times the contaminant by weight. The grooved face provides 2.3 times the surface area than ungrooved or wrapped cartridges for greater contaminant loading capacity. Additionally, the manufacturing process of Micro-Klean RB series cartridges creates significant void volume within the internal matrix to increase loading capacity.

Particle removal efficiency

Scheduled non-destructive testing during the manufacturing process provides consistent batch to batch cartridge performance. Micro-Klean™ RB series cartridges particle removal efficiencies provide consistent particulate removal throughout the cartridge life as shown in graph 1.

Turbidimetric efficiency

Micro-Klean RB series cartridges exhibit a constant and uniform effluent turbidity for nearly 70% of their service life (see graph 2). Non-rigid filters, wound or meltblown, by comparison can exhibit erratic effluent turbidities as they load and unload, indicating by-pass.

Flow characteristics

For sizing systems and calculating the operating pressure drop of Micro-Klean RB series cartridges, use the following procedure to calculate the clean pressure drop of a Micro-Klean RB series filtration system. Specific Pressure Drop (SPD) is defined as the pressure drop across a 10" length filter element per flow rate of a 1 cP fluid. By knowing the SPD of the filter media, the clean operating pressure drop of a filtration system can be quickly calculated by using the following formula:

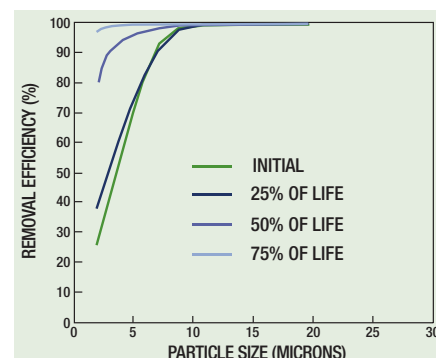
$$\text{Clean } \Delta p_{\text{psid}} (\text{mbar}) = \frac{(\text{Total system flow lpm}) (\text{Viscosity in cP}) (\text{SPD value from table})}{(\text{Number of 10" equivalent single-length cartridges in housing})}$$

Table 3: Specific Pressure Drop (SPD)

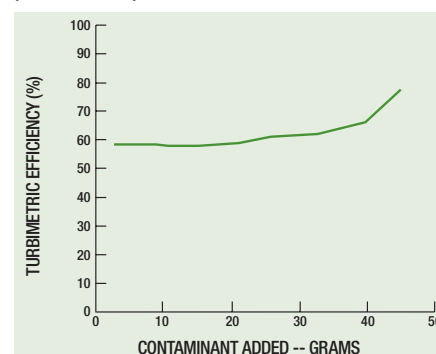
Grade	Nominal rating (microns)	Specific Pressure Drop (SPD)* (mbar/lpm-cP)
Y8	1	5.93
A8	3	3.71
B8	5	2.32
C8	10	1.30
F8	25	0.65
L8	50	0.41
Q8	75	0.26
V8	100	0.17
W8	125	0.07
X8	150	0.06
Y2	1	5.49
A2	3	2.69
B2	5	1.48
F2	25	1.30
L2	50	0.83
A3	3	2.78
B3	5	1.48
F3	25	1.19
L3	50	0.72

* Specific pressure drop for a 1 cP fluid at ambient temperature for a single length equivalent (10") cartridge.

Graph 1: Typical Micro-Klean™ RB Series cartridge retention efficiency



Graph 2: Typical Micro-Klean™ RB Series cartridge turbidimetric efficiency to 0.69 bar pressure drop



Micro-Klean™ RB Series cartridges - Ordering guide

Range	Surface type	Cartridge length*	Designation grade - rating	Formulations available	Cartridge length*	Options	
MK	G = Grooved	78 = 9 3/4"	Y = 1 µm	2, 8	1	N = None	B = 226 O-ring and spear
	U = Ungrooved	80 = 10"	A = 3 µm	2, 3, 8	2	G = Polyethylene gasket	C = 222 O-ring and spear
			B = 5 µm	2, 3, 8	3	X = 316 stainless steel core extender	F = 222 O-ring and flat cap
			C = 10 µm	8	4	P = Polypropylene core extender	Q = End cap without spring
			F = 25 µm	2, 3, 8		S = Shrink wrap	R = End cap with spring
			L = 50 µm	2, 3, 8		T = Tissue wrap	RI = End cap with plastic spring
			Q = 75 µm	8		U = Polyethylene bag	
			V = 100 µm	8			
			W = 125 µm	8			
			X = 150 µm	8			

Micro-Klean™ RB Series high temperature

Range	Surface type	Cartridge length*	Designation grade - rating	Formulations available	Cartridge length*	Temperature option	End treatment options**	Gasket material
MK	G = Grooved	78 = 9 3/4"	Y = 1 µm	8	1	H = High temperature	N = None	N = None
	U = Ungrooved	80 = 10"	A = 3 µm	8	2		X = 316 stainless steel core extender	A = Silicone
			B = 5 µm	8	3		B = Single open end, 226 O-ring & spear	B = Fluorocarbon
			C = 10 µm	8	4		C = Single open end, 222 O-ring & spear	C = EPR
			F = 25 µm	8			F = Single open end, 222 O-ring & flat cap	D = Nitrile
			L = 50 µm	8				
			Q = 75 µm	8				
			V = 100 µm	8				
			W = 125 µm	8				
			X = 150 µm	8				

* Cartridge over all lengths will be multiples of either 9 3/4" or 10".

Note: Micro-Klean RB Series is the new name for Micro-Klean III and G cartridges.

** B, C, and F options constructed of polyester.

Important Notice

The information described in this literature is accurate to the best of our knowledge. A variety of factors, however, can affect the performance of the Product(s) in a particular application, some of which are uniquely within your knowledge and control. INFORMATION IS SUPPLIED UPON THE CONDITION THAT THE PERSONS RECEIVING THE SAME WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR USE. IN NO EVENT WILL 3M PURIFICATION BE RESPONSIBLE FOR DAMAGES OF ANY NATURE WHATSOEVER RESULTING FROM THE USE OF OR RELIANCE UPON INFORMATION.

It is your responsibility to determine if additional testing or information is required and if this product is fit for a particular purpose and suitable in your specific application.

3M PURIFICATION MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Limitation of Liability

3M Purification will not be liable for any loss or damage arising from the use of the Product(s), whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

3M is a trademark of the 3M Company. Micro-Klean is a trademark of the 3M Company used under licence.

'LEED' and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.



LENNTECH

info@lennotech.com Tel. +31-152-610-900

www.lennotech.com Fax. +31-152-616-289



The LEED® (Leadership in Energy and Environmental Design) Green Building Rating System is the nationally accepted benchmark for the design, construction and operation of high performance green buildings.

For more contact addresses visit our website www.3M.eu/purification.

Data may be subject to change without further notice.

© 3M 2011. All rights reserved. Please recycle.

Micro-Klean Rb series

MKG78Y21	MKG80Y21	MKU78Y21	MKU80Y21	G78Y21	G80Y21	U78Y21	U80Y21
MKG78Y81	MKG80Y81	MKU78Y81	MKU80Y81	G78Y81	G80Y81	U78Y81	U80Y81
MKG78A21	MKG80A21	MKU78A21	MKU80A21	G78A21	G80A21	U78A21	U80A21
MKG78A31	MKG80A31	MKU78A31	MKU80A31	G78A31	G80A31	U78A31	U80A31
MKG78A81	MKG80A81	MKU78A81	MKU80A81	G78A81	G80A81	U78A81	U80A81
MKG78B21	MKG80B21	MKU78B21	MKU80B21	G78B21	G80B21	U78B21	U80B21
MKG78B31	MKG80B31	MKU78B31	MKU80B31	G78B31	G80B31	U78B31	U80B31
MKG78B81	MKG80B81	MKU78B81	MKU80B81	G78B81	G80B81	U78B81	U80B81
MKG78C81	MKG80C81	MKU78C81	MKU80C81	G78C81	G80C81	U78C81	U80C81
MKG78F21	MKG80F21	MKU78F21	MKU80F21	G78F21	G80F21	U78F21	U80F21
MKG78F31	MKG80F31	MKU78F31	MKU80F31	G78F31	G80F31	U78F31	U80F31
MKG78F81	MKG80F81	MKU78F81	MKU80F81	G78F81	G80F81	U78F81	U80F81
MKG78L21	MKG80L21	MKU78L21	MKU80L21	G78L21	G80L21	U78L21	U80L21
MKG78L31	MKG80L31	MKU78L31	MKU80L31	G78L31	G80L31	U78L31	U80L31
MKG78L81	MKG80L81	MKU78L81	MKU80L81	G78L81	G80L81	U78L81	U80L81
MKG78Q81	MKG80Q81	MKU78Q81	MKU80Q81	G78Q81	G80Q81	U78Q81	U80Q81
MKG78V81	MKG80V81	MKU78V81	MKU80V81	G78V81	G80V81	U78V81	U80V81
MKG78W81	MKG80W81	MKU78W81	MKU80W81	G78W81	G80W81	U78W81	U80W81
MKG78X81	MKG80X81	MKU78X81	MKU80X81	G78X81	G80X81	U78X81	U80X81
MKG78Y22	MKG80Y22	MKU78Y22	MKU80Y22	G78Y22	G80Y22	U78Y22	U80Y22
MKG78Y82	MKG80Y82	MKU78Y82	MKU80Y82	G78Y82	G80Y82	U78Y82	U80Y82
MKG78A22	MKG80A22	MKU78A22	MKU80A22	G78A22	G80A22	U78A22	U80A22
MKG78A32	MKG80A32	MKU78A32	MKU80A32	G78A32	G80A32	U78A32	U80A32
MKG78A82	MKG80A82	MKU78A82	MKU80A82	G78A82	G80A82	U78A82	U80A82
MKG78B22	MKG80B22	MKU78B22	MKU80B22	G78B22	G80B22	U78B22	U80B22
MKG78B32	MKG80B32	MKU78B32	MKU80B32	G78B32	G80B32	U78B32	U80B32
MKG78B82	MKG80B82	MKU78B82	MKU80B82	G78B82	G80B82	U78B82	U80B82
MKG78C82	MKG80C82	MKU78C82	MKU80C82	G78C82	G80C82	U78C82	U80C82
MKG78F22	MKG80F22	MKU78F22	MKU80F22	G78F22	G80F22	U78F22	U80F22
MKG78F32	MKG80F32	MKU78F32	MKU80F32	G78F32	G80F32	U78F32	U80F32
MKG78F82	MKG80F82	MKU78F82	MKU80F82	G78F82	G80F82	U78F82	U80F82
MKG78L22	MKG80L22	MKU78L22	MKU80L22	G78L22	G80L22	U78L22	U80L22
MKG78L32	MKG80L32	MKU78L32	MKU80L32	G78L32	G80L32	U78L32	U80L32
MKG78L82	MKG80L82	MKU78L82	MKU80L82	G78L82	G80L82	U78L82	U80L82
MKG78Q82	MKG80Q82	MKU78Q82	MKU80Q82	G78Q82	G80Q82	U78Q82	U80Q82
MKG78V82	MKG80V82	MKU78V82	MKU80V82	G78V82	G80V82	U78V82	U80V82
MKG78W82	MKG80W82	MKU78W82	MKU80W82	G78W82	G80W82	U78W82	U80W82
MKG78X82	MKG80X82	MKU78X82	MKU80X82	G78X82	G80X82	U78X82	U80X82
MKG78Y23	MKG80Y23	MKU78Y23	MKU80Y23	G78Y23	G80Y23	U78Y23	U80Y23
MKG78Y83	MKG80Y83	MKU78Y83	MKU80Y83	G78Y83	G80Y83	U78Y83	U80Y83
MKG78A23	MKG80A23	MKU78A23	MKU80A23	G78A23	G80A23	U78A23	U80A23
MKG78A33	MKG80A33	MKU78A33	MKU80A33	G78A33	G80A33	U78A33	U80A33
MKG78A83	MKG80A83	MKU78A83	MKU80A83	G78A83	G80A83	U78A83	U80A83
MKG78B23	MKG80B23	MKU78B23	MKU80B23	G78B23	G80B23	U78B23	U80B23
MKG78B33	MKG80B33	MKU78B33	MKU80B33	G78B33	G80B33	U78B33	U80B33
MKG78B83	MKG80B83	MKU78B83	MKU80B83	G78B83	G80B83	U78B83	U80B83
MKG78C83	MKG80C83	MKU78C83	MKU80C83	G78C83	G80C83	U78C83	U80C83
MKG78F23	MKG80F23	MKU78F23	MKU80F23	G78F23	G80F23	U78F23	U80F23
MKG78F33	MKG80F33	MKU78F33	MKU80F33	G78F33	G80F33	U78F33	U80F33
MKG78F83	MKG80F83	MKU78F83	MKU80F83	G78F83	G80F83	U78F83	U80F83
MKG78L23	MKG80L23	MKU78L23	MKU80L23	G78L23	G80L23	U78L23	U80L23
MKG78L33	MKG80L33	MKU78L33	MKU80L33	G78L33	G80L33	U78L33	U80L33
MKG78L83	MKG80L83	MKU78L83	MKU80L83	G78L83	G80L83	U78L83	U80L83
MKG78Q83	MKG80Q83	MKU78Q83	MKU80Q83	G78Q83	G80Q83	U78Q83	U80Q83
MKG78V83	MKG80V83	MKU78V83	MKU80V83	G78V83	G80V83	U78V83	U80V83
MKG78W83	MKG80W83	MKU78W83	MKU80W83	G78W83	G80W83	U78W83	U80W83
MKG78X83	MKG80X83	MKU78X83	MKU80X83	G78X83	G80X83	U78X83	U80X83
MKG78Y24	MKG80Y24	MKU78Y24	MKU80Y24	G78Y24	G80Y24	U78Y24	U80Y24
MKG78Y84	MKG80Y84	MKU78Y84	MKU80Y84	G78Y84	G80Y84	U78Y84	U80Y84
MKG78A24	MKG80A24	MKU78A24	MKU80A24	G78A24	G80A24	U78A24	U80A24
MKG78A34	MKG80A34	MKU78A34	MKU80A34	G78A34	G80A34	U78A34	U80A34
MKG78A84	MKG80A84	MKU78A84	MKU80A84	G78A84	G80A84	U78A84	U80A84
MKG78B24	MKG80B24	MKU78B24	MKU80B24	G78B24	G80B24	U78B24	U80B24
MKG78B34	MKG80B34	MKU78B34	MKU80B34	G78B34	G80B34	U78B34	U80B34
MKG78B84	MKG80B84	MKU78B84	MKU80B84	G78B84	G80B84	U78B84	U80B84
MKG78C84	MKG80C84	MKU78C84	MKU80C84	G78C84	G80C84	U78C84	U80C84
MKG78F24	MKG80F24	MKU78F24	MKU80F24	G78F24	G80F24	U78F24	U80F24
MKG78F34	MKG80F34	MKU78F34	MKU80F34	G78F34	G80F34	U78F34	U80F34
MKG78F84	MKG80F84	MKU78F84	MKU80F84	G78F84	G80F84	U78F84	U80F84
MKG78L24	MKG80L24	MKU78L24	MKU80L24	G78L24	G80L24	U78L24	U80L24
MKG78L34	MKG80L34	MKU78L34	MKU80L34	G78L34	G80L34	U78L34	U80L34
MKG78L84	MKG80L84	MKU78L84	MKU80L84	G78L84	G80L84	U78L84	U80L84
MKG78Q84	MKG80Q84	MKU78Q84	MKU80Q84	G78Q84	G80Q84	U78Q84	U80Q84
MKG78V84	MKG80V84	MKU78V84	MKU80V84	G78V84	G80V84	U78V84	U80V84
MKG78W84	MKG80W84	MKU78W84	MKU80W84	G78W84	G80W84	U78W84	U80W84
MKG78X84	MKG80X84	MKU78X84	MKU80X84	G78X84	G80X84	U78X84	U80X84