

PREFILTERS/DEPTH TYPE MEDIA

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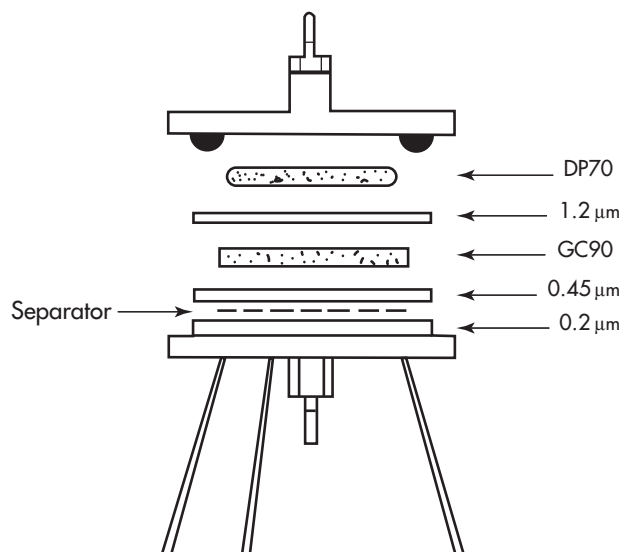
Prefilters/Depth Type Media – Introduction

The term “prefilter” refers to any type of filter that precedes the final barrier. This type of filter is often prepared from depth-type media, a random matrix of glass, cellulose, quartz or PTFE fibers. This fiber matrix may or may not include binder to maintain integrity. Because these filters trap particles within the matrix, they have a very high particle loading capacity. However, this type of filter does not have a clearly defined pore rating, only a nominal designation.

Not all depth-type filters are used as prefilters: these can be used in a wide variety of applications, such as water and air pollution analysis, liquid clarification, and cell harvesting.

Generally, a prefilter should be slightly smaller than the membrane filter it is preceding, but full sized prefilters are recommended if used alone.

| Filter Holder Model | Recommended Prefilter Diameter (mm) | |
|----------------------------------|-------------------------------------|------------|
| | used upstream of membrane | used alone |
| Vacuum Type: | | |
| KG 25, KGS 25 | 16 | 25 |
| KG 47, KGS 47, KSF 47, KGS 47 TF | 35 | 47 |
| KG 90, KGS 90 | 70 | 90 |
| Pressure Type: | | |
| KS 13 | 8 | 13 |
| KS 25, KS 25 F, PP 25 | 21 | 25 |
| KS 47, KST 47, KS 47 F | 35 | 47 |
| PP 47, PFA 47 | 42 | 47 |
| LS 25 | 25 | 25 |
| LS 47 | 47 | 47 |
| LS 47 HP | 38 | 47 |



A typical serial stack incorporating Prefilters, Membranes and Polyester Mesh Separators.

Cellulose Fiber Filters

- **Cellulosic:** Random matrix of cellulose fibers
- **Inert** to organic solvents
- **No binder**
- **Thermostable:** To 180°C in a non-reactive oil, 120°C maximum in air

APPLICATIONS

- Clarify fluids containing coarse particles
- Preliminary prefilter, prolongs membrane life

Note: Not suitable for hot dilute or cold concentrated acids. Caustic liquids cause fibers to swell. Also not recommended for viscous material.

SPECIFICATIONS AND APPLICATIONS

| Grade | Thickness (mm) | Applications |
|----------|----------------|---|
| No. 27 | 0.68 | Filtration of soft drinks and other beverages Clarification of oils and fats Filtration of paints and petroleum products |
| No. 1640 | 0.40 | Remove activated charcoal from alcohol containing beverages Polishing filter for water treatment Clarifying filtration of fine particulates |
| No. 1650 | 0.57 | Remove activated charcoal from alcohol containing beverages Polishing filter for water treatment Clarifying filtration of fine particulates Withstands higher pressures and flow rates than No. 1640 |

ORDERING INFORMATION: CELLULOSE FIBER FILTERS

- Available in disks in the following diameters (mm): 76, 124, 257
- Package of 100
- Order by specifying first the grade of filter then the diameter, e.g. N01650257MM, N02776MM

Glass Fiber Filters

- **Dense**
- **Highly resistant** to chemical attack, biologically inert
- **Easily sterilized:** Can be baked or autoclaved
- **Store indefinitely:** Unaffected by humidity

APPLICATIONS

- Use as a prefilter to extend membrane life
- Water/air pollution analysis
- Liquid clarification
- Cell harvesting



Twelve grades of glass fiber filters are available in diameters from 10–293 mm.

ORDERING INFORMATION: GLASS FIBER FILTERS

| Grade | DP70 | GA55 | GA100 | GA200 | GB100R | GB140 | GC50 | GC90 | GD120 | GF75 | GS25 |
|---------------------------|------------------|------|-------|-------|--------|-------|------|------|-------|------|------|
| | Quantity/package | | | | | | | | | | |
| 10–150 mm diameter disks | 50 | 100 | 100 | 50 | 100 | 100 | 100 | 100 | 50 | 100 | 100 |
| 257–293 mm diameter disks | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 8 x 10 inch sheets | S | 100 | S | S | 50 | S | S | S | S | S | S |

S = Special order

Available in disks in the following diameters (mm): 10, 13, 16, 20, 21, 22, 24, 25, 26, 35, 37, 45, 47, 50, 55, 70, 75, 90, 102, 110, 124, 125, 150, 257, 293.

Order by specifying first the grade of filter then the diameter, e.g. GC5090MM, GA558X10IN.

Quartz Fiber Filters

- **Highly resistant** to chemical attack, biologically inert
- **High Purity:** Very low trace metal content, does not adsorb nitrous and sulfur dioxides; Grade QR100 is pre-fired at 1000°C for 2 hours to reduce organic contamination
- **Easily sterilized:** Can be baked or autoclaved
- **Store indefinitely:** Unaffected by humidity

APPLICATIONS

- Sample acidic gases at high (>500°C) temperatures
- Air pollution analysis

ORDERING INFORMATION: QUARTZ FIBER FILTERS

| Grade | QR200 | QR100 |
|----------------------------|------------------|-------|
| | Quantity/package | |
| 21 - 150 mm diameter disks | 50 | 100 |
| 8 x 10 inch sheets | S | 50 |

S = Special order

Available in disks in the following diameters (mm): 21, 24, 26, 37, 45, 47, 55, 70, 90, 110, 125, 150.

Order by specifying first the grade of filter then the diameter, e.g. QR200125MM, QR10021MM.

SPECIFICATIONS: GLASS/QUARTZ FIBER

| Grade | Applications/Characteristics | Weight (g/m ²) | Thickness (mm) | Nominal Rating (µm) | Water Flow Time ¹ (sec) |
|--------|--|----------------------------|----------------|---------------------|------------------------------------|
| GA55 | General purpose paper Air pollution monitoring | 55 | 0.21 | 0.6 | 23 |
| GF75 | Most retentive grade offered Collection of IgC or other very fine protein precipitates Clarifying chemically aggressive solutions TCLP (EPA method 1311) – use with KST 142 | 75 | 0.35 | 0.3 | 84 |
| GA100 | General purpose paper Filtration of precipitated proteins or cells Air pollution monitoring | 110 | 0.44 | 1.0 | 11 |
| GA200 | Thick filter recommended for filtering viscous fluids such as liquid sugars and gels | 175 | 0.74 | 0.8 | 15 |
| GB100R | High and low volume aerosols for airborne dust and metal contaminants Low trace metal content of As, Pb and Cd DNA/RNA and protein precipitates | 95 | 0.40 | 0.6 | 15 |
| GB140 | Compared to GB-100R: thicker, greater wet strength, slower filtration speed Industrial waste analysis Low absorption, limited wet strength and loading capacity | 140 | 0.56 | 0.4 | 58 |
| GC50 | Prefilter for membrane filter (0.45 µm or smaller) Scintillation counting Suspended solids analysis of industrial waters and wastewater | 48 | 0.19 | 0.5 | 28 |
| GC90 | High wet strength Clinical screening | 100 | 0.30 | 0.5 | 20 |
| GD120 | Prefilter for membrane filter (1.2 µm or smaller) High wet strength, very high loading capacity | 123 | 0.51 | 0.9 | 14 |
| GS25 | Limited dirt holding capacity High wet strength Prefilter for 0.65 µm or smaller membrane | 70 | 0.22 | 0.6 | 15 |
| DP70 | High wet strength Very high loading capacity Dust measurement | 170 | 0.52 | 0.6 | 20 |
| QR200 | Filtration at elevated temperatures Low adsorption Monitor airborne particulates | 200 | 1.0 | - | - |
| QR100 | Superior chemical resistance, does not absorb acid gases | 85 | 0.38 | - | - |

1. Flow time is the time in seconds to filter 100 mL of distilled water at 20°C under pressure supplied by a 10 cm water column through a 10 cm² section of filter.

| Gas Collection Efficiency (%) at 0.3 µm DOP | Pressure Drop (mm H ₂ O/5 cm/sec) | Binder* | Maximum Operating Temperature (°C) | Conversion | | | | |
|---|--|-----------|------------------------------------|----------------|----------------------|------------------------|----------------|----------|
| | | | | Whatman | Schleicher & Schuell | Pall | Millipore | Ahlstrom |
| 99.9 | 34 | None | 500 | GF/A | 31 | | APFA | 111 |
| 99.999 | 170 | None | 500 | GF/F | 20 | | APFF | 151 |
| 96 | 20 | None | 500 | | | | | |
| 99.9 | 36 | None | 500 | | | | | |
| 99.99 | 31 | None | 500 | EPM2000 | 1HV | A/E (Use for air) | | |
| 99.99 | 113 | None | 500 | GF/B | 32 | | APFB | 121 |
| 99.99 | 53 | None | 500 | GF/C 934 AH | 30/25 | A/E (Use for water) | AP-40/ APFC | 131 |
| 99.99 | 43 | Organic | 120 | | | | AP15 | |
| 97 | 17 | None | 500 | GF/D | 40 | | APFD | 141 |
| 99.9 | 33 | Organic | 120 | | | | AP20 | 164 |
| - | 53 | Organic | 120 | | | | | |
| 99.9 | 35 | Inorganic | 1000 | | | | | |
| 99.99 | 46 | None | 1000 | QM-A | | Micro Quartz | | |

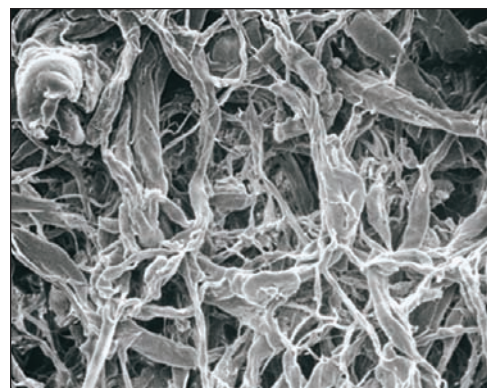
*Binder 1. Organic – Acrylic Acid Ester Emulsion
 2. Inorganic – Alumina

PTFE Filters

- **Pure PTFE fibers are sintered** to improve handling characteristics and to minimize fiber slough-off for minimal downstream contamination
- **Hydrophobic**
- **Porosity:** High air permeability with minimal pressure drop
- **Thermostable:** maximum operating temperature 260°C

APPLICATIONS

- Aqueous and nonaqueous filtration
- Filter hot acids and strong solvents
- Venting air and gases



PTFE Filter

SPECIFICATIONS

| Grade | Weight (g/m ²) | Thickness (mm) | Porosity (%) | Pressure Drop (kPa) | Pressure Drop (psi) | DOP retention (% 0.3 μm) | Retentive pore, liquid (μm) |
|-------|----------------------------|----------------|--------------|---------------------|---------------------|--------------------------|-----------------------------|
| PF100 | 500 | 1.00 | 77 | 0.059 | 0.00856 | 70 | 10 |
| PF060 | 240 | 0.50 | 75 | 0.069 | 0.01001 | 75 | 6 |
| PF050 | 210 | 0.36 | 73 | 0.26 | 0.0377 | 85 | 5 |
| PF040 | 500 | 0.95 | 75 | 0.21 | 0.03045 | 95 | 4 |
| PF020 | 500 | 0.54 | 54 | 1.6 | 0.232 | 99.9 | 2 |

ORDERING INFORMATION: PTFE FILTERS

| Grade | PF100 | PF060 | PF050 | PF040 | PF020 |
|-----------------------------|------------------|-------|-------|-------|-------|
| | Quantity/package | | | | |
| 10 – 90 mm diameter disks | 10* | 10* | 10* | 10 | 10 |
| 110 – 150 mm diameter disks | 10 | 10 | 10 | 5 | 5 |
| 8 x 10 inch sheets | 10 | 10 | 10 | 10 | 10 |

*55, 70, 90 mm are 20 disks per package.

- Disks: Available in the following diameters (mm): 13, 25, 37, 47, 55, 70, 90, 110, 125, 150
- Sheets: Available in 8 x 10 inch sheets
- Additional sizes available upon request
- Order by specifying first the grade of filter then the size, e.g. PF100257MM, PF04025MM

See also Phase Separating Filters on page 38.

Polyester Mesh Separators

- **Prevent pore blinding** by placing a polyester mesh separator between two membranes in series
- **Improve performance:** Increase liquid flow rate and throughput
- **Mesh Size:** 28 mesh

Note: Order same size recommended for prefilters.

ORDERING INFORMATION: POLYESTER MESH SEPARATORS

| Diameter (mm) | 10 | 16 | 22 | 26 | 35 | 37 | 76 | 124 | 257 |
|----------------------|----|----|----|----|----|----|----|-----|-----|
| Quantity per package | 50 | 50 | 50 | 50 | 50 | 50 | 25 | 25 | 25 |

Specify code DS followed by diameter, e.g. DS124MM, DS16MM.

800-334-7132