



FRISENETTE ApS



ADVANTEC®

Laboratory Filtration Products

Introduction

We are proud to present this second issue of a European catalogue of ADVANTEC® products manufactured by Toyo Roshi Kaisha, Ltd.

Toyo Roshi Kaisha, Ltd. is a well-reputed, leading manufacturer of filtration media and related scientific products, which was founded in 1917. To date, the company's main markets have been Japan, Asia and the United States. Since 2004 the range of laboratory filtration products and related equipment also has been available in Europe.

Our mission is to supply the pharmaceutical, public health, life science, chemical industry, food and beverage industry, environmental laboratories, and the electronics industry with high quality products in the field of separation science. The product range in this catalogue includes membrane filters, prefiltration media, glass fiber filters, qualitative and quantitative cellulose filters, capsule filters, test papers and an extensive range of filter holders in stainless steel, plastic and glass.

Customers have the right to expect the highest quality products. ADVANTEC® products are manufactured in accordance with strict quality standards and a quality control system to ensure they obtain products that offer consistent, uniform performance and superior integrity.

The quality management system at Toyo Roshi Kaisha, Ltd. is approved in pursuance of the *ISO 9001:2000* standard.

ADVANTEC® products are stocked in Denmark for fast and easy distribution in Europe and are available through a comprehensive network of selected distributors.

The catalogue contains the most central technical information. Should you have any questions, please do not hesitate to contact us or your local supplier of ADVANTEC® products.

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ADVANTEC®

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Membrane Filters

Membrane filters or membranes are microporous plastic films with specific pore size ratings. Also known as screen, sieve or microporous filters, membranes retain particles or microorganisms larger than their pore size primarily by surface capture. Some particles smaller than the stated pore size may be retained by other mechanisms.

Advantec membranes are produced by three different processes. Mixed Cellulose Ester and Cellulose Acetate are reverse phase solvent cast membranes, where controlled evaporation or removal of the complex solvent system forms the porous structure. Both hydrophilic and hydrophobic PTFE are made by a patented process where the membranes are stretched biaxially to form the porous structure – PCTE membranes are track etched.



Performance characteristics of Advantec membranes

- **Strong:**

Advantec membranes are monitored for both burst (longitudinal) and tensile (lateral) strength. Supported Acetate are the strongest reverse phase membranes available from Advantec.

- **Chemically and biologically clean:**

As a part of a comprehensive quality program, only high purity reagents and raw materials are used to produce Advantec membranes. Once cast, the membranes are handled in a class 100 clean room to minimize ambient contamination. While some membranes require a small amount (0,1-3 weight %) of an aqueous wetting agent, Cellulose Acetate has the lowest aqueous extractable (0.1 weight %). All

Advantec membranes are Triton- and pyrogen-free (0,005 ng/cm² filter area)

- **Thin membranes with high porosity:**

Uniformly thin membranes (typically 150 μm) with high porosity (about 80%) provide high gas and liquid flow per unit area. High porosity also provides high surface area for adsorption or binding.

- **Thermostable:**

All Advantec membranes can be sterilized by autoclaving. Operation temperatures of up to 180°C can be achieved depending upon the membrane polymer (see individual membrane specifications for details). Advantec membranes exhibit minimal shrinkage at elevated temperatures.

Membrane Comparison

| Membrane polymer | Sample applications | General compatibility | Hydrophilic | Hydrophobic | Pore size range available [µm] | | | | | | | | |
|-----------------------------|---|-------------------------------|-------------|-------------|--------------------------------|-----|------|-----|-----|-----|-----|-----|----|
| | | | | | 0.1 | 0.2 | 0.45 | 0.8 | 1.0 | 3.0 | 5.0 | 8.0 | 10 |
| Mixed Cellulose Ester (MCE) | General purpose Microbiology Particle analysis | Aqueous solutions | √ | | | | | | | | | | |
| Cellulose Acetate | General filtration Cytology Binding studies | Aqueous solutions | √ | | | | | | | | | | |
| Coated Cellulose Acetate | Clarify solutions Prefilter | Aqueous solutions | √ | | | | | | | | | | |
| Hydrophilic PTFE | HPLC solutions Clarify or sterilize aqueous/organic mixtures | Aqueous and organic solutions | √ | | | | | | | | | | |
| Hydrophobic PTFE | Gas venting Clarify or sterilize strong acids or solvents | Non-aqueous solvents | | √ | | | | | | | | | |
| Polycarbonate | Microscopy Beverage testing | Aqueous solutions | √ | | | | | | | | | | |

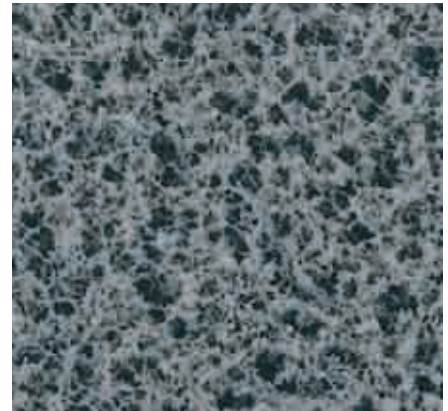
Ordering Information: Membrane filter nomenclature

| | | | | |
|--------------------------------|------------|---|----------------------|-----------------------------------|
| A | 020 | A | 293 | C |
| Quantity per package | | | | |
| A = 100 | | D = 10 | | K = HE ind. pack WG, 100 |
| B = 50 | | E = 5 | | R = 1 roll |
| C = 25 | | J = HE ind. pack WP, 100 | | W = 1000 |
| Diameter [mm] | | | | |
| 13 = 013 | | 47 = 047 | | 90 = 090 |
| 20 = 020 | | 50 = 050 | | 100 = 100 |
| 25 = 025 | | 82 = 082 | | 102 = 102 |
| 37 = 037 | | 85 = 085 | | 137 = 137 |
| Sheets/rolls [cm] | | | | |
| 20 x 20 = 204 | | 22 x 22 = 224 | | 30 x 30 = 304 |
| 33 cm x 3 m = 330 | | | | |
| Surface/Type | | | | |
| Non-sterile packages | | | Pre-sterile packages | |
| Packaging | | | Individually wrapped | |
| Surface | | | Plain | Grid |
| White | | | A, X** | B |
| White HE* | | | J | K |
| Black | | | N | P |
| Green | | | U | V |
| *HE = Hydrophobic Edge | | | | |
| **Opticlear MF | | | | |
| Membrane pore size [µm] | | | | |
| 5.0 = 500 | | 0.8 = 080 | | 0.45 = 045 |
| 3.0 = 300 | | 0.65 = 065 | | 0.30 = 030 |
| 1.0 = 100 | | 0.50 = 050 | | 0.20 = 020 |
| 0.10 = 010 | | | | |
| CMF (nominal µm) | | | | |
| 10 = 100 | | | | |
| 2 = 020 | | | | |
| 0.8 = 008 | | | | |
| Type of filter | | | | |
| A = Mixed Cellulose Ester | | H = Hydrophilic PTFE | | T = Hydrophobic PTFE, unsupported |
| B = Cellulose pads | | J = Hydrophobic PTFE, polypropylene backing | | Y = Coated Cellulose Acetate |
| C = Cellulose Acetate | | K = Polycarbonate | | |

Membrane Filters

Mixed Cellulose Esters (MCE)

- **Composition:** Mixed cellulose esters includes cellulose nitrate, also known as nitrocellulose, and cellulose acetate
- **High porosity:** Provides superior flow rates
- **High protein binding:** Can be blocked by pretreatment or utilized in applications
- **High purity:** Triton-free and non reactive to pyrogens
- **Autoclavable:** Withstands autoclaving temperatures up to 130°C without adversely affecting bubble point, flow rate or microbiological recovery
- **Rapid wetting time:** < 3 seconds to wet a 47 mm diameter disc with aqueous 1% methylene blue



Applications

- Standard membranes for many laboratory applications including filter sterilizing biological fluids, microbiology, contamination analysis and air monitoring
- Can be transparentized to view collected particles
 - using compatible liquid (immersion oil, toluene)
 - OR
 - select Opticlear membranes for the “hot block” acetone vapor method
- Gridded filters available for quantifying microbial growth
- Available non-sterile or sterilized by ethylene oxide (EtO)

Specifications for Mixed Cellulose Ester (MCE), Code A

| Pore Size [µm] | Color | Surface | Bubble Point ¹ | | Flow Rate ² | | Porosity ³ [%] | Thickness [µm] |
|----------------|-------|---------|---------------------------|-------|---------------------------------|------------------------------|---------------------------|----------------|
| | | | [MPa] | [psi] | Water [ml/min/cm ²] | Air [L/min/cm ²] | | |
| 0.10 | White | Plain | ≥0.24 | ≥35.3 | 2.7 | 0.67 | 65 | 110 |
| 0.20 | White | Plain | ≥0.37 | ≥54.5 | 17.5 | 2.4 | 73 | 133 |
| 0.30 | White | Plain | ≥0.28 | ≥41.2 | 30 | 3.7 | 75 | 140 |
| 0.45 | White | Plain | ≥0.24 | ≥35.0 | 45 | 5.0 | 78 | 145 |
| 0.45 | White | Grid | ≥0.16 | ≥24.2 | 80 | 8.0 | 79 | 142 |
| 0.65 | White | Plain | ≥0.14 | ≥21.3 | 120 | 11.2 | 79 | 150 |
| 0.80 | White | Plain | ≥0.11 | ≥16.4 | 165 | 15.0 | 80 | 150 |
| 1.00 | White | Plain | ≥0.096 | ≥13.9 | 220 | 20.4 | 80 | 150 |
| 3.00 | White | Plain | ≥0.070 | ≥10.2 | 300 | 28.3 | 81 | 155 |
| 5.00 | White | Plain | ≥0.058 | ≥8.5 | 400 | 40.9 | 81 | 160 |
| 0.45 | Black | Grid | ≥0.22 | ≥32.7 | 50 | 5.0 | 78 | 135 |
| 0.80 | Black | Grid | ≥0.10 | ≥14.9 | 170 | 15.0 | 80 | 145 |
| 0.45 | Green | Grid | ≥0.22 | ≥32.7 | 50 | 5.0 | 78 | 135 |
| 0.80 | Green | Grid | ≥0.10 | ≥14.9 | 170 | 15.0 | 80 | 145 |

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water.st (0.1 µm membranes prewet with isopropanol)
2. Flow Rate indicates initial flow rate at 10 psi using a KGS 47 filter holder
Water: Using water prefiltered to 0.1 µm pore size
Air: Using prefiltered nitrogen at 10 psi.
3. Porosity refers to the percent open area.

- Refractive index 1.50
- Maximum operating temperature 130°C
- Ash content 2-5 µg/cm²

Ash Content of White Plain MCE Membrane Filters (ppm):

| | | | | | |
|-----------|-------|-----------|------|-----------|-------|
| Al | <2.0 | K | 6.0 | Ni | <5.0 |
| Ca | 140.0 | Li | <1.0 | Pb | <1.0 |
| Cd | <0.5 | Mg | 10.0 | Si | <20.0 |
| Cr | 8.0 | Mn | <0.5 | Sn | <5.0 |
| Cu | <1.0 | Mo | <1.0 | Ti | <1.0 |
| Fe | <5.0 | Na | 10.0 | Zn | <1.0 |

Mixed Cellulose Ester Membranes (MCE)

Ordering Information

White – Non-sterile

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|-----------|-----------|
| 0.1 | 13 | Plain | 100 | A010A013A |
| | 25 | Plain | 100 | A010A025A |
| | 47 | Plain | 100 | A010A047A |
| | 50 | Plain | 100 | A010A050A |
| | 90 | Plain | 25 | A010A090C |
| | 142 | Plain | 25 | A010A142C |
| 293 | Plain | 25 | A010A293C | |
| 0.2 | 13 | Plain | 100 | A020A013A |
| | 25 | Plain | 100 | A020A025A |
| | 25 | Grid | 100 | A020B025A |
| | 47 | Plain | 100 | A020A047A |
| | 47 | Grid | 100 | A020B047A |
| | 47 | Plain* | 100 | A020J047A |
| | 47 | Grid* | 100 | A020K047A |
| | 50 | Plain | 100 | A020A050A |
| | 90 | Plain | 25 | A020A090C |
| | 142 | Plain | 25 | A020A142C |
| 293 | Plain | 25 | A020A293C | |
| 0.3 | 13 | Plain | 100 | A030A013A |
| | 25 | Plain | 100 | A030A025A |
| | 47 | Plain | 100 | A030A047A |
| | 50 | Plain | 100 | A030A050A |
| | 90 | Plain | 25 | A030A090C |
| | 142 | Plain | 25 | A030A142C |
| 293 | Plain | 25 | A030A293C | |
| 0.45 | 13 | Plain | 100 | A045A013A |
| | 13 | Grid | 100 | A045B013A |
| | 25 | Plain | 100 | A045A025A |
| | 25 | Grid | 100 | A045B025A |
| | 37 | Plain | 100 | A045A037A |
| | 37 | Grid | 100 | A045B037A |
| | 47 | Plain | 100 | A045A047A |
| | 47 | Grid | 100 | A045B047A |
| | 47 | Plain* | 100 | A045J047A |
| | 47 | Grid* | 100 | A045K047A |
| | 50 | Plain | 100 | A045A050A |
| | 50 | Grid | 100 | A045B050A |
| | 90 | Plain | 25 | A045A090C |
| | 142 | Plain | 25 | A045A142C |
| | 293 | Plain | 25 | A045A293C |

*with hydrophobic edge

White – Non-sterile (continued)

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|-----------|-----------|
| 0.65 | 13 | Plain | 100 | A065A013A |
| | 13 | Grid | 100 | A065B013A |
| | 25 | Plain | 100 | A065A025A |
| | 25 | Grid | 100 | A065B025A |
| | 47 | Plain | 100 | A065A047A |
| | 47 | Grid | 100 | A065B047A |
| | 50 | Plain | 100 | A065A050A |
| | 50 | Grid | 100 | A065B050A |
| | 90 | Plain | 25 | A065A090C |
| 142 | Plain | 25 | A065A142C | |
| 293 | Plain | 25 | A065A293C | |
| 0.8 | 13 | Plain | 100 | A080A013A |
| | 13 | Grid | 100 | A080B013A |
| | 25 | Plain | 100 | A080A025A |
| | 25 | Grid | 100 | A080B025A |
| | 37 | Plain | 100 | A080A037A |
| | 37 | Grid | 100 | A080B037A |
| | 47 | Plain | 100 | A080A047A |
| | 47 | Grid | 100 | A080B047A |
| | 50 | Plain | 100 | A080A050A |
| | 50 | Grid | 100 | A080B050A |
| 90 | Plain | 25 | A080A090C | |
| 142 | Plain | 25 | A080A142C | |
| 293 | Plain | 25 | A080A293C | |
| 1.0 | 13 | Plain | 100 | A100A013A |
| | 25 | Plain | 100 | A100A025A |
| | 47 | Plain | 100 | A100A047A |
| | 50 | Plain | 100 | A100A050A |
| | 90 | Plain | 25 | A100A090C |
| | 142 | Plain | 25 | A100A142C |
| 293 | Plain | 25 | A100A293C | |
| 3.0 | 13 | Plain | 100 | A300A013A |
| | 25 | Plain | 100 | A300A025A |
| | 47 | Plain | 100 | A300A047A |
| | 50 | Plain | 100 | A300A050A |
| | 90 | Plain | 25 | A300A090C |
| | 142 | Plain | 25 | A300A142C |
| | 293 | Plain | 25 | A300A293C |
| | 293 | Plain | 25 | A300A293C |
| 5.0 | 13 | Plain | 100 | A500A013A |
| | 25 | Plain | 100 | A500A025A |
| | 47 | Plain | 100 | A500A047A |
| | 50 | Plain | 100 | A500A050A |
| | 90 | Plain | 25 | A500A090C |
| | 142 | Plain | 25 | A500A142C |
| | 293 | Plain | 25 | A500A293C |

Mixed Cellulose Ester Membranes (MCE)

Ordering Information

Black – Non-sterile

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|---------|-----------|
| 0.45 | 13 | Plain | 100 | A045N013A |
| | 13 | Grid | 100 | A045P013A |
| | 25 | Plain | 100 | A045N025A |
| | 25 | Grid | 100 | A045P025A |
| | 37 | Plain | 100 | A045N037A |
| | 37 | Grid | 100 | A045P037A |
| 0.8 | 47 | Plain | 100 | A045N047A |
| | 47 | Grid | 100 | A045P047A |
| | 13 | Plain | 100 | A080N013A |
| | 13 | Grid | 100 | A080P013A |
| 0.8 | 25 | Plain | 100 | A080N025A |
| | 25 | Grid | 100 | A080P025A |
| | 47 | Plain | 100 | A080N047A |
| | 47 | Grid | 100 | A080P047A |

Opticlear – Non-sterile (continued)

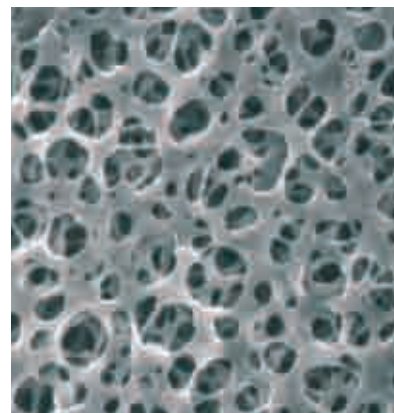
| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|---------|-----------|
| 0.8 | 25 | Plain | 100 | A080X025A |
| | 25 | Grid | 100 | A080X025B |
| | 37 | Plain | 100 | A080X037A |
| | 37 | Grid | 100 | A080X037B |
| | 47 | Plain | 100 | A080X047A |
| | 47 | Grid | 100 | A080X047B |

Green – Non-sterile

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|---------|-----------|
| 0.45 | 13 | Plain | 100 | A045U013A |
| | 13 | Grid | 100 | A045V013A |
| | 25 | Plain | 100 | A045U025A |
| | 25 | Grid | 100 | A045V025A |
| | 47 | Plain | 100 | A045U047A |
| | 47 | Grid | 100 | A045V047A |
| 0.8 | 47 | Grid | 100 | A080V047A |

Cellulose Acetate (CA)

- **Composition:** Mixture of cellulose triacetate and diacetate
- **Characteristics:** Low static charge and high strength
- **Sterilizable:** May be repeatedly sterilized without loss of integrity or change in bubble point
- **Clean:** 0.1wt% aqueous extractables
- **Relative to MCE membranes:**
 - improved solvent resistance to low molecular weight alcohols
 - better heat resistance
 - lower protein binding



Applications

- Enhanced recovery of fastidious gram positive organisms
- Filtration of enzyme solutions
- Diagnostic cytology
- Receptor binding studies

Specifications for Cellulose Acetate, Code C

| Pore Size [μm] | Bubble Point ¹ | | Flow Rate ² | | Porosity ³ [%] | Thickness ⁴ [μm] |
|-------------------|---------------------------|-------|------------------------------------|---------------------------------|------------------------------|--------------------------------|
| | [MPa] | [psi] | Water [ml/min/cm ²] | Air [L/min/cm ²] | | |
| 0.20 | ≥0.25 | ≥37.1 | 16 | 2 | 66 | 125 |
| 0.45 | ≥0.17 | ≥25.9 | 35 | 4 | 68 | 125 |
| 0.80 | ≥0.068 | ≥10.0 | 160 | 14 | 72 | 125 |
| 3.00 | ≥0.034 | ≥5.0 | 500 | 54 | 78 | 135 |

Definitions

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water
 2. Flow Rates indicates initial flow rate at 10 psi using a KGS 47 filter holder
 3. Porosity refers to the percent open area
 4. Average thickness
- Water: Using water prefiltered to 0.1 μm pore size
Air: Using prefiltered nitrogen at 10 psi

Ash Content of Cellulose Acetate

| | | | | | |
|----|------|----|------|----|------|
| Al | <5.0 | K | 2.0 | Ni | <0.5 |
| Ca | 36.4 | Li | <0.5 | Pb | <0.5 |
| Cd | <0.1 | Mg | 1.9 | Si | 7.8 |
| Cr | 2.2 | Mn | <0.5 | Sn | <0.5 |
| Cu | 1.2 | Mo | <0.5 | Ti | <5.0 |
| Fe | 1.6 | Na | 5.9 | Zn | 0.6 |

- Wetting time: < 3 seconds to wet a 47 mm diameter disc with aqueous 1% methylene blue
- Refractive index = 1.47
- Maximum operating temperature: 180°C

Ordering Information

White – Non-sterile

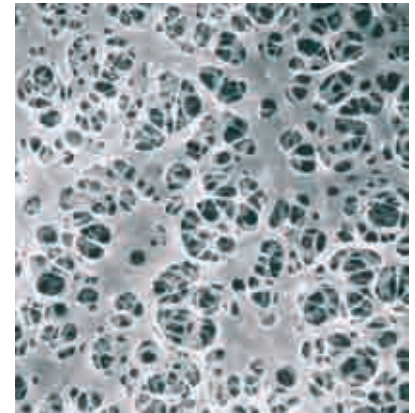
| Pore Size [μm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|-----------|-----------|
| 0.2 | 13 | Plain | 100 | C020A013A |
| | 25 | Plain | 100 | C020A025A |
| | 37 | Plain | 100 | C020A037A |
| | 47 | Plain | 100 | C020A047A |
| | 90 | Plain | 25 | C020A090C |
| | 142 | Plain | 25 | C020A142C |
| 293 | Plain | 25 | C020A293C | |
| 0.45 | 13 | Plain | 100 | C045A013A |
| | 25 | Plain | 100 | C045A025A |
| | 37 | Plain | 100 | C045A037A |
| | 47 | Plain | 100 | C045A047A |
| | 90 | Plain | 25 | C045A090C |
| | 142 | Plain | 25 | C045A142C |
| 293 | Plain | 25 | C045A293C | |

White – Non-sterile (continued)

| Pore Size [μm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|-----------|-----------|
| 0.8 | 13 | Plain | 100 | C080A013A |
| | 25 | Plain | 100 | C080A025A |
| | 37 | Plain | 100 | C080A037A |
| | 47 | Plain | 100 | C080A047A |
| | 90 | Plain | 25 | C080A090C |
| | 142 | Plain | 25 | C080A142C |
| 293 | Plain | 25 | C080A293C | |
| 3.0 | 13 | Plain | 100 | C300A013A |
| | 25 | Plain | 100 | C300A025A |
| | 37 | Plain | 100 | C300A037A |
| | 47 | Plain | 100 | C300A047A |
| | 90 | Plain | 25 | C300A090C |
| | 142 | Plain | 25 | C300A142C |
| 293 | Plain | 25 | C300A293C | |

Coated Cellulose Acetate

- **Composition:** Cellulose acetate cast onto a non-woven polyester support
- **Characteristics:** Non-fiber releasing
- **Low protein binding** relative to nitrocellulose
- **Low static charge** matrix with enhanced chemical compatibility to low molecular weight alcohols



Applications

- Use as a clarifying filter or prefilter

Specifications for Coated Cellulose Acetate, Code Y

| Nominal Rating [µm] | Bubble Point ¹ | | Flow Rate ² | | % Latex Particle Retention [particle size in µm] | | | | | | | |
|------------------------|---------------------------|-------|------------------------------------|---------------------------------|--|------|-------|----|-------|------|------|-------|
| | [MPa] | [psi] | Water [ml/min/cm ²] | Air [L/min/cm ²] | 0.48 | 0.65 | 0.80 | 1 | 2 | 3 | 5 | 10 |
| 0.80 | ≥0.088 | ≥12.8 | 100 | 10 | 99 | 99 | >99.9 | - | - | - | - | - |
| 2.00 | ≥0.049 | ≥7.1 | 290 | 32 | 96 | 99 | 99 | 99 | >99.9 | - | - | - |
| 10.00 | ≥0.017 | ≥2.6 | 750 | 80 | - | - | - | - | 98 | 99.9 | 99.9 | >99.9 |

Definitions

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water
2. Flow Rates indicates initial flow rate at 10 psi using a KGS 47 filter holder
Water: Using water prefiltered to 0.1 µm pore size
Air: Using prefiltered nitrogen at 10 psi

Ordering Information

White – Non-sterile

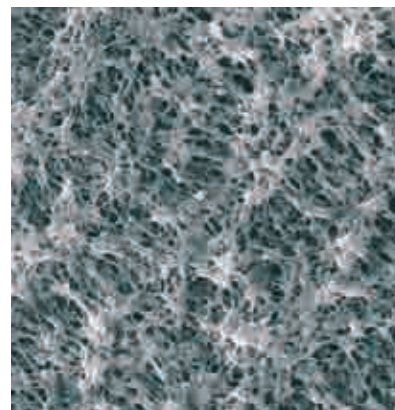
| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.8 | 35 | Plain | 100 | Y008A035A |
| | 47 | Plain | 100 | Y008A047A |
| | 76 | Plain | 100 | Y008A076A |
| | 90 | Plain | 100 | Y008A090A |
| | 124 | Plain | 100 | Y008A124A |
| | 142 | Plain | 100 | Y008A142A |
| | 257 | Plain | 100 | Y008A257A |
| | 293 | Plain | 100 | Y008A293A |
| 2.00 | 35 | Plain | 100 | Y020A035A |
| | 47 | Plain | 100 | Y020A047A |
| | 76 | Plain | 100 | Y020A076A |
| | 90 | Plain | 100 | Y020A090A |
| | 124 | Plain | 100 | Y020A124A |
| | 142 | Plain | 100 | Y020A142A |
| | 257 | Plain | 100 | Y020A257A |
| | 293 | Plain | 100 | Y020A293A |

White – Non-sterile (continued)

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 10.00 | 35 | Plain | 100 | Y100A035A |
| | 47 | Plain | 100 | Y100A047A |
| | 76 | Plain | 100 | Y100A076A |
| | 90 | Plain | 100 | Y100A090A |
| | 124 | Plain | 100 | Y100A124A |
| | 142 | Plain | 100 | Y100A142A |
| | 257 | Plain | 100 | Y100A257A |
| | 293 | Plain | 100 | Y100A293A |

Hydrophilic PTFE

- **Characteristics:** Maximum chemical and pH resistance
- **High flow rates** with minimal aqueous extractables (<0.3 wt%)
- **Optically clear** when wet with water
- **Non-supported**



Applications

- Ideal for HPLC and other mixtures of aqueous and organic solvents

Note:

Autoclaving is not recommended since the membrane then will be hydrophobic.

Specifications for hydrophilic PTFE, Code H

| Pore Size [μm] | Bubble Point ¹ | | Flow Rates ² | | Porosity ³ [%] | Thickness [μm] | Max. Operating Temperature [°C] |
|-------------------|---------------------------|-------|------------------------------------|---------------------------------|------------------------------|-------------------|---------------------------------------|
| | [MPa] | [psi] | Water [ml/min/cm ²] | Air [L/min/cm ²] | | | |
| 0.10 | ≥0.38 | ≥55.1 | 14 | 1.6 | 71 | 35 | 100 |
| 0.20 | ≥0.24 | ≥34.8 | 21 | 2.1 | 71 | 35 | 100 |
| 0.50 | ≥0.14 | ≥20.3 | 39 | 2.9 | 79 | 35 | 100 |
| 1.00 | ≥0.083 | ≥12.0 | 73 | 5.7 | 83 | 35 | 100 |

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water.
2. Flow Rate indicates initial flow rate at 10 psi using a KGS 47 filter holder.
Water: Using water prefiltered to 0.1 μm poresize
Air: Using prefiltered nitrogen at 10 psi.
3. Porosity refers to the percent open area.

Trace Metal Content [ppm]

| | | | |
|----|-----|----|-----|
| Al | 15 | K | 8 |
| Ca | 13 | Mg | 1 |
| Cr | <1 | Mn | 0.1 |
| Cu | 0.5 | Na | 20 |
| Fe | <10 | Ni | 0.9 |

Ordering Information

White – Non-sterile

| Pore Size [μm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.10 | 13 | Plain | 100 | H010A013A |
| | 25 | Plain | 100 | H010A025A |
| | 47 | Plain | 100 | H010A047A |
| | 90 | Plain | 25 | H010A090C |
| | 142 | Plain | 25 | H010A142C |
| | 293 | Plain | 10 | H010A293D |
| 0.20 | 13 | Plain | 100 | H020A013A |
| | 25 | Plain | 100 | H020A025A |
| | 47 | Plain | 100 | H020A047A |
| | 90 | Plain | 25 | H020A090C |
| | 142 | Plain | 25 | H020A142C |
| | 293 | Plain | 10 | H020A293D |

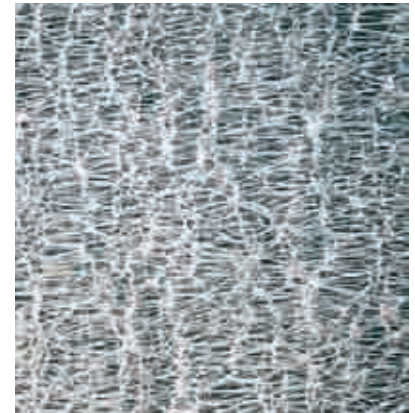
White – Non-sterile (continued)

| Pore Size [μm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.50 | 13 | Plain | 100 | H050A013A |
| | 25 | Plain | 100 | H050A025A |
| | 47 | Plain | 100 | H050A047A |
| | 90 | Plain | 25 | H050A090C |
| | 142 | Plain | 25 | H050A142C |
| | 293 | Plain | 10 | H050A293D |
| 1.00 | 13 | Plain | 100 | H100A013A |
| | 25 | Plain | 100 | H100A025A |
| | 47 | Plain | 100 | H100A047A |
| | 90 | Plain | 25 | H100A090C |
| | 142 | Plain | 25 | H100A142C |
| | 293 | Plain | 10 | H100A293D |

Membrane Filters

Hydrophobic PTFE, supported

- **Properties:** Thin, highly porous, behaves as an absolute retentive membrane
- **Supported:** Polypropylene laminated to one side to improve handling
- **Inert** to most chemically aggressive solvents, strong acids and bases
- **Thermostable:** Can be used up to 130°C



Applications

- Sterilize gases: Traps aqueous aerosols
- Air and gas venting: Allows gases to pass freely while blocking aqueous liquids, protect vacuum pumps and critical samples
- Sterilize and clarify strong acids and many other solvents incompatible with other membrane types

Specifications for hydrophobic PTFE, Code J

| Pore Size [μm] | Bubble Point ¹ | | Flow Rates ² | | Porosity ³ [%] | Maximum Operating Temperature [°C] | Water Break Through | | Thickness [μm] |
|-------------------|---------------------------|-------|--------------------------------------|---------------------------------|------------------------------|---|---------------------|-------|-------------------|
| | [MPa] | [psi] | Acetone [ml/min/cm ²] | Air [L/min/cm ²] | | | [MPa] | [psi] | |
| 0.10 | ≥0.140 | ≥20.3 | 39.1 | 2.5 | 72 | 130 | 0.40 | 58.0 | 130 |
| 0.20 | ≥0.097 | ≥14.1 | 61.4 | 4.5 | 72 | 130 | 0.28 | 40.0 | 130 |
| 0.50 | ≥0.058 | ≥8.5 | 110 | 7.5 | 74 | 130 | 0.14 | 20.1 | 120 |
| 1.00 | ≥0.029 | ≥4.3 | 445 | 17 | 76 | 130 | 0.05 | 7.0 | 90 |

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with methanol
2. Flow rates determined under constant vacuum 0.7 kg/cm² (10 psi)
3. Porosity refers to the percent open area

Ordering Information

White – Non-sterile

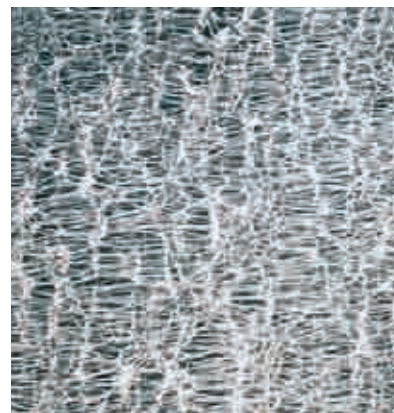
| Pore Size [μm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.10 | 13 | Plain | 100 | J010A013A |
| | 25 | Plain | 100 | J010A025A |
| | 37 | Plain | 100 | J010A037A |
| | 47 | Plain | 100 | J010A047A |
| | 50 | Plain | 100 | J010A050A |
| | 90 | Plain | 25 | J010A090C |
| | 142 | Plain | 25 | J010A142C |
| | 293 | Plain | 10 | J010A293D |
| 0.20 | 13 | Plain | 100 | J020A013A |
| | 25 | Plain | 100 | J020A025A |
| | 37 | Plain | 100 | J020A037A |
| | 47 | Plain | 100 | J020A047A |
| | 50 | Plain | 100 | J020A050A |
| | 90 | Plain | 25 | J020A090C |
| | 142 | Plain | 25 | J020A142C |
| | 293 | Plain | 10 | J020A293D |

White – Non-sterile (continued)

| Pore Size [μm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.50 | 13 | Plain | 100 | J050A013A |
| | 25 | Plain | 100 | J050A025A |
| | 37 | Plain | 100 | J050A037A |
| | 47 | Plain | 100 | J050A047A |
| | 50 | Plain | 100 | J050A050A |
| | 90 | Plain | 25 | J050A090C |
| 1.00 | 13 | Plain | 100 | J100A013A |
| | 25 | Plain | 100 | J100A025A |
| | 37 | Plain | 100 | J100A037A |
| | 47 | Plain | 100 | J100A047A |
| | 50 | Plain | 100 | J100A050A |
| | 90 | Plain | 25 | J100A090C |
| | 142 | Plain | 25 | J100A142C |
| | 293 | Plain | 10 | J100A293D |

Hydrophobic PTFE, unsupported

- **Properties:** Thin, highly porous, behaves as an absolute retentive membrane
- **Inert** to most chemically aggressive solvents, strong acids and bases
- **Operating Temperature Range:** 120 - 260°C



Applications

- Sterilize gases. Traps aqueous aerosols
- Air and gas venting: Allows gases to pass freely while blocking aqueous liquids, protect vacuum pumps and critical samples
- Sterilize and clarify strong acids and many other solvents incompatible with other membranes

Specifications for hydrophobic PTFE, Code T

| Pore Size [μm] | Bubble Point ¹ | | Flow Rates ² Acetone [ml/min/cm ²] | Porosity ³ [%] | Thickness [μm] | Max. Operating Temp. [°C] |
|-------------------|---------------------------|-------|---|------------------------------|-------------------|------------------------------|
| | [MPa] | [psi] | | | | |
| 0.10 | ≥0.12 | ≥17.4 | 27 | 68 | 70 | 260 |
| 0.20 | ≥0.091 | ≥13.2 | 55 | 74 | 80 | 260 |
| 0.50 | ≥0.063 | ≥9.1 | 100 | 78 | 75 | 260 |
| 0.80 | ≥0.039 | ≥5.7 | 200 | 76 | 75 | 260 |
| 1.00 | ≥0.031 | ≥4.5 | 300 | 79 | 75 | 260 |
| 3.00 | ≥0.013 | ≥1.9 | 750 | 83 | 75 | 260 |

Trace Metal Content [μg/g]

| | | | |
|----|--------|----|--------|
| Al | 0.001 | K | <0.1 |
| Ca | 0.001 | Mg | 0.005 |
| Cr | 0.001 | Mn | <0.001 |
| Cu | 0.01 | Na | <0.05 |
| Fe | <0.001 | Ni | 0.005 |

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with isopropylalcohol
2. Flow rates determined under constant vacuum 0.7 kg/cm² (10 psi)
3. Porosity refers to the percent open area

Note:

PTFE membrane filters tend to shrink as they are manufactured by stretching method. Do not remove the separating paper between membranes until shortly before placed in the filter holder. PTFE membranes tend to shrink when heated.

Ordering Information

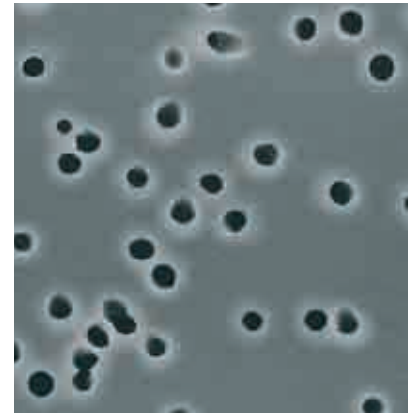
| Pore Size [μm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.10 | 13 | Plain | 100 | T010A013A |
| | 25 | Plain | 100 | T010A025A |
| | 47 | Plain | 100 | T010A047A |
| | 90 | Plain | 25 | T010A090C |
| | 142 | Plain | 25 | T010A142C |
| | 293 | Plain | 10 | T010A293D |
| 0.20 | 13 | Plain | 100 | T020A013A |
| | 25 | Plain | 100 | T020A025A |
| | 47 | Plain | 100 | T020A047A |
| | 90 | Plain | 25 | T020A090C |
| | 142 | Plain | 25 | T020A142C |
| | 293 | Plain | 10 | T020A293D |
| 0.50 | 13 | Plain | 100 | T050A013A |
| | 25 | Plain | 100 | T050A025A |
| | 47 | Plain | 100 | T050A047A |
| | 90 | Plain | 25 | T050A090C |
| | 142 | Plain | 25 | T050A142C |
| | 293 | Plain | 10 | T050A293D |

| Pore Size [μm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.80 | 13 | Plain | 100 | T080A013A |
| | 25 | Plain | 100 | T080A025A |
| | 47 | Plain | 100 | T080A047A |
| | 90 | Plain | 25 | T080A090C |
| | 142 | Plain | 25 | T080A142C |
| | 293 | Plain | 10 | T080A293D |
| 1.00 | 13 | Plain | 100 | T100A013A |
| | 25 | Plain | 100 | T100A025A |
| | 47 | Plain | 100 | T100A047A |
| | 90 | Plain | 25 | T100A090C |
| | 142 | Plain | 25 | T100A142C |
| | 293 | Plain | 10 | T100A293D |
| 3.00 | 13 | Plain | 100 | T300A013A |
| | 25 | Plain | 100 | T300A025A |
| | 47 | Plain | 100 | T300A047A |
| | 90 | Plain | 25 | T300A090C |
| | 142 | Plain | 25 | T300A142C |
| | 293 | Plain | 10 | T300A293D |

Membrane Filters

Polycarbonate

- **Characteristics:** Low non-specific binding and optically translucent, extremely uniform, cylindrical pores
- **Thin screen-type membranes** minimize entrapment within the filter structure, resulting in surface capture of particles on the membrane
- **Stable:** Excellent chemical resistance, good thermal stability, non-hygroscopic and extreme weight stable



Applications

- Epifluorescence microscopy: Available in black for this method
- Electron microscopy: Smooth surface is ideal for observing captured particles
- Light microscopy: Easily transparentized for optical illumination
- Beverage and sterility testing

Specifications for Polycarbonate Membrane, Code K

| Pore Size [µm] | Bubble Point ¹ | | Flow Rate ² | | Nominal Thickness [µm] |
|-------------------|---------------------------|-------|------------------------------------|---------------------------------|---------------------------|
| | [MPa] | [psi] | Water [ml/min/cm ²] | Air [L/min/cm ²] | |
| 0.10 | ≥0.22 | 100 | 2 | 2 | 6 |
| 0.20 | ≥0.13 | 72 | 17 | 4 | 10 |
| 0.40 | ≥0.082 | 36 | 41 | 10 | 10 |
| 0.80 | ≥0.048 | 18 | 120 | 20 | 9 |
| 8.00 | ≥0.0048 | 2 | 1300 | 40 | 7 |

Definitions

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with isopropanol.
2. Flow rate indicates initial flow at 10 psi using a KGS 47 filter holder.
Water: Using water prefiltered to 0.1 µm pore size
Air: Using prefiltered nitrogen at 10 psi

Maximum Operation Temperature: 140 °C

Ordering Information

White – Non-sterile

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.10 | 13 | Plain | 100 | K010A013A |
| | 25 | Plain | 100 | K010A025A |
| | 47 | Plain | 100 | K010A047A |
| 0.20 | 13 | Plain | 100 | K020A013A |
| | 25 | Plain | 100 | K020A025A |
| | 47 | Plain | 100 | K020A047A |
| 0.40 | 13 | Plain | 100 | K040A013A |
| | 25 | Plain | 100 | K040A025A |
| | 47 | Plain | 100 | K040A047A |
| 0.80 | 13 | Plain | 100 | K080A013A |
| | 25 | Plain | 100 | K080A025A |
| | 47 | Plain | 100 | K080A047A |
| 8.00 | 13 | Plain | 100 | K800A013A |
| | 25 | Plain | 100 | K800A025A |
| | 47 | Plain | 100 | K800A047A |

Black – Non-sterile

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|-------------------|------------------|---------|---------|-----------|
| 0.20 | 25 | Plain | 100 | K020N025A |
| | 47 | Plain | 100 | K020N047A |
| 0.40 | 25 | Plain | 100 | K040N025A |
| | 47 | Plain | 100 | K040N047A |

Sterile Membranes for Microbiology

- **Made from Mixed Esters of Cellulose (MCE) or Cellulose Acetate**

MCE is a mixture of nitrocellulose and other cellulose esters.

- **Available with grid lines**

Contrasting grid lines facilitate counting colonies on the filter surface and are tested to assure freedom from grid line inhibition. 3.1 mm squares represent 1/100 of the filtration area of a 47 mm diameter filter (9.6 cm²)

- **Convenient packaging**

Membranes are available individually wrapped for optimum sterility.

- **Specially tested for microbiology**

All 0.45 µm white gridded membranes are tested for Coliform, Fecal Streptococci and Serratia marcescens. All 0.65 µm white gridded membranes are tested for complete retention and optimal recovery of Fecal Coliform and Saccharomyces cerevisiae. Black and green membranes are tested for optimal recovery of yeast and total bacteria.

All membranes are also tested for uniform wetting, freedom from grid line inhibition and optimal color reactions on appropriate test media.

- **Membrane certification**

for individual lot numbers is available on request. Advantec membranes were developed and are manufactured to comply with the provisions of:

- ISO 7704:1985, Water Quality – Evaluation of membrane filters for microbiological analysis
- The National Interim Primary Drinking Water Regulations
- Guidelines for Establishing Test Procedures for the Analysis of Pollutants
- Standard Methods for the Examination of Water and Waste water
- ASTM

- **Applications**

Applications include microbiological analysis of water, wastewater, pharmaceuticals and beverages.

Membrane Filters

Sterile Membranes for Microbiology

Three colors are available:

- White plain and with grids
- Black plain and with grids
- Green with grids

Specifications for MCE membranes, please see page 6 and page 9 for CA membranes



Ordering Information

MCE – White

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|-----------|-----------|
| 3.00 | 47 | Plain | 100 | A300G047A |
| | 50 | Plain | 100 | A300G050A |
| 1.00 | 47 | Plain | 100 | A100G047A |
| | 47 | Grid | 100 | A100H047A |
| | 50 | Grid | 100 | A100H050A |
| 0.80 | 47 | Plain | 100 | A080G047A |
| | 47 | Grid | 100 | A080H047A |
| | 47 | Grid | 1000 | A080H047W |
| | 50 | Plain | 100 | A080G050A |
| 50 | Grid | 100 | A080H050A | |
| | | | | |
| 0.65 | 47 | Plain | 100 | A065G047A |
| | 47 | Grid | 100 | A065H047A |
| | 50 | Grid | 100 | A065H050A |
| 0.45 | 47 | Plain | 100 | A045G047A |
| | 47 | Grid | 100 | A045H047A |
| | 47 | Grid | 1000 | A045H047W |
| | 50 | Plain | 100 | A045G050A |
| | 50 | Grid | 100 | A045H050A |
| | 82 | Grid | 100 | A045H082A |
| 0.20 | 47 | Plain | 100 | A020G047A |
| | 47 | Grid | 100 | A020H047A |

CA – White

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|---------|-----------|
| 0.45 | 47 | Plain | 100 | C045G047A |
| | 85 | Plain | 100 | C045G085A |
| 0.20 | 47 | Plain | 100 | C020G047A |

MCE – Black

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|---------|-----------|
| 0.80 | 47 | Grid | 100 | A080R047A |
| | 47 | Grid | 1000 | A080R047W |
| 0.45 | 47 | Grid | 100 | A045R047A |
| | 47 | Grid | 1000 | A045R047W |
| | 50 | Grid | 100 | A045R050A |

MCE – Green

| Pore Size [µm] | Diameter [mm] | Surface | Packing | Cat. No. |
|----------------|---------------|---------|---------|-----------|
| 0.45 | 47 | Grid | 100 | A045W047A |
| | 50 | Grid | 100 | A045W050A |

Petri Dishes

- **Polystyrene dishes** suitable for culturing micro-organisms on 47 mm diameter membrane filters
- **Convenient:** Snug fit prevents drying during incubation. Squared edges and a raised ridge for ease of handling and secure stacking
- **Available with or without pad:** 47 mm absorbent cellulose pad (8.85 ± 0.17 mm thick, absorbs 1.8 - 2.2 ml liquid)
- **Manufacturer's certification** of compliance available upon request



Ordering Information

| Model | Description | Size | Packing | Cat. No. |
|--------|--------------------------------|--------------|-----------------------|----------|
| PD-47A | Sterile Petri Dishes | OD54 x 11 mm | 100 (5 sleeves of 20) | 42004010 |
| PD-47B | Sterile Petri Dishes with Pads | OD54 x 11 mm | 100 (5 sleeves of 20) | 42004020 |

Pre-Sterilized Absorbent Pads

- **Cellulose Pads:** 47 mm plain white discs fit into standard petri dishes
- **Routinely tested** for absorption of 1.8 - 2.2 ml of culture media, pH neutral
- **Convenient Packaging:** 100 individual pre-sterilized packages per box



Ordering Information

| Cat. No. | Packing |
|-----------|---------|
| B200G047A | 100 |

Filterceps

- **Forceps** of polished type 304 stainless steel are ideally designed for handling membranes
- **Tips are beveled and unserrated** to minimize the risk of damaging membrane filters
- **Non-slip handle** allows Filterceps to be held securely and flamed without risk of burning one's fingers
- **Length:** 115 mm



Ordering Information

| Model | Material | Cat. No. |
|-------|----------|----------|
| FS-1 | SUS 304 | 17800000 |

DISMIC Disposable Syringe Filter Units

LABODISC Disposable In-Line/Syringe Filter Units



Features

- **Minimum sample hold-up:**
Unit housings are specifically designed to maximize sample recovery
- **High Purity:**
Non-pigmented housings and integral filter sealing assure that filtrates will not be adulterated due to pigment, dye or adhesives leaching into filtrate
- **Convenient:**
Each unit is clearly marked with an identifying code to denote pore size, membrane material and housing material
- **Sterile:**
Units can be purchased presterilized and individually packed or non-sterile in bulk pack (all polypropylene can be autoclaved)

The Advantec range of DISMIC syringe filters is versatile in terms of volume to be filtered and which kind of liquids to be filtered.

- 3 mm filters for volumes <2 ml
- 13 mm filters for volumes <10 ml
- 25 mm filters for volumes <50 ml
- 50 mm filters for volumes <1 liter

Different membrane types and filter housings available for any kind of filtration. Some types available both non-sterile and sterile.

Specifications:

| | | DISMIC 3 | DISMIC 13 | DISMIC 25 | | LABODISC |
|-----------------------------------|--------------------|--|-----------|-----------|---------|---|
| Housing material | | PP | PP | PP | Acrylic | PP |
| Housing diameter | [mm] | 3 | 13 | 25 | 25 | 50 |
| Filtration area | [cm ²] | 0.06 | 0.9 | 4.0 | 4.0 | 19.6 |
| Hold-up volume | [ml] | <0.01 | <0.03 | <0.1 | <0.1 | <3.0 |
| Sample volume | [ml] | <2 ml | <10 ml | <50 ml | <50 ml | <1 liter |
| Pressure limit | [psi] | 74 | 74 | 74 | 74 | 49 |
| Max. operating temperature | [°C] | 60 | 60 | 60 | 45 | 60 |
| Connections | | Inlet: female luer-lock / Outlet: male luer slip | | | | 7-13.5 mm hose barb, female luer slip |

Note: Pressure limits for DISMIC 13HP and DISMIC 25HP is 57 psi.

DISMIC – Disposable Syringe Filter Units

DISMIC 3

Membrane Types and Ordering Information

Membrane Types

| | Characteristics |
|--------------------------|--|
| Cellulose Acetate | A commonly used hydrophilic membrane. Low protein binding, suitable for aqueous protein solutions. Suitable for most alcohols. |
| PTFE, hydrophobic | Ideal for filtration of solvents, acids and bases. Air venting. |



Ordering Information

| Diameter [mm] | Membrane material | Pore size (µm) | Housing material | Packing | Cat. No. Non-sterile | Cat. No. Sterile |
|---------------|-------------------|----------------|------------------|---------|----------------------|------------------|
| 3 | Cellulose Acetate | 0.20 | Polypropylene | 100 | 03CP020AN | 03CP020AS |
| 3 | Cellulose Acetate | 0.45 | Polypropylene | 100 | 03CP045AN | 03CP045AS |
| 3 | PTFE, hydrophobic | 0.50 | Polypropylene | 100 | 03JP050AN | - |

DISMIC – Disposable Syringe Filter Units

DISMIC 13

Membrane Types and Ordering Information

Membrane Types

| | Characteristics |
|--------------------------|--|
| Cellulose Acetate | A commonly used hydrophilic membrane. Low protein binding, suitable for aqueous protein solutions. Suitable for most alcohols. |
| PTFE, hydrophobic | Ideal for filtration of solvents, acids and bases. Air venting. |
| PTFE, hydrophilic | Versatile: Suitable for both solvents and aqueous solutions. Ideal for filtering HPLC samples. Studies has shown that hydrophilic PTFE has a low binding of Pesticides. The models in blister packs, Cat. Nos.13HP020CN and 13HP045CN, are specially manufactured for Ion Chromatography analysis. |



13CP AN / AS



13JP



13HP



13HP in blister pack

Table of Negative Ion elution comparison

| Item | F ⁻ | Cl ⁻ | No ₂ ⁻ | Br ⁻ | No ₃ ⁻ | PO ₄ ³⁻ | SO ₄ ²⁻ |
|-----------------------|----------------|-----------------|------------------------------|-----------------|------------------------------|-------------------------------|-------------------------------|
| 13HP020CN | ND* | 16.0 | ND | ND | ND | ND | ND |
| 13HP045CN | ND | 10.2 | ND | ND | ND | ND | ND |
| A company filter unit | ND | 56.6 | ND | ND | 7.6 | ND | 35.6 |
| B company filter unit | ND | 22.6 | ND | ND | ND | ND | ND |
| C company filter unit | ND | 14.0 | ND | ND | 90.4 | ND | 88.6 |

*) No Detection: less than detection limit

Ordering Information

| Diameter [mm] | Membrane material | Pore size (µm) | Housing material | Packing | Cat. No. Non-sterile | Cat. No. Sterile |
|---------------|-------------------|----------------|------------------|---------|----------------------|------------------|
| 13 | Cellulose Acetate | 0.20 | Polypropylene | 100 | 13CP020AN | 13CP020AS |
| 13 | Cellulose Acetate | 0.45 | Polypropylene | 100 | 13CP045AN | 13CP045AS |
| 13 | PTFE, hydrophobic | 0.20 | Polypropylene | 100 | 13JP020AN | - |
| 13 | PTFE, hydrophobic | 0.50 | Polypropylene | 100 | 13JP050AN | - |
| 13 | PTFE, hydrophilic | 0.20 | Polypropylene | 100 | 13HP020AN | - |
| 13 | PTFE, hydrophilic | 0.45 | Polypropylene | 100 | 13HP045AN | - |
| 13 | PTFE, hydrophilic | 0.20 | Polypropylene | 50 | 13HP020CN | - |
| 13 | PTFE, hydrophilic | 0.45 | Polypropylene | 50 | 13HP045CN | - |

DISMIC – Disposable Syringe Filter Units

DISMIC 25

Membrane Types and Ordering Information

Membrane Types

| | Characteristics |
|------------------------------|---|
| Mixed Cellulose Ester | A hydrophilic membrane with high porosity which provides a high flow rate. This type will bind proteins. |
| Cellulose Acetate | A commonly used hydrophilic membrane. Low protein binding, suitable for aqueous protein solutions. Suitable for most alcohols. |
| PTFE, hydrophobic | Ideal for filtration of solvents, acids and bases. Air venting. |
| PTFE, hydrophilic | Versatile: Suitable for both solvents and aqueous solutions. Ideal for filtering HPLC samples. Studies has shown that hydrophilic PTFE has a low binding of Pesticides. |



25AS AN / AS



25CS AN / AS



25JP



25HP

Ordering Information

| Diameter [mm] | Membrane material | Pore size (µm) | Housing material | Packing | Cat. No. Non-sterile | Cat. No. Sterile |
|---------------|-----------------------|----------------|------------------|---------|----------------------|------------------|
| 25 | Mixed Cellulose Ester | 0.20 | Acrylic | 50 | 25AS020AN | 25AS020AS |
| 25 | Mixed Cellulose Ester | 0.45 | Acrylic | 50 | 25AS045AN | 25AS045AS |
| 25 | Cellulose Acetate | 0.20 | Acrylic | 50 | 25CS020AN | 25CS020AS |
| 25 | Cellulose Acetate | 0.45 | Acrylic | 50 | 25CS045AN | 25CS045AS |
| 25 | Cellulose Acetate | 0.80 | Acrylic | 50 | 25CS080AN | 25CS080AS |
| 25 | PTFE, hydrophobic | 0.20 | Polypropylene | 50 | 25JP020AN | 25JP020AS |
| 25 | PTFE, hydrophobic | 0.50 | Polypropylene | 50 | 25JP050AN | - |
| 25 | PTFE, hydrophilic | 0.20 | Polypropylene | 100 | 25HP020AN | - |
| 25 | PTFE, hydrophilic | 0.45 | Polypropylene | 100 | 25HP045AN | - |

LABODISC – Disposable In-Line/Syringe Filter Units

LABODISC 50

Membrane Types and Ordering Information

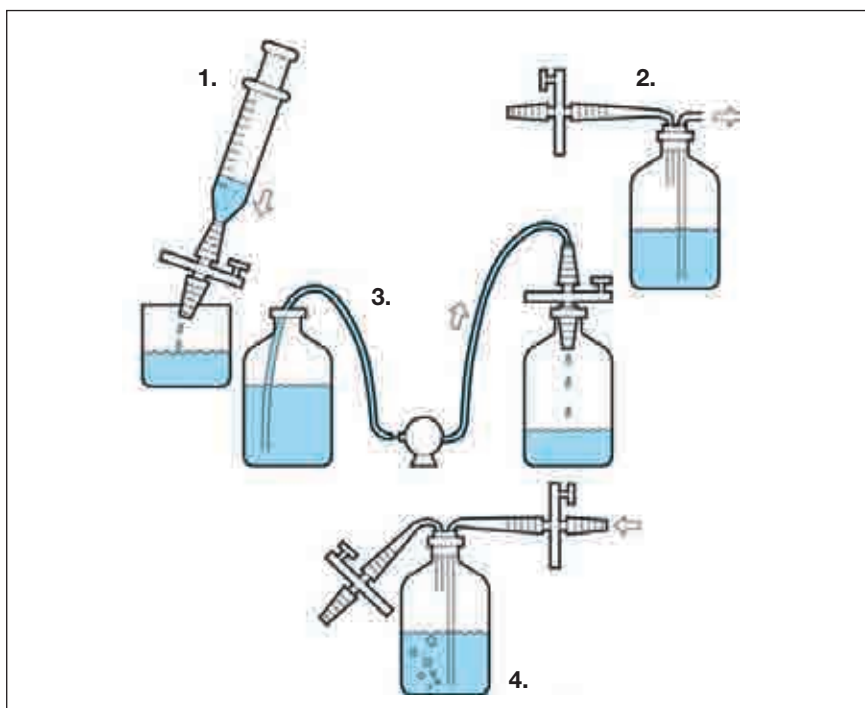
Membrane Types

| | Characteristics |
|--------------------------|--|
| Cellulose Acetate | A commonly used hydrophilic membrane. Low protein binding, suitable for aqueous protein solutions. Suitable for most alcohols. |
| PTFE, hydrophobic | Ideal for filtration of solvents, acids and bases. Air venting. |



Ordering Information

| Diameter [mm] | Membrane material | Pore size (µm) | Housing material | Packing | Cat. No. Non-sterile | Cat. No. Sterile |
|---------------|-------------------|----------------|------------------|---------|----------------------|------------------|
| 50 | Cellulose Acetate | 0.20 | Polypropylene | 10 | 50CP020AN | 50CP020AS |
| 50 | Cellulose Acetate | 0.45 | Polypropylene | 10 | 50CP045AN | 50CP045AS |
| 50 | PTFE, hydrophobic | 0.20 | Polypropylene | 10 | 50JP020AN | 50JP020AS |
| 50 | PTFE, hydrophobic | 0.50 | Polypropylene | 10 | 50JP050AN | - |



1. Filtration with a syringe
2. Venting when emptying a container
3. Filtration with a peristaltic pump
4. Venting when filling a container

› USY Disposable Ultrafiltration Units

- **Easy** small volume ultrafiltration
- **Collect** concentrated solution, filtrate or both
- **Syringe-driven** filtration, no equipment required
- **Ultrafilter membranes** integrated into the units
- **Choose from** 10, 50 and 200 kDa ultrafilter units
- **Simple** unit assembly and operation

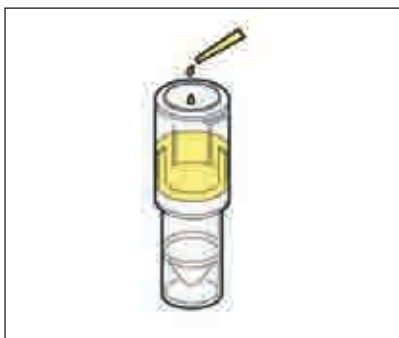
› Applications

These disposable ultrafiltration units are designed to easily concentrate, separate or otherwise purify small volumes (<2 ml) of liquids, on the basis of molecular weight cut off using positive pressure. Clear filtration chamber allows visual confirmation of filtration progress.



› Specifications:

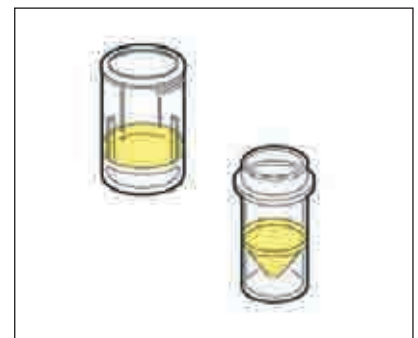
| Materials | |
|-----------------------------------|--------------------------|
| Cell cap, Luer cap | Polypropylene |
| Check valve: | Silicone |
| Retentive cell: | Acrylic |
| Ultra filter: | Polysulfone |
| Filtrate cell: | Acrylic |
| Effective filtration Area: | 2.0 cm ² |
| Maximum cell capacity: | 2.0 ml |
| Minimum graduated volume: | 0.5 ml |
| Minimum recovery volume: | 0.5 ml |
| Maximum concentration: | 40 x |
| Maximum temperature: | 50°C |
| Sterilization: | 25% Ethanol, 5% Formalin |
| Maximum pressure: | 0.29 MPa (42.6 psi) |
| Filtrate cell capacity: | 2.5 ml |



1
Pipet sample (approximately 1-2 ml) into the retentate cell.



2
Place the cell cap onto the retentate cell and gently screw into place. Pressurize the unit by injecting 10 ml of air with a syringe.



3
The concentrated sample can be collected from the retentate cell while the filtrate can be collected from the filter cell.

› Solute Rejection [%]

1 ml of sample filtered at 0.2 MPa

| | | USY-1 | USY-5 | USY-20 |
|--|------------------|--------|--------|---------|
| Molecular Weight Cut Off of Ultra Filter | | 10,000 | 50,000 | 200,000 |
| Solute | Molecular weight | | | |
| Lysozyme | 14,800 | >98 | 50 | - |
| Myoglobin | 16,800 | >95 | 40 | - |
| α - Chymotrypsin | 24,500 | >98 | 85 | - |
| β - Lactoglobulin | 35,000 | >98 | 85 | 10 |
| Ovalbumin | 44,000 | >98 | 95 | 60 |
| Albumin (0.01%) | 64,000 | >98 | >98 | - |
| Bovine albumin | 67,000 | >98 | >90 | 60 |
| β - Globulin | 110,000 | >98 | >98 | >95 |
| γ - Globulin | 160,000 | >98 | >98 | >90 |

› Ordering Information

1 box contains:

- 24 pcs. Retentate cells
- 24 pcs. Filtrate Cells
- 4 pcs. Luer Caps
- 4 pcs. Cell Caps
- 4 pcs. Check Valves

| Type | Cut Off | Cat. No. |
|--------|--------------|----------|
| USY-1 | 10,000 MWCO | 39651001 |
| USY-5 | 50,000 MWCO | 39651005 |
| USY-20 | 200,000 MWCO | 39651020 |

Glass Fiber and Quartz Fiber filters are perhaps the most highly engineered fibrous filtration media available for research and industrial applications.

Glass microfibers, the starting raw material, are entirely man-made. Since the ultimate retention characteristics of the filter paper are determined by the microfiber diameter, rigid manufacturing controls are imposed to produce consistent, controlled diameter fibers. Typical diameters range from 0.5 to 1.0 μm .

Once compacted, these fibers form a dense, random fiber matrix. When used in aqueous filtration, high flow rates and high loading capacities are observed as particles are entrapped within the filter matrix.

Chemical resistance, pH resistance and biological inertness are maximized since the fibers are borosilicate glass. Thermal resistance can be increased from 500°C to 1000°C by reinforcing the fiber within alumina binder.

Glass fiber filters with binder are recommended for long duration filtrations under pressure.

Glass fiber filters without binder are recommended for analytical and gravimetric determinations.



Glass Fiber Filters



Quartz Fiber Filters

Glass Fiber Filters

Characteristics

- **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 and air pollution analysis
- Liquid clarification
- Cell harvesting



Specifications

| Type | Applications/ Characteristics | Weight [g/m ²] | Thick- ness [mm] | Nominal Rating [μm] | Water Flow Time ¹ [sec.] | Gas Collection Efficiency [%; 0.3 μm DOP] | Pressure Drop at 5 cm/sec [kPa] | Binder | Max. Temp. [°C] |
|---------|--|-------------------------------|------------------------|---------------------------|---|---|---------------------------------------|---------|-----------------------|
| GA-55 | General purpose paper Air pollution monitoring | 55 | 0.21 | 0.6 | 23 | 99.9 | 0.33 | None | 500 |
| GA-100 | General purpose paper Filtration of precipitated proteins or cells Air pollution monitoring | 110 | 0.44 | 1.0 | 11 | 96 | 0.20 | None | 500 |
| GA-200 | Thick filter recommended for filtering viscous fluids as liquid sugars and gels | 175 | 0.74 | 0.8 | 15 | 99.9 | 0.35 | None | 500 |
| GB-100R | 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 | 0.38 | 0.6 | 15 | 99.99 | 0.30 | None | 500 |
| GB-140 | 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 | 99.99 | 1.11 | None | 500 |
| GC-50 | Prefilter for membrane filters (0.45 μm or smaller) Scintillation counting Suspended solids analysis of industrial waters and wastewater | 48 | 0.19 | 0.5 | 28 | 99.99 | 0.52 | None | 500 |
| GC-90 | High wet strength Clinical screening | 100 | 0.30 | 0.5 | 20 | 99.99 | 0.42 | Organic | 120 |
| GD-120 | Prefilter for 0.45 μm – 1.2 μm membranes High wet strength, very high loading capacity | 123 | 0.51 | 0.9 | 14 | 97 | 0.17 | None | 500 |
| GF-75 | 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 | 99.999 | 1.67 | None | 500 |
| GS-25 | Limited dirt holding capacity High wet strength Prefilter for 0.65 μm or smaller mem- branes | 70 | 0.21 | 0.6 | 15 | 99.9 | 0.32 | Organic | 120 |
| DP-70 | High wet strength Very high loading capacity Dust measurement | 170 | 0.52 | 0.6 | 20 | - | 0.52 | Organic | 120 |

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.

Comparison Table and Metal Content Table, see page 31

Glass Fiber Filters

Ordering Information

Grade GA-55

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 100 | GA055.025 |
| 37 | 100 | GA055.037 |
| 45 | 100 | GA055.045 |
| 47 | 100 | GA055.047 |
| 50 | 100 | GA055.050 |
| 55 | 100 | GA055.055 |
| 70 | 100 | GA055.070 |
| 90 | 100 | GA055.090 |
| 110 | 100 | GA055.110 |
| 125 | 100 | GA055.125 |
| 150 | 100 | GA055.150 |
| Sheets, size | | |
| 203 x 254 | 100 | GA055.810 |

Grade GA-100

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 100 | GA100.025 |
| 35 | 100 | GA100.035 |
| 37 | 100 | GA100.037 |
| 45 | 100 | GA100.045 |
| 47 | 100 | GA100.047 |
| 55 | 100 | GA100.055 |
| 70 | 100 | GA100.070 |
| 90 | 100 | GA100.090 |
| 110 | 100 | GA100.110 |
| 125 | 100 | GA100.125 |
| 150 | 100 | GA100.150 |
| Sheets, size | | |
| 203 x 254 | 50 | GA100.810 |

Grade GA-200

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 50 | GA200.025 |
| 37 | 50 | GA200.037 |
| 45 | 50 | GA200.045 |
| 47 | 50 | GA200.047 |
| 55 | 50 | GA200.055 |
| 70 | 50 | GA200.070 |
| 90 | 50 | GA200.090 |
| 110 | 50 | GA200.110 |
| 125 | 50 | GA200.125 |
| 150 | 50 | GA200.150 |
| Sheets, size | | |
| 203 x 254 | 50 | GA200.810 |

Grade GB-100R

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|------------|
| 25 | 100 | GB100R.025 |
| 37 | 100 | GB100R.037 |
| 45 | 100 | GB100R.045 |
| 47 | 100 | GB100R.047 |
| 55 | 100 | GB100R.055 |
| 70 | 100 | GB100R.070 |
| 90 | 100 | GB100R.090 |
| 110 | 100 | GB100R.110 |
| 125 | 100 | GB100R.125 |
| 150 | 100 | GB100R.150 |
| Sheets, size | | |
| 203 x 254 | 50 | GB100R.810 |

Glass Fiber Filters

Ordering Information

Grade GB-140

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 100 | GB140.025 |
| 37 | 100 | GB140.037 |
| 45 | 100 | GB140.045 |
| 47 | 100 | GB140.047 |
| 55 | 100 | GB140.055 |
| 70 | 100 | GB140.070 |
| 90 | 100 | GB140.090 |
| 110 | 100 | GB140.110 |
| 125 | 100 | GB140.125 |
| 150 | 100 | GB140.150 |
| Sheets, size | | |
| 203 x 254 | 50 | GB140.810 |

Grade GC-50

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 100 | GC050.025 |
| 37 | 100 | GC050.037 |
| 45 | 100 | GC050.045 |
| 47 | 100 | GC050.047 |
| 55 | 100 | GC050.055 |
| 70 | 100 | GC050.070 |
| 90 | 100 | GC050.090 |
| 110 | 100 | GC050.110 |
| 125 | 100 | GC050.125 |
| 150 | 100 | GC050.150 |
| Sheets, size | | |
| 203 x 254 | 100 | GC050.810 |

Grade GC-90

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 100 | GC090.025 |
| 37 | 100 | GC090.037 |
| 45 | 100 | GC090.045 |
| 47 | 100 | GC090.047 |
| 55 | 100 | GC090.055 |
| 70 | 100 | GC090.070 |
| 90 | 100 | GC090.090 |
| 110 | 100 | GC090.110 |
| 125 | 100 | GC090.125 |
| 150 | 100 | GC090.150 |
| Sheets, size | | |
| 203 x 254 | 50 | GC090.810 |

Grade GD-120

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 50 | GD120.025 |
| 37 | 50 | GD120.037 |
| 45 | 50 | GD120.045 |
| 47 | 50 | GD120.047 |
| 55 | 50 | GD120.055 |
| 70 | 50 | GD120.070 |
| 90 | 50 | GD120.090 |
| 110 | 50 | GD120.110 |
| 125 | 50 | GD120.125 |
| 150 | 50 | GD120.150 |
| Sheets, size | | |
| 203 x 254 | 50 | GD120.810 |

Glass Fiber Filters

Ordering Information

Grade GF-75

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 100 | GF075.025 |
| 37 | 100 | GF075.037 |
| 45 | 100 | GF075.045 |
| 47 | 100 | GF075.047 |
| 55 | 100 | GF075.055 |
| 70 | 100 | GF075.070 |
| 90 | 100 | GF075.090 |
| 110 | 100 | GF075.110 |
| 125 | 100 | GF075.125 |
| 150 | 100 | GF075.150 |
| Sheets, size | | |
| 203 x 254 | 50 | GF075.810 |

Grade GS-25

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 100 | GS025.025 |
| 37 | 100 | GS025.037 |
| 45 | 100 | GS025.045 |
| 47 | 100 | GS025.047 |
| 55 | 100 | GS025.055 |
| 70 | 100 | GS025.070 |
| 90 | 100 | GS025.090 |
| 110 | 100 | GS025.110 |
| 125 | 100 | GS025.125 |
| 150 | 100 | GS025.150 |
| Sheets, size | | |
| 203 x 254 | 100 | GS025.810 |

Grade DP-70

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 35 | 50 | DP070.035 |
| 37 | 50 | DP070.037 |
| 45 | 50 | DP070.045 |
| 47 | 50 | DP070.047 |
| 55 | 50 | DP070.055 |
| 70 | 50 | DP070.070 |
| 90 | 50 | DP070.090 |
| 110 | 50 | DP070.110 |
| 125 | 50 | DP070.125 |
| 150 | 50 | DP070.150 |
| Sheets, size | | |
| 203 x 254 | 25 | DP070.810 |

Quartz Fiber Filters

Characteristics

- **Highly resistant** to chemical attack, biologically inert
- **High purity:** Very low trace metal content, does not adsorb nitrous and sulfur dioxides; Grade QR-100 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



Specifications

| Type | Applications/ Characteristics | Weight [g/m ²] | Thickness [mm] | Gas Collection Efficiency [%; 0.3 µm DOP] | Pressure Drop at 5 cm/sec. [kPa] | Binder | Max. Temp. [°C] |
|--------|--|----------------------------|----------------|---|----------------------------------|-----------|-----------------|
| QR-100 | Superior chemical resistance, does not absorb acid gases | 85 | 0.38 | 99.9 | 0.45 | None | 1000 |
| QR-200 | Filtration at elevated temperatures Low adsorption Monitor airborne particulates | 200 | 1.0 | 99.9 | 0.34 | Inorganic | 1000 |

Comparison Table and Metal Content Table, see page 31

Grade QR-100

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 100 | QR100.025 |
| 37 | 100 | QR100.037 |
| 45 | 100 | QR100.045 |
| 47 | 100 | QR100.047 |
| 55 | 100 | QR100.055 |
| 70 | 100 | QR100.070 |
| 90 | 100 | QR100.090 |
| 110 | 100 | QR100.110 |
| 125 | 100 | QR100.125 |
| 150 | 100 | QR100.150 |
| Sheets, size | | |
| 203 x 254 | 50 | QR100.810 |

Grade QR-200

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 25 | 50 | QR200.025 |
| 37 | 50 | QR200.037 |
| 45 | 50 | QR200.045 |
| 47 | 50 | QR200.047 |
| 55 | 50 | QR200.055 |
| 70 | 50 | QR200.070 |
| 90 | 50 | QR200.090 |
| 110 | 50 | QR200.110 |
| 125 | 50 | QR200.125 |
| 150 | 50 | QR200.150 |
| Sheets, size | | |
| 203 x 254 | 50 | QR200.810 |

Glass Fiber & Quartz Fiber Filters

Comparison Table

Binder Free Glass Fiber Filters

| Advantec | Whatman | Millipore | Munktell | Macherey-Nagel | ALBET-Hahnemuehle |
|----------|---------|-----------|----------|----------------|-------------------|
| GA-55 | GF/A | APFA | MGA | GF-1 | FPGF 50 |
| GB-140 | GF/B | APFB | MGB | GF-2 | FPGF 51 |
| GC-50 | GF/C | APFC | MGC | GF-3 | FPGF 52 |
| GD-120 | GF/D | APFD | MGD | GF-4 | FPGF 53 |
| GF-75 | GF/F | APFF | MGF | GF-5 | FPGF 55 |

Quartz Fiber Filters

| QR-100 | QM-A | AQFA | MK 360 | QF-10 | FQT |
|--------|------|------|--------|-------|-----|
| | | | | | |

Note:

This table should be considered as alternatives rather than equivalents. When comparing depth filters like glass fiber filters it is impossible to obtain an exact equivalent. The comparison is based on filters made of the same type of raw material giving similar filtration properties. Filtration speed can differ between types with the same retention efficiency because of the thickness of the filter. Thin filters filter faster than thick filters.

Metal Content Table

Glass Fiber Filters [µg/g]

| Grade | Pb | Cd | Mn | Zn | Cu | Ni | Cr | Fe |
|---------|----|------|------|-------|----|----|----|-----|
| GA-55 | 1 | <0.5 | 3.8 | 14000 | <1 | <1 | 3 | 100 |
| GA-100 | <1 | <0.5 | <0.5 | <1 | <1 | <1 | <1 | 10 |
| GA-200 | <1 | <0.5 | <0.5 | <1 | <1 | <1 | <1 | 8 |
| GB-100R | 3 | <0.5 | <0.5 | <1 | <1 | <1 | <1 | 10 |
| GB-140 | <1 | <0.5 | 1.6 | 8700 | <1 | <1 | 1 | 57 |
| GC-50 | <1 | <0.5 | 2.6 | 7600 | <1 | <1 | 7 | 73 |
| GC-90 | <1 | <0.5 | <0.5 | <1 | <1 | <1 | <1 | 9 |
| GD-120 | <1 | <0.5 | <0.5 | 1200 | <1 | <1 | <1 | 10 |
| GF-75 | 2 | <0.5 | 4 | 1800 | <1 | <1 | 6 | 180 |
| GS-25 | <1 | <0.5 | <0.5 | <1 | <1 | <1 | <1 | 11 |
| DP-70 | <1 | <0.5 | 1.4 | 4200 | <1 | <1 | 2 | 37 |

Analysis Method: Flame atomic absorption spectrophotometry

- Pre-treatment:
1. Extracting by heated HCl-HNO₃ mixed acid
 2. Condensing the extracted solution
 3. Re-extracting by heated H-Cl-HNO₃ mixed acid
 4. Analyzing the re-extracted solution

Quartz Fiber Filters [µg/g]

| Grade | Pb | Cd | Mn | Zn | Cu | Ni | Cr | Fe |
|--------|----|------|------|----|----|----|----|----|
| QR-100 | <1 | <0.5 | <0.5 | <1 | <1 | <1 | 1 | 8 |
| QR-200 | <1 | <0.5 | <0.5 | <1 | <1 | 1 | 3 | 45 |

Analysis Method except for Zn: Electric heating atomic absorption spectrophotometry

Analysis Method for Zn: Flame atomic absorption spectrophotometry

- Pre-treatment:
1. Extracting to dryness
 2. Evaporating to dryness
 3. Dissolving by HNO₃(conc.)
 4. Filtrating by Filter paper No. 5C
 5. Analyzing

Composite Filters

PG-60

- **Glass Fibers** covered with polytetrafluoroethylene (PTFE)
- **Hydrophobic**
- **Low absorption:** The moisture absorption is very low as the surface is coated with PTFE. Therefore the measurement of dust concentration is not affected by humidity of the air
- **The absorption of acid gases** such as SO_x or NO_x is very low since Fluoropolymer is used as binder

Applications

- Measurement of dust concentration in air and exhaust gas



Usage note

PG-60 is designed for air/gas filtration only, and any liquid should not be filtrated.

Specifications

| Grade | Weight [g/m ²] | Thickness [mm] | Pressure Drop [kPa] ¹ | DOP retention [% , 0.3 μm] ² | Water Break Through [kPa] ³ | Binder | Max. Operating Temp. [°C] |
|-------|----------------------------|----------------|----------------------------------|---|--|---------------|---------------------------|
| PG-60 | 60 | 0.15 | 0.30 | 99.9 | >7.8 | Fluoropolymer | 260 |

1) Air velocity: 5 cm/sec.

2) Test conditions are subject to JIS Z 8901 (Air velocity: 5 cm/sec.)

3) Pressure of the water passing through the filter.

Metal Content (μg/g)

| Pb | Cd | Mn | Zn | Cu | Ni | Cr | Fe |
|------|------|------|-----|-----|------|------|----|
| <1.0 | <0.1 | <0.5 | 6.3 | 2.6 | <0.5 | <0.1 | 31 |

Ordering Information

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|----------|
| 25 | 100 | PG60.025 |
| 26 | 100 | PG60.026 |
| 37 | 100 | PG60.037 |
| 45 | 100 | PG60.045 |
| 47 | 100 | PG60.047 |
| 55 | 100 | PG60.055 |
| 70 | 100 | PG60.070 |
| 90 | 50 | PG60.090 |
| 110 | 50 | PG60.110 |
| 125 | 50 | PG60.125 |
| 150 | 50 | PG60.150 |
| Sheets, size | | |
| 203 x 254 | 50 | PG60.810 |



Qualitative and Quantitative Filter Papers

- Qualitative Filter Papers are manufactured from 100% alpha cotton cellulose.
- Primarily used for clarifying and removing precipitates, these papers are ideal for filtrations that do not require low ash.
- Six types of qualitative papers are available. Choice of paper is usually based on the size of precipitates to be retained and the flow rate. Papers are available in both circles and sheets.
- Quantitative Filter Papers are made from the highest quality alpha cotton cellulose. One critical step in the manufacture of these filter papers is acid washing. Papers are double acid washed in hydrochloric then hydrofluoric acid to further reduce levels of SiO_2 , CaO and Fe^{2+} . Following the acid wash, all papers are rinsed with ultrapure water to neutralize them.

Qualitative Filter Papers

Characteristics

- 100% alpha cotton cellulose
- pH tolerant 0 to 12
- Temperature Maximum 120°C
- Wide selection – six types
- Higher ash than quantitative

Applications

- Clarify and remove precipitates
- Preparation for qualitative analysis



Descriptions

- No.1** Produced for general filtrations with a fast flow rate. This paper will retain coarse and gelatinous precipitates (>10 µm). Smooth paper of normal hardness.
- No.2** This paper is thicker than No. 1 paper and will retain medium sized precipitates (5-10 µm). Smooth paper of normal hardness.
- No. 131** This paper has highest retention efficiency of qualitative papers (<5 µm) and slower flow rates. This paper has a higher wet strength and will withstand suction.
- No. 231** This paper is thin and slightly more retentive (8 µm) than No. 1. General purpose.
- No. 232** This thin retentive paper (5 µm) has a slow initial flow rate.
- No. 235** A smooth, dense paper, the No. 235 will retain very fine crystalline precipitates. Smooth normal hardness.

Specifications

| Type | Applications/Characteristics | Weight [g/m ²] | Thickness [mm] | Flow Time ¹ [sec] | Absorption-speed ² [cm] | Retention Characteristics | Gas Collection Efficiency [%; 0.3 µm DOP] |
|---------|---|----------------------------|----------------|------------------------------|------------------------------------|---------------------------|---|
| No. 1 | Retains large crystalline particles and gelatinous precipitates. Fast flow rate, smooth surface, normal hardness. | 90 | 0.20 | 45 | 9.0 | Coarse | 65 |
| No. 2 | Retains medium crystalline precipitates, fast flow rate, smooth surface, normal hardness. | 125 | 0.26 | 80 | 8.0 | Medium | 80 |
| No. 131 | High retention efficiency for fine crystalline precipitates like barium sulfate, slow flow rate, smooth surface, normal hardness. | 140 | 0.25 | 240 | 6.0 | Medium-Fine | 90 |
| No. 231 | Retains crystalline precipitates, moderate flow rate, smooth surface, normal hardness. | 95 | 0.18 | 130 | 7.5 | Medium | - |
| No. 232 | Retains medium to medium-fine particulates, slow flow rate, smooth, normal hardness. | 90 | 0.18 | 250 | 5.0 | Medium-Medium-Fine | - |
| No. 235 | Highest retention efficiency, retains very fine particulates, very slow flow rate, smooth. | 95 | 0.17 | 1200 | 4.0 | Very fine | - |

1. Flow time is the time in seconds required 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 paper.

2. Absorption speed is the distance in cm that water will travel in an upright strip of filter paper in 10 minutes at 20°C.

Comparison Table, see page 41

Qualitative Filter Papers

Ordering Information

Grade No. 1

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|----------|
| 55 | 100 | 1.055 |
| 70 | 100 | 1.070 |
| 90 | 100 | 1.090 |
| 110 | 100 | 1.110 |
| 125 | 100 | 1.125 |
| 150 | 100 | 1.150 |
| 185 | 100 | 1.185 |
| 240 | 100 | 1.240 |
| 285 | 100 | 1.285 |
| 300 | 100 | 1.300 |
| 330 | 100 | 1.330 |
| 360 | 100 | 1.360 |
| 400 | 100 | 1.400 |
| 500 | 100 | 1.500 |
| 600 | 100 | 1.600 |
| Sheets, size | | |
| 485 x 560 | 100 | 1.485560 |
| 600 x 600 | 100 | 1.600600 |

Grade No. 2

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|----------|
| 55 | 100 | 2.055 |
| 70 | 100 | 2.070 |
| 90 | 100 | 2.090 |
| 110 | 100 | 2.110 |
| 125 | 100 | 2.125 |
| 150 | 100 | 2.150 |
| 185 | 100 | 2.185 |
| 240 | 100 | 2.240 |
| 285 | 100 | 2.285 |
| 300 | 100 | 2.300 |
| 330 | 100 | 2.330 |
| 360 | 100 | 2.360 |
| 400 | 100 | 2.400 |
| 500 | 100 | 2.500 |
| 600 | 100 | 2.600 |
| Sheets, size | | |
| 485 x 560 | 100 | 2.485560 |
| 600 x 600 | 100 | 2.600600 |

Grade No. 131

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|------------|
| 55 | 100 | 131.055 |
| 70 | 100 | 131.070 |
| 90 | 100 | 131.090 |
| 110 | 100 | 131.110 |
| 125 | 100 | 131.125 |
| 150 | 100 | 131.150 |
| 185 | 100 | 131.185 |
| 240 | 100 | 131.240 |
| 285 | 100 | 131.285 |
| 300 | 100 | 131.300 |
| 330 | 100 | 131.330 |
| 360 | 100 | 131.360 |
| 400 | 100 | 131.400 |
| 500 | 100 | 131.500 |
| 600 | 100 | 131.600 |
| Sheets, size | | |
| 485 x 560 | 100 | 131.485560 |
| 600 x 600 | 100 | 131.600600 |

Grade No. 231

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|------------|
| 55 | 100 | 231.055 |
| 70 | 100 | 231.070 |
| 90 | 100 | 231.090 |
| 110 | 100 | 231.110 |
| 125 | 100 | 231.125 |
| 150 | 100 | 231.150 |
| 185 | 100 | 231.185 |
| Sheets, size | | |
| 485 x 560 | 100 | 231.485560 |

Qualitative Filter Papers

› Ordering Information

Grade No. 232

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|------------|
| 55 | 100 | 232.055 |
| 70 | 100 | 232.070 |
| 90 | 100 | 232.090 |
| 110 | 100 | 232.110 |
| 125 | 100 | 232.125 |
| 150 | 100 | 232.150 |
| 185 | 100 | 232.185 |
| Sheets, size | | |
| 485 x 560 | 100 | 232.485560 |

Grade No. 235

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|------------|
| 55 | 100 | 235.055 |
| 70 | 100 | 235.070 |
| 90 | 100 | 235.090 |
| 110 | 100 | 235.110 |
| 125 | 100 | 235.125 |
| 150 | 100 | 235.150 |
| 185 | 100 | 235.185 |
| Sheets, size | | |
| 485 x 560 | 100 | 235.485560 |

Quantitative Filter Papers

Characteristics

- **Highest quality** alpha cotton cellulose
- **Low ash** content
- **Acid washed:** Double acid washed in hydrochloric then hydrofluoric acid, then rinsed with ultrapure water to neutralize. No. 4A is further treated with nitric acid before washing

Applications

- Gravimetric analysis
- Environmental monitoring

Descriptions



- No. 4A** This acid washed paper is further treated with nitric acid to harden the paper for superior wet strength. No. 4A papers has a high retention efficiency for fine particulates <5 μm, excellent pH and chemical resistance.
- No. 5A** This is a double acid washed paper of low ash to retain coarse precipitates (>10 μm) with high flow rates. Recommended for filtering hydroxides, metallic aerosols and determining silica content in steel.
- No. 5B** This is a double acid washed paper for retaining medium size (5-10 μm) precipitates. General purpose paper.
- No. 5C** A double washed paper with slow flow rate and high retention efficiency. Recommended for collecting particles <5μm, gravimetric analysis and for collecting precipitates that tend toward colloidal dispersion.
- No. 6** High purity, low ash paper for retaining medium fine 2-10 μm particulates. Uses are primarily precision analyses of trace and precious metals, beverages, water etc.
- No. 7** This is the highest purity quantitative paper available with fast flow rate for retaining medium size particles (5-10 μm). Recommended for gravimetric analyses of minute trace and precious metals and for research labs where precision is a high priority.

Specifications

| Type | Applications/ Characteristics | Weight [g/m ²] | Thickness [mm] | Flow Time ¹ [sec] | Absorption- speed ² [cm] | Retention Characteristics | Gas Collection Efficiency [%; 0.3 μm DOP] |
|--------|--|-------------------------------|-------------------|---------------------------------|---|------------------------------|---|
| No. 4A | High retention efficiency, hardened ashless for retaining fine crystalline particulates (<5 μm). Slow flow rate. High chemical and pH resistance. High wet strength. This filter is suitable for use under pressure. | 96 | 0.12 | 915 | 4.0 | Very Fine | 90 |
| No. 5A | Fast flow rate, retains coarse particulates and gelatinous precipitates (>10 μm). Filter hydroxides and metallic aerosols, environmental monitoring, determine silica content in steel. | 97 | 0.22 | 60 | 9.5 | Coarse and gelatinous | 75 |
| No. 5B | Retains medium particles (5-10 μm) such as CaCO ₃ , PbSO ₄ , CaCO ₄ , MnCO ₃ , ZnCO ₃ , ZnS, AgCl | 108 | 0.21 | 195 | 7.0 | Medium | 90 |
| No. 5C | Collect fine precipitates (<5 μ) such as SrSO ₄ , BaSO ₄ , HgCrO ₄ and colloidal dispersions, gravimetric analysis | 118 | 0.22 | 570 | 6.0 | Fine | 93 |
| No. 6 | Retains medium-fine particulates (2-10 μm), trace and precious metals | 103 | 0.20 | 300 | 6.0 | Medium-Fine | 90 |
| No. 7 | Highest purity for retaining medium particles (5-10 μm), precise gravimetric analysis | 87 | 0.18 | 200 | 7.0 | Medium | 85 |

1. Flow time is the time in seconds required 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 paper.

2. Absorption speed is the distance in cm that water will travel in an upright strip of filter paper in 10 minutes at 20°C.

Comparison Table and Ash Content table, see page 41

Quantitative Filter Papers

Ordering Information

Grade No. 4A

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 55 | 100 | 4A.055 |
| 70 | 100 | 4A.070 |
| 90 | 100 | 4A.090 |
| 110 | 100 | 4A.110 |
| 125 | 100 | 4A.125 |
| 150 | 100 | 4A.150 |
| 185 | 100 | 4A.185 |
| 240 | 100 | 4A.240 |
| 285 | 100 | 4A.285 |
| 300 | 100 | 4A.300 |
| 330 | 100 | 4A.330 |
| 360 | 100 | 4A.360 |
| 400 | 100 | 4A.400 |
| 500 | 100 | 4A.500 |
| Sheets, size | | |
| 485 x 560 | 100 | 4A.485560 |

Grade No. 5A

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 55 | 100 | 5A.055 |
| 70 | 100 | 5A.070 |
| 90 | 100 | 5A.090 |
| 110 | 100 | 5A.110 |
| 125 | 100 | 5A.125 |
| 150 | 100 | 5A.150 |
| 185 | 100 | 5A.185 |
| 240 | 100 | 5A.240 |
| 285 | 100 | 5A.285 |
| 300 | 100 | 5A.300 |
| 330 | 100 | 5A.330 |
| 360 | 100 | 5A.360 |
| 400 | 100 | 5A.400 |
| 500 | 100 | 5A.500 |
| Sheets, size | | |
| 485 x 560 | 100 | 5A.485560 |

Grade No. 5B

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 55 | 100 | 5B.055 |
| 70 | 100 | 5B.070 |
| 90 | 100 | 5B.090 |
| 110 | 100 | 5B.110 |
| 125 | 100 | 5B.125 |
| 150 | 100 | 5B.150 |
| 185 | 100 | 5B.185 |
| 240 | 100 | 5B.240 |
| 285 | 100 | 5B.285 |
| 300 | 100 | 5B.300 |
| 330 | 100 | 5B.330 |
| 360 | 100 | 5B.360 |
| 400 | 100 | 5B.400 |
| 500 | 100 | 5B.500 |
| Sheets, size | | |
| 485 x 560 | 100 | 5B.485560 |

Grade No. 5C

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|-----------|
| 55 | 100 | 5C.055 |
| 70 | 100 | 5C.070 |
| 90 | 100 | 5C.090 |
| 110 | 100 | 5C.110 |
| 125 | 100 | 5C.125 |
| 150 | 100 | 5C.150 |
| 185 | 100 | 5C.185 |
| 240 | 100 | 5C.240 |
| 285 | 100 | 5C.285 |
| 300 | 100 | 5C.300 |
| 330 | 100 | 5C.330 |
| 360 | 100 | 5C.360 |
| 400 | 100 | 5C.400 |
| 500 | 100 | 5C.500 |
| Sheets, size | | |
| 485 x 560 | 100 | 5C.485560 |

Quantitative Filter Papers

Ordering Information

Grade No. 6

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|----------|
| 55 | 100 | 6.055 |
| 70 | 100 | 6.070 |
| 90 | 100 | 6.090 |
| 110 | 100 | 6.110 |
| 125 | 100 | 6.125 |
| 150 | 100 | 6.150 |
| 185 | 100 | 6.185 |
| 240 | 100 | 6.240 |
| 285 | 100 | 6.285 |
| 300 | 100 | 6.300 |
| 330 | 100 | 6.330 |
| 360 | 100 | 6.360 |
| 400 | 100 | 6.400 |
| 500 | 100 | 6.500 |
| Sheets, size | | |
| 485 x 560 | 100 | 6.485560 |

Grade No. 7

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|----------|
| 55 | 100 | 7.055 |
| 70 | 100 | 7.070 |
| 90 | 100 | 7.090 |
| 110 | 100 | 7.110 |
| 125 | 100 | 7.125 |
| 150 | 100 | 7.150 |
| 185 | 100 | 7.185 |
| 240 | 100 | 7.240 |
| 285 | 100 | 7.285 |
| 300 | 100 | 7.300 |
| 330 | 100 | 7.330 |
| 360 | 100 | 7.360 |
| 400 | 100 | 7.400 |
| 500 | 100 | 7.500 |
| Sheets, size | | |
| 485 x 560 | 100 | 7.485560 |

Phase Separating Filters

► Characteristics

- **Silicone treated** cellulose paper
- **Separate** aqueous and non-aqueous phases of mixtures
- **Hydrophobic filters** retain aqueous phase while non-aqueous phase passes through



Specifications

| Grade Code | Material | Weight [g/m ²] | Thickness [mm] | Particle Retention [µm] |
|------------|----------------------------|----------------------------|----------------|-------------------------|
| 2S | Silicone treated cellulose | 120 | 0.26 | 5 |

► Ordering Information

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|----------|
| 55 | 100 | 2S.055 |
| 70 | 100 | 2S.070 |
| 90 | 100 | 2S.090 |
| 110 | 100 | 2S.110 |
| 125 | 100 | 2S.125 |
| 150 | 100 | 2S.150 |
| 185 | 100 | 2S.185 |

Comparison Table, see page 41



Qualitative & Quantitative Filter Papers

Comparison Table

| Advantec | Whatman | Former S&S | Munktell | Macherey-Nagel | Filtrak | ALBET-Hahnemuehle |
|----------|---------|------------|----------|----------------|---------|-------------------|
|----------|---------|------------|----------|----------------|---------|-------------------|

Qualitative Filter Papers

| | | | | | | |
|-----|--------|------|------|-------|-----|---------|
| 1 | 4 | - | 3 | 617 | 288 | FP604 |
| 2 | 1 | 595 | 1F | 615 | 289 | FP597 |
| 131 | 3 or 6 | 598 | 106 | 618 | 290 | FP602H |
| 231 | 1 | 595 | 1F | 615 | 289 | FP595 |
| 232 | 2 | - | 150 | 616md | 292 | FP593 |
| 235 | 5 | 602h | 120H | 619de | 291 | FP602eh |

Quantitative Filter Papers

| | | | | | | |
|----|----|------------------|--------------------------|-------|------|---------|
| 4A | 50 | 1575 | 4/N | 1674 | 1291 | - |
| 5A | 41 | 589 ¹ | OOR | 640w | 388 | FP589/1 |
| 5B | 40 | 589 ² | OOA or OOK ¹⁾ | 640m | 392 | FP589/2 |
| 5C | 42 | - | OOH | 640d | 391 | FP589/5 |
| 6 | 44 | 589 ³ | OOA or OOK ¹⁾ | 640dd | 390 | FP589/3 |
| 7 | 43 | - | OOM | 640m | 389 | FP589/6 |

Phase Separating Filters

| | | | | | |
|----|-----|---|-----|-------|-----|
| 2S | 1PS | - | 124 | 616WA | 480 |
|----|-----|---|-----|-------|-----|

1) Munktell OOA and OOK are very similar

Note:

This table should be considered as alternatives rather than equivalents.

When comparing depth filters like filter papers it is impossible to obtain an exact equivalent.

The comparison is based on papers made of the same type of raw material giving similar filtration properties. Filtration speed can differ between types with the same retention efficiency because of the thickness of the filter. Thin filters filter faster than thick filters.

Ash Content of Quantitative Filter Papers

[mg per circle (up to diameter 185 mm)]

| Circle diameter | No. 5A | No. 5B | No. 5C | No. 6 | No. 7 |
|-----------------|--------|--------|--------|-------|-------|
| 55 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 70 | 0.03 | 0.04 | 0.04 | 0.03 | 0.03 |
| 90 | 0.06 | 0.06 | 0.06 | 0.05 | 0.04 |
| 11 | 0.09 | 0.10 | 0.10 | 0.08 | 0.07 |
| 125 | 0.11 | 0.12 | 0.12 | 0.10 | 0.09 |
| 150 | 0.16 | 0.18 | 0.18 | 0.15 | 0.12 |
| 185 | 0.24 | 0.27 | 0.27 | 0.23 | 0.19 |

Milk Sediment Discs

› Milk Sediment Discs

- **Use to check** for contamination in dairy products
- **Discs made of high purity** cellulose fibers
- **Choose from** black or white discs



› Ordering Information

| | Color | Packing | Cat. No. |
|--------------------|-------|---------|-----------|
| Milk Sediment Disc | White | 50 | 1026.033 |
| Milk Sediment Disc | Black | 50 | 1026B.033 |

Antibiotic Assay Discs

- Made of **pure cellulose** fibers
- **High absorbency**
- **Three types available** for the following applications:
 - Antibiotic assay
 - Detection of Antimicrobial substances in Carcass
 - Detection of Benzylpenicillin in meat



Ordering Information

| | Thickness [mm] | Diameter [mm] | Packing | Cat. No. |
|----------------------|----------------|---------------|---------|----------|
| for Antibiotic Assay | 1.5 | 8 | 1000 | 49005010 |
| for Antibiotic Assay | 0.7 | 8 | 1000 | 49005020 |
| for Antibiotic Assay | 0.7 | 6 | 1000 | 49005040 |

| | Thickness [mm] | Diameter [mm] | Absorbing Capacity [ml/disc] | Packing | Cat. No. |
|------------------------------|----------------|---------------|------------------------------|---------|----------|
| for Antimicrobial Substances | 1.1 | 10 | 0.07-0.08 | 1000 | 49006010 |
| for Benzylpenicillin | 1.5 | 10 | 0.2 | 100 | 49007010 |

Blaine Test Paper

- Standard for testing cement using the Blaine air permeation test
- 12.7 mm diameter discs

| | Packing | Cat. No. |
|-------------------|---------|----------|
| Blaine Test Paper | 250 | 01511012 |



► Polyflon – PTFE Fiber 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

- Separation of aqueous and non-aqueous phases
- Filtration of hot acids and strong solvents
- Venting air and gases



Specifications

| Grade | Weight [g/m ²] | Thickness [mm] | Porosity [%] | Pressure drop at 5 cm/sec. [kPa] | Pressure drop [psi] | DOP retention [%, 0.3 μm] | Particle retention [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 |

Polyflon – PTFE Fiber Filters

Ordering Information

Grade PF100

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|--------------|
| 47 | 20 | PF100.047 |
| 55 | 20 | PF100.055 |
| 70 | 20 | PF100.070 |
| 90 | 20 | PF100.090 |
| 110 | 10 | PF100.110 |
| 125 | 10 | PF100.125 |
| 150 | 10 | PF100.150 |
| Sheets, size | | |
| 300 x 300 | 5 | PF100.300300 |

Grade PF040

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|--------------|
| 47 | 10 | PF040.047 |
| 50 | 10 | PF040.050 |
| 55 | 10 | PF040.055 |
| 70 | 10 | PF040.070 |
| 90 | 10 | PF040.090 |
| 110 | 5 | PF040.110 |
| 125 | 5 | PF040.125 |
| 150 | 5 | PF040.150 |
| Sheets, size | | |
| 300 x 300 | 5 | PF040.300300 |

Grade PF060

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|--------------|
| 47 | 20 | PF060.047 |
| 55 | 20 | PF060.055 |
| 70 | 20 | PF060.070 |
| 90 | 20 | PF060.090 |
| 110 | 10 | PF060.110 |
| 125 | 10 | PF060.125 |
| 150 | 10 | PF060.150 |
| Sheets, size | | |
| 300 x 300 | 5 | PF060.300300 |

Grade PF020

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|--------------|
| 47 | 10 | PF020.047 |
| 50 | 10 | PF020.050 |
| 55 | 10 | PF020.055 |
| 70 | 10 | PF020.070 |
| 90 | 10 | PF020.090 |
| 110 | 5 | PF020.110 |
| 125 | 5 | PF020.125 |
| 150 | 5 | PF020.150 |
| Sheets, size | | |
| 300 x 300 | 5 | PF020.300300 |

Grade PF050

| Diameter [mm] | Packing | Cat. No. |
|---------------|---------|--------------|
| 47 | 20 | PF050.047 |
| 55 | 20 | PF050.055 |
| 70 | 20 | PF050.070 |
| 90 | 20 | PF050.090 |
| 110 | 10 | PF050.110 |
| 125 | 10 | PF050.125 |
| 150 | 10 | PF050.150 |
| Sheets, size | | |
| 300 x 300 | 5 | PF050.300300 |

Extraction Thimbles

Extraction Thimbles are seamless, high purity filters with a distinctive thimble shape. Thimbles are available in four different materials of construction in many sizes. Typical applications include analysis of fats, oils, grease, organics, pesticides and pollutants, additives in plastic and rubber materials.



› Cellulose Thimbles – No. 84

- Suitable for Soxhlet extractions of organic components
- Dust sampling
- Lipid content <0.1% by weight

› Glass Fiber Thimbles – No. 86R

- Borosilicate glass
- High temperature extractions or dust monitoring (≤ 500 °C)
- Acid resistant (except hydrofluoric)
- Acid washed for minimum trace metal content

› Quartz Fiber Thimbles – Nos. 88R and 88RH

- Use up to 1000°C
- No. 88RH is treated at 900°C for 4 hours to stabilize the weight prior to use
- Both 88R and 88RH are tapered for ease in loading into stack samplers

› PTFE Fiber and PTFE/Quartz Fiber Thimbles – Nos. 89 and 89S

- Durable, temperature resistant
- Non-adsorptive with respect to acid gases
- PTFE is inherently hydrophobic
- Little or no trace metal contamination

Specifications

| Type | Material | Nominal Rating [μm] | Wall Thickness [mm] | Weight [g per 25x90 mm Thimble] | Pressure drop at 5 l/min. [kPa] | Collection Efficiency [%; 0.3 μm DOP] | Max. Operating Temperature [°C] | Heating loss rate [%] |
|------|-------------------|----------------------------------|---------------------|---------------------------------|---------------------------------|--|---------------------------------|-----------------------|
| 84 | Cellulose | 8 | 1.5 | 3.6 | 0.25 | 89 | 120 | - |
| 86R | Glass Fiber | 1 | 1.6 | 1.8 | 0.30 | >99.9 | 500 | 0.2 |
| 88R | Quartz Fiber | - | 2.2 | 1.6 | 0.44 | >99.9 | 1000 | - |
| 88RH | Quartz Fiber | - | 2.2 | 1.6 | 0.44 | >99.9 | 1000 | 0.1 |
| 89 | PTFE Fiber | - | 1.8 | 11.0 | 4.5 | >99.9 | 260 | - |
| 89S | PTFE/Quartz Fiber | - | 1.6 | 6 | 0.54 | >99.9 | 400 | 0.07 |

Ordering Information

Note

Please note that there are two versions of sizes available; either expressed as Internal diameter x height or External diameter x height.

Cat. Nos. with "X" as the last digit means External diameter and Cat. Nos. without the "X" mentioned, is the Internal diameter of the thimbles.

Tolerances:

Diameter +/- 3%

Height +/- 1.5%

Cellulose Thimbles – No. 84

External diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|----------|
| 20 x 90 | 25 | 84.209X |
| 22 x 90 | 25 | 84.229X |
| 25 x 90 | 25 | 84.259X |
| 28 x 100 | 25 | 84.280X |
| 30 x 100 | 25 | 84.300X |
| 33 x 120 | 25 | 84.332X |
| 35 x 120 | 25 | 84.352X |
| 40 x 150 | 25 | 84.405X |
| 45 x 150 | 25 | 84.455X |
| 53 x 150 | 25 | 84.535X |
| 60 x 200 | 25 | 84.600X |
| 75 x 210 | 25 | 84.751X |

Glass Fiber Thimbles – No. 86R

External diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|----------|
| 20 x 90 | 25 | 86R.209X |
| 22 x 90 | 25 | 86R.229X |
| 25 x 90 | 25 | 86R.259X |
| 28 x 100 | 25 | 86R.280X |
| 30 x 100 | 25 | 86R.300X |
| 33 x 120 | 25 | 86R.332X |
| 35 x 120 | 25 | 86R.352X |
| 40 x 150 | 25 | 86R.405X |
| 45 x 150 | 25 | 86R.455X |
| 53 x 150 | 25 | 86R.535X |
| 60 x 200 | 25 | 86R.600X |
| 75 x 210 | 25 | 86R.751X |

Cellulose Thimbles – No. 84

Internal diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|----------|
| 19 x 90 | 25 | 84.199 |
| 22 x 65 | 25 | 84.226 |
| 22 x 80 | 25 | 84.228 |
| 25 x 60 | 25 | 84.256 |
| 25 x 80 | 25 | 84.258 |
| 25 x 90 | 25 | 84.259 |
| 25 x 100 | 25 | 84.250 |
| 28 x 100 | 25 | 84.280 |
| 30 x 80 | 25 | 84.308 |
| 30 x 100 | 25 | 84.300 |
| 33 x 80 | 25 | 84.338 |
| 33 x 94 | 25 | 84.339 |
| 33 x 100 | 25 | 84.330 |
| 43 x 123 | 25 | 84.432 |

Glass Fiber Thimbles – No. 86R

Internal diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|----------|
| 19 x 90 | 25 | 86R.199 |
| 25 x 90 | 25 | 86R.259 |
| 25 x 100 | 25 | 86R.250 |
| 30 x 80 | 25 | 86R.308 |
| 30 x 100 | 25 | 86R.300 |
| 43 x 123 | 25 | 86R.432 |

Ordering Information

Quartz Fiber Thimbles – No. 88R

External diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|----------|
| 20 x 90 | 25 | 88R.209X |
| 22 x 90 | 25 | 88R.229X |
| 25 x 90 | 10 | 88R.259X |
| 28 x 100 | 25 | 88R.280X |
| 30 x 100 | 25 | 88R.300X |
| 33 x 120 | 25 | 88R.332X |
| 35 x 120 | 25 | 88R.352X |
| 40 x 150 | 25 | 88R.405X |
| 45 x 150 | 25 | 88R.455X |
| 53 x 150 | 25 | 88R.535X |
| 60 x 200 | 25 | 88R.600X |
| 75 x 210 | 25 | 88R.751X |

Quartz Fiber Thimbles – No. 88R

Internal diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|----------|
| 19 x 90 | 25 | 88R.199 |
| 25 x 100 | 25 | 88R.250 |
| 30 x 80 | 25 | 88R.308 |
| 30 x 100 | 25 | 88R.300 |
| 33 x 80 | 25 | 88R.338 |
| 43 x 123 | 25 | 88R.432 |

Quartz Fiber Thimbles – No. 88RH

External diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|-----------|
| 25 x 90 | 10 | 88RH.259X |

PTFE Fiber Thimbles – No. 89

External diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|----------|
| 25 x 90 | 10 | 89.259X |

PTFE/Quartz Fiber Thimbles – No. 89S

External diameter

| Size [mm] diameter x height | Packing | Cat. No. |
|--------------------------------|---------|----------|
| 25 x 90 | 10 | 89S.259X |

▶ Nitrocellulose Blotting Membranes

- **Pure esters of nitrocellulose**, free of acetate and other esters
- **Maximal protein/nucleic acid binding**, up to 80-100 µg/cm²
- **Low background**
- **Two pore sizes available:** 0.45 µm is suitable for most blotting applications, 0.2 µm sizes for lower molecular weights
- **Complete range available:** Circles, sheets and rolls



▶ Ordering Information

Pore size 0.2 µm

| Circles, size | Packing | Cat. No. |
|---------------|---------|-----------|
| 82 mm | 25 | S020A082C |
| 85 mm | 25 | S020A085C |
| Sheets, size | | |
| 22 x 22 cm | 10 | S020A224D |
| 30 x 30 cm | 10 | S020A304D |
| Rolls, size | | |
| 33 cm x 3 m | 1 | S020A330R |

Pore size 0.45 µm

| Circles, size | Packing | Cat. No. |
|---------------|---------|-----------|
| 82 mm | 25 | S045A082C |
| 85 mm | 25 | S045A085C |
| Sheets, size | | |
| 22 x 22 cm | 10 | S045A224D |
| 30 x 30 cm | 10 | S045A304D |
| Rolls, size | | |
| 33 cm x 3 m | 1 | S045A330R |

Blotting/Chromatography Papers

- **High quality papers** are carefully tested for spot formation, capillary action, water flow rate and absorption speed to assure uniformity and reproducibility
- **Better resolution** with slower flow rate papers
- **Smooth surface** for optimal contact with membrane
- **Five grades** available of different thickness
- **Available in** cuts on request



Specifications

| Grade | Weight [g/m ²] | Thickness [mm] | Absorption Speed ¹ [cm] |
|-------|----------------------------|----------------|------------------------------------|
| 51B | 87 | 0.17 | 7.0 |
| 514A | 185 | 0.32 | 7.5 |
| 50 | 140 | 0.25 | 6.0 |
| 526 | 325 | 0.70 | 11.0 |
| 590 | 285 | 0.93 | 18.0 |

1) Absorption speed is the distance in cm that water will travel in an upright strip of filter paper in 10 minutes at 20°C.

Ordering Information

Grade 50

| Size [cm] | Packing | Cat. No. |
|-----------|---------|-----------|
| 60 x 60 | 50 | 50.600600 |

Grade 51B

| Size [cm] | Packing | Cat. No. |
|-----------|---------|------------|
| 45 x 57 | 100 | 51B.460570 |

Grade 526

| Size [cm] | Packing | Cat. No. |
|-----------|---------|------------|
| 60 x 60 | 50 | 526.600600 |

Grade 514A

| Size [cm] | Packing | Cat. No. |
|-----------|---------|-------------|
| 45 x 57 | 100 | 514A.460570 |

Grade 590

| Size [cm] | Packing | Cat. No. |
|-----------|---------|------------|
| 60 x 60 | 50 | 590.600600 |

Vacuum filtration is used primarily in micro-biological and analytical procedures that involve collecting a particulate (bacteria, precipitate etc.) from a liquid suspension.

Liquid poured into a funnel passes through a filter, which retains the particulate, and filtrate can be collected into a filter flask,

directly or via a vacuum manifold. Applying vacuum reduces process time compared to gravity flow. Advantec supplies a wide range of vacuum filter holders and accessories.

Select from glass, polysulfone and stainless steel assemblies with funnels holding from 22 ml to 1,100 ml.



KG-25



KGS-25



KG-47



KGS-47



KGS-47-TF



KG-90



KGS-90

Glass Microfiltration: Support Systems

▶ Sintered Glass Support (Glass Frit)

- Glass frit (nominal retention 30-50 μm)
- Recommended when filtering highly acidic (low pH) solutions or when slower flow rates are preferred to maximize contact with the filter or reagent
- Ground glass seal



Sintered base

▶ Stainless Steel Support

- Stainless steel screen (Type 316, 100 mesh)
- PTFE gasket
- Maximize flow rate with proteinaceous or viscous solutions
- Will not shed particles into the filtrate
- Ground glass seal



SS support base

Filter Specifications

| Model | KG-25 KGS-25 | KG-47 KGS-47 KGS-47-TF | KG-90 KGS-90 |
|---|-----------------|------------------------------|-----------------|
| Filter dia. [mm] | 25 | 47 | 90 |
| Effective filtration area [cm^2] | 2.1 | 9.6 | 43.0 |

Vacuum Filter Holders

25 mm Glass Microanalysis Holders

- **Use for filtering small volumes** for biological or particulate contamination
- Available with either sintered glass base or with stainless steel screen support
- **Use stainless steel screen** when producing ultraclean filtrate or when filtering proteinaceous solutions



KG-25

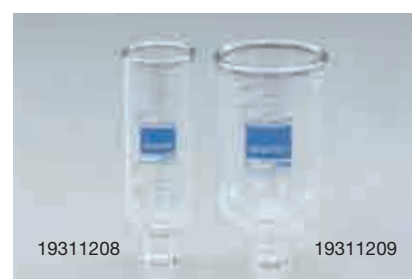
KGS-25

Specifications

| | KG-25 | KGS-25 |
|---------------------------------------|---|------------------------|
| Funnel capacity: | Maximum volume 22 ml, graduated to 15 ml | |
| Materials: | | |
| Support | Sintered glass | Stainless steel screen |
| Funnel and base | Borosilicate glass | Borosilicate glass |
| Stopper | Silicone rubber | Silicone rubber |
| Clamp | Anodized aluminium | Anodized aluminium |
| Connection: | | |
| Included | No. 4 stopper adapts to standard 125 ml vacuum filter flask | |
| Membrane Filter Compatibility: | | |
| Filter size | 25 mm | 25 mm |
| Prefilter size | 16 mm | 16 mm |
| Filtration area | 2.1 cm ² | 2.1 cm ² |

Ordering Information

| Model | KG-25 | KGS-25 |
|----------|----------|----------|
| Cat. No. | 17311200 | 17311300 |

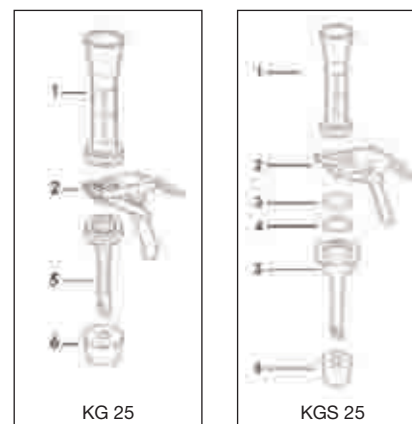


19311208

19311209

Replacement parts and optional funnels

| | | KG-25 | KGS-25 |
|---|--------------------------|----------|----------|
| 1 | Funnel, 15 ml (22 ml) | 19311201 | 19311201 |
| 1 | Funnel, 150 ml (160 ml) | 19311208 | 19311208 |
| 1 | Funnel, 300 ml (320 ml) | 19311209 | 19311209 |
| 2 | Clamp | 19311003 | 19311003 |
| 3 | Screen (stainless steel) | - | 19311304 |
| 4 | Gasket (PTFE) | - | 19311305 |
| 5 | Base | 19311202 | 19311302 |
| 6 | Stopper No. 4 | 19311004 | 19311004 |



KG 25

KGS 25

47 mm Glass Microanalysis Holders

- **Standard size** for microbiology and particulate analysis
- **Filter up to 500 ml**
- **Available with sintered glass support and stainless steel support.** Last-mentioned also with PTFE flange to prevent membrane sticking to glass when autoclaving with filter in place



KG-47

KGS-47

KGS-47-TF

Specifications

| | KG-47 | KGS-47 | KGS-47-TF |
|---------------------------------------|--|------------------------|--------------------------|
| Funnel capacity: | Maximum volume 320 mm (graduated to 300 ml) | | |
| Materials: | | | |
| Support | Sintered glass | Stainless steel screen | Stainless steel and PTFE |
| Funnel and base | Borosilicate glass | Borosilicate glass | Borosilicate glass |
| Stopper | Silicone rubber | Silicone rubber | Silicone rubber |
| Clamp | Anodized aluminium | Anodized aluminium | Anodized aluminium |
| Connection: | | | |
| Included | No. 8A stopper adapts to standard 1 L vacuum filter flask or vacuum manifold | | |
| Membrane Filter Compatibility: | | | |
| Filter size | 47 mm | 47 mm | 47 mm |
| Prefilter size | 35 mm | 35 mm | 35 mm |
| Filtration area | 9.6 cm ² | 9.6 cm ² | 9.6 cm ² |

Ordering Information

| Model | KG-47 | KGS-47 | KGS-47-TF |
|----------|----------|----------|-----------|
| Cat. No. | 17311400 | 17311500 | 17311600 |

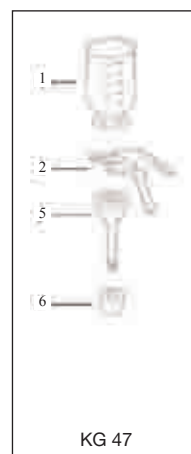


19311408

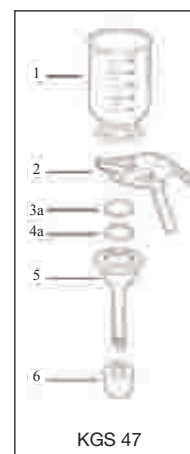
19311409

Replacement parts and optional funnels

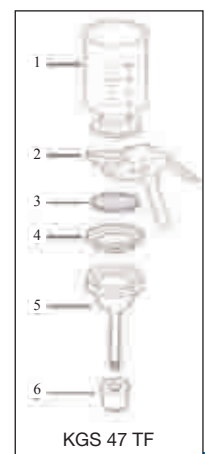
| | KG-47 | KGS-47 | KGS-47-TF |
|-------------------------------|----------|----------|-----------|
| 1 Funnel, 100 ml | 19311408 | 19311408 | 19311408 |
| 1 Funnel, 300 ml | 19311401 | 19311401 | 19311401 |
| 1 Funnel, 500 ml | 19311409 | 19311409 | 19311409 |
| 2 Clamp | 19311403 | 19311403 | 19311403 |
| 3a/3 Screen (stainless steel) | - | 19311504 | 19311504 |
| 4a Gasket (PTFE) | - | 19311505 | - |
| 4 Flange (PTFE) | - | - | 19311605 |
| 5 Base | 19311402 | 19311502 | 19311602 |
| 6 Stopper No. 8A | 19311404 | 19311404 | 19311404 |



KG 47



KGS 47



KGS 47 TF

Vacuum Filter Holders

90 mm Glass Microanalysis Holders

- **Larger filtration** area for filtering larger volumes (>500 ml)
- **Use for viscous samples** or those with a heavy particle or bioburden that would clog a 47 mm filter
- Available with sintered glass or stainless steel support



KG-90

KGS-90

Specifications

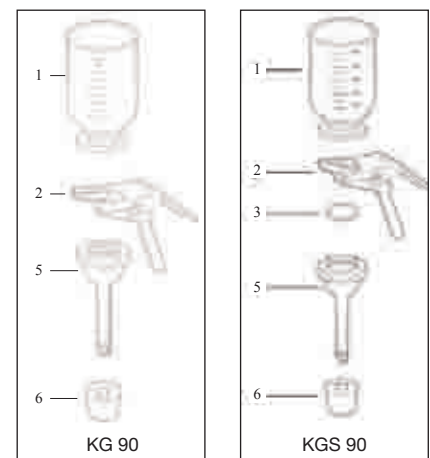
| | KG-90 | KGS-90 |
|---------------------------------------|--|------------------------|
| Funnel capacity: | Maximum volume 1100 ml, graduated to 1000 ml | |
| Materials: | | |
| Support | Sintered glass | Stainless steel screen |
| Funnel and base | Borosilicate glass | Borosilicate glass |
| Stopper | Silicone rubber | Silicone rubber |
| Clamp | Anodized aluminium | Anodized aluminium |
| Connection: | | |
| Included | No. 8A stopper adapts to standard 1 L vacuum filter flask or vacuum manifold | |
| Membrane Filter Compatibility: | | |
| Filter size | 90 mm | 90 mm |
| Prefilter size | 70 mm | 70 mm |
| Filtration area | 43 cm ² | 43 cm ² |

Ordering Information

| Model | KG-90 | KGS-90 |
|----------|----------|----------|
| Cat. No. | 17312100 | 17312200 |

Replacement parts

| | | KG-90 | KGS-90 |
|---|---------------------------|----------|----------|
| 1 | Funnel, 1000 ml (1100 ml) | 19312101 | 19312101 |
| 2 | Clamp | 19312102 | 19312102 |
| 3 | Screen (stainless steel) | - | 19312204 |
| 5 | Base | 19312103 | 19312203 |
| 6 | Stopper No. 8A | 19311404 | 19311404 |



Polysulfone Filter Holders

- **Can be used aseptically**
- **Recessed filter support** provides sufficient clearance so that the membrane will not twist or tear when the funnel is secured
- **Graduated funnel** in 300 ml (standard) or 500 ml (wide mouth) capacities
- **Receiver flask** (KP-47S) is interchangeable with all other models
- **Funnel cover** can be vented aseptically using disposable syringe filter (13JP050AN, see page 20)
- **Autoclavable** at 120°C for 20 min.



KP-47H



KP-47U



KP-47W



KP-47S

Specifications

| | KP-47H | KP-47U | KP-47W | KP-47S |
|--|--|----------------------|----------------------|----------------------|
| Materials: | | | | |
| Support | Polypropylene | Polypropylene | Polypropylene | Polypropylene |
| Funnel and base | Polysulfone | Polysulfone | Polysulfone | Polysulfone |
| Receiver flask | - | - | - | Polysulfone |
| Stopper, O-rings | Silicone Rubber | Silicone Rubber | Silicone Rubber | Silicone Rubber |
| Caps | - | Silicone Rubber | - | Silicone Rubber |
| Vacuum adapter | - | - | - | Polypropylene |
| Connection: | | | | |
| Outlet | No. 8B stopper adapts to standard 1 L vacuum filter flask, vacuum manifold. KP-47S screws onto receiver flask. | | | |
| Receiving flask port | - | - | - | Luer slip |
| Funnel cover port | - | Luer slip | - | Luer slip |
| Capacity: | | | | |
| Funnel | 300 ml | 300 ml | 500 ml | 300 ml |
| Receiver | - | - | - | 300 ml |
| Pressure: Vacuum (25 in Hg maximum) | | | | |
| Membrane Filter Compatibility: | | | | |
| Filter size | 47 mm | 47 mm | 47 mm | 47 mm |
| Prefilter size | 41 mm | 41 mm | 41 mm | 41 mm |
| Filtration area | 13.5 cm ² | 13.5 cm ² | 13.5 cm ² | 13.5 cm ² |

Ordering Information

| Model | Description | Main Components | Cat. No. |
|---------------|--------------------------------------|------------------------------|----------|
| KP-47H | Polysulfone Filter Holder | Funnel, base | 43301030 |
| KP-47U | Polysulfone Aseptic Filter Unit | Funnel, base, cover | 43301020 |
| KP-47W | Wide Mouth Polysulfone Filter Holder | Funnel, base | 43301050 |
| KP-47S | Polysulfone Aseptic Filter System | Funnel, base cover, receiver | 43301010 |

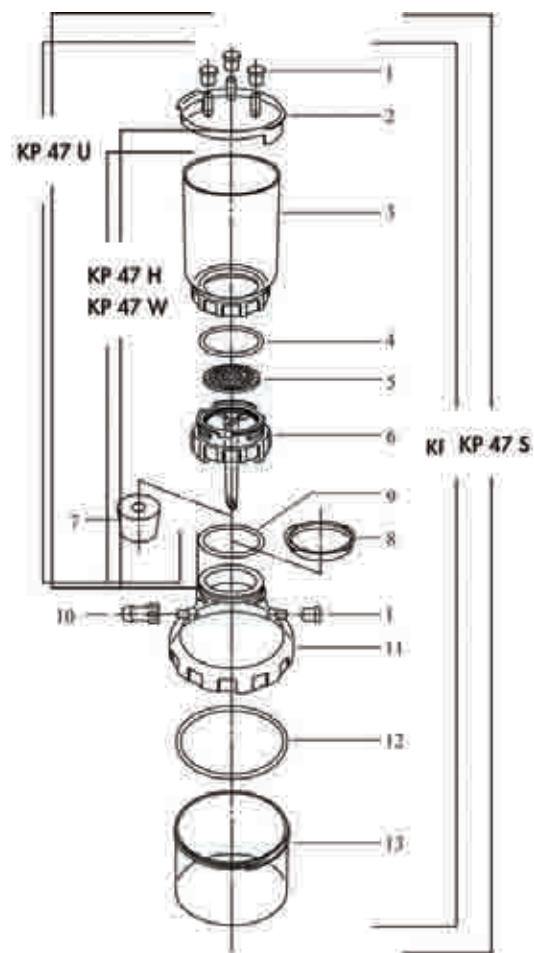
Replacement parts

Replacement Parts – Funnel assembly

| | Model | KP-47H | KP-47U | KP-47W | KP-47S |
|---|-----------------|----------|----------|----------|----------|
| | Cat. No. | 43301030 | 43301020 | 43301050 | 43301010 |
| 1 | Gum rubber cap | - | 44501010 | - | 44501010 |
| 2 | Funnel cover | - | 44501001 | - | 44501001 |
| 3 | Funnel | 44501002 | 44501002 | 44501102 | 44501002 |
| 4 | Funnel O-ring | 44501008 | 44501008 | 44501008 | 44501008 |
| 5 | Filter support | 44501004 | 44501004 | 44501004 | 44501004 |
| 6 | Base | 44501003 | 44501003 | 44501003 | 44501003 |
| 7 | Stopper No. 8B | 19311008 | 19311008 | 19311008 | 19311008 |

Replacement Parts – Receiver flask

| | Model | KP-47S |
|----|-------------------------|----------|
| 8 | Receiver cover | 44501005 |
| 9 | Receiver adapter O-ring | 44501009 |
| 10 | Vacuum adapter | 44501013 |
| 11 | Receiver adapter | 44501007 |
| 12 | Receiver O-ring | 44501015 |
| 13 | Receiver flask | 44501006 |



Stainless Steel Filter Holders – KSF-47

- **Nonbreakable stainless steel unit** may be flame sterilized to sanitize the holder between samples
- **Set pins and a locking nut** on the funnel to help prevent twisting and tearing of the membrane
- **Autoclavable** with membrane in place



Specifications

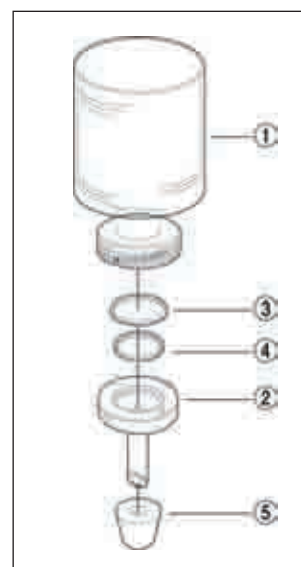
| KSF-47 | |
|---------------------------------------|--|
| Materials: | |
| Support | Type 316 stainless steel |
| Funnel, base | Type 304 stainless steel |
| Stopper | Silicone rubber |
| Gasket | PTFE |
| Connection: | |
| Included | No. 8A stopper adapts to standard 1 L vacuum filter flask or vacuum manifold |
| Capacity: | |
| Funnel | 500 ml |
| Pressure: | |
| | Vacuum (21 in Hg recommended) |
| Membrane Filter Compatibility: | |
| Filter size | 47 mm |
| Prefilter size | 35 mm |
| Filtration area | 9.3 cm ² |

Ordering Information

| Model | KSF-47 |
|----------|----------|
| Cat. No. | 17312600 |

Replacement parts

| KSF-47 | | |
|--------|-------------------|----------|
| 1 | Funnel | - |
| 2 | Base | - |
| 3 | SS support screen | 19311504 |
| 4 | PTFE gasket | 19311505 |
| 5 | Stopper No. 8A | 19311404 |



Vacuum Filtration

▶ Disposable Vacuum Filtration Unit

- **Disposable**; no cleaning saves labor time
- **Hydrophilic PTFE membrane**, suitable for filtration of both aqueous liquids and solvents
- **Fits receiver flasks** with neck diameter from 24 mm to 50 mm and minimum height of 30 mm
- **Two pore sizes available**, 0.2 μm and 0.5 μm

Applications

Ideal for filtering and degassing HPLC mobile phases.



▶ Specifications

| Model | VH020P | VH050P |
|---|--|--------|
| Materials: | Hydrophilic PTFE membrane filter in polyethylene housing | |
| Pore size, μm | 0.20 | 0.50 |
| Effective Filtration area [cm^2] | 22.1 | 22.1 |
| Funnel capacity, ml | 350 | 350 |

▶ Ordering Information

| Model | VH020P | VH050P |
|----------|---------|---------|
| Cat. No. | 8100020 | 8100050 |

▶ PVC Manifolds

- **Lightweight**
- **Resistant to acids**
- **Standard cup** accepts stoppers Nos. 8A and 8B to adapt microanalysis units and other devices
- **2-way** valve with Teflon (PTFE) stopcock in PVC body
- Not autoclavable



▶ Specifications

Materials:

| | |
|-------------------|-------------------------|
| Body and branches | Polyvinylchloride (PVC) |
| Valves | PTFE stopcock, PVC body |

Connection:

| | |
|--------------|---|
| Outlet | 1/4 " male PT to hose barb fitting connects main manifold to 11 mm i.d. vacuum tubing |
| Standard cup | Accepts stoppers Nos. 8A and 8B |

Temperature:

| | |
|---------|------|
| Maximum | 60°C |
|---------|------|

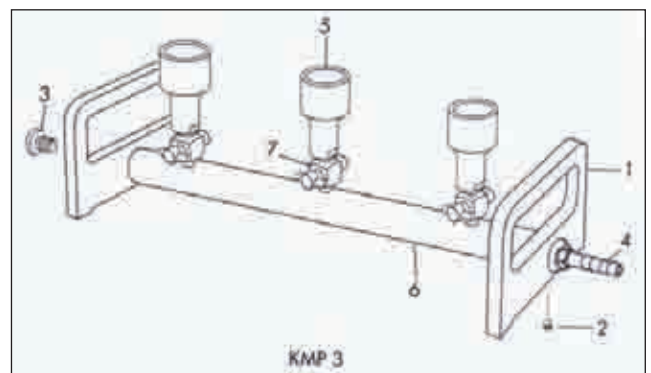
| Dimensions | L x W x H [cm] | Distance between stations (center to center) [cm] | Weight [kg] |
|------------|------------------|--|-------------|
| 3 station | 45.1 x 12 x 17.8 | 14 | 1.5 |
| 6 station | 87.6 x 12 x 17.8 | 14 | 2.5 |

▶ Ordering Information

| Model | | Cat. No. |
|-----------|-------|----------|
| 3 station | KMP 3 | 17313400 |
| 6 station | KMP 6 | 17313600 |

▶ Replacement parts

| | | Cat. No. |
|---|--------------------------|----------|
| 1 | Handle | - |
| 2 | Handle set screw | - |
| 3 | Pipe plug | - |
| 4 | Hose barb | 19313411 |
| 5 | Branch (standard cup) | - |
| 6 | Main manifold | |
| | 3 station | - |
| | 6 station | - |
| 7 | Stopcock assembly, 2-way | 19313405 |



Filtration Manifolds

Stainless Steel Manifolds

- **Durable**, made of type 304 stainless steel
- **Autoclavable**
- **2-way valves**, individual or multiple (up to 6) filtrations possible
- **Standard cup** accepts stoppers Nos. 8A and 8B to adapt microanalysis units and other devices



Specifications

Materials:

| | |
|-------------------|---|
| Body and branches | Type 304 stainless steel |
| Valves | PTFE stopcock, chrome plated brass body |

Connection:

| | |
|--------------|--|
| Outlet | 1/4 " male NPT to hose barb fitting connects main manifold to 11 mm i.d. vacuum tubing |
| Standard cup | Accepts stoppers Nos. 8A and 8B |

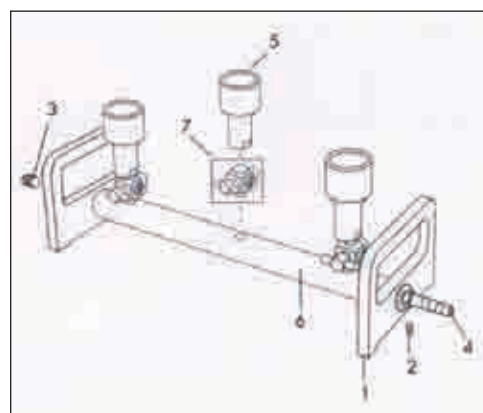
| Dimensions | L x W x H [cm] | Distance between stations [cm] | Weight [kg] |
|------------|------------------|--------------------------------|-------------|
| 3 station | 45.7 x 12 x 20.3 | 14 | 5.0 |
| 6 station | 72.4 x 12 x 20.3 | 14 | 8.0 |

Ordering Information

| Model | | Cat. No. |
|-----------|------|----------|
| 3 station | KM3N | 17313100 |
| 6 station | KM6N | 17313300 |

Replacement parts

| | | Cat. No. |
|---|--------------------------|----------|
| 1 | Handle | - |
| 2 | Handle set screw | - |
| 3 | Pipe plug | - |
| 4 | Hose barb | 19313011 |
| 5 | Branch (standard cup) | - |
| 6 | Main manifold | |
| | 3 station | - |
| | 6 station | - |
| 7 | Stopcock assembly, 2-way | 19313005 |



Pressure type filter holders can be used for ultracleaning or sterilizing liquids and gases. Advantec holders have been designed to maximize flow rates and to minimize holder resistance and can be used in either batch or continuous filtration procedures.



Advantages of Pressure Filtration

- Higher differential pressures are possible, resulting in higher flow rates. The pressure differential across the membrane is not limited to atmospheric pressure (≤ 14.7 psi)
- Denaturation of proteins and other biological polymers due to foaming downstream of the membrane is avoided
- Unintentional contamination downstream of the membrane is minimized
- Vapor accumulation and possible explosion can be avoided using an inert gas to pressurize solvents and combustible or flammable liquids

Recommended Pressure Filter Holders for typical applications and volumes

| Volume to be filtered: | <10 ml | <50 ml | < 1 liter | <5 liters | <20 liters | >20 liters |
|---|--------------------------------|---|---|---|---|---|
| Typical Applications | Enzymes, radiolabelled samples | Proteins, enzymes, radiolabelled samples, gases | Biological media, electrolyte solutions for counters, gases | Biological media, ultrapure water, serum, gases | Biological media, ultrapure water, serum, gases | Pharmaceuticals, cosmetics, large scale biologicals |
| Recommended Models | | | | | | |
| Luer Connection | KS 13 | KS 25 | - | - | - | |
| Threaded Connection | - | LS 25 PP 25 PFA 25 | KS 47 LS 47 PP 47 PFA 47 | KS 90 | KS 142 | KS 293 |
| Sanitary Connection | - | KS 25 F | KS 47 F | KS 90 ST | KS 142 ST | KS 293 ST |
| Filter Specifications | | | | | | |
| Membrane Diameter [mm] | 13 | 25 | 35, 38, 42, or 47 | 90 | 142 | 293 |
| Prefilter Diameter ¹ [mm] | 8 | 21 or 25 | 37 | 76 | 124 | 257 |
| Filtration Area [cm ²] | 0.9 | 3.5 or 3.8 | 12.5 | 45.3 | 113 | 530 |
| Liquid Flow Rate² [l/min] | | | | | | |
| 0.20 μ m | 0.005 | 0.03 | 0.15 | 0.8 | 1.7 | 7.1 |
| 0.45 μ m | 0.02 | 0.08 | 0.4 | 1.64 | 4.9 | 18.8 |
| 1.00 μ m | 0.12 | 0.35 | 1.3 | 7.0 | 11.0 | 32.0 |
| 5.00 μ m | 0.3 | 1.1 | 2.1 | 9.5 | 14.0 | 35.5 |

1) Prefilter size varies with model. Refer to individual model specifications before choosing a prefilter.
 2) Liquid flow rates represent typical initial water flow rates at 0.7 kg/cm² differential pressure at 20°C using clean water filtered to 0.1 μ m using MCE membrane.

▶ Polypropylene In-Line Holders

- **Compatible** with a wide range of chemicals and temperatures
- **Exterior locking ring design** allows the unit to be assembled quickly and efficiently without tearing the membrane
- **Two sizes available**, 25 mm for volumes (liquids) <50 ml and 47 mm for up to 1 liter
- **Autoclavable**, at 121°C for 20 minutes



PP 25



PP 47

▶ Specifications

| | PP 25 | PP 47 |
|------------------------------------|----------------------|--|
| Materials: | | |
| Body and support screens | Polypropylene | Polypropylene |
| O-ring (standard) | Silicone | Silicone |
| Connection: | | |
| Inlet | Female Luer-lock | Combination 1/4" NPTM and female Luer slip |
| Outlet | Male Luer slip | Combination 1/4" NPTM and female Luer slip |
| Pressure: | | |
| Inlet | 5 kg/cm ² | 5 kg/cm ² |
| Differential | 3 kg/cm ² | 5 kg/cm ² |
| Temperature: | | |
| Maximum (autoclave) 1 bar, 20 min. | 121°C | 121°C |
| Maximum operating (liquids) | 80°C | 80°C |
| Filter Specifications: | | |
| Filter size | 25 mm | 47 mm |
| Prefilter size | 21 mm | 42 mm |
| Filtration area | 3.5 cm ² | 13.5 cm ² |
| Recommended volume | <50 ml | Up to 1 liter |
| Dimensions: | | |
| Diameter | 30 mm | 65 mm |
| Height | 30 mm | 50 mm |

▶ Ordering Information

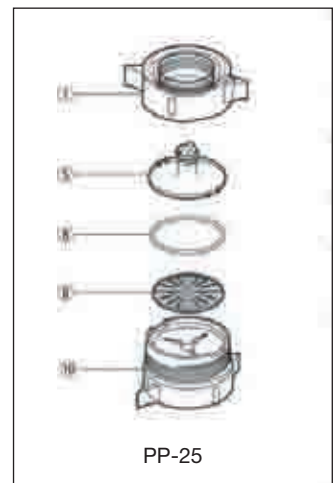
| Model | PP 25 | PP 47 |
|----------|----------|----------|
| Cat. No. | 43303010 | 43303020 |
| Packing | 6 | 1 |

Polypropylene In-Line Holders

Typical initial liquid flow rates [ml/min]

| Membrane Pore size [µm] | PP 25 | PP 47 |
|-------------------------|-------|-------|
| 0.20 | 35 | 250 |
| 0.45 | 80 | 600 |
| 1.00 | 320 | 1700 |
| 3.00 | 740 | 2800 |

Conditions: Water, 20°C, filtered through MCE membranes at 1 kg/cm² differential pressure.



Replacement Parts

| | | PP 25 |
|----|-----------------------------|----------|
| 1 | Locking ring, outer | 44540101 |
| 5 | Inlet cap | 44540102 |
| 6 | Support screen | 44540104 |
| 8 | Inlet cap O-ring (standard) | 44540106 |
| 10 | Outlet base | 44540103 |

| | | PP 47 |
|----|--|----------|
| 1 | Locking ring, outer | 44501201 |
| 5 | Inlet cap | 44501202 |
| 6 | Support screen | 44501004 |
| 7 | Locking O-ring | 44501204 |
| 8 | Inlet cap O-ring (standard) | 44501204 |
| 9 | Outlet base O-ring (standard) | 44501208 |
| 10 | Outlet base | 44501203 |
| 11 | Outlet adapter (male luer slip to hose barb) | 44501013 |



▶ PFA In-Line Filter Holders

- **Superior chemical compatibility**, can be used with chemically aggressive liquids
- **Dual support screens** allow flow in either direction
- **Exterior locking ring** for quick assembly without tearing the membrane

▶ Applications

- Sterilize and ultraclean liquids under positive pressure
- Ideal for filtering small volumes of high purity acids, alkalis or organic solvents

Note: PFA 47 has an air/bleed vent.



PFA 25



PFA 47

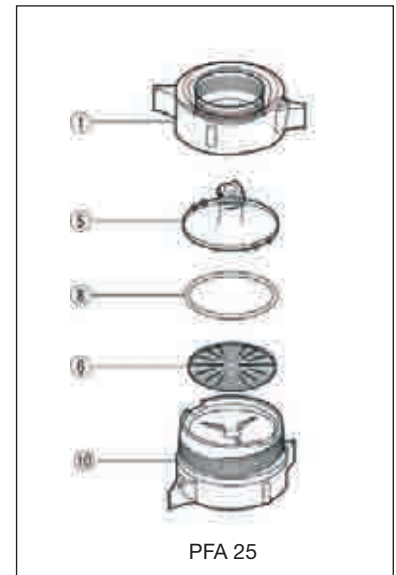
▶ Specifications

| | PFA 25 | PFA 47 |
|---|--|--|
| Materials: | | |
| Body and support screens | Teflon PFA (except for locking ring on PFA 47: glass filled ETFE) | |
| O-ring (standard) | Perfluoroelastomer | Perfluoroelastomer |
| Connection: | | |
| Inlet | Female Luer-lock | Combination 1/4" NPTM, 1/4" tubing adapter |
| Outlet | Male Luer slip | Combination 1/4" NPTM, 1/4" tubing adapter |
| Pressure: | | |
| Inlet | 3 kg/cm ² | 3 kg/cm ² |
| Differential, positive or negative, at 25°C | 3 kg/cm ² | 3 kg/cm ² |
| Temperature: | | |
| Maximum operating | 100°C | 100°C |
| Autoclave | 121°C, 15 min | 121°C, 15 min |
| Dimensions: | | |
| Diameter | 32 mm | 65 mm |
| Height | 32 mm | 70 mm |
| Membrane Compatibility: | | |
| Filter size | 25 mm | 47 mm |
| Prefilter size | 21 mm | 42 mm |
| Filtration area | 3.5 cm ² | 13.5 cm ² |
| Flow Rate: | | |
| Pore size (PTFE membrane) | Typical methanol flow rate at 1 kg/cm ² , 20°C [ml/min] | |
| 0.2 µm (J020) | 60 | 400 |
| 0.5 µm (J050) | 150 | 700 |
| 1.0 µm (J100) | 350 | 1200 |

PFA In-Line Filter Holders

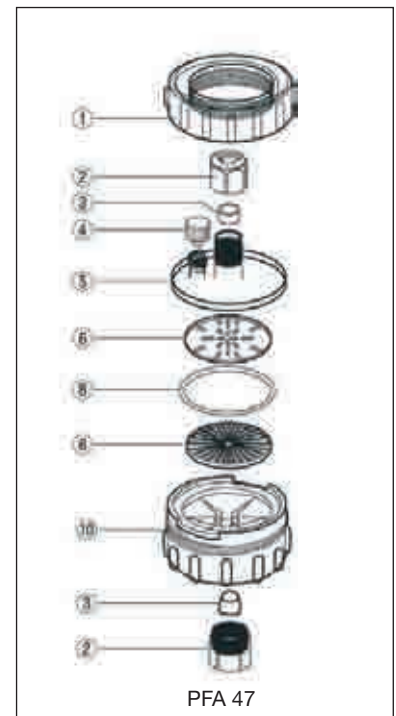
Ordering Information

| Model | PFA 25 | PFA 47 |
|----------|----------|----------|
| Cat. No. | 43307010 | 43307020 |



Replacement Parts

| | | PFA 25 | PFA 47 |
|----|-------------------------|----------|----------|
| 1 | Locking ring | 44530201 | 44530101 |
| 2 | Inlet/Outlet adapter | - | 44530111 |
| 3 | Tubing adapter | - | 44530110 |
| 4 | Vent cap | - | 44530105 |
| 5 | Inlet cap | 44530202 | 44530102 |
| 6 | Support screen | 44530204 | 44530104 |
| 8 | Inlet O-ring (standard) | 44530206 | 44530106 |
| 10 | Body | 44530203 | 44530103 |



Pressure Filtration

Stainless Steel Syringe Holders

- **Sterilizable** by standard procedures including autoclaving
- **Luer fittings** fit typical syringes
- **Can be tightened securely**, wrench set included

Applications

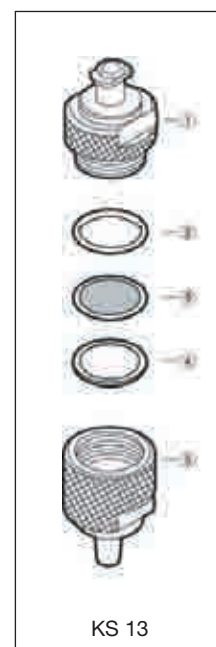
- Filter or clean small volumes of liquid such as eyewash or photoresists
- Clear turbid solutions such as serum
- Purify virus solutions

Specifications

| | KS 13 | KS 25 |
|--------------------------------|--------------------------|--------------------------|
| Materials: | | |
| Body, support screens | Type 304 Stainless Steel | Type 304 Stainless Steel |
| Gasket | PTFE (teflon) | PTFE (teflon) |
| O-ring | PTFE (teflon) | PTFE (teflon) |
| Connection: | | |
| Inlet | Female Luer-lock | Female Luer-lock |
| Outlet | Male Luer slip | Male Luer slip |
| Pressure: | | |
| Inlet | 7 kg/cm ² | 7 kg/cm ² |
| Differential | 3 kg/cm ² | 3 kg/cm ² |
| Membrane Compatability: | | |
| Filter size | 13 mm | 25 mm |
| Pre-filter size | 8 mm | 21 mm |
| Filtration area | 0.9 cm ² | 3.8 cm ² |
| Dead volume | 0.2 ml | 0.4 ml |
| Dimensions: | | |
| Diameter | 16 mm | 32 mm |
| Height | 39 mm | 36 mm |



KS 13 / KS 25



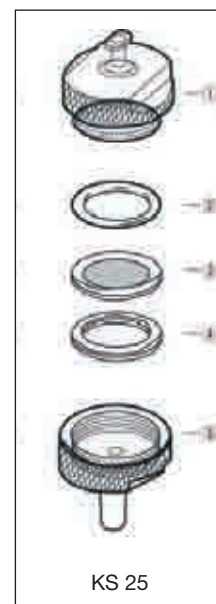
KS 13

Ordering Information

| Model | KS 13 | KS 25 |
|----------|----------|----------|
| Cat. No. | 17301000 | 17301200 |

Replacement Parts

| | | KS 13 | KS 25 |
|---|-------------------------|----------|----------|
| 1 | Inlet, female Luer-lock | - | - |
| 2 | O-ring (PTFE) | 19301004 | 19301204 |
| 3 | Screen | 19301003 | 19301203 |
| 4 | Gasket (PTFE) | 19301002 | 19301202 |
| 5 | Outlet, male Luer slip | - | - |



KS 25

Stainless Steel Gas Line Holders

- **Female threaded locking ring** enables filter changes without removing the holder from connecting gas lines
- **Dual support screens** protect the membrane filter from reverse pressure surges and allow forward and reverse flow from either inlet or outlet

Applications

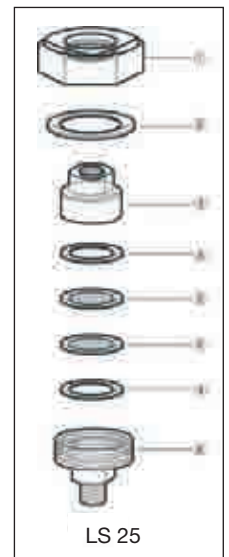
- Ultraclean and sterilize air and other gases including compressed gases
- In-line between pressurizing source (pump or gas cylinder) and dispensing vessel

Specifications

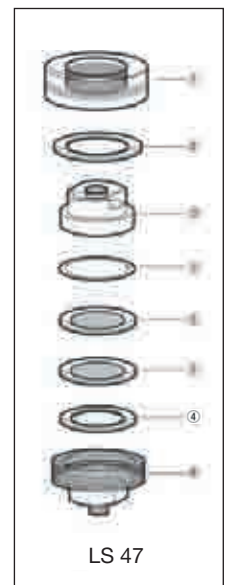
| | LS 25 | LS 47 |
|--------------------------------|--------------------------|--------------------------|
| Materials: | | |
| Body, support screens | Type 304 Stainless Steel | Type 304 Stainless Steel |
| Locking ring | Chrome-plated brass | Chrome-plated brass |
| Gasket | PTFE (teflon) | PTFE (teflon) |
| O-ring | PTFE (teflon) | Silicone |
| Connection: | | |
| Inlet | 1/4" NPTF | 1/4" NPTF |
| Outlet | 1/4" NPTM | 1/4" NPTM |
| Pressure: | | |
| Inlet | 5 kg/cm ² | 5 kg/cm ² |
| Differential | 2 kg/cm ² | 2 kg/cm ² |
| Membrane Compatability: | | |
| Filter size | 25 mm | 47 mm |
| Prefilter size | 25 mm | 47 mm |
| Filtration area | 3.8 cm ² | 12.5 cm ² |
| Dimensions: | | |
| Diameter | 38 mm | 69 mm |
| Height | 50 mm | 57 mm |



LS 25 / LS 47



LS 25



LS 47

Ordering Information

| Model | LS 25 | LS 47 |
|----------|----------|----------|
| Cat. No. | 17304500 | 17304700 |

Replacement Parts and and Optional O-rings

| | | LS 25 | LS 47 |
|---|--------------------------------|----------|----------|
| 1 | Locking ring | - | - |
| 2 | Locking ring gasket | 19304504 | 19304704 |
| 3 | Inlet body (1/4" NPTF) | - | - |
| 4 | Gasket PTFE | 19301202 | 19304702 |
| 5 | Stainless steel screen (304SS) | 19301203 | 19304703 |
| 6 | Outlet body (1/4" NPTM) | - | - |
| 7 | Silicone O-ring | - | 19304703 |

Pressure Filtration

High Pressure Stainless Steel Holders

- Operate at high pressure, up to 100 kg/cm²
- Standard Viton O-rings compatible with many aggressive liquids and gases
- Back pressure support screen available to prevent membrane rupture and deflect flow at very high pressures

Applications

- Filter liquids or gases under high pressure

Specifications

| LS 47 HP | |
|--------------------------------|--------------------------|
| Materials: | |
| Body, support screens | Type 304 Stainless Steel |
| O-ring | FPM |
| Connection: | |
| Inlet and Outlet | 1/4" NPTF |
| Pressure: | |
| Inlet | 100 kg/cm ² |
| Differential | 20 kg/cm ² |
| Dead volume: | |
| Upstream | 3 ml |
| Downstream | 6.5 ml |
| Membrane Compatibility: | |
| Filter size | 47 mm |
| Prefilter size | 38 mm |
| Filtration area | 12.5 cm ² |
| Dimensions: | |
| Diameter | 88 mm |
| Height (incl. adapters) | 94 mm |

Ordering Information

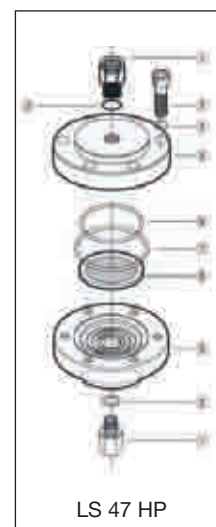
| Model | LS 47 HP |
|----------|----------|
| Cat. No. | 17304900 |

Replacement Parts and Accessories

| LS 47 HP | | |
|----------|------------------------|----------|
| 1 | Inlet/outlet adapter | - |
| 2 | Adapter O-ring | 19304905 |
| 3 | Hex cap screw, M-8 | - |
| 4 | Cap screw washer | - |
| 5 | Inlet plate | - |
| 6 | Inner O-ring | 19304906 |
| 7 | Outer O-ring | 19304910 |
| 8 | Sintered steel support | 19304903 |
| 9 | Outlet plate | - |



LS 47 HP



LS 47 HP

Sanitary In-Line Stainless Steel Holders

- **Sanitary inlet and outlet connections** are non-threaded and can be completely disassembled for thorough cleaning
- **47 mm holder features vent** to allow air venting on upstream side of the membrane at any time during filtration

Applications

- Point of use filtration on sterile filling machines
- Flow decay studies for scale up to larger filtration systems
- Liquid or gas

Specifications

| | KS 25 F | KS 47 F |
|--------------------------|--------------------------|--------------------------|
| Materials: | | |
| Body, support screens | Type 304 Stainless Steel | Type 304 Stainless Steel |
| O-ring | FPM and Silicone | FPM and Silicone |
| Gasket | PTFE | PTFE |
| Connection: | | |
| Inlet/outlet | 6 mm OD barb/4 mm ID | 8 mm OD barb/6 mm ID |
| Pressure: | | |
| Inlet | 5 kg/cm ² | 5 kg/cm ² |
| Differential | 3 kg/cm ² | 3 kg/cm ² |
| Dimensions: | | |
| Diameter (without clamp) | 50 mm | 64 mm |
| Length (with vent valve) | 72 mm | 78 mm |

Ordering Information

| Model | KS 25 F | KS 47 F |
|----------|----------|----------|
| Cat. No. | 17307000 | 17307200 |

Replacement Parts

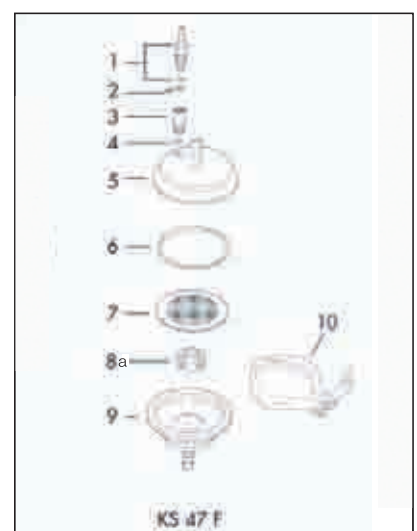
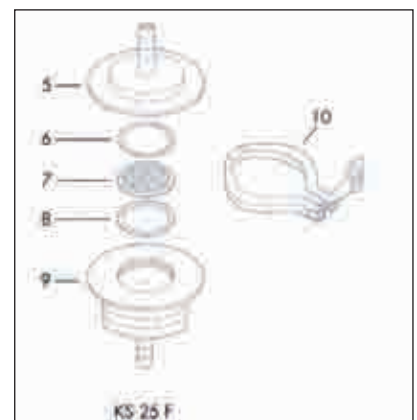
| | KS 25 F | KS 47 F | |
|-----|--------------------|----------|----------|
| 1-3 | Vent valve set | - | 19307220 |
| 4 | Gasket (PTFE) | - | 19307208 |
| 5 | Inlet body | - | - |
| 6 | O-ring | 19307003 | 19304712 |
| 7 | Support screen | 19301203 | 19304703 |
| 8a | Underdrain support | - | 19307204 |
| 8 | Gasket PTFE | 19307004 | - |
| 9 | Outlet body | - | - |
| 10 | Clamp | 19306000 | 19306300 |



KS 25 F



KS 47 F



Pressure Filtration

▶ Vented In-Line Stainless Steel Holder

- **Support screens are Teflon coated** to prevent membrane sticking during autoclaving
- **Back pressure support screen** prevents membrane rupture during reverse pressure surges
- **Vent valve** in inlet body enables venting at any time during filtration

▶ Applications

- Sterilize and ultraclean liquids and gases under positive pressure
- Sterilize with membrane in place for microbiological studies
- Install for point of use filtration on filling machines

Note: When using KS 47 to filter gases, a second support screen should be used upstream the membrane (Replacement Parts, No. 8)



KS 47

▶ Specifications

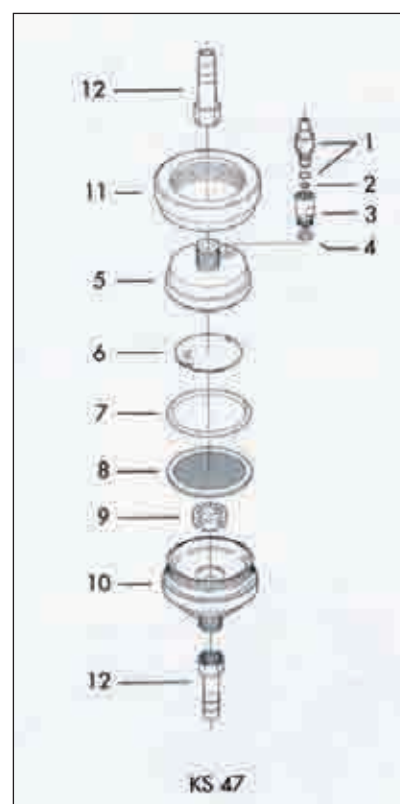
| KS 47 | |
|--------------------------|-------------------------------|
| Materials: | |
| Body and support screens | Type 304 Stainless Steel |
| O-ring | FPM and silicone |
| Support screens | PTFE coated stainless steel |
| Gasket | PTFE |
| Connections: | |
| | 1/4" PS to hose barb (9.5 mm) |
| Pressure: | |
| Inlet | 7 kg/cm ² |
| Differential | 3 kg/cm ² |
| Dead volume: | |
| Upstream | 5 ml |
| Downstream | 2 ml |

▶ Ordering Information

| Type Stainless Steel | KS 47 |
|----------------------|----------|
| 304 SS | 17307400 |

▶ Replacement Parts

| KS 47 | | |
|-------------|---------------------------------|----------|
| Type 304 SS | | |
| 1-4 | Vent valve set | 19307220 |
| 5 | Inlet body | - |
| 6 | Back pressure support | 19307404 |
| 7 | O-ring (silicone) | 19304712 |
| 8 | Support screen | 19304715 |
| 9 | Underdrain support | 19307204 |
| 10 | Outlet body | - |
| 11 | Locking ring | - |
| 12 | Inlet/outlet adapter | 19301510 |
| | Gasket for inlet/outlet adapter | 19321014 |



Large Standard Stainless Steel – 90, 142, 293 mm

- **Seal membrane by hand tightening** locking wing nuts
- **Optimal holder design** minimizes resistance and maximizes flow rate
- **Each unit labelled** with identifying serial numbers on the outside of both the inlet and outlet plates

Applications

- Use in-line for filtering gases or liquids
- Use with pressure vessels for batch type operations



KS 90

Specifications

| | KS 90 | KS 142 | KS 293 |
|--------------------------------|--|----------------------|----------------------|
| Materials: | | | |
| Body | Type 304 stainless steel | | |
| Support screen | PTFE (Teflon) coated photoetched stainless steel | | |
| O-rings | Silicone | | |
| Gaskets | PTFE | | |
| Connection: | | | |
| Inlet and outlet, 3/4" PS to: | 11 mm hose barb | 11 mm hose barb | 16 mm hose barb |
| Pressure: | | | |
| Inlet | 7 kg/cm ² | 7 kg/cm ² | 7 kg/cm ² |
| Differential | 3 kg/cm ² | 3 kg/cm ² | 3 kg/cm ² |
| Membrane Compatability: | | | |
| Filter size | 90 mm | 142 mm | 293 mm |
| Prefilter size | 76 mm | 124 mm | 257 mm |
| Filtration area | 45 cm ² | 113 cm ² | 530 cm ² |

Supplied with aluminium wrench (spanner) and 6 mm allen wrench (hex key).



KS 142



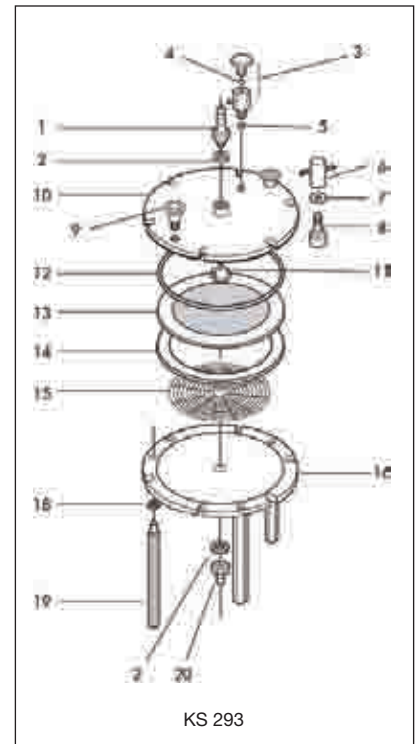
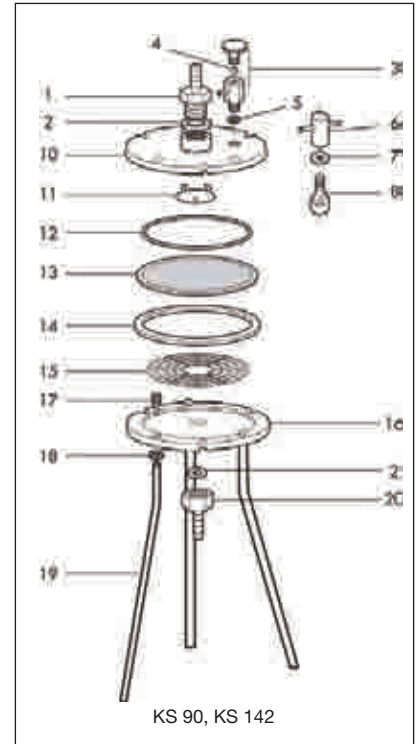
KS 293

Ordering Information

| Type Stainless Steel | KS 90 | KS 142 | KS 293 |
|----------------------|----------|----------|----------|
| 304 SS | 17301700 | 17301900 | 17302500 |

Replacement Parts

| | | Material | KS 90 | KS 142 | KS 293 |
|----|--------------------------|----------------|----------|----------|----------|
| 1 | 3/4" PSM Inlet adapter | SUS304 | 19301713 | 19301713 | 19302510 |
| 2 | Gasket for Inlet adapter | PTFE | 19301710 | 19301710 | 19301710 |
| 3 | Vent valve | SUS304 | 19301711 | 19301911 | 19301911 |
| 4 | Stopsheet for vent valve | PTFE | - | - | - |
| 5 | Gasket for vent valve | PTFE | 19301712 | 19301912 | 19302512 |
| 6 | Sealing wing nut | SUS304 | - | 19301770 | 19301773 |
| 7 | Sealing washer | | | | |
| 8 | Sealing bolt | | | | |
| 9 | Handle for Inlet plate | SUS304 | - | - | - |
| 10 | Inlet plate | SUS304 | - | - | - |
| 11 | Flow deflector | SUS304 | - | - | - |
| 12 | O-ring | Silicone | 19301705 | 19301905 | 19302505 |
| 13 | Support screen | PTFE coatet SS | 19301704 | 19301904 | 19302504 |
| 14 | Gasket | PTFE | 19301703 | 19301903 | 19302503 |
| 15 | Underdrain support | SUS304 | 19301702 | 19301902 | 19302502 |
| 16 | Outlet plate | SUS304 | - | - | - |
| 17 | Leg bolt | SUS304 | 19301760 | 19301760 | - |
| 18 | Leg washer | | | | |
| 19 | Leg | SUS304 | - | - | - |
| 20 | 3/4" PSF Outlet adapter | SUS304 | 19301717 | 19301717 | 19302511 |



Large Sanitary Stainless Steel Holders – 90, 142, 293 mm

- **Sanitary connections** are non-threaded and can be completely disassembled for thorough cleaning
- **Designed for** minimal resistance and maximal flow
- **Removable wing nuts** tighten easily by hand to seal membrane
- **Both inlet and outlet plates clearly marked** with identifying serial numbers

Applications

- Ultraclean or sterilize gases or liquids
- Use with a pressure vessel for large volume and batch type operations



KS 90 ST



KS 142 ST



KS 293 ST

Specifications

| | KS 90 ST | KS 142 ST | KS 293 ST |
|-------------------------------|--|-------------------------------------|-------------------------------------|
| Materials: | | | |
| Body | Type 304 stainless steel | | |
| Support screen | PTFE (Teflon) coated photoetched stainless steel | | |
| O-rings, gaskets | PTFE (Teflon), silicone rubber | | |
| Connection: | | | |
| Inlet / outlet: | 1.0" | 1.0" | 1.5" |
| | sanitary fitting to 16 mm hose barb | sanitary fitting to 16 mm hose barb | sanitary fitting to 16 mm hose barb |
| Pressure: | | | |
| Inlet | 7 kg/cm ² | 7 kg/cm ² | 7 kg/cm ² |
| Differential | 3 kg/cm ² | 3 kg/cm ² | 3 kg/cm ² |
| Membrane Compatibility | | | |
| Membrane filter size | 90 mm | 142 mm | 293 mm |
| Prefilter size | 76 mm | 124 mm | 257 mm |
| Filtration area | 45.3 cm ² | 113 cm ² | 530 cm ² |

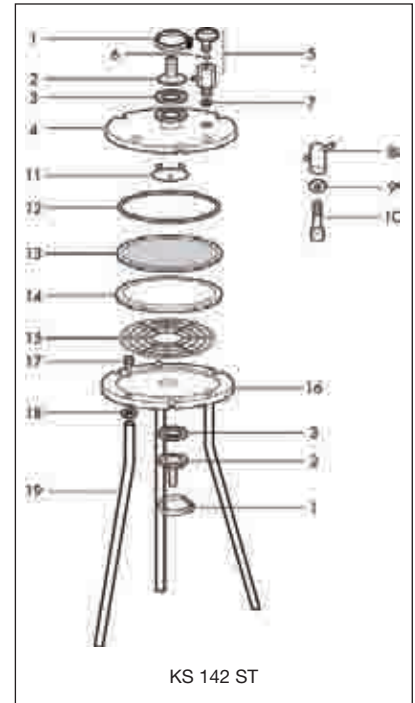
Supplied with aluminium wrench (spanner) and 6 mm allen wrench (hex key).

Ordering Information

| Type Stainless Steel | KS 90 ST | KS 142 ST | KS 293 ST |
|----------------------|----------|-----------|-----------|
| 304 SS | 17301800 | 17302100 | 17302700 |

Replacement Parts

| | | Material | KS 90 ST | KS 142 ST | KS 293 ST |
|----|--------------------------|----------------|----------|-----------|-----------|
| 1 | Clamp, 1.5S | SUS304 | 19306000 | 19306000 | 19306000 |
| 2 | Inlet/Outlet adapter | SUS304 | 19306200 | 19306200 | 19306200 |
| 3 | Inlet/Outlet gasket | Silicone | 19306100 | 19306100 | 19306108 |
| 4 | Inlet plate | SUS304 | - | - | - |
| 5 | Vent valve | SUS304 | 19301711 | 19301911 | 19301911 |
| 6 | Stopsheet for vent valve | PTFE | - | - | - |
| 7 | Gasket for vent valve | PTFE | 19301712 | 19301912 | 19302512 |
| 8 | Sealing wing nut | SUS304 | 19301770 | 19301770 | 19301773 |
| 9 | Sealing washer | | | | |
| 10 | Sealing bolt | | | | |
| 11 | Flow deflector | SUS304 | - | - | - |
| 12 | O-ring | Silicone | 19301705 | 19301905 | 19302505 |
| 13 | Support screen | PTFE coatet SS | 19301704 | 19301904 | 19302504 |
| 14 | Gasket | PTFE | 19301703 | 19301903 | 19302503 |
| 15 | Underdrain support | SUS304 | 19301702 | 19301902 | 19302502 |
| 16 | Outlet plate | SUS304 | - | - | - |
| 17 | Leg bolt | SUS304 | 19301760 | 19301760 | - |
| 18 | Leg washer | | | | |
| 19 | Leg | - | - | - | |



Introduction

- All polypropylene housings are sturdy and chemically compatible
- Three membrane type media and two depth type media
- Wide range of retentive pore sizes
- All types available in three different lengths
- Diameter is standard 78 mm
- Selected media available presterilized

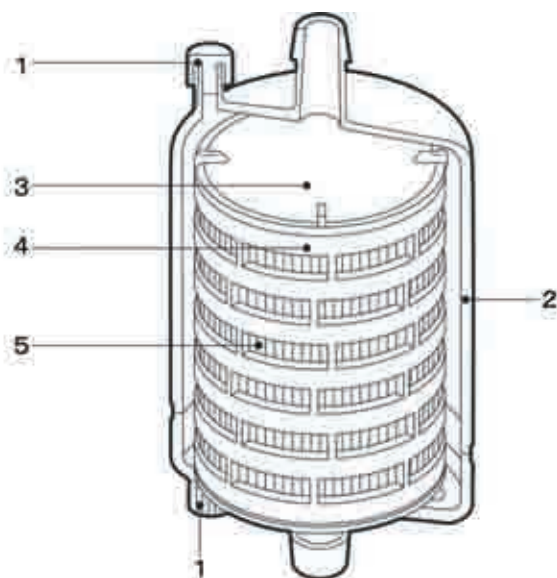
Applications

- Filter tissue culture media, fermentation broths, ground water
- Can be set in serial mode to maximize throughput volumes
- Point-of-use sterile filtration
- Use capsules for pilot/prototype studies, scale up to the same media in cartridge format
- Cannot be used for gas filtration



Product Overview

| Media | Code | Characteristics | Media type | Pore size or Nominal Rating [μm] | Membrane layers | Filtration area per capsule [cm ²] |
|---------------|------|-----------------|------------|----------------------------------|-----------------|--|
| PES | CCS | Hydrophilic | Membrane | 0.20 - 0.45 | Double | Up to 1800 |
| PTFE | CCF | Hydrophobic | Membrane | 0.05 - 1.0 | Single/double | Up to 3600 |
| PTFE | CCFH | Hydrophilic | Membrane | 0.20 | Single | Up to 3600 |
| Polypropylene | CCP | Hydrophobic | Depth-type | 0.8 - 30 | - | Up to 2600 |
| Glass | CCG | - | Depth-type | 0.45 - 1.0 | - | Up to 1200 |



- 1: Vent/drain
- 2: Housing
- 3: End cap
- 4: Outer sleeve
- 5: Pleated filter media



End Fixture B
1/4" NPTM



End Fixture D
1/2" NPTM



End Fixture H
3/8" hose barb



End Fixture N
1 1/2" sanitary fitting

Capsule Filters

▶ PES Capsule Filters – Code CCS

- **Can be sterilized** by autoclaving (121°C) or treatment with ethylene oxide (EtO)
- **Available presterilized (EtO) or rinsed** (recommended when filtering high purity water)

▶ Applications

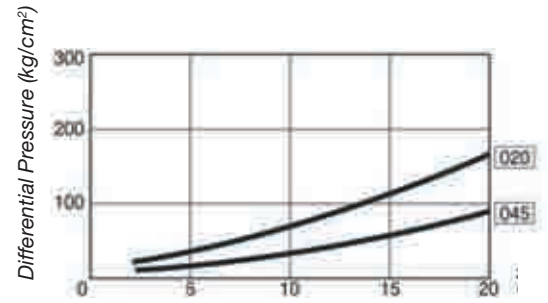
- Filter pure water, high purity chemicals, pharmaceuticals, tissue culture media
- Remove bacteria or sub-micron particulates

▶ Specifications

| | CCS-020 | CCS-045 |
|-----------------------------------|-----------------------|-----------------------|
| Membrane layers | Double | Double |
| Pore Size [µm] | 0.20 | 0.45 |
| Max. inlet pressure | 4 kg/cm ² | 4 kg/cm ² |
| Max. Operating Temperature | 60°C | 60°C |
| Bubble point [water] | ≥4 kg/cm ² | ≥3 kg/cm ² |
| LRV / Organism | ≥7 / B. diminuta | ≥7 / S. marcescens |

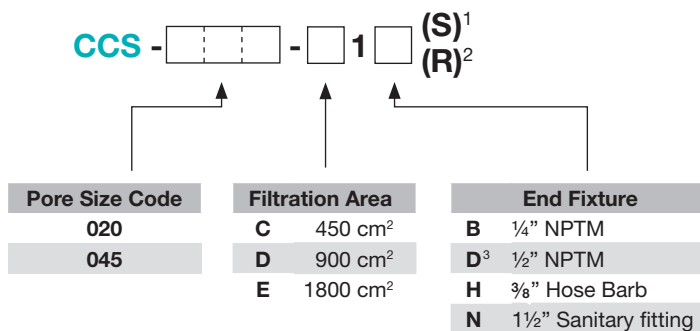
| Length Code | Length [mm]* | Filtration Area [cm ²] |
|-------------|--------------|------------------------------------|
| C | 102 | 450 |
| D | 129 | 900 |
| E | 201 | 1800 |

*Length given is for capsules with end fixture H.



Flow Rate (L/min)
Typical water flow rate
for CCS-___-D1B at 25°C

▶ Ordering Information



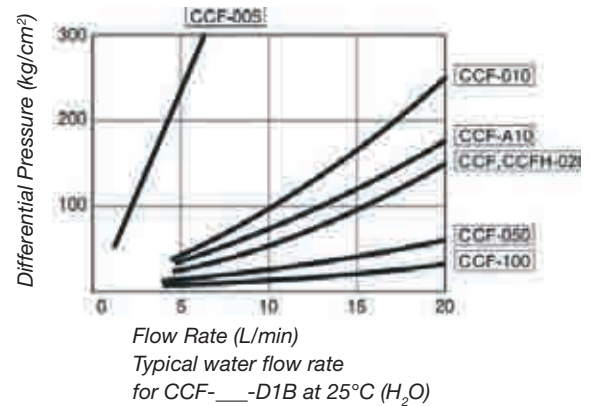
- 1) When ordering sterile units, specify "S" in the last position of the Cat. No.
- 2) When ordering pre-rinsed units, specify "R" in the last position of the Cat. No.
- 3) When ordering length code "C" (filtration area), end fixture code "D" is not available.

PTFE Capsule Filters

– Code CCF (Hydrophobic) and Code CCFH (Hydrophilic)

- **Compatible;** solvent and pH resistant
- **Hydrophobic:**
 - Supported membrane except CCF-A10 and CCF-005
 - Single layer except CCF-A10 and CCF-005 which has double layer
 - 5 pore sizes
 - Can be sterilized by autoclaving (121°C, 30 min.) or treatment with ethylene oxide (EtO)
- **Hydrophilic:**
 - Polyester membrane support
 - Single layer
 - 0.20 µm pore size

Note: Autoclaving or allowing membrane to dry will make it hydrophobic



Applications

- Use serially as prefilter and final filter
- Corrosive fluids and gases, photoresists, and both alkalis and acids
- Hydrophobic:
 - Solvent filtration
 - Air venting
- Hydrophilic:
 - Solvents with higher surface tension
 - Heterogeneous fluid mixtures

Specifications

| Type Code | CCF-005 | CCF-A10 | CCF-010 | CCF-020 | CCF-050 | CCF-100 | CCFH-020 | |
|---|----------------------|----------------------|---|----------------------|----------------------|----------------------|----------------------|------|
| | Hydrophobic | Hydrophobic | Hydrophobic | Hydrophobic | Hydrophobic | Hydrophobic | Hydrophilic | |
| Membrane layers | Double | Double | Single | Single | Single | Single | Single | |
| Pore size [µm] | 0.05 | 0.10 | 0.10 | 0.20 | 0.50 | 1.0 | 0.20 | |
| Bubble point (IPA) [kg/cm²] | ≥1.65 | ≥1.6 | ≥1.4 | ≥0.9 | ≥0.5 | ≥0.3 | - | |
| Max. Inlet Pressure | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | |
| Max. Operating Temperature | 60°C | 60°C | 60°C | 60°C | 60°C | 60°C | 60°C | |
| Length Code | Length [mm]* | | Filtration Area [cm²] | | | | | |
| C | 102 | 900 | 900 | 570 | 570 | 570 | 570 | 900 |
| D | 129 | 1800 | 1800 | 1150 | 1150 | 1150 | 1150 | 1800 |
| E | 201 | 3600 | 3600 | 2300 | 2300 | 2300 | 2300 | 3600 |

*Length given is for capsules with end fixture H.

Ordering Information

| CCF - [] - [] 1 [] (S) ¹ | | | CCFH - [] - [] 1 [] (S) ¹ | | |
|--|------------------------|------------------------|---|------------------------|------------------------|
| Pore Size Code | Filtration Area | End Fixture | Pore Size Code | Filtration Area | End Fixture |
| 005 | C 570 cm ² | B ¼" NPTM | 020 | C 900 cm ² | B ¼" NPTM |
| 010 | D 1150 cm ² | D ² ½" NPTM | | D 1800 cm ² | D ² ½" NPTM |
| 020 | E 2300 cm ² | H ⅜" Hose Barb | | E 3600 cm ² | H ⅜" Hose Barb |
| 050 | | N 1½" Sanitary fitting | | | N 1½" Sanitary fitting |
| 100 | | | | | |

1) When ordering sterile units, specify "S" in the last position of the Cat. No.

2) When ordering length code "C" (filtration area), end fixture code "D" is not available.

Capsule Filters

▶ Polypropylene Capsule Filters – Code CCP

- **Depth type matrix:** High dirt holding capacity, superior retention
- **Compatible** with aqueous solutions and solvents
- **Thermally welded** to prevent fiber slough-off and minimize changes in pore size during filtration
- **Wide range** of particle size cut-offs
- **Can be sterilized** by autoclaving (121°C, 30 min.) or treatment with ethylene oxide (EtO)

▶ Applications

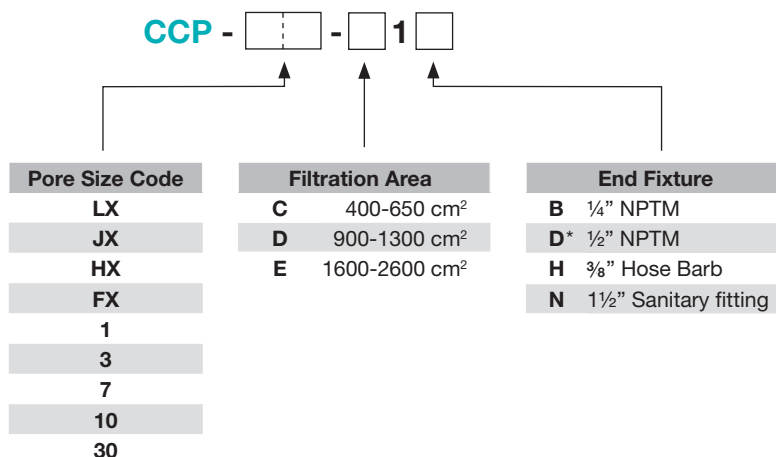
- High purity water filtration
- Prefiltration to a final membrane filter such as PES or PTFE (CCS, CCF or CCFH)
- Ultracleaning
- Filtration of process chemicals

▶ Specifications

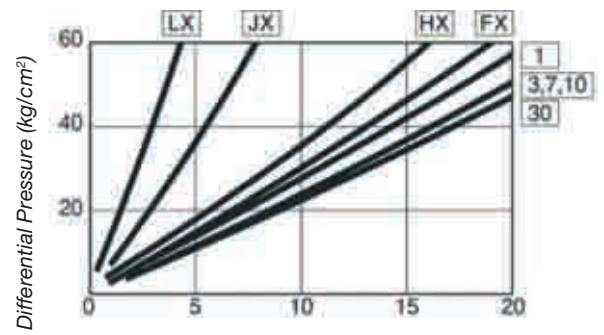
| Type Code | CCP-LX | CCP-JX | CCP-HX | CCP-FX | CCP-1 | CCP-3 | CCP-7 | CCP-10 | CCP-30 | |
|-----------------------------|----------------------|----------------------|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|------|
| Nominal rating [µm] | 0.8 | 1.0 | 2.0 | 3.0 | 2-5 | 5-10 | 10-20 | 10-20 | 20-30 | |
| % Particle retention | >99 | >99 | >99 | >99 | 94 | 98 | 98 | 92 | 97 | |
| Max. Inlet Pressure | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | 4 kg/cm ² | |
| Max. Operating Temp. | 60°C | 60°C | 60°C | 60°C | 60°C | 60°C | 60°C | 60°C | 60°C | |
| Length Code | Length [mm]* | | Filtration Area [cm²] | | | | | | | |
| C | 102 | 400 | 500 | 500 | 550 | 500 | 600 | 500 | 550 | 650 |
| D | 129 | 800 | 1000 | 1000 | 1100 | 1000 | 1200 | 1000 | 1100 | 1300 |
| E | 201 | 1600 | 2000 | 2000 | 2200 | 2000 | 2400 | 2000 | 2200 | 2600 |

*Length given is for capsules with end fixture H.

▶ Ordering Information



*) When ordering length code "C" (filtration area), end fixture code "D" is not available.



Flow Rate (L/min)
Typical water flow rate for
CCP-___-D1B at 25°C

› Glass Microfiber Capsule Filters – Code CCG

- **Depth type matrix** of borosilicate glass microfiber
- **Large dirt holding** capacity
- **Resistant** to most fluids except strong acids
- **Contains a small amount of acrylic resin binder** to enhance wet strenght
- **Can be sterilized** by autoclaving (121°C, 30 min.) or treatment with ethylene oxide (EtO)

› Applications

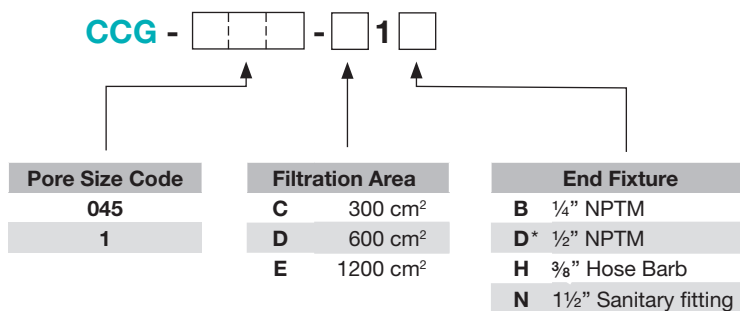
- Sea water filtration
- Aquaculture
- Prefiltration to a final membrane filter such as PES or PTFE (CCS, CCF or CCFH)

› Specifications

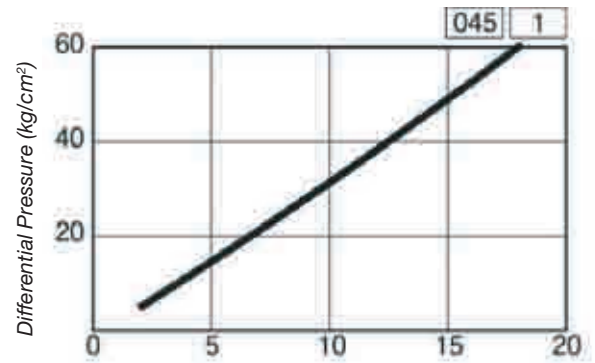
| Type Code | 045 | 1 |
|-----------------------------------|----------------------|---|
| Nominal rating [µm] | 1-1.5 | 1.5-2 |
| Particle retention | 99,9% | 99,9% |
| Max. Inlet Pressure | 3 kg/cm ² | 3 kg/cm ² |
| Max. Operating Temperature | 60°C | 60°C |
| Length Code | Length [mm]* | Filtration Area (cm²) |
| C | 102 | 300 |
| D | 129 | 600 |
| E | 201 | 1200 |

*Length given is for capsules with end fixture H.

› Ordering Information



*) When ordering length code "C" (filtration area), end fixture code "D" is not available.



Flow Rate (L/min)
Typical water flow rate for
CCG-045-1 at 25°C

37 mm Monitors for Microbial and Contamination Analysis

These 37 mm monitor units are disposable filter units which consists of a transparent plastic container in which a Mixed Cellulose Ester membrane and an absorption pad/support disc are assembled together.

Monitors are mainly used for microbiological inspection of gases and liquids. There are two types available, 2-piece and 3-piece units in which 0.45 µm or 0.80 µm membranes are placed together with a pad. 2-piece units are available with membranes with a hydrophobic edge to prevent air locks.

Collected samples can be cultured in place or be removed for further analysis or study.



» Applications – Recommended product

| Application | Unit | Membrane |
|-------------------------------|---------------|---|
| Microbiology – bacterial | 2- or 3-piece | 0.45 µm, white grid or black grid |
| Microbiology – yeast and mold | 3-piece | 0.80 µm, white grid or black grid |
| Aerosol analysis | 3-piece | 0.80 µm, white plain |
| Contamination analysis | 2- or 3-piece | 0.45 µm or 0.80 µm, white plain or grid |

» Specifications

| Monitor Type | 2-piece | 3-piece |
|----------------------------|---|--------------|
| Housing | Styrene acrylonitrile | |
| Membrane | Mixed cellulose ester | |
| Support Pad | Pure cotton cellulose | |
| Internal dimensions | Ø 34 x 9 mm | Ø 34 x 18 mm |
| External dimensions | Ø 42 x 29 mm | Ø 42 x 39 mm |
| Filtration area | 9.0 cm ² (6.7 cm ² for HE* types) | |
| Internal volume | 8 ml | 16 ml |
| Max. operating temperature | 45°C | |

* HE = Hydrophobic Edge

Ordering Information

2-piece Monitors

| Pore size [µm] | Membrane Color | Surface | Packing | Sterile | Sterile-HE |
|----------------|----------------|---------|---------|-----------|--------------|
| 0.45 | White | Grid | 50 | 37AS245BS | 37AS245BS-HE |
| 0.45 | Black | Grid | 50 | - | 37AS245PS-HE |

3-piece Monitors

| Pore size [µm] | Membrane Color | Surface | Packing | Sterile | Non sterile |
|----------------|----------------|---------|---------|-----------|-------------|
| 0.45 | White | Grid | 50 | 37AS345BS | - |
| 0.45 | Black | Grid | 50 | 37AS345PS | - |
| 0.80 | White | Grid | 50 | 37AS380BS | - |
| 0.80 | White | Plain | 50 | - | 37AS380AN |

Optional and Replacement Parts

| Type description | Packing | Cat. No. |
|--------------------------------|---------|-----------|
| Unassembled 2-piece with plugs | 50 | 37OS200ON |
| Unassembled 3-piece with plugs | 50 | 37OS300ON |
| Middle ring for 3-piece | 50 | 37OS300MR |
| Absorbent pads/Support disc | 100 | M-085 |

pH Indicator Test Papers

Advantages of Test Papers

- Determination of pH value easily and inexpensively, without instrumentation
- Color changes instantaneously, compare to chart for determination
- Two convenient formats:
 - Roll, 9 mm wide, in dispenser, 5.5 m or 6 m length
 - Booklet of 20 strips, 7 x 70 mm, 10 booklets per pack



Test Papers – Roll type



Test Papers – Booklet

Ordering Information – Roll Types

Note: Type WR is 5.5 m length, others are 6 m.

| Type description | Measuring pH range | | | | | | | | | | | Cat. No. |
|------------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----------|
| UNIV | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 07011030 |
| UNIV Refill | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 07011050 |
| WR | 0 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 07011040 |
| BCG | 4.0 | 4.2 | 4.4 | 4.6 | 4.8 | 5.0 | 5.2 | 5.4 | 5.6 | | | 07011010 |
| BTB | 6.2 | 6.4 | 6.6 | 6.8 | 7.0 | 7.2 | 7.4 | 7.6 | 7.8 | | | 07011020 |

Ordering Information – Booklet Types

Note: Each box contains 10 booklets of 20 strips.

| Type description | Measuring pH range | | | | | | | | | | | Cat. No. |
|------------------|--------------------|------|------|------|------|------|------|------|------|----|----|----------|
| CR | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | | | 07010010 |
| | 7.2 | 7.4 | 7.6 | 7.8 | 8.0 | 8.2 | 8.4 | 8.6 | 8.8 | | | |
| TB | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | | | 07010020 |
| | 8.0 | 8.2 | 8.4 | 8.6 | 8.8 | 9.0 | 9.2 | 9.4 | 9.6 | | | |
| BPB | 2.8 | 3.0 | 3.2 | 3.4 | 3.6 | 3.8 | 4.0 | 4.2 | 4.4 | | | 07010030 |
| PB | 3.2 | 3.6 | 4.0 | 4.2 | 4.4 | 4.6 | 4.8 | 5.2 | 5.6 | | | 07010090 |
| PP | 3.4 | 3.8 | 4.2 | 4.6 | 5.0 | 5.2 | 5.6 | 6.0 | 6.4 | | | 07010130 |
| BCG | 4.0 | 4.2 | 4.4 | 4.6 | 4.8 | 5.0 | 5.2 | 5.4 | 5.6 | | | 07010040 |
| CPR | 5.0 | 5.2 | 5.4 | 5.6 | 5.8 | 6.0 | 6.2 | 6.4 | 6.6 | | | 07010100 |
| MR | 5.4 | 5.6 | 5.8 | 6.0 | 6.2 | 6.4 | 6.6 | 6.8 | 7.0 | | | 07010050 |
| BCP | 5.6 | 5.8 | 6.0 | 6.2 | 6.4 | 6.6 | 6.8 | 7.0 | 7.2 | | | 07010140 |
| BTB | 6.2 | 6.4 | 6.6 | 6.8 | 7.0 | 7.2 | 7.4 | 7.6 | 7.8 | | | 07010060 |
| PR | 0.0 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | | | 07010150 |
| | 6.6 | 6.8 | 7.0 | 7.2 | 7.4 | 7.6 | 7.8 | 8.0 | 8.2 | | | |
| AZY | 10.0 | 10.4 | 10.8 | 11.0 | 11.2 | 11.4 | 11.6 | 11.8 | 12.0 | | | 07010070 |
| ALB | 11.0 | 11.4 | 11.8 | 12.2 | 12.6 | 12.8 | 13.0 | 13.2 | 13.6 | | | 07010080 |
| UNIV | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 07010120 |

› Litmus Paper

- **Litmus Papers** made from high purity litmus to secure high sensitivity and clear color change
- **Blue Litmus Paper** change color to red when the liquid is acidic
- **Red Litmus Paper** change color to blue when the liquid is alkalic
- **Available in two sizes and packing;** booklets and loose strips



› Ordering Information

Red Litmus

| Size [mm] | Packing | Cat. No. |
|-----------|-------------------------------|----------|
| 7 x 70 | 10 booklets each of 20 strips | 07020020 |
| 9 x 85 | 10 boxes each of 100 strips | 07020040 |

Blue Litmus

| Size [mm] | Packing | Cat. No. |
|-----------|-------------------------------|----------|
| 7 x 70 | 10 booklets each of 20 strips | 07020010 |
| 9 x 85 | 10 boxes each of 100 strips | 07020030 |

Key to the Symbols:

Recommendations are based on a 24-hour static exposure to the test fluid at room temperature.

- **Recommended:**
No change in either water flow rate or bubble point will be observed.
- ▼ **Limited resistance:**
Additional in-house testing is advised as swelling, discoloration or other minor changes may occur.
- ✘ **Not recommended:**
Significant changes in water flow rate and/or bubble point can be expected.
- ✦ **Data not available.**

Membrane Filters

| CHEMICAL | Polymer / Product | | | | | | | |
|---|---|--|------|------|----------------|------------------|-----------|---|
| | MCE | CA | PCTE | PTFE | Supported PTFE | Hydrophilic PTFE | Coated CA | |
| Acid | Glacial Acetic acid | ✘ | ✘ | ✘ | ● | ● | ● | ✘ |
| | 10% Acetic acid | ● | ● | ● | ● | ● | ● | ● |
| | 12 kmol/m ³ Hydrochloric acid (37%, 12N) | ✘ | ✘ | ● | ● | ● | ● | ✘ |
| | 6 kmol/m ³ Hydrochloric acid (19%, 6N) | ▼ | ✘ | ● | ● | ● | ● | ✘ |
| | 12 kmol/m ³ Nitric acid (53%, 12N) | ✘ | ✘ | ● | ● | ● | ▼ | ✘ |
| | 6 kmol/m ³ Nitric acid (26%, 6N) | ▼ | ✘ | ● | ● | ● | ● | ✘ |
| | 18 kmol/m ³ Sulfuric acid (96%, 36N) | ✘ | ✘ | ✘ | ● | ● | ✘ | ✘ |
| | 3 kmol/m ³ Sulfuric acid (16%, 6N) | ▼ | ✘ | ● | ● | ● | ● | ✘ |
| | 85% Phosphoric acid | ● | ✘ | ✘ | ● | ● | ● | ✘ |
| | 5% Boric acid | ● | ● | ● | ● | ● | ● | ● |
| | 50% Formic acid | ▼ | ▼ | ● | ● | ● | ● | ▼ |
| | 35% Hydrofluoric acid | ✘ | ✘ | ● | ● | ● | ● | ✘ |
| | 60% Perchloric acid | ● | ✘ | ✘ | ● | ● | ● | ✘ |
| | Alkalis | 6 kmol/m ³ Sodium hydroxide (26%, 6N) | ✘ | ✘ | ✘ | ● | ● | ● |
| 6 kmol/m ³ Potassium hydroxide (20%, 6N) | | ✘ | ✘ | ✘ | ● | ● | ● | ✘ |
| 6 kmol/m ³ Aqueous ammonia (11%, 6N) | | ✘ | ✘ | ✘ | ● | ● | ● | ✘ |
| Alcohol | Methyl alcohol | ✘ | ● | ● | ● | ● | ● | ● |
| | Ethyl alcohol | ✘ | ● | ● | ● | ● | ● | ● |
| | Isopropyl alcohol | ▼ | ● | ● | ● | ● | ● | ● |
| | Isobutyl alcohol | ▼ | ● | ● | ● | ● | ● | ● |
| | Butyl alcohol | ● | ● | ● | ● | ● | ● | ● |
| | Glycerol | ● | ● | ● | ● | ● | ● | ● |
| | Amyl alcohol | ▼ | ● | ● | ● | ● | ● | ● |
| | Benzyl alcohol | ▼ | ✘ | ✘ | ● | ● | ● | ✘ |
| Ethylene glycol | ✘ | ● | ● | ● | ● | ● | ● | |

To be continued next page

Membrane Filters (Continued)

| CHEMICAL | Polymer / Product | | | | | | |
|--|----------------------------------|----|------|------|-----------------|-------------------|-----------|
| | MCE | CA | PCTE | PTFE | Sup-ported PTFE | Hydro-philic PTFE | Coated CA |
| Ethers | Ethyl ether | ▼ | ● | ● | ● | ▼ | ● |
| | Isopropyl ether | ● | ● | ● | ● | ● | ● |
| | Tetrahydrofuran | ✗ | ✗ | ✗ | ● | ✗ | ● |
| | Dioxane | ✗ | ✗ | ✗ | ● | ● | ● |
| | Petroleum ether | ● | ● | ● | ● | ● | ● |
| Esters | Methyl acetate | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Butyl acetate | ✗ | ✗ | ● | ● | ● | ✗ |
| | Amyl acetate | ✗ | ▼ | ● | ● | ● | ▼ |
| Ketones | Acetone | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Methylethyl ketone | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Methyl isobutyl ketone | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Cyclohexanone | ✗ | ✗ | ✗ | ● | ● | ✗ |
| Hydrocarbons | Benzene | ● | ● | ✗ | ● | ● | ● |
| | Toluene | ● | ● | ✗ | ● | ● | ● |
| | Xylene | ● | ● | ● | ● | ● | ● |
| | Hexane | ● | ● | ● | ● | ● | ● |
| | Gasoline | ● | ● | ● | ● | ▼ | ● |
| | Kerosene | ● | ● | ● | ● | ● | ● |
| Halogenated hydrocarbons | Chloroform | ● | ✗ | ✗ | ● | ▼ | ✗ |
| | Methylene chloride | ✗ | ✗ | ✗ | ● | ▼ | ✗ |
| | Trichloroethylene | ● | ● | ✗ | ● | ● | ● |
| | Tetrachloroethylene | ● | ● | ● | ● | ● | ● |
| | Carbon tetrachloride | ● | ● | ✗ | ● | ▼ | ● |
| Amines | Aniline | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Dimethyl formamide | ✗ | ✗ | ✗ | ● | ▼ | ✗ |
| | Diethyl acetamide | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Triethanolamine | ✗ | ● | ✗ | ● | ● | ● |
| Miscellaneous | Methyl cellosolve | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Butyl cellosolve | ✗ | ● | ✗ | ● | ● | ● |
| | Nitrogen | ● | ● | ● | ● | ● | ● |
| | Hydrogen | ● | ● | ● | ● | ● | ● |
| | Oxygen | ● | ● | ● | ● | ● | ● |
| | 30% Hydrogen peroxide | ✗ | ● | ● | ● | ● | ● |
| | Saline solution | ● | ● | ● | ● | ● | ● |
| | Dimethylsulfoxide | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Nitrobenzene | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Methanol (1): Chloroform (1) | ▼ | ✗ | ✗ | ● | ● | ✗ |
| | Pyridine | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Acetonitrile | ✗ | ✗ | ✗ | ● | ● | ✗ |
| | Phenol | ● | ✗ | ✗ | ● | ● | ✗ |
| | Freon | ● | ● | ● | ● | ● | ● |
| | 37% Formaldehyde | ▼ | ▼ | ● | ● | ● | ▼ |
| | Silicone oil | ● | ✗ | ● | ● | ● | ✗ |
| | n-Hexane (95): Ethyl acetate (5) | ✗ | ● | ● | ● | ● | ● |
| Nitric acid (70): Distilled water (30) | ✗ | ✗ | ✗ | ● | ● | ✗ | |
| Petroleum oil | ● | ● | ● | ● | ● | ● | |

Disposable Syringe Filter Units

| CHEMICAL | | AS | CS | CP | HP | JP | |
|---|---|--|--|-----------------------------------|----------------------------------|----------------------------------|---|
| | | Mixed Cellulose Esters with acrylic housing | Cellulose Acetate with acrylic housing | Cellulose Acetate with PP housing | Hydrophilic PTFE with PP housing | Hydrophobic PTFE with PP housing | |
| Acids | 3 kmol/m ³ Hydrochloric acid (10%, 3N) | ● | ▼ | ▼ | ● | ● | |
| | 9 kmol/m ³ Hydrochloric acid (30%, 9N) | ✗ | ✗ | ✗ | ● | ● | |
| | 1 kmol/m ³ Sulfuric acid (5%, 2N) | ● | ● | ● | ● | ● | |
| | 4 kmol/m ³ Sulfuric acid (20%, 8N) | ✗ | ✗ | ✗ | ● | ● | |
| | 1 kmol/m ³ Nitric acid (5%, 1N) | ● | ● | ▼ | ● | ● | |
| | 5 kmol/m ³ Nitric acid (20%, 5N) | ✗ | ✗ | ✗ | ▼ | ▼ | |
| | 20% Acetic acid | ● | ● | ● | ● | ● | |
| | Glacial acetic acid | ✗ | ✗ | ✗ | ● | ● | |
| | 10% Hydrofluoric acid | ✗ | ✗ | ✗ | ● | ● | |
| | 35% Hydrofluoric acid | ✗ | ✗ | ✗ | ● | ● | |
| | 10% Chromic acid | ▼ | ▼ | ▼ | ▼ | ▼ | |
| | 10% Phosphoric acid | ● | ● | ● | ● | ● | |
| | Alkalis | 2.5 kmol/m ³ Sodium hydroxide (10%, 2.5N) | ✗ | ✗ | ✗ | ● | ● |
| | | 2 kmol/m ³ Potassium hydroxide (10%, 2N) | ✗ | ✗ | ✗ | ● | ● |
| 8 kmol/m ³ Aqueous ammonia (28%, 8N) | | ✗ | ● | ▼ | ● | ● | |
| Alcohols | Methyl alcohol | ✗ | ✗ | ● | ● | ● | |
| | Ethyl alcohol | ✗ | ▼ | ● | ● | ● | |
| | n-Propyl alcohol | ▼ | ● | ● | ● | ● | |
| | Isopropyl alcohol | ▼ | ● | ● | ● | ● | |
| | n-Butyl alcohol | ▼ | ● | ● | ● | ● | |
| | Amyl alcohol | ▼ | ● | ● | ● | ● | |
| | Benzyl alcohol | ▼ | ✗ | ✗ | ● | ● | |
| | Ethylene glycol | ✗ | ✗ | ● | ● | ● | |
| | Glycerol | ● | ● | ● | ● | ● | |
| | Ethers | Ethyl ether | ✗ | ✗ | ▼ | ▼ | ▼ |
| Isopropyl ether | | ✗ | ✗ | ● | ● | ● | |
| Tetrahydrofuran (THF) | | ✗ | ✗ | ✗ | ▼ | ▼ | |
| Dioxane | | ✗ | ✗ | ✗ | ▼ | ▼ | |
| Esters | Methyl acetate | ✗ | ✗ | ✗ | ▼ | ▼ | |
| | Ethyl acetate | ✗ | ✗ | ✗ | ▼ | ▼ | |
| | Butyl acetate | ✗ | ✗ | ✗ | ▼ | ▼ | |
| | Amyl acetate | ✗ | ✗ | ▼ | ▼ | ▼ | |
| Ketones | Acetone | ✗ | ✗ | ✗ | ● | ● | |
| | Methyl ethyl ketone (MEK) | ✗ | ✗ | ✗ | ▼ | ▼ | |
| | Methyl isobutyl ketone (MIBK) | ✗ | ✗ | ✗ | ▼ | ▼ | |
| | Cyclohexanone | ✗ | ✗ | ✗ | ▼ | ▼ | |
| Hydro-carbons | Benzene | ✗ | ✗ | ▼ | ▼ | ▼ | |
| | Toluene | ✗ | ✗ | ▼ | ▼ | ▼ | |
| | Xylene | ✗ | ✗ | ▼ | ▼ | ▼ | |
| | n-Hexane | ✗ | ✗ | ▼ | ▼ | ▼ | |
| | Gasoline | ▼ | ▼ | ● | ● | ● | |
| Kerosene | ● | ● | ▼ | ▼ | ▼ | | |

To be continued next page

Disposable Syringe Filter Units (Continued)

| CHEMICAL | | AS | CS | CP | HP | JP |
|---------------------------------|-------------------------------|---|--|-----------------------------------|----------------------------------|----------------------------------|
| | | Mixed Cellulose Esters with acrylic housing | Cellulose Acetate with acrylic housing | Cellulose Acetate with PP housing | Hydrophilic PTFE with PP housing | Hydrophobic PTFE with PP housing |
| Halogenated hydrocarbons | Chloroform | × | × | × | ▼ | ▼ |
| | Methylene chloride | × | × | × | ▼ | ▼ |
| | Trichloroethylene | × | × | ▼ | ▼ | ▼ |
| | Carbon tetrachloride | × | × | ▼ | ● | ● |
| | Trichloroethane | × | × | × | ▼ | ▼ |
| | Perchloroethylene | × | × | × | ▼ | ▼ |
| Amines | Freon (TMC) | × | × | ▼ | ▼ | ▼ |
| | Aniline | × | × | × | ▼ | ▼ |
| | Dimethyl formamide | × | × | × | ▼ | ▼ |
| | Diethylacetamide | × | × | × | ▼ | ▼ |
| | Triethanolamine | × | ● | ● | ● | ● |
| Misc. | Ethyl acetate cellosolve | × | × | × | ▼ | ▼ |
| | Acetonitrile | × | × | × | ▼ | ▼ |
| | Pyridine | × | × | × | ▼ | ▼ |
| | Sodium Hypochloride | × | × | × | ● | ● |
| | 35% Formaldehyde | × | ▼ | ▼ | ● | ● |
| | Iron (II) chloride | ● | ● | ● | ● | ● |
| | Copper sulfate | ● | ● | ● | ● | ● |
| | Mineral oil | ▼ | ● | ▼ | ▼ | ▼ |
| | Salt water | ● | ● | ● | ● | ● |
| | 10% Hydrogen peroxide | × | ▼ | ● | ● | ● |
| | Nitrobenzene | × | × | × | ▼ | ▼ |
| | Phenol | × | × | × | ● | ● |
| | Silicone oil | × | × | × | ● | ● |
| | Petroleum oil | ▼ | ▼ | ● | ● | ● |
| | Acetonitrile (70): water (30) | × | × | × | ● | ● |

Capsule Filters

| CHEMICAL | CCS | CCF/CCFH | CCP | CCG | | |
|---|---|---|-----|-----|---|---|
| Acids | 5% Acetic acid | ● | ● | ● | ● | |
| | 20% Acedic acid | ● | ● | ● | ▼ | |
| | 10% Chromic acid | ✦ | ▼ | ▼ | ✖ | |
| | 3 kmol/m ³ Hydrochloric acid (10%, 3N) | ● | ● | ● | ● | |
| | 11 kmol/m ³ Hydrochloric acid (35%, 11N) | ● | ● | ● | ▼ | |
| | 10% Hydrofluoric acid | ✦ | ● | ● | ✖ | |
| | 1 kmol/m ³ Nitric acid (5%, 1N) | ✦ | ● | ● | ▼ | |
| | 4 kmol/m ³ Nitric acid (20%, 4N) | ✦ | ▼ | ▼ | ✖ | |
| | 10% Phosphoric acid | ✦ | ● | ● | ● | |
| | 1 kmol/m ³ Sulfuric acid (5%, 2N) | ● | ● | ● | ● | |
| | 4 kmol/m ³ Sulfuric acid (20%, 8N) | ● | ● | ● | ▼ | |
| | Alkalis | 2.5 kmol/m ³ Sodium hydroxide (10%, 3N) | ● | ● | ● | ▼ |
| | | 2 kmol/m ³ Potassium hydroxide (10%, 2N) | ● | ● | ● | ▼ |
| 5 kmol/m ³ Aqueous ammonia (10%. 5N) | | ● | ● | ● | ▼ | |
| 15 kmol/m ³ Aqueous ammonia (28%. 15N) | | ● | ● | ● | ▼ | |
| Alcohols | Methyl alcohol | ● | ● | ● | ▼ | |
| | Ethyl alcohol | ● | ● | ● | ▼ | |
| | n-Propyl alcohol | ● | ● | ● | ▼ | |
| | n-Butyl alcohol | ● | ● | ● | ▼ | |
| | Ethylene glycol | ● | ● | ● | ● | |
| Ethers | Ethyl ether | ▼ | ▼ | ▼ | ✖ | |
| | Dioxane | ▼ | ▼ | ▼ | ✖ | |
| | Tetrahydrofuran (THF) | ✖ | ▼ | ▼ | ✖ | |
| Esters | Amyl acetate | ✦ | ▼ | ▼ | ✦ | |
| | Methyl acetate | ✦ | ▼ | ▼ | ▼ | |
| | Ethyl acetate | ✖ | ▼ | ▼ | ▼ | |
| | Butyl acetate | ✦ | ▼ | ▼ | ▼ | |
| Ketones | Acetone | ✖ | ▼ | ▼ | ✖ | |
| | Methyl ethyl ketone (MEK) | ✖ | ▼ | ▼ | ✖ | |
| | Methyl isobutyl ketone (MIBK) | ✖ | ▼ | ▼ | ✖ | |
| Hydro-carbons | n-Hexane | ▼ | ▼ | ▼ | ▼ | |
| | Cyclohexane | ▼ | ▼ | ▼ | ▼ | |
| | Benzene | ▼ | ▼ | ▼ | ▼ | |
| | Toluene | ✖ | ▼ | ▼ | ✖ | |
| | Xylene | ✦ | ▼ | ▼ | ▼ | |
| Halogenated hydrocarbons | Chloroform | ✖ | ▼ | ▼ | ✖ | |
| | Carbon tetrachloride | ✦ | ▼ | ▼ | ▼ | |
| | Freon (TMC) | ✖ | ▼ | ▼ | ✖ | |
| | Methylene chloride | ✖ | ▼ | ▼ | ✖ | |
| | Trichloroethylene | ✦ | ▼ | ▼ | ✖ | |
| Amines | Trichloroethane | ✦ | ▼ | ▼ | ▼ | |
| | Dimethyl formamide | ✖ | ▼ | ▼ | ✖ | |
| Aldehydes | Acetaldehyde | ✦ | ✦ | ✦ | ✦ | |
| | 35% Formaldehyde | ● | ● | ● | ● | |
| Misc. | Acetic cellosolve | ✦ | ▼ | ▼ | ▼ | |
| | Acetonitrile | ✦ | ▼ | ▼ | ✦ | |
| | Pyridine | ✦ | ▼ | ▼ | ✖ | |
| | Nitrobenzene | ✦ | ✦ | ✦ | ✦ | |
| | 6% Sodium hypochlorite | ✦ | ● | ● | ● | |
| | Ferrous chloride | ● | ● | ● | ● | |
| | Copper Sulfate | ● | ● | ● | ● | |
| | Mineral oil | ▼ | ▼ | ▼ | ▼ | |
| | Salt water | ● | ● | ● | ● | |
| | 10% Hydrogen peroxide | ● | ● | ● | ▼ | |

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