



sartorius

Technical Cleanliness Filters, Balances and Accessories for Your Particle Analysis



turning science **into solutions**

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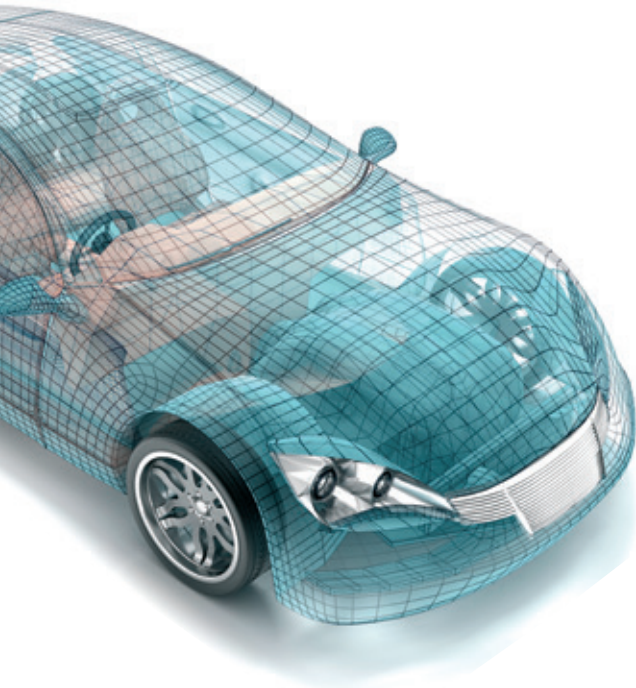
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Technical Cleanliness

In many cases, the absence of critical particles is decisive for the reliable performance and durability of a technical system. This is why analysis of the cleanliness of components is of crucial importance.

Sartorius as a leading supplier of laboratory equipment offers filtration and weighing products that meet even the most demanding requirements of cleanliness analysis.



Cleaning Processes Ensure Technical Cleanliness

Following the manufacture of subassemblies and components, particularly for sensitive fluid systems, critical particles are removed from such components. This is usually done by rinsing or immersing in an ultrasonic bath.

Such cleaning processes are performed in sectors of the following industries:

- Automotive industry
- Aerospace industry
- Precision mechanical and medical engineering

To ensure the cleanliness of subassemblies and components, particulate contamination is analyzed in various steps of the cleaning process:

- Validation of cleaning methods
- Incoming goods inspection and final QC
- In-process control and root cause analysis

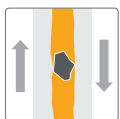
Guidelines and Standards

Component suppliers and manufacturers often test the technical cleanliness of parts using internal standard operating procedures and a number of guidelines and standards, such as the ones listed below:

- ISO 16232 Road vehicles – Cleanliness of components of fluid circuits
- VDA 19 Part 1 Inspection of Technical Cleanliness
- ISO 18413 Hydraulic fluid power – Cleanliness of components

Samples of Damage and Typical Components Tested for Cleanliness

Blocked bearings or hydrodynamic surfaces



- Turbochargers
- Crankshaft bearings
- Dispensing pumps
- Cylinder linings

Blocked valves



- Anti-lock brakes
- Power brake boosters
- Lubrication components and hydraulic parts

Plugged nozzles or filters



- Injectors
- Fuel feed components

Short-circuited electrical contacts

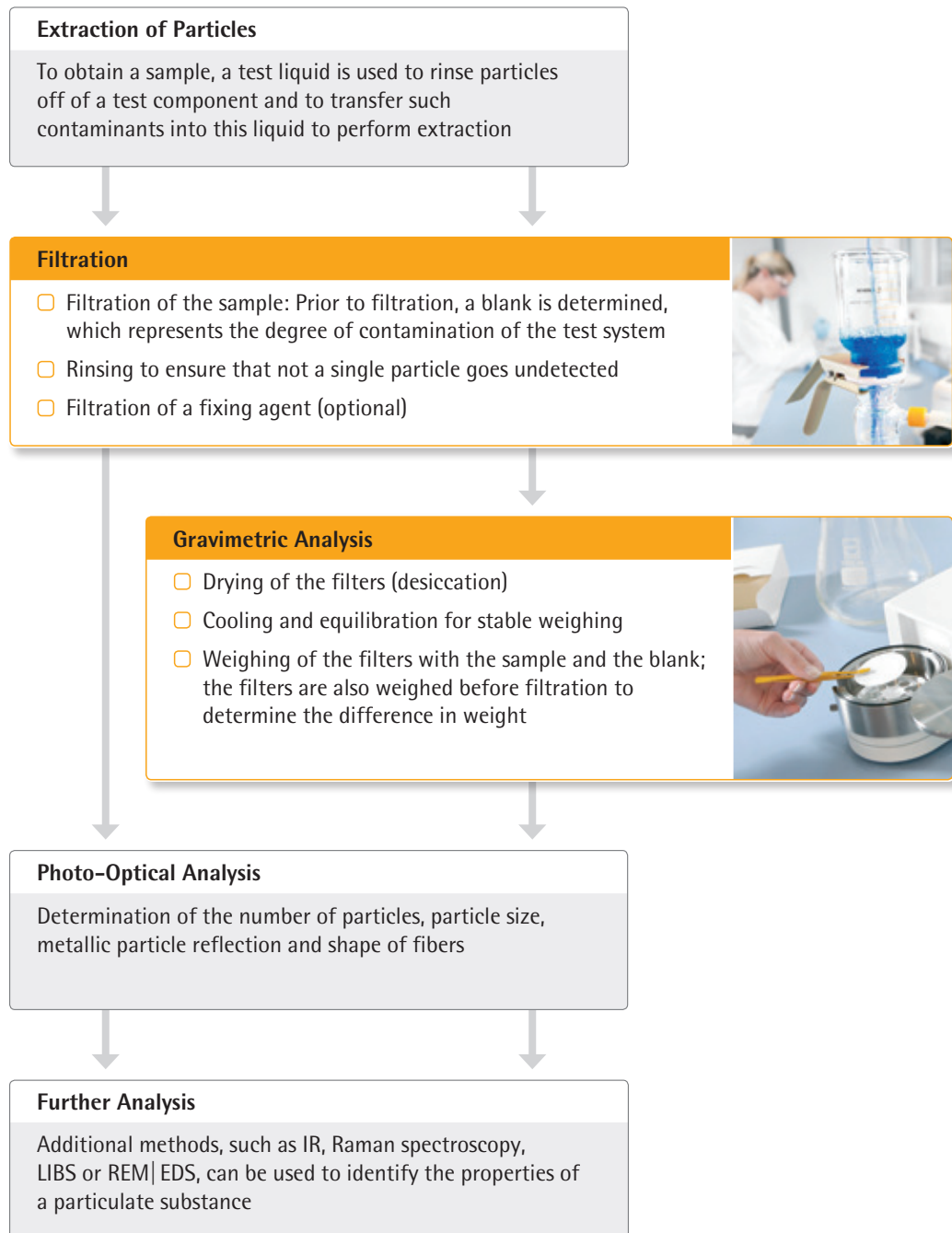


- Control electronics

■ Component ■ Particle ■ Liquid, such as fuel or oil

Schematic Workflow of Cleanliness Analysis

Inspection of components for cleanliness can be subdivided into the steps of extraction, filtration and analysis. In the process, all critical particles need to be detected as just a few individual particles are all it takes to cause a malfunction in a technical system.



Filtration

In cleanliness analysis, filtration of a sample is an essential step. Filters are used in this process to separate particles from the extraction liquid, and as sample carriers for gravimetric and photo-optical analysis.

Sartorius offers a wide variety of filter materials and pore sizes to cover many different requirements.



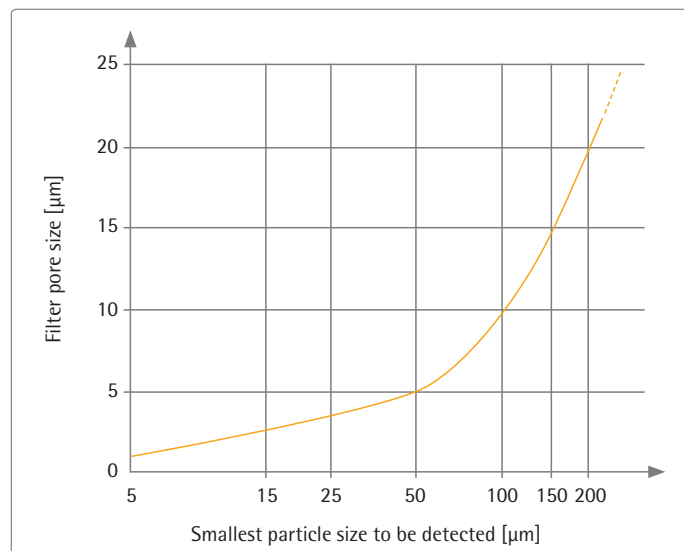
Selection of a Suitable Analytical Filter

Chemical Compatibility

Cellulose nitrate filters are the No. 1 choice for many applications. If this filter material is not compatible or has limited compatibility with the test, rinsing or fixing solution, alternative filter materials can be considered, such as cellulose acetate or PTFE having different compatibility properties.

Pore Size

The pore size of an analytical filter depends on the rated retentive capability of the particle sizes to be determined. As a rule, these pore sizes are specified in the requirements defined for the cleanliness of a specific component. For example, in VDA 19, Part 1, the pore sizes for retaining the smallest critical particles are suggested (see diagram) as a rule of thumb.



Particle size > 50 μm

Pore size (max.) = $\frac{1}{10}$ to $\frac{1}{5}$ of the particle size

Particle size < 50 μm

Pore size (max.) = $\frac{1}{5}$ of the particle size



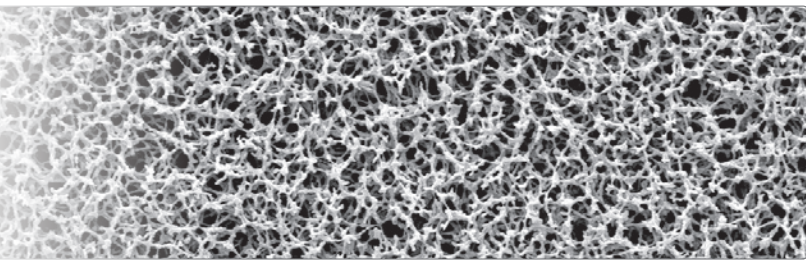
Guidance Table for Filter Selection

| | Filter Material | | | | |
|---|---|-------------------|-----------|-------------------------------|------|
| | Cellulose Nitrate (Mixed Cellulose Esters) | Cellulose Acetate | Polyamide | Polycarbonate Track-Etched | PTFE |
| Test or Rinsing Liquids | | | | | |
| Neutral cleaning agent, water-based | ● | ● | ● | ● | ● |
| Isopropanol | ○ | ● | ● | ● | ● |
| Ethanol | ○ | ● | ● | ● | ● |
| Aliphatic hydrocarbons (e.g. cold cleaner) | ● | ● | ● | ● | ● |
| Ketone (e.g., acetone) | - | - | ● | ● | ● |

● Compatible - Not compatible ○ Limited compatibility

| Pore Size | Cellulose Nitrate (Mixed Cellulose Esters) | Cellulose Acetate | Polyamide | Polycarbonate Track-Etched | PTFE |
|------------------|---|-------------------|-----------|-------------------------------|------|
| 0.2 µm | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.45 µm 0.4 µm | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.65 µm | ✓ | ✓ | - | - | - |
| 0.8 µm | ✓ | ✓ | - | ✓ | - |
| 1.2 µm | ✓ | ✓ | - | - | ✓ |
| 3 µm | ✓ | - | - | - | - |
| 5 µm | ✓ | ✓ | - | - | ✓ |
| 8 µm | ✓ | - | - | - | - |

✓ Available - Not available



Cellulose Nitrate (Mixed Cellulose Esters)

Cellulose nitrate membrane filters are hydrophilic, have high flow rates thanks to their symmetrical structure and are compatible with aqueous solutions (pH 4–8), hydrocarbons and several other organic solvents. These cellulose nitrate membranes are available in different pore sizes from 0.2 μm to 8 μm .

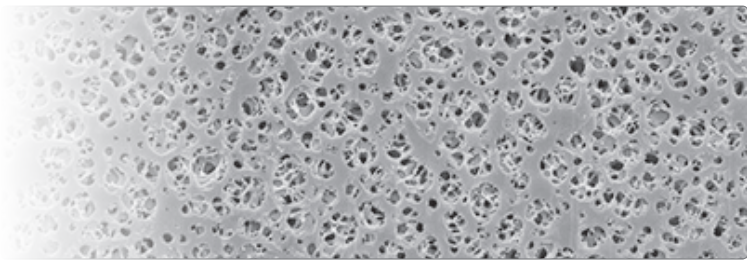
Specifications

| Pore Size (μm) | Type | Thickness (μm) | Water Flow Rate (mL/min/cm ² /bar) | Thermal Resistance max. ($^{\circ}\text{C}$) | Bubble Point (bar) |
|-----------------------------|-------|-----------------------------|---|--|--------------------|
| 0.2 | 11327 | 130 | 25 | 130 | 4.2 |
| 0.45 | 11306 | 130 | 70 | 130 | 2.4 |
| 0.65 | 11305 | 130 | 130 | 130 | 2.0 |
| 0.8 | 11304 | 130 | 200 | 130 | 1.2 |
| 1.2 | 11303 | 130 | 200 | 130 | 1.0 |
| 3 | 11302 | 130 | 430 | 130 | 0.5 |
| 5 | 11342 | 130 | 570 | 130 | 0.5 |
| 8 | 11301 | 130 | 750 | 130 | 0.3 |

Ordering Information

| Pore Size | Ø 13 mm | Ø 25 mm | Ø 47 mm | Ø 50 mm | Ø 90 mm | Ø 100 mm |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.2 μm | 11327--13-----N | 11327--25-----N | 11327--47-----N | | | |
| 0.45 μm | 11306--13-----N | 11306--25-----N | 11306--47-----N | 11306--50-----N | 11306--90-----N | 11306-100-----N |
| 0.65 μm | 11305--13-----N | 11305--25-----N | 11305--47-----N | 11305--50-----N | | 11306-100-----N |
| 0.8 μm | 11304--13-----N | 11304--25-----N | 11304--47-----N | 11304--50-----N | 11304--90-----G | 11304-100-----G |
| 1.2 μm | 11303--13-----N | 11303--25-----N | 11303--47-----N | 11303--50-----N | 11303--90-----G | 11303-100-----G |
| 3 μm | 11302--13-----N | 11302--25-----N | 11302--47-----N | 11302--50-----N | 11302--90-----G | 11302-100-----G |
| 5 μm | 11342--13-----N | 11342--25-----N | 11342--47-----N | 11342--50-----N | | |
| 8 μm | 11301--13-----N | 11301--25-----N | 11301--47-----N | 11301--50-----N | | 11301-100-----N |

G = 25 filters, N = 100 filters | Other dimensions and quantities per package are available on request



Cellulose Acetate

Cellulose acetate membranes combine thermal stability with exceptionally low adsorption characteristics. They are hydrophilic, have high flow rates thanks to their symmetrical structure and are compatible with aqueous solutions (pH 4–8), oils, alcohols and other organic solvents. These cellulose acetate membranes are available in different pore sizes from 0.2 to 5 µm.

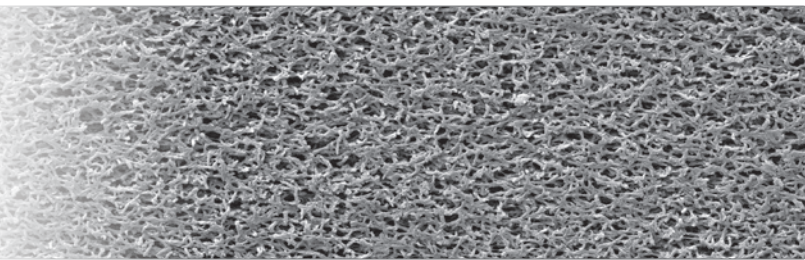
Specifications

| Pore Size (µm) | Type | Thickness (µm) | Water Flow Rate (mL/min/cm ² /bar) | Thermal Resistance max. (°C) | Bubble Point (bar) |
|----------------|-------|----------------|---|------------------------------|--------------------|
| 0.2 | 11107 | 120 | 24 | 180 | 2.9 |
| 0.45 | 11106 | 120 | 69 | 180 | 1.9 |
| 0.65 | 11105 | 120 | 115 | 180 | 1.5 |
| 0.8 | 11104 | 120 | 200 | 180 | 1 |
| 1.2 | 12303 | 140 | 320 | 180 | 0.8 |
| 5 | 12342 | 140 | 570 | 180 | 0.4 |

Ordering Information

| Pore Size | Ø 13 mm | Ø 25 mm | Ø 47 mm | Ø 50 mm | Ø 90 mm | Ø 100 mm |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.2 µm | 11107--13-----N | 11107--25-----N | 11107--47-----N | 11107--50-----N | 11107--90-----G | 11107-100-----N |
| 0.45 µm | 11106--13-----N | 11106--25-----N | 11106--47-----N | 11106--50-----N | 11106--90-----G | 11106-100-----N |
| 0.65 µm | | 11105--25-----N | 11105--47-----N | 11105--50-----N | 11105--90-----G | |
| 0.8 µm | 11104--13-----N | 11104--25-----N | 11104--47-----N | 11104--50-----N | 11104--90-----N | |
| 1.2 µm | | 12303--25-----N | 12303--47-----N | 12303--50-----N | | 12303-100-----G |
| 5 µm | | 12342--25-----N | 12342--47-----N | | | |

G = 25 filters, N = 100 filters | Other dimensions and quantities per package are available on request



Polyamide

Polyamide membrane filters are hydrophilic and chemically resistant to alkaline solutions and organic solvents.

Specifications

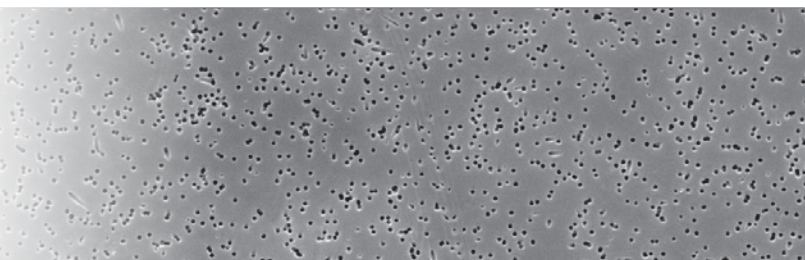
| Pore Size (µm) | Type | Thickness (µm) | Water Flow Rate (mL/min/cm ² /bar) | Thermal Resistance (°C)* | Bubble Point (bar) |
|----------------|-------|----------------|---|--------------------------|--------------------|
| 0.2 | 25007 | 115 | 15 | 100 | 3.2 |
| 0.45 | 25006 | 115 | 35 | 100 | 2.3 |

*Max. continuous operating temperature in water

Ordering Information

| Pore Size | Ø 13 mm | Ø 25 mm | Ø 47 mm | Ø 50 mm | Ø 90 mm |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.2 µm | 25007--13-----N | 25007--25-----N | 25007--47-----N | 25007--50-----N | 25007--90-----G |
| 0.45 µm | 25006--13-----N | 25006--25-----N | 25006--47-----N | 25006--50-----N | 25006--90-----G |

G = 25 filters, N = 100 units | Other dimensions and quantities per package are available on request



Polycarbonate Track-Etched

White and hydrophilic polycarbonate track-etched membranes are manufactured from high-grade polycarbonate film using track-etch technology. Their capillary pore structure is uniform and precise, with a narrow pore size distribution.

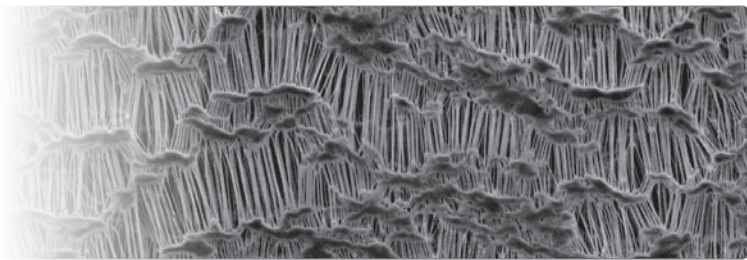
Specifications

| Pore Size (µm) | Type | Thickness (µm) | Water Flow Rate (mL/min/cm ² /bar) | Thermal Resistance max. (°C) | Bubble Point (bar) |
|----------------|-------|----------------|---|------------------------------|--------------------|
| 0.2 | 23007 | 25 | ≥ 10 | 140 | 4.8 |
| 0.4 | 23006 | 25 | ≥ 30 | 140 | 2.5 |
| 0.8 | 23004 | 25 | ≥ 40 | 140 | 0.6 |

Ordering Information

| Pore Size | Ø 25 mm | Ø 47 mm | Ø 50 mm |
|-----------|-----------------|-----------------|-----------------|
| 0.2 µm | 23007--25-----N | 23007--47-----N | 23007--50-----N |
| 0.4 µm | 23006--25-----N | 23006--47-----N | |
| 0.8 µm | 23004--25-----N | | |

N = 100 filters | Other dimensions and quantities per package are available on request



Hydrophobic PTFE

PTFE filters are permanently hydrophobic. These membrane filters feature excellent chemical compatibility (pH 1 to 14) so they are also used for filtration of solvents and acids that cannot be filtered using other filter types due to a lack of or limited compatibility.

Specifications

| Pore Size (µm) | Type | Thickness (µm) | Isopropanol Flow Rate (mL/min/cm ² /bar) | Thermal Resistance max. (°C) | Bubble Point (bar) |
|----------------|-------|----------------|---|------------------------------|--------------------|
| 0.2 | 11807 | 65 | 11 | 200 | 1.4 |
| 0.45 | 11806 | 80 | 20 | 200 | 0.9 |
| 1.2 | 11803 | 100 | 80 | 200 | 0.45 |
| 5 | 11842 | 100 | 250 | 200 | 0.10 |

Ordering Information

| Pore Size | Ø 13 mm | Ø 25 mm | Ø 47 mm | Ø 50 mm | Ø 90 mm | Ø 100 mm |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.2 µm | 11807--13-----N | 11807--25-----N | 11807--47-----N | 11807--50-----N | 11807--90-----G | 11807-100-----G |
| 0.45 µm | 11806--13-----N | 11806--25-----N | 11806--47-----N | 11806--50-----N | 11806--90-----G | 11806-100-----G |
| 1.2 µm | 11803--13-----N | 11803--25-----N | 11803--47-----N | 11803--50-----N | 11803--90-----G | 11803-100-----G |
| 5 µm | | 11842--25-----N | 11842--47-----N | 11842--50-----N | | 11842-100-----G |

G = 25 filters, N = 100 filters | Other dimensions and quantities per package are available on request

Gravimetric Analysis

The gravimetric method is used as a standard procedure for determining technical cleanliness as it provides information on the total particle burden of a component. Our Cubis® balances meet the highest requirements on accuracy and ease of operation for particle mass determination.

Cubis® Premium Laboratory Balances

Cubis enables you to combine your choice of display and control unit, weighing module, data interface module and much more. You can choose from thousands of options to configure your balance to suit your individual needs and obtain the optimal solution for integration into your process.

Cubis® Residual Dirt Analysis Q-App

To turn your Cubis® laboratory balance into a Cubis® individual instrument, download the Residual Dirt Analysis Q-App into your balance (order no. YAPP10). This app ensures gravimetric determination of particles in compliance with VDA19.



Selection of an Optimal Balance

Two criteria are important for selecting a balance in line with the recommendations of VDA 19 or ISO 16232:

- Maximum allowable particle load on a component
- Maximum allowable blank value (10% of the maximum allowable particle load)

The blank is determined at the beginning before extraction of particles flushed from a component and indicates the basic particulate contamination of the test setup and the liquids used.

| Your Needs | | Our Solutions | |
|------------------------------|----------------------------|--------------------------------|------------------------------|
| Max. Allowable Particle Load | Max. Allowable Blank Value | Min. Resolution of the Balance | Recommended Type of Balance |
| 10 mg | 1 mg | 0.1 mg | Analytical balance or better |
| 1 mg | 0.1 mg | 0.01 mg | Semi-micro balance or better |
| 0.1 mg | 0.01 mg | 0.001 mg | Micro balance or better |
| 0.01 mg | 0.001 mg | 0.0001 mg | Ultra-micro balance |



Specifications

| | Ultra-Micro Balance 0.0001 mg | Micro Balance 0.001 mg | Semi-Micro Balance 0.01 mg | Analytical Balance 0.1 mg |
|---|----------------------------------|---------------------------|--|------------------------------|
| Order number | MSA 2.7S-000-DF | MSA 6.6S-000-DF | MSA 225S-100-DI | MSA 224S-100-DI |
| Draft shield | DF | DF | DI | DI |
| Readability [mg] | 0.0001 | 0.001 | 0.01 | 0.1 |
| Weighing capacity [g] | 2.1 | 6.1 | 220 | 220 |
| Standard weighing pan (W × D) [mm] | ∅ 20 | ∅ 30 | 85 × 85 | 85 × 85 |
| Filter weighing pan (50 mm) | incl. | incl. | – | – |
| Typical stabilization time [≤s] | 7 | 5 | 2 | 1 |
| Typical response time [≤s] | 10 | 8 | 6 | 3 |
| Repeatability [± mg] | 0.00025 | 0.001 | 0 ... 60 g: 0.015 60 ... 220 g: 0.025 | 0.07 |
| Linearity [± mg] | 0.0009 | 0.004 | 0.1 | 0.2 |
| Eccentric load [mg]* (Test load [g]) | 0.0025 (1) | 0.004 (2) | 0.15 (100) | 0.2 (100) |

* Position according to OIML R76

Accessories

| Description | Availability for Ultra-Micro Balances and Micro Balances | Availability for Semi-Micro Balances and Analytical Balances | Order Number |
|--|--|--|--------------|
| Cubis® Residual Dirt Analysis Q-App | ✓ | ✓ | YAPP10 |
| Filter weighing pan, 75 mm diameter | ✓ | – | VF2562 |
| Filter weighing pan, 90 mm diameter | ✓ | – | VF2880 |
| Flexible holder for filters of up to 120 mm diameters (replaces the original weighing pan) | – | ✓ | YFH01MS |
| Stat-Pen ionizing probe for neutralizing static electricity on samples or filters | ✓ | ✓ | YSTP01 |
| Balance table made of cast stone; for weighing with vibration damping | ✓ | ✓ | YWT03 |
| Infrared sensor for touch-free activation of functions (e.g., controlling the draft shield) | – | ✓ | YHS01MS |
| Printer | ✓ | ✓ | YDP30 |
| SartoriusWedge software for data communication between the balance and a PC | ✓ | ✓ | YSW02 |

✓ Available – Not available



DF draft shield



DI draft shield

Accessories

Rugged and efficient filtration accessories are required to ensure reliable removal of particles in every filtration run. Sartorius facilitates your filtration procedures by offering a large selection of filter holders and vacuum systems.

Selection of Filtration Accessories

Individual Filter Holders

All-Glass Filter Holder, 250 mL

16309

For more information, see page 16.



Glass Filter Holder, 30 mL

16306 or 16315

For more information, see page 17.



Glass Filter Holder, 250 mL

16307 or 16316

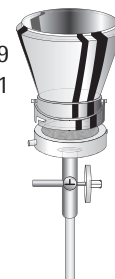
For more information, see page 18.



Stainless Steel Funnels

40 mL: 16220
100 mL: 16219
500 mL: 16201

For more information, see page 19.



Silicone Stopper

17174

For more information, see page 24.



Silicone Stopper

17175

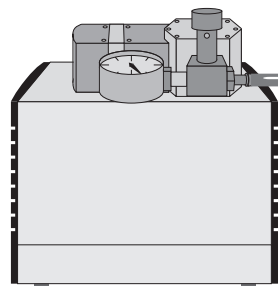
For more information, see page 24.



Silicone Stopper

17173

For more information, see page 24.

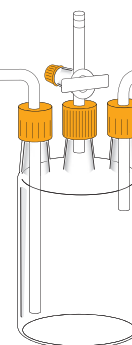


Vacuum Hose

Silicone: 1ZAS--0029

Rubber: 16623

For more information, see page 25.



Woulff's Bottle

500 mL: 16610

or

Vacusart®

17804-----M

For more information, see pages 24 and 25.

Vacuum Pumps*

Recommended: Mini.vac for 1-branch manifold;
others pumps for 3- and 6-branch manifolds

Microsart® Maxi.vac

Microsart® Mini.vac

Conventional pump, 13 mbar, 26/L min

Conventional pump, 100 mbar, 20/L min

For more information, see page 26.

Multi-Branch Filter Holders

Glass Filter Holder, 30 mL

16306 or 16315

For more information, see page 17.



Glass Filter Holder, 250 mL

16307 or 16316

For more information, see page 18.



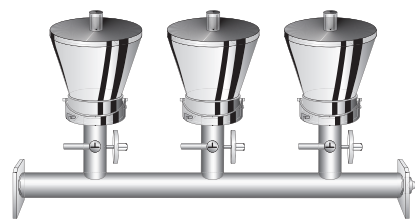
Stainless Steel Funnels

40 mL: 6981004
100 mL: 6981065
500 mL: 6981002

For more information, see page 19.



Stainless Steel Manifold



For more information, see page 20.

Adapter

16836

For more information, see page 23.



Adapter

16837

For more information, see page 23.



Individual Base

16840

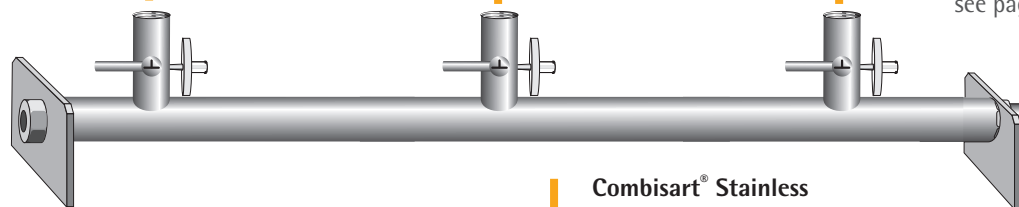
For more information, see page 23.



Prefilter Attachment for Stainless Steel Funnels

16807

For more information, see page 25.



Combisart® Stainless Steel Manifolds

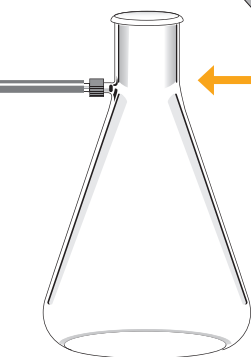
1-branch: 16844
3-branch: 16842
6-branch: 16843

For more information, see page 22.

Connection to Vacuum Flask

17204 tube connector
17173 silicon stopper

For more information, see page 24.



2 L Suction Flask
16672

5 L Suction Flask
16672-----1 (incl. stopper and glass tube)

For more information, see page 24.



All-Glass Vacuum Filter Holder

All areas where liquid and device can come into direct contact are made of glass or PTFE. Several features ensure convenient handling. A 6-mm-wide, non-ground rim above the ground glass neck of the suction flask prevents the filtrate from coming in contact with grease on the ground glass surface, thus preventing it from contamination while being poured out of the flask.

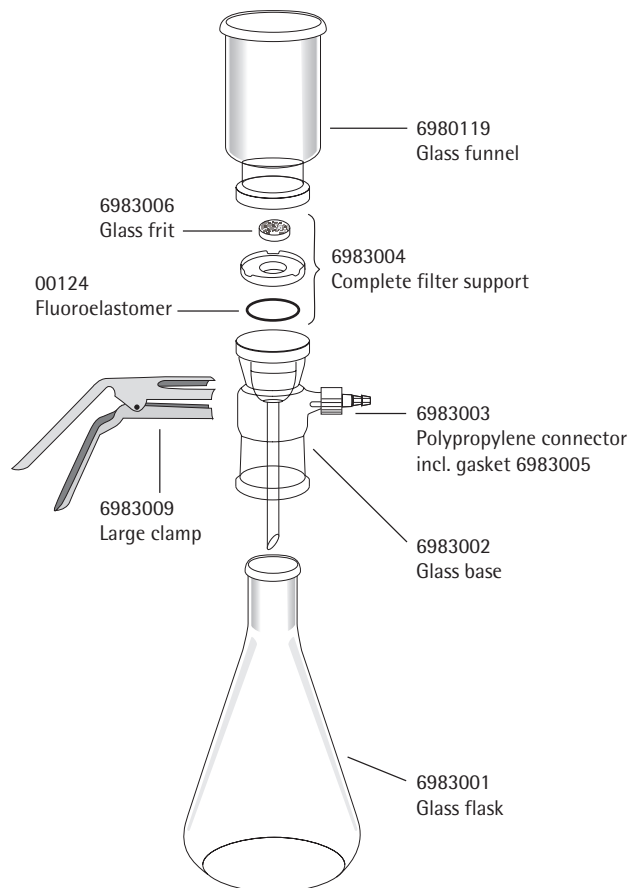
Specifications

| | |
|-----------------------------------|---|
| Parts and materials | Borosilicate glass funnel, base and flask; sintered glass frit in a PTFE ring and fluoroelastomer O-ring (45 × 3 mm) underneath; anodized aluminium clamp |
| Chemical compatibility | As for glass and PTFE |
| Funnel capacity | 250 mL |
| Capacity of the filtrate flask | 1 liter |
| Filtration area | 12.5 cm ² |
| Max. operating pressure | Only for vacuum |
| Suitable membrane filter diameter | 47 mm 50 mm |
| Sterilization (without connector) | By autoclaving (max. 134°C) or by dry heat (max. 180°C) |

Ordering Information

| Description | Order No. |
|--|-----------|
| All-glass vacuum filter holder for 50 mm (or 47 mm) membrane filter, with vacuum-resistant flask, capacity 1 liter | 16309 |

Replacement parts are shown in the diagram.





Glass Vacuum Filter Holders

25 mm Glass Vacuum Filter Holder

This filter holder is available in two versions that differ from each other only in the type of the filter support. The filter holder with a glass frit ensures uniform distribution of retained particles and is therefore recommended if the residue on the filter surface is of interest. Because it is easy to clean, the filter holder with the PTFE-coated screen support is preferable if the filtrate is required or if liquids difficult to remove from the glass frit need to be examined.

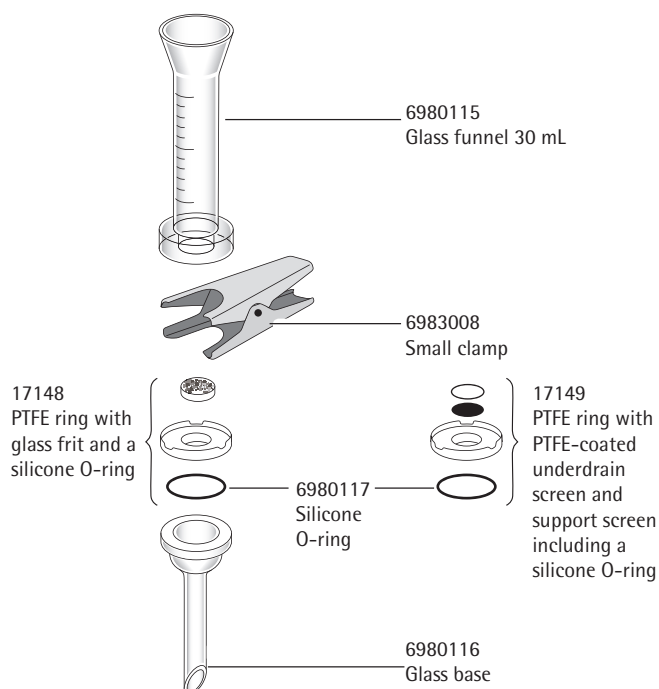
Specifications

| | |
|-----------------------------------|--|
| Base outlet | 12 mm diameter |
| Parts and materials | Borosilicate glass funnel and base; PTFE glass filter support (type 16306) or PTFE stainless steel filter support, coated with PTFE (type 16315) Silicone O-ring 25×3 mm Anodized aluminum clamp |
| Chemical compatibility | As for glass, PTFE and silicone. The silicone O-ring can be replaced by a fluoroelastomer O-ring (order no. 00118) |
| Funnel capacity | 30 mL |
| Filtration area | 3 cm ² |
| Max. operating pressure | Only for vacuum |
| Suitable membrane filter diameter | 25 mm |
| Sterilization | By autoclaving (max. 134°C) or by dry heat (max. 180°C) |

Ordering Information

| Description | Order No. |
|--|-----------|
| Glass vacuum filtration holder for 25 mm membrane filter, with glass frit filter support | 16306 |
| Glass vacuum filtration holder for 25 mm membrane filter, with PTFE-coated screen filter support | 16315 |

Replacement parts are shown in the diagram.



Note: PTFE rings in sets 17148 and 17149 have different dimensions and are not interchangeable.

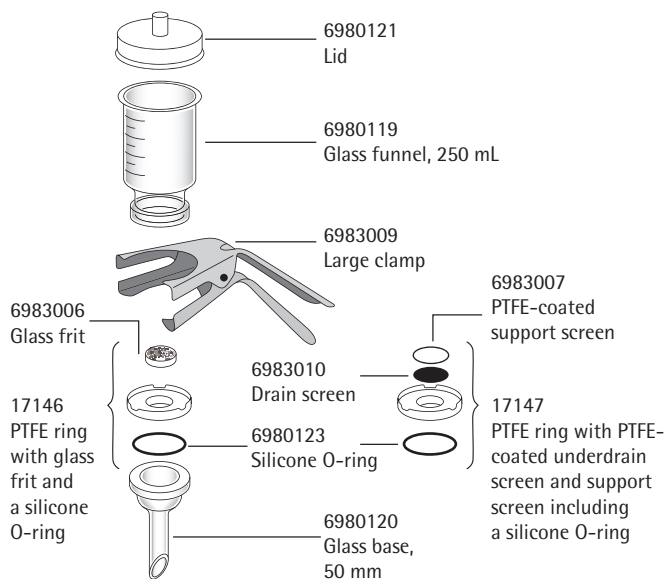


50 mm Glass Vacuum Filter Holder

This filter holder is available in two versions that differ from each other only in the type of filter support. The filter holder with a glass frit ensures uniform distribution of retained particles and is therefore recommended if the residue on the filter surface is of interest. Because it is easy to clean, the filter holder with a PTFE-coated screen support is preferable if the filtrate is required or if a liquid difficult to remove from the glass frit needs to be examined.

Specifications

| | |
|-----------------------------------|---|
| Base outlet | 15 mm diameter |
| Parts and materials | Borosilicate glass funnel and base Silicone rubber lid PTFE glass filter support (type 16307) or PTFE stainless steel filter support, coated with PTFE (type 16316) Silicone O-ring 45×3 mm Anodized aluminum clamp |
| Chemical compatibility | As for glass, PTFE and silicone The silicone O-ring can be replaced by a fluoroelastomer O-ring (order no. 00124). |
| Funnel capacity | 250 mL |
| Filtration area | 12.5 cm ² |
| Max. operating pressure | Only for vacuum |
| Suitable membrane filter diameter | 47 mm 50 mm |
| Sterilization | By autoclaving (max. 134°C) or by dry heat (max. 180°C) |



Ordering Information

| Description | Order No. |
|---|-----------|
| Glass vacuum filtration holder for 50 mm (or 47 mm) membrane filter, with glass frit filter support | 16307 |
| Glass vacuum filtration holder for 50 mm (or 47 mm) membrane filter, with PTFE-coated screen filter support | 16316 |

Replacement parts are shown in the diagram.

Note: PTFE rings in sets 17146 and 17147 have different dimensions and are not interchangeable.



Individual Stainless Steel Filter Holders

The three stainless steel holder types differ only in the funnel capacity (40 mL, 100 mL or 500 mL). The stainless steel frit filter support ensures uniform distribution of retained particles on the membrane surface. The filter holders feature simple handling, which is very important for performing routine tests. The convenient stainless steel tap in each base enables vacuum to be easily turned on and off independently.

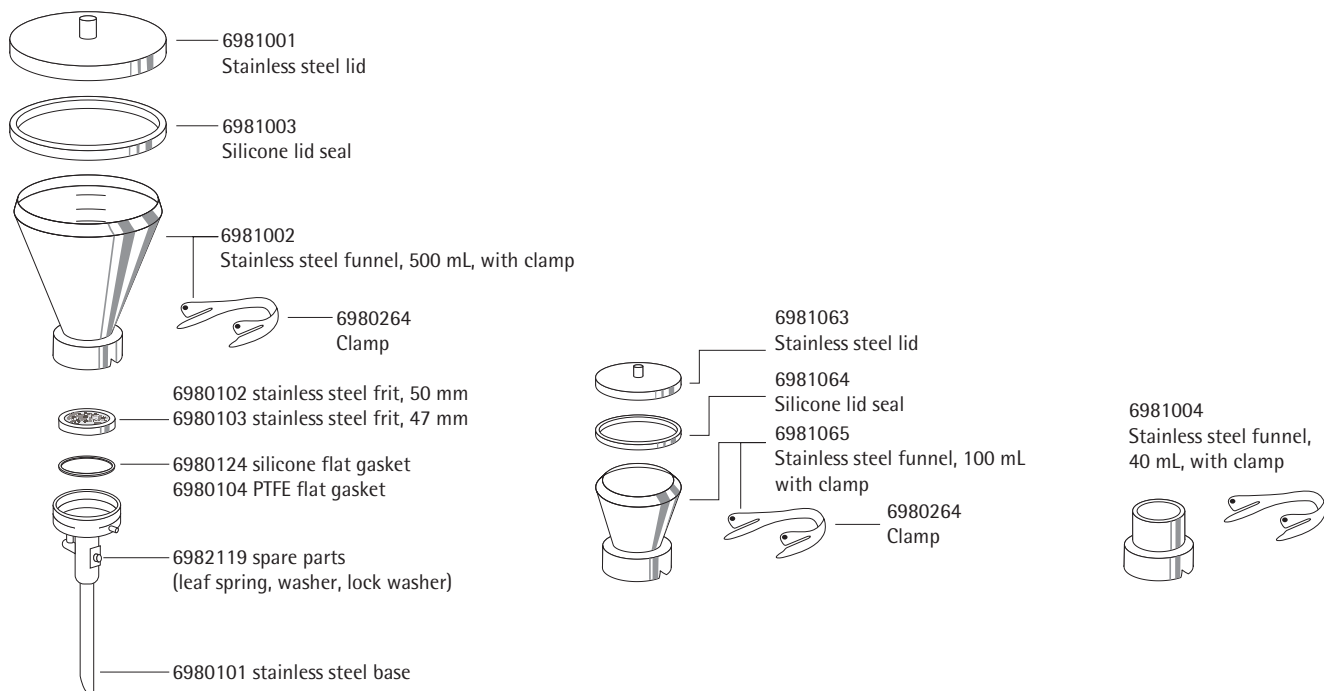
Specifications

| | |
|-----------------------------------|---|
| Base outlet | 10 mm diameter |
| Parts and materials | Filter holder: High-grade stainless steel: B.S. 304S31 AISI 304 Stainless steel frit: 1.4539 (EN) 904 (ASTM) Flat gasket: silicone (PTFE available. Order No.: 6980104) |
| Chemical compatibility | As for stainless steel and silicone |
| Choice of funnel capacity | 40 mL, 100 mL and 500 mL |
| Filtration area | 12.5 cm ² |
| Max. operating pressure | Vacuum |
| Suitable membrane filter diameter | 47 mm 50 mm |
| Sterilization | By autoclaving (max. 134°C), dry heat (max. 180°C) or by flaming |

Ordering Information

| Description | Order No. |
|---|-----------|
| Individual stainless steel filter holder, 100 mL | 16219 |
| Individual stainless steel filter holder, 500 mL | 16201 |
| Individual stainless steel filter holder without lid, 40 mL | 16220 |

Replacement parts are shown in the diagram.





Conventional Stainless Steel Manifolds

The pre-assembled and integral manifold systems are available with a choice of 100 mL or 500 mL capacity funnels. The three or six separate filter holders save time when large series of tests need to be carried out. The stainless steel taps on the manifold ports enable the vacuum for each holder to be conveniently turned on and off independently.

Specifications

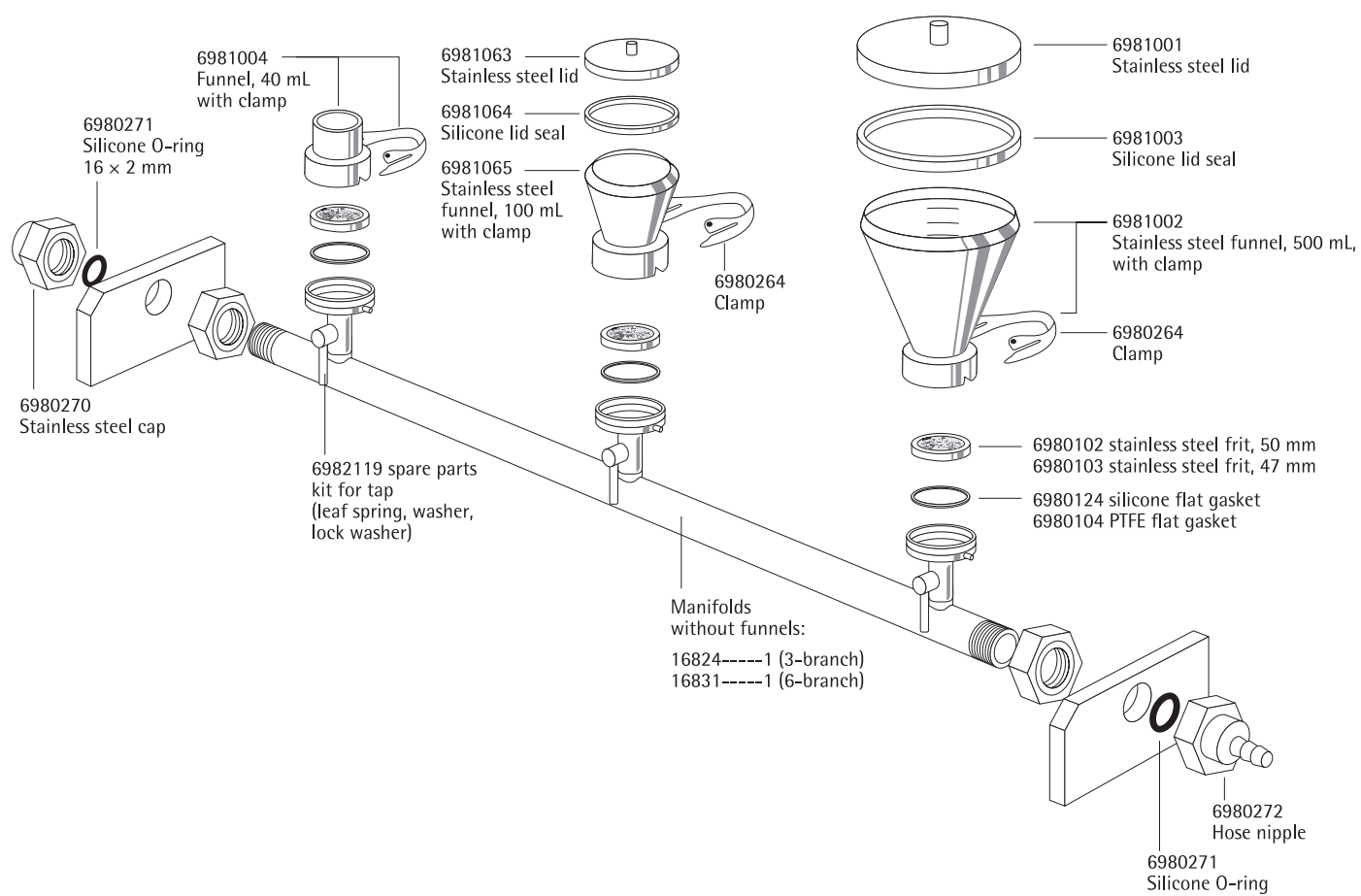
| | |
|--------------------------------------|--|
| Parts and materials | Filter holder: High-grade stainless steel: B.S. 304S31 AISI 304 Flat gasket: silicone (PTFE available. Order No. 6980104) lid seal: silicone |
| Chemical compatibility | As for stainless steel and silicone |
| Choice of funnel capacity | 40 mL, 100 mL and 500 mL |
| Filtration area | 12.5 cm ² |
| Dimensions in mm (W H D) | 3-branch manifold: 3 × 100 mL: 432 184 120 3 × 500 mL: 442 262 132 6-branch manifold: 6 × 100 mL: 906 268 120 6 × 500 mL: 916 329 132 |
| Max. operating pressure | Vacuum |
| Suitable membrane filter diameter | 47 mm 50 mm |
| Sterilization | By autoclaving (max. 134°C), dry heat (max. 180°C) or by flaming |
| Outlet | Hose nipple, DN 10 |

Ordering Information

| Description | Order No. |
|---|-----------|
| 3-branch manifold with 3 × 100 mL funnels and lids | 16824 |
| 3-branch manifold with 3 × 500 mL funnels and lids | 16828 |
| 6-branch manifold with 3 × 100 mL funnels and lids | 16832 |
| 6-branch manifold with 3 × 500 mL funnels and lids | 16831 |

Replacement parts are shown in the diagram.

Replacement Parts





Combisart® Modular Stainless Steel Manifold

The Sartorius Combisart® system features a modular design and field-proven standard accessories to make it easy for you to choose the right system. At the heart of the Combisart® system is a high-grade stainless steel manifold designed to accommodate stainless steel or glass funnels.

Specifications

| | |
|-----------------------------------|---|
| Parts and materials | Lid, funnel, base, filter support, clamp and tap made of stainless steel B.S.304S31 AISI304 Flat gasket: silicone (PTFE available. Order No. 6980104) lid seal: silicone |
| Chemical compatibility | As for stainless steel and silicone |
| Filtration area | 12.5 cm ² |
| Max. operating pressure | Vacuum only |
| Suitable membrane filter diameter | 25 mm 47 mm 50 mm |
| Sterilization | By autoclaving (max. 134°C), dry heat (max. 180°C) or by flaming |
| Inlet | Female thread, TR 20 × 2 |
| Outlet | Quick-connect nipple, DN 10 (1- and 3-branch manifolds); hose nipple DN 10 (6-branch) |

Ordering Information

Filter Holders and Funnels

| Description | Diameter of Filter Discs | Order No. |
|--|--------------------------|-----------|
| 30 mL glass filter holder with glass funnel glass frit filter support (specifications and replacement parts on page 17) | 25 mm | 16306 |
| 30 mL glass filter holder with PTFE-coated screen filter support (specifications and replacement parts on page 17) | 25 mm | 16315 |
| 250 mL glass filter holder with glass funnel glass frit filter support (specifications and replacement parts on page 18) | 47 mm 50 mm | 16307 |
| 250 mL glass filter holder for with PTFE-coated screen filter support (specifications and replacement parts on page 18) | 47 mm 50 mm | 16316 |
| 40 mL stainless steel funnel with clamp for closure | 47 mm 50 mm | 6981004 |
| 100 mL stainless steel funnel with clamp for closure | 47 mm 50 mm | 6981065 |
| 500 mL stainless steel funnel with clamp for closure | 47 mm 50 mm | 6981002 |
| Lid, stainless steel for 100 mL funnel | | 6981063 |
| Lid seal, silicone for 100 mL funnel | | 6981064 |
| Lid, stainless steel for 500 mL funnel | | 6981001 |
| Lid seal, silicone for 500 mL funnel | | 6981003 |

Adapters and Base Support

Description

Adaption Components for Combisart® Manifolds 16844, 16842 and 16843

Order No.

Glass funnel adapter, stainless steel with silicone stopper

16306 | 16315
(glass funnels, 30 mL)

16836

Glass funnel adapter, stainless steel with silicone stopper

16307 | 16316
(glass funnels, 250 mL)

16837

Combisart® individual base with frit, stainless steel

Stainless steel funnels: 40 mL
(6981004) | 100 mL (6981065) |
500 mL (6981002)

16840

Manifolds

Description

Order No.

Combisart® 1-branch stainless steel manifold, without base and frit

16844

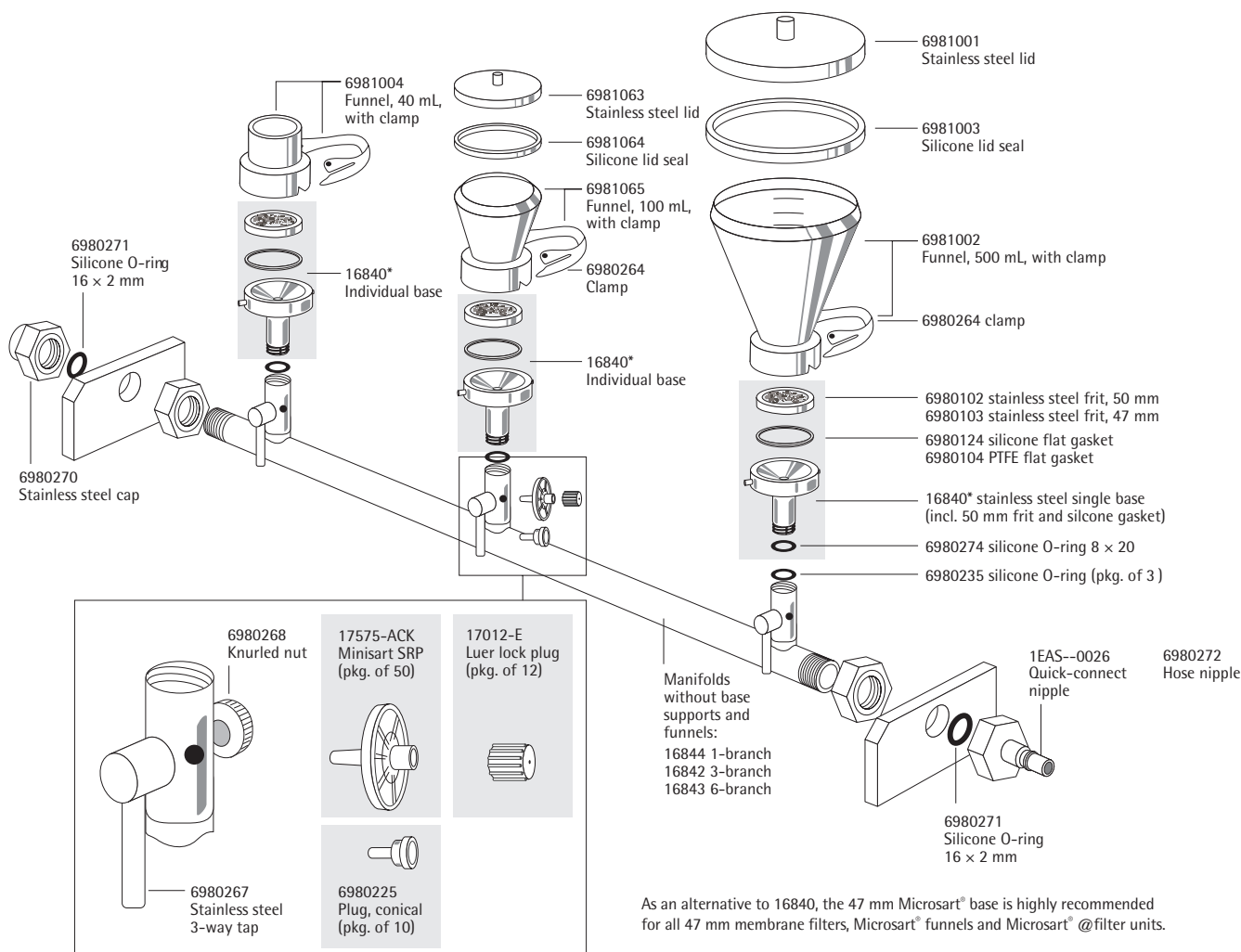
Combisart® 3-branch stainless steel manifold, without base and frits

16842

Combisart® 6-branch stainless steel manifold, without base and frits

16843

Replacement parts are shown in the diagram.





Additional Accessories

Ordering Information

Suction Flasks

| Description | Order No. |
|--|-------------|
| Suction flask, 2 liters acc. to DIN 12476, without stopper | 16672 |
| Suction flask, 5 liters acc. to DIN 12476, incl. stopper 75 D and glass tube | 16672-----1 |

Silicone Stoppers and Connectors

| Description | Flask Type | Order No. |
|---|------------------------|------------|
| Perforated stopper for individual stainless steel filter holders 16201 16219 16220 and for tube connector (17204) | 2 liters (16672) | 17173 |
| Tube connector for connecting a rubber hose 16623 or a silicone hose (1ZAS--0029) | 2 liters (16672) | 17204 |
| Perforated stopper for 30 mL glass funnels 16306 16315 | 2 liters (16672) | 17174 |
| Perforated stopper for 250 mL glass funnel 16307 16316 | 2 liters (16672) | 17175 |
| Perforated stopper 75 D for glass tube (1EAQ--0017) | 5 liters (16672-----1) | 1EAS--0019 |
| Glass tube for silicone stopper 75 D (1EAS--0019) | 5 liters (16672-----1) | 1EAQ--0017 |

Replacement Parts

| | | |
|---|------------------------|------------|
| Hose barb, complete, polypropylene | 2 liters (16672) | 6983003 |
| Glass tube for silicone stopper 75 D (1EAS--0019) | 5 liters (16672-----1) | 1EAQ--0017 |
| Assembly kit for hose barb | 5 liters (16672-----1) | 1EA---0018 |



Woulff's Bottle

Used between a suction flask and a vacuum source for simple control of vacuum in glass units without a separate tap and also prevents the filtrate from overflowing from the suction flask.

Ordering Information

| Description | Order No. |
|-------------------------|-----------|
| Woulff's Bottle, 500 mL | 16610 |



Vacusart®

□ Ordering Information

| Description | Order No. |
|------------------------------------|-------------|
| Vacusart® water trap, package of 3 | 17804-----M |



Vacuum Hoses

Thick-walled hoses for connecting system components, e. g. suction flasks, vacuum pumps, etc. When ordering, please state the length you require in meters.

□ Ordering Information

| Description | Order No. |
|--|------------|
| Rubber vacuum hose (1 meter), ID: 7mm | 16623 |
| Silicone vacuum hose (1 meter), ID: 7 mm | 1ZAS--0029 |



Stainless Steel Tweezers

Membrane filters need to be handled using suitable tweezers. Sartorius tweezers have blunt-edged tips for a careful, firm hold of the membrane filter. The stainless steel tweezers can be flamed and are autoclavable.

□ Ordering Information

| Description | Order No. |
|--------------------------|-----------|
| Stainless steel tweezers | 16625 |



Stainless Steel Prefilter Attachment

The stainless steel prefilter holder allows gradual retention ("cascade filtration") of particles by size. The device is clipped between the funnel and the base of stainless steel vacuum filter holders. It can be sterilized by autoclaving or flaming.

□ Ordering Information

| Description | Order No. |
|---|-----------|
| Stainless steel prefilter attachment | 16807 |
| Replacement part: support plate; sterilizable by autoclaving or flaming | 6981139 |



Vacuum Pumps

Microsart® mini.vac | Microsart® maxi.vac

These Sartorius neoprene membrane pumps have a low noise level and are reliable oil- and maintenance-free sources of vacuum. The two vacuum pump series feature state-of-the-art technology for daily use. Vacuum produced by the pumps is controlled and can be easily adjusted to your specifications.

Specifications

| | Microsart® maxi.vac | Microsart® mini.vac |
|--|--|--|
| Delivery | 22 L/min | 6 L/min |
| Final vacuum | 100 mbar | 100 mbar |
| Noise level [100 mbar] | 57.5–59.0 dBA | 53.5 dBA |
| Operating pressure | 1 bar (14.5 psi) | 2.5 bar (~36 psi) |
| Materials (contact with filtrate possible) | Aluminum, CR (neoprene), NBR (Perbunan®) | PPS, EPDM, FPM (fluoroelastomer) |
| Connectors for tube (mm) | ID 9 | ID 4 |
| Ambient temperature | 5°C to 40°C | 5°C to 40°C |
| Power requirements (mains) | 16694-2-50-22: 230 V 50 Hz 16694-1-60-22: 115 V 60 Hz | 16694-2-50-06: 230 V 50 Hz 16694-1-60-06: 115 V 60 Hz |
| Motor protection rating | IP 44 | IP 20 |
| Power P1 | 130 W | 65 W |
| Operating current | 0.9 A | 0.63 A |
| Weight | 7.1 kg | 1.9 kg |
| Dimensions W H D (mm) | 261 204 110 | 164 141 90 |
| Recommended application | All multi-branch manifolds | Individual filtration run using up to 3-branch manifolds |

Ordering Information

| Description | Order No. |
|---|---------------|
| Microsart® maxi.vac for multiple filtration runs, 230 V, 50 Hz | 16694-2-50-22 |
| Microsart® maxi.vac for multiple filtration runs, 115 V, 60 Hz | 16694-1-60-22 |
| Microsart® mini.vac up to 3 filter stations in parallel, 230 V, 50 Hz | 16694-2-50-06 |
| Microsart® mini.vac up to 3 filter stations in parallel, 115 V, 60 Hz | 16694-1-60-06 |

Replacement Parts

| Description | Order No. |
|--|------------|
| Replacement kit for 16694-2-50-22 and -1-60-22; set of one membrane, two valve springs and two head seals | 1ED---0055 |
| Replacement kit for 16694-2-50-06 and -1-60-06; set of one membrane, two valve springs and two head seals | 1ED---0054 |
| Sound absorber for 16694-2-50-22 and -1-60-22 | 1EH---0002 |
| Sound absorber for 16694-2-50-06 and -1-60-06 | 1EH---0001 |
| Fine adjustment head for 16694-2-50-22 and -1-60-22 | 1EV---0002 |
| Fine adjustment head for 16694-2-50-06 and -1-60-06 | 1EV---0001 |
| Fine adjustment head for 16694-2-50-06 and -1-60-06, for pressure filtration | 1EV---0003 |

Traditional Pumps

Ordering Information

| Description | Order No. |
|--|-----------|
| Multiple filtration runs: 13 mbar final vacuum, 26 L/min max., 220 V, 50 Hz | 16612 |
| Multiple filtration runs: 13 mbar final vacuum, 26 L/min max., 110 V, 60 Hz | 16615 |
| Individual filtration run: 100 mbar final vacuum, 20 L/min max., 220 V, 50 Hz | 16692 |
| Individual filtration run: 100 mbar final vacuum, 20 L/min max., 110 V, 60 Hz | 16695 |

Replacement Parts

| Description | Order No. |
|--|-----------|
| Set of two neoprene membranes, four valve springs and two neoprene head seals for 16612/16615 | 6986017 |
| Set of one neoprene membrane, two valve springs and one neoprene head seal for 16692/16695 | 6986105 |
| Thick-walled rubber hose | 16623 |

Chemical Compatibility

Filter Materials

| Solvents | Cellulose Acetate 111 | Cellulose Nitrate 113 | Reg. Cellulose 184 | PTFE 118 | Polyamide 250 | Glass Fiber 134 | Polycarbonate 230 | Polyether-sulfone 154 |
|------------------------|--------------------------|--------------------------|-----------------------|-------------|------------------|--------------------|----------------------|--------------------------|
| Acetone | - | - | • | • | - | • | ○ | - |
| Acetonitrile | ? | ? | • | • | - | ? | ? | • |
| Benzene | • | • | • | • | • | • | ? | • |
| Benzyl alcohol | ○ | ○ | • | • | • | • | ? | - |
| n-Butyl acetate | ○ | - | • | • | • | • | • | • |
| n-Butanol | • | • | • | • | • | • | • | • |
| Carbon tetrachloride | ○ | • | • | • | • | • | ? | • |
| Cellosolve | • | - | • | • | ? | • | - | • |
| Chloroform | - | • | • | • | • | • | - | - |
| Cyclohexane | ○ | ○ | • | • | ? | • | • | - |
| Cyclohexanone | - | - | • | • | • | • | ? | ? |
| Diethylacetamide | - | - | • | • | • | • | ? | ? |
| Diethyl ether | • | - | • | • | • | • | • | ? |
| Dimethyl formamide | - | - | ○ | • | ○ | • | - | ? |
| Dimethylsulfoxide | - | - | • | • | • | • | - | - |
| Dioxane | - | - | • | • | • | • | - | • |
| Ethanol, 98% | • | ○ | • | • | • | • | • | • |
| Ethyl acetate | - | - | • | • | • | • | ? | - |
| Ethylene glycol | • | ○ | • | • | ? | • | • | • |
| Formamide | ? | ? | ? | • | ? | • | - | ? |
| Gasoline | • | • | • | • | • | • | • | • |
| Glycerine | • | • | • | • | • | • | • | • |
| n-Heptane | • | • | • | • | ? | • | ? | ? |
| n-Hexane | • | • | • | • | • | • | • | ? |
| Isobutanol | ○ | ○ | • | • | • | • | • | ? |
| Isopropanol | • | ○ | • | • | • | • | • | • |
| Isopropyl acetate | ○ | - | • | • | ? | • | ? | • |
| Methanol, 98% | • | - | • | • | ? | • | • | • |
| Methyl acetate | - | - | • | • | • | • | ? | - |
| Methylene chloride | - | ○ | • | • | • | • | - | - |
| Methyl ethyl ketone | - | - | • | • | • | • | ? | - |
| Methyl isobutyl ketone | • | - | • | • | • | • | ? | ? |
| Monochlorobenzene | • | • | • | • | • | • | - | ? |
| Nitrobenzene | • | ○ | • | • | • | • | - | ? |
| n-Pentane | • | • | • | • | • | • | • | ? |
| Perchloroethylene | • | • | • | • | • | • | • | ? |
| Pyridine | - | - | • | • | • | • | - | - |
| Tetrahydrofuran | - | - | • | • | • | • | - | - |
| Toluene | • | • | • | • | • | • | ? | • |

Key to symbols: see next page.

| | Cellulose Acetate | Cellulose Nitrate | Reg. Cellulose | PTFE | Polyamide | Glass Fiber | Polycarbonate | Polyether-sulfone |
|---------------------------|-------------------|-------------------|----------------|------|-----------|-------------|---------------|-------------------|
| Solvents | 111 | 113 | 184 | 118 | 250 | 134 | 230 | 154 |
| Trichloroethane | ○ | ● | ● | ● | ? | ● | ? | ? |
| Trichloroethylene | ● | ● | ● | ● | ● | ● | – | ● |
| Xylene | ● | ● | ● | ● | ● | ● | ● | ● |
| Acids | | | | | | | | |
| Acetic acid, 25% | ● | ● | ● | ● | ○ | ? | ○ | ● |
| Acetic acid, 96% | – | – | ● | ● | – | ? | ? | ● |
| Hydrochloric acid, 25% | – | ○ | – | ● | – | ? | ● | ● |
| Hydrochloric acid, 37% | – | – | – | ● | – | ? | ● | ● |
| Hydrofluoric acid, 25% | ● | ○ | ○ | ● | – | ? | ● | ? |
| Hydrofluoric acid, 50% | ● | ○ | – | ● | – | ? | ● | ? |
| Perchloric acid, 25% | – | ○ | ○ | ● | – | ? | ? | ? |
| Phosphoric acid, 25% | ● | ○ | ○ | ● | – | ? | ? | ? |
| Phosphoric acid, 85% | ○ | ○ | ○ | ● | – | ? | – | ? |
| Nitric acid, 25% | – | ○ | – | ● | – | ? | ● | ● |
| Nitric acid, 65% | – | – | – | ● | – | ? | ● | ● |
| Sulfuric acid, 25% | – | ○ | ○ | ● | – | ● | ? | ● |
| Sulfuric acid, 98% | – | – | – | ● | – | ? | – | ? |
| Trichloroacetic acid, 25% | – | ○ | ● | ● | – | ? | ? | ? |
| Bases | | | | | | | | |
| Ammonium, 1N | ● | ● | ○ | ● | ● | ● | – | ● |
| Ammonium hydroxide, 25% | – | ○ | – | ○ | ● | ○ | – | ● |
| Potassium hydroxide, 32% | – | – | ○ | ● | ○ | ○ | – | ● |
| Sodium hydroxide, 32% | – | – | ○ | ● | ○ | ○ | – | ● |
| Sodium hydroxide, 1N | ○ | – | ○ | ● | ● | ● | – | ● |
| Aqueous Solutions | | | | | | | | |
| Formaline, 30% | ○ | ● | ○ | ● | ○ | ● | ● | ● |
| Hydrogen peroxide, 35% | ● | ● | ○ | ● | ○ | ? | ? | ? |
| Sodium hypochlorite, 5% | ● | ○ | ● | ● | ○ | ● | ? | ? |

Key to Symbols

● = Compatible ○ = Limited compatibility
 – = Not compatible ? = Not tested

E = Compatible after replacing the silicone O-ring with an EPDM O-ring

V = Compatible after replacing the silicone O-ring with a fluoroelastomer O-ring

Contact time: 24 hours at 20°C

Chemical compatibilities can be influenced by various factors.

Therefore, we recommend that you confirm compatibility with the liquid you wish to filter by performing a trial filtration run before you begin with actual filtration.

Filter Holder | O-Ring Materials

| | Glass | Poly-carbonate | Poly-propylene | PTFE | Stainless-Steel | EPDM O-Ring | PTFE O-Ring | Silicone O-Ring | Fluoro-elastomer O-Ring |
|------------------------|-------|----------------|----------------|------|-----------------|-------------|-------------|-----------------|-------------------------|
| Solvents | | | | | | | | | |
| Acetone | • | ○ | • | • | • | • | • | – | – |
| Acetonitrile | • | ? | • | • | • | ○ | • | – | • |
| Benzene | • | – | – | • | • | – | • | – | • |
| Benzyl alcohol | • | – | • | • | • | ○ | • | • | • |
| n-Butyl acetate | • | – | ○ | • | • | • | • | – | – |
| n-Butanol | • | • | • | • | • | • | • | • | • |
| Carbon tetrachloride | • | – | ○ | • | • | – | • | – | • |
| Cellosolve | • | – | – | • | • | ○ | • | – | – |
| Chloroform | • | – | – | • | • | – | • | – | • |
| Cyclohexane | • | ○ | • | • | • | – | • | – | • |
| Cyclohexanone | • | – | • | • | • | – | • | – | – |
| Diethylacetamide | • | – | ? | • | • | ? | • | • | – |
| Diethyl ether | • | – | ○ | • | • | – | • | – | – |
| Dimethyl formamide | • | – | • | • | • | • | • | ○ | – |
| Dimethylsulfoxide | • | ? | ? | • | • | ? | • | ○ | – |
| Dioxane | • | – | ○ | • | • | • | • | – | – |
| Ethanol, 98% | • | • | • | • | • | • | • | • | • |
| Ethyl acetate | • | – | • | • | • | • | • | – | – |
| Ethylene glycol | • | • | • | • | • | • | • | • | • |
| Formamide | • | – | • | • | • | • | • | – | ○ |
| Gasoline | • | ○ | • | • | • | – | • | – | • |
| Glycerine | • | ○ | • | • | • | • | • | • | • |
| n-Heptane | • | • | • | • | • | – | • | • | • |
| n-Hexane | • | • | • | • | • | – | • | – | • |
| Isobutanol | • | • | • | • | • | • | • | • | • |
| Isopropanol | • | ○ | • | • | • | • | • | • | • |
| Isopropyl acetate | • | • | • | • | • | • | • | – | – |
| Methanol, 98% | • | – | • | • | • | • | • | • | • |
| Methyl acetate | • | ? | • | • | • | • | • | – | – |
| Methylene chloride | • | – | – | • | • | – | • | – | ○ |
| Methyl ethyl ketone | • | – | • | • | • | • | • | – | – |
| Methyl isobutyl ketone | • | – | ? | • | • | – | • | – | – |
| Monochlorobenzene | • | – | • | • | • | – | • | – | • |
| Nitrobenzene | • | – | ○ | • | • | – | • | – | – |
| n-Pentane | • | • | • | • | • | – | • | – | • |
| Perchloroethylene | • | – | ○ | • | • | – | • | – | • |
| Pyridine | • | – | ○ | • | • | – | • | – | – |
| Tetrahydrofuran | • | – | ○ | • | • | – | • | – | – |
| Toluene | • | – | • | • | • | – | • | – | ○ |

Key to symbols: see next page.

| | Glass | Poly-carbonate | Poly-propylene | PTFE | Stainless-Steel | EPDM O-Ring | PTFE O-Ring | Silicone O-Ring | Fluoro-elastomer O-Ring |
|---------------------------|-------|----------------|----------------|------|-----------------|-------------|-------------|-----------------|-------------------------|
| Solvents | | | | | | | | | |
| Trichloroethane | • | – | ? | • | • | – | • | – | • |
| Trichloroethylene | • | – | – | • | • | – | • | – | • |
| Xylene | • | – | ○ | • | • | – | • | – | ○ |
| Acids | | | | | | | | | |
| Acetic acid, 25% | • | • | • | • | • | • | • | • | – |
| Acetic acid, 96% | • | – | • | • | • | • | • | ? | – |
| Hydrochloric acid, 25% | • | ○ | • | • | – | ○ | • | – | • |
| Hydrochloric acid, 37% | • | – | • | • | – | • | • | – | • |
| Hydrofluoric acid, 25% | – | – | • | • | – | ○ | • | – | ○ |
| Hydrofluoric acid, 50% | – | – | • | • | – | ○ | • | – | ○ |
| Perchloric acid, 25% | • | ○ | • | • | – | • | • | – | • |
| Phosphoric acid, 25% | • | ○ | • | • | ○ | • | • | – | • |
| Phosphoric acid, 85% | • | ○ | • | • | ○ | • | • | – | • |
| Nitric acid, 25% | • | – | • | • | – | ○ | • | – | • |
| Nitric acid, 65% | • | – | – | • | – | – | • | – | • |
| Sulfuric acid, 25% | • | • | • | • | ○ | • | • | – | • |
| Sulfuric acid, 98% | • | – | – | • | – | – | • | – | • |
| Trichloroacetic acid, 25% | • | ○ | • | • | – | • | • | – | – |
| Bases | | | | | | | | | |
| Ammonium, 1N | • | – | • | • | • | • | • | – | – |
| Ammonium hydroxide, 25% | • | – | • | • | • | • | • | • | – |
| Potassium hydroxide, 32% | • | – | • | • | • | • | • | ○ | ○ |
| Sodium hydroxide, 32% | • | – | • | • | • | • | • | ○ | • |
| Sodium hydroxide, 1N | • | – | • | • | • | • | • | • | • |
| Aqueous Solutions | | | | | | | | | |
| Formaline, 30% | • | • | • | • | • | • | • | ○ | • |
| Hydrogen peroxide, 35% | • | • | • | • | • | • | • | • | • |
| Sodium hypochlorite, 5% | • | • | • | • | • | • | • | • | • |

Key to Symbols

• = Compatible
– = Not compatible

○ = Limited compatibility
? = Not tested

Contact time: 24 hours at 20°C

Chemical compatibilities can be influenced by various factors.

Therefore, we recommend that you confirm compatibility with the liquid you wish to filter by performing a trial filtration run before you begin with actual filtration.

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