sartorius stedim biotech

# Minisart® Syringe Filters

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# Minisart® product overview and user's application guide

# Company Profile

Sartorius Stedim Biotech brings more than 70 years of worldwide experience in membrane technology to each application. As a leading international supplier, we provide innovative products, cost-effective solutions, certified quality and superior technical support.

**Increasing our high quality standard**
We place our highest priority on quality. From product design, testing and production to marketing and administration, quality assurance is our most important parameter. Sartorius Stedim Biotech is also an accredited institution, playing a major role in quality assurance issues, including the development of new standards.

**Innovative manufacturing processes**
Our casting equipment for manufacturing filter membranes have set new process and environmental standards in Germany and throughout the world. We recycle 99% of the solvents used in production and reuse 96% of the recycled material in our production processes.

**Application research and development**
Sartorius Stedim Biotech relies on their customers for input and experience to help guide our new product development. This interaction helps the R&D team to create innovative products and systems that meet customer needs and exceed customer expectations. Today, in cooperation with our partners and accredited science and research institutes at industrial centers throughout the world, Sartorius Stedim Biotech is developing international standards of technology for tomorrow.

**Up-to-date expertise through training**
We stress continuous training and qualification of our employees in all areas. We also offer standard or customized training programs for our customers employees who work with Sartorius Stedim Biotech products.

**cGMP Quality and its assurance**
Consistently high quality of our Membrane Filters, Minisart® syringe filters are assured by careful selection of the raw materials. The production process and the efficient Quality Assurance procedure is well-planned and validated, all of which results in high batch-to-batch reproducibility. The test procedures used are based both on external standard methods, such as the USP, EP and ASTM, and on in-house methods which are the result of Sartorius Stedim Biotech's experience over the past 70 years.

BIOCOMPATIBILITY

CERTIFICATE

Testmaterial: **Minisart High-Flow type, representing syringe filter with MBS housing and PES membrane**
**Order No.: 16532 - GUK**
**Lot No.: 16532 000726**

Supplier: SARTORIUS AG
Weender Landstraße 94-108, D-37075 Göttingen

Studies performed: The following studies were performed in order to determine the biocompatibility of the device. The material was produced according to the manufacturing process of SARTORIUS AG.

CYTOTOXICITY
HAEMOLYSIS TEST
USP BIOLOGICAL TESTS
(CLASSIFICATION VI/121 °C)

Results: **The test item did not show any effect in the performed studies and meets the criteria of USP Biological Tests Classification VI. No leachable substances with cytotoxic or haemolytic potential were released from the test item.**

**BSL BIOSERVICE Scientific Laboratories GmbH**
Behringstraße 6
D-82152 Planegg

Dr. Daniela Brummer
Biological Safety Testing
Date: October 06, 2009

GLP
ISO 17025

Minisart® CE/CE

Directions for Use

Certificate of Quality

100% Tested during Manufacture

Quality Assurance Just Release Criteria

CE 0297 mar
models, whic
sterile packa
16534-GUK
16534-K
16555-GUK
16555-K
16596-HYK
17507-K
17508-K

CE mark of c
models avail
16534-Q
16555-Q
16596-HYQ
17507-Q
17508-Q

**Applications**
- Sterile filtr
  0.2 µm por
- Particulate
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  from dry a

Minisarts' ca
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medical purp

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direction, do

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Declaration of Conformity CE
According to EU Directive 93/42/EC

BIOCOMPATIBILITY

CERTIFICATE

Testmaterial: **Minisart type, representing syringe filter with MBS housing and PTFE membrane**
**Order No.: 16596 - HYK**
**Lot No.: 16596 000757**

Supplier: SARTORIUS AG
Weender Landstraße 94-108, D-37075 Göttingen

Studies performed: The following studies were performed in order to determine the biocompatibility of the device. The material was produced according to the manufacturing process of SARTORIUS AG.

CYTOTOXICITY
HAEMOLYSIS TEST
USP BIOLOGICAL TESTS
(CLASSIFICATION VI/121 °C)

Results: **The test item did not show any effect in the performed studies and meets the criteria of USP Biological Tests Classification VI. No leachable substances with cytotoxic or haemolytic potential were released from the test item.**

**BSL BIOSERVICE Scientific Laboratories GmbH**
Behringstraße 6
D-82152 Planegg

Dr. Daniela Brummer
Biological Safety Testing
Date: October 06, 2009

GLP
ISO 17025

BIOCOMPATIBILITY

CERTIFICATE

Testmaterial: **Minisart type, representing syringe filter with MBS housing and CA membrane**
**Order No.: 16534 - K**
**Lot No.: 16534 000689**

Supplier: SARTORIUS AG
Weender Landstraße 94-108, D-37075 Göttingen

Studies performed: The following studies were performed in order to determine the biocompatibility of the device. The material was produced according to the manufacturing process of SARTORIUS AG.

CYTOTOXICITY
HAEMOLYSIS TEST
USP BIOLOGICAL TESTS
(CLASSIFICATION VI/121 °C)

Results: **The test item did not show any effect in the performed studies and meets the criteria of USP Biological Tests Classification VI. No leachable substances with cytotoxic or haemolytic potential were released from the test item.**

**BSL BIOSERVICE Scientific Laboratories GmbH**
Behringstraße 6
D-82152 Planegg

Dr. Daniela Brummer
Biological Safety Testing
Date: October 06, 2009

GLP
ISO 17025

sartorius stedim

Declaration of Conformity CE
According to EU Directive 93/42/EC

**Quality Assurance**
Adherence to cGMP requirements (clean-room conditions, gowning and employee hygiene, etc.) which are monitored by documented in-process-controls, ensures optimal quality control in standard operating procedures for production. Finished Minisart® syringe filters undergo final product quality control. This involves 100% non-destructive testing of each individual product and other individual tests carried out on a representative number of samples. A lot is not released until all in-process and final quality control data are available and within their specifications.

**Complete Traceability**
The product name, product description, article code, pore size, sterilization method, expiration date, product lot number and the CE mark is printed on each individual blister lid. In addition, the pack size and the barcodes for article code and lot number are printed on the outer packaging. The traceable lot number allows convenient retrieval of all data complied on the materials used, production steps and QC tests.

**DIN ISO 9001 Certificates**
Sartorius Stedim Biotech implemented Quality Management Systems to assure consistently high quality of Membrane Filters, Ultra Filters, Filter Cartridges and Disposables.

Exemplary Quality Systems Certificates:
– Global Quality Systems Certificates/ Quality Certificates (ISO 9001:2000)
– Global Quality Systems Certificates/ Quality Certificates for Medical Devices (ISO 13485:2003 and directive 93/42/EEC)

The complete Quality Systems Certificates are continuously updated and can be downloaded on our website www.sartorius-stedim.com/qm-certificates

**Certificate of product**
The certificate in every package of Minisart® syringe filters documents passing of quality assurance tests as well as compliance with HPLC instruments for Minisart® RC and SRP.

**Declaration as Medical Devices**
In addition, the Sartorius Stedim Biotech Quality Management System fulfills the requirements of the DIN EN ISO 13485, the harmonized standard for Quality Systems for Medical Devices.

**Declaration of Conformity CE**
As part of the CE-marking Procedure, the Sartorius Stedim Biotech Quality Management system fulfills and is certified according to EU Guideline 93/42/EEC Annex II, setting specific requirements for medical devices. On the basis of this certification as well as appropriate documentation, the declaration of conformity for Minisart® syringe filters was obtained.

**Biocompatibility**
Minisart® syringe filters are free of cytotoxic and haemolytic effects, they pass the USP Biological Tests (classification VI|121°C), Haemolysis Tests and the Cytotoxicity Tests.

# Sterile Filtration

For sterilization of liquids, sterile filtration is the optimal method. It removes all microorganisms and particles reliably, without any influence of their ingredients, due to adsorption or decomposition. Beyond the sterility of pharmaceutical products, the absence of particles or dead microorganisms which may release pyrogens is very important. For optimal sterilization of liquids, syringe filters must provide high flow rates and low adsorption characteristics.

# Sterile Filtration

**Reliable removal of microorganisms and particles from liquids with Minisart® syringe filters with pore sizes ≤ 0.2 µm**

**Applications**
- Sterile filtration of small volume liquids
- Drug development studies
- Product compatibility and recovery studies
- Filterability testing
- Separation of virus | bacteria suspension
- Medical applications (see also page 43)

**Minisart® Features**
- Low adsorption
- Superior flow rate
- High total throughput
- Low hold-up volume
- Particulate-free
- Minimum extractables
- Scaleable
- Integrity testable
- 100% integrity tested
- Easy pore size identification
- PVC-free

**Additional Minisart® Features**
- Pre-sterilized or non-sterile
- Gamma irradiated or EO sterilized
- Fully validated
- Certified quality
- Maximum chemical compatibility
- Various membrane diameters available
- Various outlet connectors available
- Bi-directional use
- CE-marked

**Media Types**
- Tissue culture-, nutrient-, cell line- and bone marrow media
- Additives for tissue culture and nutrient media
- Pharmaceuticals and cosmetics
- Diagnostics
- Buffers and emulsifiers
- Biological- and dilution solutions

# How do the Minisarts® meet my needs for my sterile filtration?

| My Requirements are... | The Minisart® Features are... |
|---|---|
| **No interaction with the media** | |
| The composition of the ingredients of my media must stay the same prior to filtration | The Minisart® type should have the lowest adsorption of proteins and preservatives |
| The syringe filter must not release any particles into my media | The Minisart® type must be particulate-free |
| There should be no chemicals released from the syringe filter into my media | The Minisart® type should be extractable-free |
| Any possible residues from Ethylene oxide must be avoided | The Minisart® type should be gamma irradiated |
| The syringe filter should not be decomposed by solvents and aggressive solutions | The Minisart® type should have a high chemical compatibility |
| The plastic materials must be carefully selected and should not contain any softening agent | The Minisart® type must be PVC-free |
| **Superior performance** | |
| My filtration must be completed as fast as possible | The Minisart® type must have the highest flow rate |
| I don't want to change the filter within one filtration campaign | The Minisart® type must have the highest total throughput |
| **Flexibility** | |
| The small volume filtration must easily transition to my pilot or production scale | The membrane within Minisart® must be available in filter units with larger filtration areas |
| The syringe filter must have an optimal ratio between speed and hold-up volume | The Minisart® type should be available with various diameters |
| I want to be flexible in the future to decide which connectors are ideal for my application | The Minisart® type should be available with different outlet connectors |
| I don't want to be worry about the syringe filter orientation | The Minisart® type should be used bi-directional |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your sterile filtration with our **Application Guide Disc**.

**Reliability & less validation work**

| | |
|---|---|
| My main prerequisite is the sterility of my media after filtration | The integrity of every single Minisart® unit is tested during manufacturing |
| I want to check the integrity of the syringe filter unit after use | The Minisart® type must be integrity testable |
| The syringe filter must provide documents to support my validation procedure | The Minisart® type must be validated and a Validation Guide should be available |
| I have to file a certificate which certifies the high quality of the syringe filter | The Minisart® type must have a certificate in each box |
| The pore size of the syringe filter must be clearly visible to me | The Minisart® type is color-coded or the pore size is printed on the housing |
| Any loss of my expensive media must be avoided | The design of the Minisart® type guarantees the lowest hold-up volume |
| The syringe filter is used for a medical application | The Minisart® type must have the CE mark |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your sterile filtration with our **Application Guide Disc**.

# Sterile Filtration: Minisart® Syringe Filters individually, sterile packaged

## Minisart® high flow Syringe Filters,

for fastest sterile filtration and low binding, individually, sterile packaged, Polyethersulfone membrane, MBS[2] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF Ø [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|---|
| Minisart® high flow | 0.1 | EO | dark red | Male Luer Lock | 28 \| 100 ml | 16553----------K |
| Minisart® high flow | 0.2[7] | GI | royal blue | Male Luer Lock | 28 \| 100 ml | 16532--------GUK |
| Minisart® high flow | 0.2[7] | EO | royal blue | Male Luer Lock | 28 \| 100 ml | 16532----------K |
| Minisart® high flow | 0.2[7] | EO | royal blue | Male Luer Slip | 28 \| 100 ml | 16541----------K |

## Minisart® NML Syringe Filters,

for fast sterile filtration and lowest binding, individually, sterile packaged, surfactant-free Cellulose Acetate membrane, MBS[2] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF Ø [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|---|
| Minisart® NML | 0.2[7] | GI | blue | Male Luer Lock | 28 \| 100 ml | 16534--------GUK |
| Minisart® NML | 0.2[7] | EO | blue | Male Luer Lock | 28 \| 100 ml | 16534----------K |
| Minisart® NML | 0.2[7] | EO | blue | Male Luer Slip | 28 \| 100 ml | 17597----------K |
| Ophthalsart | 0.2 | EO | pink | Male Luer Slip | 28 \| 100 ml | 17528----------K |

## Minisart® plus Syringe Filters,

for fast sterile filtration of high particulate liquids, individually, sterile packaged, surfactant-free Cellulose Acetate membrane and GF[2] depth filter, MBS[2] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF Ø [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|---|
| Minisart® plus | 0.2 | GI | blue | Male Luer Lock | 28 \| 100 ml | 17823--------GUK |
| Minisart® plus | 0.2 | EO | blue | Male Luer Lock | 28 \| 100 ml | 17823----------K |

## Minisart® NY25 Syringe Filters,

for fast sterile filtration and high chemical compatibility, individually, sterile packaged, Nylon membrane, PP[2] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF Ø [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|---|
| Minisart® NY25 | 0.2 | EO | printed[8] | Male Luer Slip | 28 \| 100 ml | 17845--------ACK |

## Minisart® SRP Syringe Filters,

for sterile filtration and maximum chemical compatibility, individually, sterile packaged, PTFE[2] membrane, PP[2] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF Ø [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|---|
| Minisart® SRP15 | 0.2 | EO | printed[8] | Male Luer Slip | 15 \| 20 ml | 17573--------ACK |
| Minisart® SRP25 | 0.2 | EO | printed[8] | Male Luer Slip | 25 \| 100 ml | 17575--------ACK |

# Sterile Filtration: Minisart® Syringe Filters non-sterile

## Minisart® Syringe Filters,

for diverse sterile filtrations, non-sterile, 0.2 µm membranes, connector inlet: Female Luer Lock, 500 units

| Type | MF \| Housing[2] | Feasible sterilization[1] | Color code | Connector outlet | MF Ø [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|---|
| Minisart® high flow | PES \| MBS | EO, GI | royal blue | Male Luer Lock | 28 \| 100 ml | 16532----------Q |
| Minisart® high flow | PES \| MBS | EO, GI | royal blue | Male Luer Slip | 28 \| 100 ml | 16541----------Q |
| Minisart® NML | SFCA \| MBS | EO, GI | blue | Male Luer Lock | 28 \| 100 ml | 16534----------Q |
| Minisart® NML | SFCA \| MBS | EO, GI | blue | Male Luer Slip | 28 \| 100 ml | 17597----------Q |
| Minisart® plus | SFCA+GF \| MBS | EO, GI | blue | Male Luer Lock | 28 \| 100 ml | 17823----------Q |
| Minisart®NY25 | Nylon \| PP | EO, AU | printed[8] | Male Luer Slip | 25\| 100 ml | 17845----------Q[5] |
| Minisart® SRP4 | PTFE \| PP | EO, AU | blue[8] | Male Luer Slip | 4 \| 1 ml | 17844----------Q |
| Minisart® SRP15 | PTFE \| PP | EO, AU | printed[8] | Male Luer Slip | 15 \| 20 ml | 17573----------Q[3] |
| Minisart® SRP15 | PTFE \| PP | EO, AU | printed[8] | Male Spike | 15 \| 20 ml | 17558----------Q[3] |
| Minisart® SRP25 | PTFE \| PP | EO, AU | printed[8] | Male Luer Slip | 25 \| 100 ml | 17575----------Q[3,4] |

For sterile filtration of larger volumes we recommend the use of Sartolab® P filter units, capsules and cartridge filters.
Minisart® syringe filters with pore sizes > 0.2 µm are described under the section „Clarification".

1) Sterilization
EO: Ethylene oxide | GI: Gamma irradiation | AU: Autoclave 121°C, 30 min
2) Materials
MBS: Meta acrylate butadiene styrene polymerisate | PP: Polypropylene
GF: Binder-free glass fiber depth filter | Nylon: Polyamide | PES: Polyethersulfone | PTFE: Polytetra-fluorethylene (hydrophobic material, hydrophilic after wetting with IPA) | SFCA: Surfactant-free Cellulose Acetate
3) Also available as box with 50 units: ---------- Q replaced by ----------K
4) Also available as box with 200 units: ---------- Q replaced by ----------S
5) Also available as box with 1,000 units: ---------- Q replaced by ----------R
6) The process volume is a recommended value and depends on the ratio of retentive substances
7) These Minisart® syringe filters are fully vaildated (Validation Guide can be obtained foc. Order No. SL-5707e)
8) The pore size and the type of membrane of 15 mm and 25 mm syringe filters is printed on the housing, 4 mm filter units are packaged in a color coded tray (blue for 0.2 µm, yellow for 0.45 µm)

# Sterile Venting

For sterilization and removal of particles from air and other gases, filtration with PTFE membranes is the optimal method. It removes all microorganisms and particles reliably, in order to vent containers, fermenters and tubing systems in medical devices. The 100% hydrophobic character of the membrane ensures the availability of 100% of the filtration area at any time, because the membrane area could not cut down by wetting with aqueous solutions. Additionally the Minisart® syringe filters can be used bi-directional, which makes in-line use a lot easier.

# Sterile Venting

**Reliable removal of microorganisms and particles from air and gases with Minisart® syringe filters with pore sizes 0.2 µm and 0.45 µm**

**Applications**
- Sterile venting of fermenters
- Sterile venting of containers
- General sterile filtration of gases and air
- Medical applications (see also page 43)

**Minisart® Features**
- Superior flow rate
- High total throughput
- Bi-directional use
- Certified quality
- Integrity testable
- 100% integrity tested
- Minimum extractables
- Scaleable
- Easy pore size identification
- Various outlet connectors available
- Particulate-free
- PVC-free

**Additional Minisart® Features**
- Pre-sterilized or non-sterile
- Gamma irradiated or EO sterilized
- Fully validated
- Maximum chemical compatibility
- Various membrane diameters available
- CE-marked

# How do the Minisarts® meet my needs for my sterile venting?

| My Requirements are... | The Minisart® Features are... |
|---|---|
| No reduction in effective filtration area | The Minisart® type must have a 100 % hydrophobic membrane |
| **No interaction with the media** | |
| The syringe filter must not release any irritating particles into my container | The Minisart® type must be particulate-free |
| There should be no chemicals released from the syringe filter into my container | The Minisart® type should be extractable-free |
| Any possible residues from Ethylene oxide must be avoided | The Minisart® type should be gamma irradiated |
| The syringe filter should not be decomposed by solvents and aggressive solutions | The Minisart® type should have a high chemical compatibility |
| The plastic materials must be carefully selected and should not contain any softening agent | The Minisart® type must be PVC-free |
| **Superior performance** | |
| The pressure compensation of my container must be completed as fast as possible | The Minisart® type must have the highest flow rate |
| I don't want to change the filter within one filtration campaign | The Minisart® type must have the highest total throughput |
| **Flexibility** | |
| The small volume filtration must easily transition to my pilot or production scale | The membrane within the Minisart® must be available in filter units with larger filtration areas |
| The syringe filter must have an optimal ratio between speed and hold-up volume | The Minisart® type should be available with various diameters |
| I want to be flexible in the future to decide which connectors are ideal for my application | The Minisart® type should be available with different outlet connectors |
| I don't want to be worry about the syringe filter orientation, it should be optimal for in-line use | The Minisart® type should be used bi-directional |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your sterile venting with our **Application Guide Disc**.

**Reliability & less validation work**

| | |
|---|---|
| My main prerequisite is the sterility of the air or gas after filtration | The integrity of every single Minisart® unit is tested during manufacturing |
| I want to check the integrity of the syringe filter unit after use | The Minisart® type must be integrity testable |
| The syringe filter must provide documents to support my validation procedure | The Minisart® type must be validated and a Validation Guide should be available |
| I have to file a certificate which certifies the high quality of the syringe filter | The Minisart® type must have a certificate in each box |
| The pore size of the syringe filter must be clearly visible to me | The Minisart® type is color-coded or the pore size is printed on the housing |
| The syringe filter is used for a medical application | The Minisart® type must have the CE mark |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your sterile venting with our **Application Guide Disc**.

# Sterile Venting: Minisart® Syringe Filters individually, sterile packaged

## Minisart® HY Syringe Filters,

for sterile venting, individually, sterile packaged, PTFE membrane, MBS[4] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|
| Minisart® HY | 0.2 | EO | transparent | Male Luer Lock | 26 | 16596--------HYK |

## Minisart® Air,

with connected needle, for sterile venting, individually, double packaged, sterile, optimal for use in isolators, PTFE membrane, MBS[4] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|
| Minisart® Air | 0.2[5] | GI | yellow | Male Luer Slip + needle | 15 | 16596--------HNK |

## Minisart® SRP Syringe Filters,

for sterile venting, individually, sterile packaged, PTFE membrane, PP[4] housing (pore size printed on), connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|
| Minisart® SRP | 0.2 | EO | printed[6] | Male Luer Slip | 15 | 17573--------ACK |
| Minisart® SRP | 0.2 | EO | printed[6] | Male Luer Slip | 25 | 17575--------ACK |

# Sterile Venting: Minisart® Syringe Filters non-sterile

## Minisart® Syringe Filters,

for sterile venting, non-sterile, PTFE membrane, 500 units

| Type | Housing material[4] | Pore size [µm] | Feasible sterilization[1] | Connector inlet | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|---|
| Minisart® HY | MBS | 0.2 | EO | Female Luer Lock | Male Luer Lock | 26 | 16596--------HYQ |
| Minisart® HY | MBS | 0.2 | EO | Female Luer Lock | Male Luer Slip | 26 | 17595--------HYQ |
| Minisart® HY | MBS | 0.2 | EO | Male Luer Slip | Male Luer Lock | 26 | 16599--------HYQ |
| Minisart® SRP4 | PP[6] | 0.2 | EO, AU | Female Luer Lock | Male Luer Slip | 4 | 17844----------Q |
| Minisart® SRP15 | PP[6] | 0.2 | EO, AU | Female Luer Lock | Male Luer Slip | 15 | 17573----------Q[2] |
| Minisart® SRP15 | PP[6] | 0.2 | EO, AU | Female Luer Lock | Male Spike | 15 | 17558----------Q[2] |
| Minisart® SRP25 | PP[6] | 0.2 | EO, AU | Female Luer Lock | Male Luer Slip | 25 | 17575----------Q[2,3] |
| NEW Minisart® HY | MBS | 0.2 | EO | Tube Connector ∅ 5 mm | Tube Connector ∅ 5 mm | 26 | 40078----------Q |
| NEW Minisart® HY Res[7] | MBS | 0.45 | EO | Tube Connector ∅ 5 mm | Tube Connector ∅ 5 mm | 26 | 40080----------Q |
| Minisart® SRP4 | PP[6] | 0.45 | EO, AU | Female Luer Lock | Male Luer Slip | 4 | 17820----------Q[2] |
| Minisart® SRP15 | PP[6] | 0.45 | EO, AU | Female Luer Lock | Male Luer Slip | 15 | 17574----------Q[2] |
| Minisart® SRP15 | PP[6] | 0.45 | EO, AU | Female Luer Lock | Male Spike | 15 | 17559----------Q[2] |
| Minisart® SRP25 | PP[6] | 0.45 | EO, AU | Female Luer Lock | Male Luer Slip | 25 | 17576----------Q[2,3] |

## Minisart® Air,

for sterile venting and gas filtration, non-sterile, gamma-irradiatable PTFE membrane, color code: yellow, 500 units

| Type | Housing material[4] | Pore size [µm] | Feasible sterilization[1] | Connector inlet | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|---|
| Minisart® Air | MBS | 0.2[5] | EO \| GI | Female Luer Lock | Male Luer Slip | 15 | 1751A----------Q |

For higher flow rates of gases we recommend the use of Midisart® filter units, Sartofluor® capsules and cartridge filters.

1) Sterilization: EO: Ethylene oxide | GI: Gamma irradiation | AU: Autoclave 121°C, 30 min
2) Also available as box with 50 units: ----------Q replaced by ----------K
3) Also available as box with 200 units: ----------Q replaced by ----------S
4) Materials: MBS: Meta acrylate butadiene styrene polymerisate | PP: Polypropylene
PTFE: Polytetra-fluorethylene
5) Minisart® Air is part of the fully validated Sterisart® NF system
6) The pore size and the type of membrane of 15 mm and 25 mm syringe filters is printed on the housing, 4 mm filter units are packaged in a color coded tray (blue for 0.2 µm, yellow for 0.45 µm)
7) Minisart® HY Res is a liquid barrier with reservoir. For technical information, please refer to the Technical Specification Disc under "Actiosart", with two exceptions: The connectors are tube connectors ∅ 5 mm and Minisart® HY Res has no sealed 5 µm PTEE on the inlet.

# Chromatography Sample Preparation

Reliable elimination of particles and microorganisms prior to chromatographic analysis is essential in order to protect your chromatography columns from fine particles or from premature plugging. The result spectrum must be free of ghost peaks, which may influenced by the filter unit. Syringe filters for these applications must provide the maximum chemical compatibility and minimum extractables combined with a low hold-up volume.

# Chromatography Sample Preparation

**Reliable ultra-cleaning of small volume samples for HPLC | IC | GC with Minisart® syringe filters with pore sizes 0.2 µm and 0.45 µm**

**Applications**
- Protection of columns and chromatography instruments
- Dissolution testing

**Minisart® Features**
- Low adsorption
- Particulate-free
- Maximum chemical compatibility
- Minimum extractables
- Superior flow rate
- High total throughput
- Low hold-up volume
- Certified quality
- Integrity testable
- 100% integrity tested
- Easy pore size identification
- PVC-free
- Bi-directional use


**Additional Minisart® Features**
- Pre-sterilized or non-sterile
- Various membrane diameters available
- Various outlet connectors available
- Scaleable

**Media Types**
- Aqueous solutions
- Solvents
- Hydrocarbons

# How do the Minisarts® meet my needs for my sample preperation?

| My Requirements are... | The Minisart® Features are... |
|---|---|
| **No interaction with the media** | |
| The composition of the ingredients of my sample must stay the same prior to filtration | The Minisart® type should have the lowest adsorption of proteins and preservatives |
| The syringe filter must not release any premature plugging particles into my sample | The Minisart® type must be particulate-free |
| There should be no UV-absorbing chemicals released from the syringe filter into my sample (to avoid ghost peaks) | The Minisart® type should be extractable-free |
| The syringe filter should not be decomposed by solvents and aggressive solutions | The Minisart® type should have a high chemical compatibility |
| The plastic materials must be carefully selected and should not contain any softening agent | The Minisart® type must be PVC-free |
| **Superior performance** | |
| My filtration must be completed as fast as possible | The Minisart® type must have the highest flow rate |
| I don't want to change the filter within one filtration step | The Minisart® type must have the highest total throughput |
| **Flexibility** | |
| The small volume filtration must easily transition to my pilot or production scale | The membrane within Minisart® must be available in filter units with larger filtration areas |
| The syringe filter must have an optimal ratio between speed and hold-up volume | The Minisart® type should be available with various diameters |
| I want to be flexible in the future to decide which connectors are ideal for my application | The Minisart® type should be available with different outlet connectors |
| I don't want to be worry about the syringe filter orientation | The Minisart® type should be used bi-directional |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your sample preparation with our **Application Guide Disc**.

**Reliability & less validation work**

| | |
|---|---|
| My main prerequisite is reliable particle removal from my sample | The integrity of every single Minisart® unit is tested during manufacturing |
| I want to check the integrity of the syringe filter unit after use | The Minisart® type must be integrity testable |
| I have to file a certificate which certifies the high quality of the syringe filter | The Minisart® type must have a certificate in each box |
| The pore size of the syringe filter must be clearly visible to me | The Minisart® type is color-coded or the pore size is printed on the housing |
| Any loss of my expensive sample must be avoided | The design of the Minisart® type guarantees the lowest hold-up volume |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your sample preparation with our **Application Guide Disc**.

# Sample preperation: Minisart® Syringe Filters non-sterile

## Minisart® RC Syringe Filters,

for fastest sample preperation and high chemical compatibility, regenerated Cellulose membrane, PP[5] housing, connector inlet: Female Luer Lock, non-sterile[1]

| Type | Pore size [µm] | MF Ø [mm] \| Process volume[4] | Connector outlet | Pack size | Order number |
|---|---|---|---|---|---|
| Minisart® RC4 | 0.2 | 4 \| 1 ml | Male Luer Slip | 50 | 17821----------K |
| Minisart® RC4 | 0.2 | 4 \| 1 ml | Male Luer Slip | 500 | 17821----------Q |
| Minisart® RC15 | 0.2 | 15 \| 20 ml | Male Luer Slip | 50 | 17761----------K[2] |
| Minisart® RC15 | 0.2 | 15 \| 20 ml | Male Luer Slip | 100 | 17761----------N |
| Minisart® RC15 | 0.2 | 15 \| 20 ml | Male Luer Slip | 500 | 17761----------Q |
| Minisart® RC15 | 0.2 | 15 \| 20 ml | Male Luer Slip | 1,000 | 17761----------R |
| Minisart® RC25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 50 | 17764----------K[2] |
| Minisart® RC25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 200 | 17764----------S |
| Minisart® RC25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 500 | 17764----------Q[3] |
| Minisart® RC4 | 0.45 | 4 \| 1 ml | Male Luer Slip | 50 | 17822----------K |
| Minisart® RC4 | 0.45 | 4 \| 1 ml | Male Luer Slip | 500 | 17822----------Q[3] |
| Minisart® RC15 | 0.45 | 15 \| 20 ml | Male Luer Slip | 50 | 17762----------K |
| Minisart® RC15 | 0.45 | 15 \| 20 ml | Male Luer Slip | 500 | 17762----------Q |
| Minisart® RC25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 50 | 17765----------K |
| Minisart® RC25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 200 | 17765----------S |
| Minisart® RC25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 500 | 17765----------Q |

## Minisart® NY Syringe Filters,

for fast sample preparation and high chemical compatibility
Nylon membrane, PP[5] housing, connector inlet: Female Luer Lock

| Type | Pore size [µm] | MF Ø [mm] \| Process volume[4] | Connector outlet | Pack size | Order number |
|---|---|---|---|---|---|
| Minisart® NY15 | 0.2 | 15 \| 20 ml | Male Luer Slip | 50 \| non-sterile[1] | 1776B----------K |
| Minisart® NY15 | 0.2 | 15 \| 20 ml | Male Luer Slip | 500 \| non-sterile[1] | 1776B----------Q |
| Minisart® NY25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 50 \| EO-sterile | 17845--------ACK |
| Minisart® NY25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 500 \| non-sterile[1] | 17845----------Q |
| Minisart® NY25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 1,000 \| non-sterile[1] | 17845----------R |
| Minisart® NY15 | 0.45 | 15 \| 20 ml | Male Luer Slip | 50 \| non-sterile[1] | 1776C----------K |
| Minisart® NY15 | 0.45 | 15 \| 20 ml | Male Luer Slip | 500 \| non-sterile[1] | 1776C----------Q |
| Minisart® NY25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 50 \| EO-sterile | 17846--------ACK |
| Minisart® NY25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 500 \| non-sterile[1] | 17846----------Q |
| Minisart® NY25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 1,000 \| non-sterile[1] | 17846----------R |

## Minisart® NY25 X Plus Syringe Filters,

for fast sample preparation of high particulate liquids and high chemical compatibility
Nylon membrane and GF[5] depth filter, PP[5] housing, connector inlet: Female Luer Lock

| Type | Pore size [µm] | MF Ø [mm] \| Process volume[4] | Connector outlet | Pack size | Order number |
|---|---|---|---|---|---|
| Minisart® NY25 X Plus | 0.2 | 25 \| 100 ml | Male Luer Slip | 50 \| non-sterile[1] | 1784B----------K |
| Minisart® NY25 X Plus | 0.2 | 25 \| 100 ml | Male Luer Slip | 500 \| non-sterile[1] | 1784B----------Q |
| Minisart® NY25 X Plus | 0.45 | 25 \| 100 ml | Male Luer Slip | 50 \| non-sterile[1] | 1784C----------K |
| Minisart® NY25 X Plus | 0.45 | 25 \| 100 ml | Male Luer Slip | 500 \| non-sterile[1] | 1784C----------Q |

## Minisart® SRP Syringe Filters,

for fast sample preparation and maximum chemical compatibility,
PTFE membrane, PP[5] housing, connector inlet: Female Luer Lock, non-sterile[1]

| Type | Pore size [µm] | MF Ø [mm] \| Process volume[4] | Connector outlet | Pack size | Order number |
|---|---|---|---|---|---|
| Minisart® SRP4 | 0.2 | 4 \| 1 ml | Male Luer Slip | 500 | 17844----------Q |
| Minisart® SRP15 | 0.2 | 15 \| 20 ml | Male Spike | 50 | 17558----------K |
| Minisart® SRP15 | 0.2 | 15 \| 20 ml | Male Spike | 500 | 17558----------Q |
| Minisart® SRP15 | 0.2 | 15 \| 20 ml | Male Luer Slip | 50 | 17573----------K[2] |
| Minisart® SRP15 | 0.2 | 15 \| 20 ml | Male Luer Slip | 500 | 17573----------Q |
| Minisart® SRP25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 50 | 17575----------K[2] |
| Minisart® SRP25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 200 | 17575----------S |
| Minisart® SRP25 | 0.2 | 25 \| 100 ml | Male Luer Slip | 500 | 17575----------Q |

## Minisart® SRP Syringe Filters,

for fast sample preparation and maximum chemical compatibility,
PTFE membrane, PP[5] housing, connector inlet: Female Luer Lock, non-sterile[1]

| Type | Pore size [µm] | MF ∅ [mm] \| Process volume[4] | Connector outlet | Pack size | Order number |
|---|---|---|---|---|---|
| Minisart® SRP4 | 0.45 | 4 \| 1 ml | Male Luer Slip | 50 | 17820----------K |
| Minisart® SRP4 | 0.45 | 4 \| 1 ml | Male Luer Slip | 500 | 17820----------Q |
| Minisart® SRP15 | 0.45 | 15 \| 20 ml | Male Spike | 50 | 17559----------K |
| Minisart® SRP15 | 0.45 | 15 \| 20 ml | Male Spike | 500 | 17559----------Q |
| Minisart® SRP15 | 0.45 | 15 \| 20 ml | Male Luer Slip | 50 | 17574----------K |
| Minisart® SRP15 | 0.45 | 15 \| 20 ml | Male Luer Slip | 500 | 17574----------Q |
| Minisart® SRP25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 50 | 17576----------K |
| Minisart® SRP25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 200 | 17576----------S |
| Minisart® SRP25 | 0.45 | 25 \| 100 ml | Male Luer Slip | 500 | 17576----------Q |

For particle removal from larger volumes (e.g. eluents) we recommend the use of Midisart® filter units, Sartofluor® and Sartolon® capsules or disc filters with all-glass filter holders.

1) Supplied non-sterile, feasible sterilization methods: By ethylene oxide or by autoclaving 121°C, 30 min
2) Also available as individually, sterile packaged (EO): ----------K replaced by --------ACK
3) Also available as individually, sterile packaged (EO): ----------Q replaced by --------ACQ
4) The process volume is a recommended value and depends on the ratio of retentive substances
5) Materials
   Housing: Polypropylene, the pore size and the type of membrane of 15 mm and 25 mm syringe filters is printed on the housing, 4 mm filter units are packaged in a color coded tray (blue for 0.2 µm, yellow for 0.45 µm)
   Membrane: GF: Binder-free glass fiber depth filter | Nylon: Polyamide | PTFE: Polytetra-fluorethylene (hydrophobic material, hydrophilic after wetting with IPA) | RC: Regenerated Cellulose


PTFE 0.45 µm
NY 0.45µm
NY 0.20µm
RC 0.45µm
RC 0.20µm

# Clarification

Prior to sterile filtration steps or for general removal of particles and large microorganisms, such as yeasts and molds, Minisart® syringe filters, available in various pore sizes, are ideal for clarification, purification and ultra-cleaning of liquids. The filter units with their Luer Lock outlet can be screwed tightly to the inlet of the final filter. Syringe filters for these applications excel by high flow rates and low adsorption characteristics in order to fulfill your requirements.

# Clarification

**Reliable ultra-cleaning, purification and pre-filtration of liquids with Minisart® syringe filters with pore sizes ≥ 0.45 µm**

**Applications**
- Ultra-cleaning, purification, particulate removal and clarification of liquids
- Medical applications (see also page 43)

**Minisart® Features**
- Low adsorption
- Superior flow rate
- High total throughput
- Low hold-up volume
- Minimum extractables
- Easy pore size identification
- PVC-free

**Additional Minisart® Features**
- Pre-sterilized or non-sterile
- Gamma irradiated or EO sterilized
- Particulate-free
- Scaleable
- Certified quality
- Integrity testable
- 100% integrity tested
- Maximum chemical compatibility
- Various membrane diameters available
- Various outlet connectors available
- Bi-directional use
- CE-marked

**Media Types**
- Tissue culture-, nutrient-, cell line- and bone marrow media
- Additives for tissue culture and nutrient media
- Pharmaceuticals and cosmetics
- Diagnostics
- Buffers and emulsifiers
- Biological- and dilution solutions

# How do the Minisarts® meet my needs for my clarification?

| My Requirements are... | The Minisart® Features are... |
|---|---|
| **No interaction with the media** | |
| The composition of the ingredients of my media must stay the same prior to filtration | The Minisart® type should have the lowest adsorption of proteins and preservatives |
| The syringe filter must not release any particles into my media | The Minisart® type must be particulate-free |
| There should be no chemicals released from the syringe filter into my media | The Minisart® type should be extractable-free |
| Any possible residues from Ethylene oxide must be avoided | The Minisart® type should be gamma irradiated |
| The syringe filter should not be decomposed by solvents and aggressive solutions | The Minisart® type should have a high chemical compatibility |
| The plastic materials must be carefully selected and should not contain any softening agent | The Minisart® type must be PVC-free |
| **Superior performance** | |
| My filtration must be completed as fast as possible | The Minisart® type must have the highest flow rate |
| I don't want to change the filter within one filtration campaign | The Minisart® type must have the highest total throughput |
| **Flexibility** | |
| The small volume filtration must easily transition to my pilot or production scale | The membrane within Minisart® must be available in filter units with larger filtration areas |
| The syringe filter must have an optimal ratio between speed and hold-up volume | The Minisart® type should be available with various diameters |
| I want to be flexible in the future to decide which connectors are ideal for my application | The Minisart® type should be available with different outlet connectors |
| I don't want to be worry about the syringe filter orientation | The Minisart® type should be used bi-directional |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your clarification with our **Application Guide Disc**.

## Reliability & less validation work

| | |
|---|---|
| The syringe filter is used for a medical application | The Minisart® type must have the CE mark |
| I want to check the integrity of the syringe filter unit after use | The Minisart® type must be integrity testable |
| My main prerequisite is reliable elimination of any substances which are larger than the nominal pore size from my media | The integrity of every single Minisart® unit is tested during manufacturing |
| The syringe filter must provide documents to support my validation procedure | The Minisart® type must be validated and a Validation Guide should be available |
| I have to file a certificate which certifies the high quality of the syringe filter | The Minisart® type must have a certificate in each box |
| The pore size of the syringe filter must be clearly visible to me | The Minisart® type is color-coded or the pore size is printed on the housing |
| Any loss of my expensive media must be avoided | The design of the Minisart® type guarantees the lowest hold-up volume |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your clarification with our **Application Guide Disc**.

# Clarification: Minisart® Syringe Filters individually, sterile packaged

## Minisart® high flow Syringe Filters,

for fastest pre-filtration and low binding, individually, sterile packaged,
Polyethersulfone membrane, MBS[5] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF ∅ [mm] | Process volume[6] | Order number |
|---|---|---|---|---|---|---|---|
| Minisart® high flow | 0.45 | EO | yellow | Male Luer Lock | 28 | 100 ml | 16537----------K |
| Minisart® high flow | 0.45 | GI | yellow | Male Luer Slip | 28 | 100 ml | 16533--------GUK |
| Minisart® high flow | 0.45 | EO | yellow | Male Luer Slip | 28 | 100 ml | 16533----------K |

## Minisart® NML Syringe Filters,

for fast pre-filtration and lowest binding, individually, sterile packaged,
surfactant-free Cellulose Acetate membrane, MBS[5] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF ∅ [mm] | Process volume[6] | Order number |
|---|---|---|---|---|---|---|---|
| Minisart® NML | 0.45 | GI | yellow | Male Luer Lock | 28 | 100 ml | 16555--------GUK |
| Minisart® NML | 0.45 | EO | yellow | Male Luer Lock | 28 | 100 ml | 16555----------K |
| Minisart® NML | 0.45 | EO | yellow | Male Luer Slip | 28 | 100 ml | 17598----------K |
| Minisart® NML | 0.65 | EO | pink | Male Luer Slip | 28 | 100 ml | 16569----------K |
| Minisart® NML | 0.8 | GI | green | Male Luer Lock | 28 | 100 ml | 16592--------GUK |
| Minisart® NML | 0.8 | EO | green | Male Luer Lock | 28 | 100 ml | 16592----------K |
| Minisart® NML | 1.2 | GI | red | Male Luer Lock | 28 | 100 ml | 17593--------GUK |
| Minisart® NML | 1.2 | EO | red | Male Luer Lock | 28 | 100 ml | 17593----------K |
| Minisart® NML | 5 | EO | brown | Male Luer Lock | 28 | 100 ml | 17594----------K |
| Minisart® PA | 20 µm Nylon gauze | EO | transparent | Male Luer Lock | 28 | 100 ml | 17710--------TUK |

## Minisart® plus Syringe Filters,

for fast pre-filtration and high throughput, individually, sterile packaged, surfactant-free Cellulose Acetate membrane and GF[5] depth filter, MBS[5] housing, color code: yellow, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Connector outlet | MF ∅ [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|
| Minisart® plus | 0.45 | GI | Male Luer Lock | 28 \| 100 ml | 17829--------GUK |
| Minisart® plus | 0.45 | EO | Male Luer Lock | 28 \| 100 ml | 17829----------K |

## Minisart® NY25 Syringe Filters,

for fast pre-filtration and high chemical compatibility, individually, sterile packaged,
Nylon membrane, PP[5] housing (pore size printed on), connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Connector outlet | MF ∅ [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|
| Minisart® NY25 | 0.45 | EO | Male Luer Slip | 25 \| 100 ml | 17846--------ACK |

# Clarification: Minisart® Syringe Filters non-sterile

## Minisart® Syringe Filters,

for various pre-filtrations, non-sterile, connector inlet: Female Luer Lock, 500 units

| Type | Pore size [µm] | MF \| Housing[5] | Feasible sterilization[1] | Color code | Connector outlet | MF ∅ [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|---|---|
| Minisart® high flow | 0.45 | PES \| MBS | EO, GI | yellow | Male Luer Lock | 28 \| 100 ml | 16537----------Q |
| Minisart® high flow | 0.45 | PES \| MBS | EO, GI | yellow | Male Luer Slip | 28 \| 100 ml | 16533----------Q |
| Minisart® NML | 0.45 | SFCA \| MBS | EO, GI | yellow | Male Luer Lock | 28 \| 100 ml | 16555----------Q |
| Minisart® NML | 0.45 | SFCA \| MBS | EO, GI | yellow | Male Luer Slip | 28 \| 100 ml | 17598----------Q |
| Minisart® plus | 0.45 | SFCA+GF \| MBS | EO, GI | yellow | Male Luer Lock | 28 \| 100 ml | 17829----------Q |
| Minisart® RC4 | 0.45 | RC \| PP | EO, AU | yellow[7] | Male Luer Slip | 4 \| 1 ml | 17822----------Q[2] |
| Minisart® RC15 | 0.45 | RC \| PP | EO, AU | printed[7] | Male Luer Slip | 15 \| 20 ml | 17762----------Q[2] |
| Minisart® RC25 | 0.45 | RC \| PP | EO, AU | printed[7] | Male Luer Slip | 25 \| 100 ml | 17765----------Q[2,3] |
| Minisart® NY15 | 0.45 | Nylon \| PP | EO, AU | printed[7] | Male Luer Slip | 15 \| 20 ml | 1776B----------Q[2] |
| Minisart® NY25 | 0.45 | Nylon \| PP | EO, AU | printed[7] | Male Luer Slip | 25 \| 100 ml | 17846----------Q[4] |
| Minisart® NY25 X Plus | 0.45 | Nylon+GF \| PP | EO, AU | printed[7] | Male Luer Slip | 25 \| 100 ml | 1784C----------Q[2] |
| Minisart® SRP4 | 0.45 | PTFE \| PP | EO, AU | yellow[7] | Male Luer Slip | 4 \| 1 ml | 17820----------Q[2] |
| Minisart® SRP15 | 0.45 | PTFE \| PP | EO, AU | printed[7] | Male Spike | 15 \| 20 ml | 17559----------Q[2] |
| Minisart® SRP15 | 0.45 | PTFE \| PP | EO, AU | printed[7] | Male Luer Slip | 15 \| 20 ml | 17574----------Q[2] |
| Minisart® SRP25 | 0.45 | PTFE \| PP | EO, AU | printed[7] | Male Luer Slip | 25 \| 100 ml | 17576----------Q[2,3] |
| Minisart® GF | – | GF \| MBS | EO | white | Male Luer Lock | 28 \| 100 ml | 17824----------Q[2] |

## Minisart® Syringe Filters,

for various pre-filtrations, non-sterile, connector inlet: Female Luer Lock, 500 units

| Type | Pore size [µm] | MF \| Housing[5] | Feasible sterilization[1] | Color code | Connector outlet | MF ∅ [mm] \| Process volume[6] | Order number |
|---|---|---|---|---|---|---|---|
| Minisart® NML | 0.8 | SFCA \| MBS | EO, GI | green | Male Luer Lock | 28 \| 100 ml | 16592----------Q |
| Minisart® NML | 1.2 | SFCA \| MBS | EO, GI | red | Male Luer Lock | 28 \| 100 ml | 17593----------Q |
| Minisart® plus | 1.2 | SFCA+GF \| MBS | EO, GI | red | Male Luer Lock | 28 \| 100 ml | 17825----------Q |
| Minisart® NML | 5 | SFCA \| MBS | EO, GI | brown | Male Luer Lock | 28 \| 100 ml | 17594----------Q |
| Minisart® GF | - | GF \| MBS | EO, GI | white | Male Luer Lock | 28 \| 100 ml | 17824----------Q |
| Minisart® GF | - | GF \| MBS | EO, GI | white | Male Luer Slip | 28 \| 100 ml | 17856----------Q |

Minisart® syringe filters with pore sizes < 0.45 µm are described under the section „Sterile Filtration".

1) Sterilization
EO: Ethylene oxide | GI: Gamma irradiation | AU: Autoclave 121°C, 30 min
2) Also available as box with 50 units: ----------Q replaced by ----------K
3) Also available as box with 200 units: ----------Q replaced by ----------S
4) Also available as box with 1,000 units: ----------Q replaced by ----------R
5) Materials
MBS: Meta acrylate butadiene styrene polymerisate | PP: Polypropylene
GF: Binder-free glass fiber depth filter | Nylon: Polyamide | PES: Polyethersulfone | PTFE: Polytetra-fluorethylene (hydrophobic material, hydrophilic after wetting with IPA) | RC: Regenerated Cellulose | SFCA: Surfactant-free Cellulose Acetate
6) The process volume is a recommended value and depends on the ratio of retentive substances
7) The pore size and the type of membrane of 15 mm and 25 mm syringe filters is printed on the housing, 4 mm filter units are packaged in a color coded tray (blue for 0.2 µm, yellow for 0.45 µm)


SRP 25
RC 0.45µm
RC 0.45µm

# Medical Applications

Sterile filtration of liquids or gases | air in hospitals, pharmacies and direct patient care are the optimal method for the preparation of pharmaceuticals, infusion solutions and blood | urine samples for laboratory tasks. More than 15 different types of Minisart® syringe filters are CE-marked and available with various types of membranes, connectors and housing materials.

# Medical Applications

**Minisart® syringe filters with various pore sizes for use in hospitals, pharmacies and for direct patient care**

**Applications**
- Filtration of serum and urine samples
- Filtration of patient serum (IVF)
- Filtration of buffer solutions
- Filtration of infusion- and parenteral solutions
- Filtration of pharmaceuticals and chemotherapeuticals
- Filtration of diagnostics and anesthetics

**Minisart® Features**
- Low adsorption
- Superior flow rate
- High total throughput
- Low hold-up volume
- Particulate-free
- Minimum extractables
- Easy pore size identification
- PVC-free

**Additional Minisart® Features**
- Pre-sterilized or non-sterile
- Gamma irradiated or EO sterilized
- CE-marked
- Certified quality
- Fully validated
- Integrity testable
- 100% integrity tested
- Easy to stick to other plastic parts
- Scaleable
- Bi-directional use
- Various membrane diameters available
- Various outlet connectors available
- Maximum chemical compatibility

**Additional Applications**
- Total parenteral nutrition
- Sterile venting of containers
- Sterile venting of tubing | infusion systems

# How do the Minisarts® meet my needs for my medical applications?

| My Requirements are... | The Minisart® Features are... |
|---|---|
| **No interaction with the media** | |
| The composition of the ingredients of my media must stay the same prior to filtration | The Minisart® type should have the lowest adsorption of proteins and preservatives |
| The syringe filter must not release any particles into my media | The Minisart® type must be particulate-free |
| There should be no chemicals released from the syringe filter into my media | The Minisart® type should be extractable-free |
| Any possible residues from Ethylene oxide must be avoided | The Minisart® type should be gamma irradiated |
| The syringe filter should not be decomposed by solvents and aggressive solutions | The Minisart® type should have a high chemical compatibility |
| The plastic materials must be carefully selected and should not contain any softening agent | The Minisart® type must be PVC-free |
| **Superior performance** | |
| My filtration must be completed as fast as possible | The Minisart® type must have the highest flow rate |
| I don't want to change the filter within one filtration campaign | The Minisart® type must have the highest total throughput |
| **Flexibility** | |
| The small volume filtration must easily transition to my pilot or production scale | The membrane within Minisart® must be available in filter units with larger filtration areas |
| The syringe filter must have an optimal ratio between speed and hold-up volume | The Minisart® type should be available with various diameters |
| I want to be flexible in the future to decide which connectors are ideal for my application | The Minisart® type should be available with different outlet connectors |
| I don't want to be worry about the syringe filter orientation | The Minisart® type should be used bi-directional |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your medical application with our **Application Guide Disc**.

## Easy to process

| | |
|---|---|
| The syringe filter housing must be easily stick to other plastic parts i.e. tubes, cannulae | The Minisart® type must have a styrene housing |

## Reliability & less validation work

| | |
|---|---|
| The syringe filter is used for a medical application | The Minisart® type must have the CE mark |
| I want to check the integrity of the syringe filter unit after use | The Minisart® type must be integrity testable |
| My main prerequisite is reliable elimination of microorganisms or any other substances which are larger than the nominal pore size from my media | The integrity of every single Minisart® unit is tested during manufacturing |
| The syringe filter must provide documents to support my validation procedure | The Minisart® type must be validated and a Validation Guide should be available |
| I have to file a certificate which certifies the high quality of the syringe filter | The Minisart® type must have a certificate in each box |
| The pore size of the syringe filter must be clearly visible to me | The Minisart® type is color-coded or the pore size is printed on the housing |
| Any loss of my expensive media must be avoided | The design of the Minisart® type guarantees the lowest hold-up volume |

You can fold out the last page of this brochure to easily select your optimal Minisart® type for your medical application with our **Application Guide Disc**.

# Medical Applications: Minisart® Syringe Filters individually, sterile packaged

## Minisart® NML Syringe Filters,

mostly CE-marked, for fast liquid filtration and lowest binding, individually, sterile packaged,
surfactant-free Cellulose Acetate membrane, MBS[2] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF ∅ [mm] \| Process volume[3] | Order number | |
|---|---|---|---|---|---|---|---|
| Minisart® NML | 0.2[4] | GI | blue | Male Luer Lock | 28 \| 100 ml | 16534--------GUK | CE |
| Minisart® NML | 0.2[4] | EO | blue | Male Luer Lock | 28 \| 100 ml | 16534----------K | CE |
| Minisart® NML | 0.2[4] | EO | blue | Male Luer Slip | 28 \| 100 ml | 17597----------K | CE |
| Ophthalsart | 0.2 | EO | pink | Male Luer Slip | 28 \| 100 ml | 17528----------K | CE |
| Minisart® NML | 0.45 | GI | yellow | Male Luer Lock | 28 \| 100 ml | 16555--------GUK | CE |
| Minisart® NML | 0.45 | EO | yellow | Male Luer Lock | 28 \| 100 ml | 16555----------K | CE |
| Minisart® NML | 0.45 | EO | yellow | Male Luer Slip | 28 \| 100 ml | 17598----------K | CE |
| Minisart® NML | 0.65 | EO | pink | Male Luer Slip | 28 \| 100 ml | 16569----------K | |
| Minisart® NML | 0.8 | GI | green | Male Luer Lock | 28 \| 100 ml | 16592--------GUK | |
| Minisart® NML | 0.8 | EO | green | Male Luer Lock | 28 \| 100 ml | 16592----------K | |
| Minisart® NML | 1.2 | GI | red | Male Luer Lock | 28 \| 100 ml | 17593--------GUK | |
| Minisart® NML | 1.2 | EO | red | Male Luer Lock | 28 \| 100 ml | 17593----------K | |
| Minisart® NML | 5 | EO | brown | Male Luer Lock | 28 \| 100 ml | 17594----------K | |
| Minisart® PA | 20 µm Nylon gauze | EO | transparent | Male Luer Lock | 28 \| 100 ml | 17710--------TUK | |

## Minisart® Air,

with connected needle, for sterile venting, validated, individually, double packaged, sterile, optimal for use in isolators, PTFE membrane, MBS[2] housing, connector inlet: Female Luer Lock, 50 units

| Type | Pore size [µm] | Sterilization[1] | Color code | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|
| Minisart® Air | 0.2 | GI | yellow | Male Luer Slip + needle | 15 | 16596--------HNK |

## Minisart® HY and SRP Syringe Filters,

mostly CE-marked, for sterile venting and gas filtration, individually, sterile packaged, PTFE membrane, pore size 0.2 µm, connector inlet: Female Luer Lock, 50 units

| Type | Housing material[2] | Sterilization[1] | Color code | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|
| Minisart® HY | MBS | EO | white | Male Luer Lock | 26 | 16596--------HYK CE |
| Minisart® SRP25 | PP | EO | pore size printed on | Male Luer Slip | 25 | 17575--------ACK CE |

# Medical Applications: Minisart® Syringe Filters non-sterile

## Minisart® NML Syringe Filters,

mostly CE-marked, for fast liquid filtration and lowest binding, non-sterile
surfactant-free Cellulose Acetate membrane, MBS[2] housing, connector inlet: Female Luer Lock, 500 units

| Type | Pore size [µm] | Feasible sterilization[1] | Color code | Connector outlet | MF ∅ [mm] \| Process volume[3] | Order number |
|---|---|---|---|---|---|---|
| Minisart® NML | 0.2 | EO, GI | blue | Male Luer Lock | 28 \| 100 ml | 16534----------Q CE |
| Minisart® NML | 0.2 | EO, GI | blue | Male Luer Slip | 28 \| 100 ml | 17597----------Q CE |
| Minisart® NML | 0.45 | EO, GI | yellow | Male Luer Lock | 28 \| 100 ml | 16555----------Q CE |
| Minisart® NML | 0.45 | EO, GI | yellow | Male Luer Slip | 28 \| 100 ml | 17598----------Q CE |
| Minisart® NML | 0.8` | EO, GI | green | Male Luer Lock | 28 \| 100 ml | 16592----------Q |
| Minisart® NML | 1.2 | EO, GI | red | Male Luer Lock | 28 \| 100 ml | 17593----------Q |
| Minisart® NML | 5 | EO, GI | brown | Male Luer Lock | 28 \| 100 ml | 17594----------Q |

## Minisart® Air,

for sterile venting and gas filtration, validated, non-sterile, gamma-irradiatable
PTFE membrane, pore size 0.2 µm, connector inlet: Female Luer Lock, 500 units

| Type | Housing material[2] | Feasible sterilization[1] | Color code | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|
| Minisart® Air | MBS | EO \| GI | yellow | Male Luer Slip | 15 | 1751A----------Q |

## Minisart® HY Syringe Filters,

mostly CE-marked, for sterile venting and gas filtration, non-sterile,
PTFE membrane, 500 units

| Type | Housing material[2] | Pore size [µm] | Feasible sterilization[1] | Connector inlet | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|---|
| Minisart® HY | MBS | 0.2 | EO | Female Luer Lock | Male Luer Lock | 26 | 16596--------HYQ CE |
| Minisart® HY | MBS | 0.2 | EO | Female Luer Lock | Male Luer Slip | 26 | 17595--------HYQ |
| Minisart® HY | MBS | 0.2 | EO | Male Luer Slip | Male Luer Lock | 26 | 16599--------HYQ CE |
| Minisart® HY | MBS | 0.2 | EO | Tube Connector ∅ 5 mm | Tube Connector ∅ 5 mm | 26 | 40078----------Q |
| Minisart® HY Res[5] | MBS | 0.45 | EO | Tube Connector ∅ 5 mm | Tube Connector ∅ 5 mm | 26 | 40080----------Q |

## Acticosart active carbon filter unit,

for ultra-cleaning of gases, e.g. to adsorb unpleasant smells, non-sterile,
MBS housing with high-adsorptive active carbon filling, two PTFE membranes, 500 units

| Type | Housing material[2] | Pore size [µm] | Feasible sterilization[1] | Connector inlet | Connector outlet | MF ∅ [mm] | Order number |
|---|---|---|---|---|---|---|---|
| Acticosart | MBS | inlet 5 µm outlet 0.45 µm | EO | Male Luer Slip | Male Luer Slip | 26 | 17840----------Q |

Other filter unit types with different, membranes, connectors and housing on request.

1) Sterilization
EO: Ethylene oxide | GI: Gamma irradiation
2) Materials
MBS: Meta acrylate butadiene styrene polymerisate | PP: Polypropylene
Nylon: Polyamide | PTFE: Polytetra-fluorethylene | SFCA: Surfactant-free Cellulose Acetate
3) The process volume is a recommended value and depends on the ratio of retentive substances
4) These Minisart® syringe filters are fully validated (Validation Guide can be obtained foc. Order No. SL-5707-e)
5) Minisart® HY Res is a liquid barrier with reservoir. For technical information, please refer to the Technical Specification Disc under "Actiosart", with two exceptions: The connectors are tube connectors ∅ 5 mm and Minisart® HY Res has no sealed 5 µm PTEE on the inlet.


PTFE 0.20

## Chemical Compatibility

| | PES membrane | SFCA membrane | PTFE membrane | RC membrane | Nylon membrane | Nylon gauze | GF depth filter | Housing MBS | Housing PP | Minisart® High Flow | Minisart® NML \| Ophthalsart | Minisart® plus | Minisart® GF | Minisart® HY | Minisart® PA | Acticosart | Minisart® Air | Minisart® RC | Minisart® NY | Minisart® SRP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Filter** | PES | SFCA | PTFE | RC | PA | PA | GF | | | PES | SFCA | SFCA + GF | GF | PTFE | PA | PTFE | PTFE | RC | PA | PTFE |
| **Housing** | | | | | | | | MBS | PP | MBS | MBS | MBS | MBS | MBS | MBS | MBS | MBS | PP | PP | PP |
| **Sterilization** | | | | | | | | | | | | | | | | | | | | |
| Ethylene oxide | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ |
| Gamma irradiation | ++ | ++ | -[1] | ++ | - | - | ++ | ++ | - | ++ | ++ | ++ | ++ | - | - | - | + | - | - | - |
| Autoclaving 121 °C, 30 min | ++ | ++ | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| **Solvents** | | | | | | | | | | | | | | | | | | | | |
| Acetone | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Acetonitrile | - | - | ++ | ++ | n.a. | n.a. | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | n.a. | ++ |
| Gasoline | + | + | ++ | ++ | ++ | ++ | ++ | ++ | ++ | + | + | + | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ |
| Benzene | - | + | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Benzyl alcohol | - | - | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| n-Butyl acetate | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| n-Butanol | + | + | ++ | ++ | ++ | ++ | ++ | ++ | ++ | + | + | + | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ |
| Cellosolve | ++ | - | ++ | ++ | ++ | ++ | ++ | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Chloroform | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Cyclohexane | - | + | ++ | ++ | ++ | ++ | ++ | + | + | - | + | + | + | + | + | + | + | + | + | + |
| Cyclohexanone | - | + | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Diethylacetamide | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Diethyl ether | - | + | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Dimethyl formamide | - | - | ++ | + | + | + | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Dimethylsulfoxide | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Dioxane | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Ethanol, 98% | ++ | + | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Ethyl acetate | - | - | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Ethylene glycol | ++ | + | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | + | + | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ |
| Formamide | ++ | - | ++ | + | ++ | ++ | ++ | ++ | ++ | ++ | - | - | ++ | ++ | ++ | ++ | ++ | + | ++ | ++ |
| Glycerin | ++ | + | ++ | ++ | ++ | ++ | ++ | + | + | + | + | + | + | + | + | + | + | + | + | + |
| n-Heptane | ++ | + | ++ | ++ | ++ | ++ | ++ | + | ++ | + | + | + | + | + | + | + | + | ++ | ++ | ++ |
| n-Hexane | ++ | + | ++ | ++ | ++ | ++ | ++ | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Isobutanol | ++ | + | ++ | ++ | ++ | ++ | ++ | ++ | - | ++ | + | + | ++ | ++ | ++ | ++ | ++ | - | - | - |
| Isopropanol | ++ | + | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | + | - | - | - | - | - | ++ | ++ | ++ |

| | PES membrane | SFCA membrane | PTFE membrane | RC membrane | Nylon membrane | Nylon gauze | GF depth filter | Housing MBS | Housing PP | Minisart® High Flow | Minisart® NML \| Ophthalsart | Minisart® plus | Minisart® GF | Minisart® HY | Minisart® PA | Acticosart | Minisart® Air | Minisart® RC | Minisart® NY | Minisart® SRP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Filter** | PES | SFCA | PTFE | RC | PA | PA | GF | | | PES | SFCA | SFCA + GF | GF | PTFE | PA | PTFE | PTFE | RC | PA | PTFE |
| **Housing** | | | | | | | | MBS | PP | MBS | MBS | MBS | MBS | MBS | MBS | MBS | MBS | PP | PP | PP |
| **Sterilization** | | | | | | | | | | | | | | | | | | | | |
| Isopropyl acetate | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Methanol, 98% | + | - | ++ | ++ | ++ | ++ | ++ | ++ | + | + | - | + | ++ | ++ | ++ | ++ | ++ | + | + | + |
| Methyl acetate | - | - | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Methylene chloride | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Methyl ethyl ketone | - | - | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Methyl isobutyl ketone | - | - | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Monochlorobenzene | - | - | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Nitrobenzene | - | - | ++ | ++ | + | + | ++ | - | + | - | - | + | - | - | - | - | - | + | + | + |
| n-Pentane | ++ | + | ++ | ++ | ++ | ++ | ++ | + | ++ | + | + | + | + | + | + | + | + | ++ | ++ | ++ |
| Perchloroethylene | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Pyridine | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | ++ | ++ | ++ |
| Carbon tetrachloride | - | - | ++ | ++ | ++ | ++ | ++ | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Tetrahydrofuran | - | - | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | ++ | - | - | - | - | - | ++ | ++ | ++ |
| Toluene | - | + | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | ++ | - | - | - | - | - | ++ | ++ | ++ |
| Trichloroethane | - | - | ++ | ++ | ++ | ++ | ++ | - | n.a. | - | - | - | - | - | - | - | - | n.a. | n.a. | n.a |
| Trichloroethylene | - | + | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | ++ | - | - | - | - | - | ++ | ++ | ++ |
| Xylene | - | + | ++ | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | - | - | - | + | + | + |
| **Acids** | | | | | | | | | | | | | | | | | | | | |
| Acetic acid, 25% | + | + | ++ | ++ | - | - | ++ | - | + | - | - | - | - | - | - | - | - | + | - | + |
| Acetic acid, 80% | n.a. | - | ++ | ++ | - | - | ++ | - | + | - | - | - | - | - | - | - | - | + | - | + |
| Hydrofluoric acid, 25% | + | - | ++ | + | - | - | ++ | + | + | + | - | - | + | + | - | + | + | + | - | + |
| Hydrofluoric acid, 50% | + | - | ++ | + | - | - | ++ | + | + | + | - | - | + | + | - | + | + | + | - | + |
| Perchloric acid, 25% | - | - | ++ | - | - | - | ++ | n.a. | + | - | - | - | n.a. | n.a. | - | n.a. | n.a. | - | - | + |
| Phosphoric acid, 1% | ++ | + | ++ | - | - | - | ++ | + | + | + | + | + | + | + | - | + | + | - | - | + |
| Phosphoric acid, 86% | ++ | + | ++ | - | - | - | ++ | + | + | + | + | + | + | + | - | + | + | - | - | + |
| Nitric acid, 30% | + | - | ++ | - | - | - | ++ | + | + | + | - | - | + | + | - | + | + | - | - | + |
| Nitric acid, conc. | - | - | ++ | - | - | - | ++ | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hydrochloric acid, 15% | ++ | + | ++ | - | - | - | ++ | + | + | + | + | + | + | + | - | + | + | - | - | + |
| Hydrochloric acid, 20% | ++ | - | ++ | - | - | - | ++ | + | + | + | - | - | + | + | - | + | + | - | - | + |

## Chemical Compatibility

| | PES membrane | SFCA membrane | PTFE membrane | RC membrane | Nylon membrane | Nylon gauze | GF depth filter | Housing MBS | Housing PP | Minisart® High Flow | Minisart® NML \| Ophthalsart | Minisart® plus | Minisart® GF | Minisart® HY | Minisart® PA | Acticosart | Minisart® Air | Minisart® RC | Minisart® NY | Minisart® SRP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Filter** | PES | SFCA | PTFE | RC | PA | PA | GF | | | PES | SFCA | SFCA + GF | GF | PTFE | PA | PTFE | PTFE | RC | PA | PTFE |
| **Housing** | | | | | | | | MBS | PP | MBS | MBS | MBS | MBS | MBS | MBS | MBS | MBS | PP | PP | PP |
| **Sterilization** | | | | | | | | | | | | | | | | | | | | |
| **Acids** | | | | | | | | | | | | | | | | | | | | |
| Sulfuric acid, 25% | + | - | ++ | + | - | - | ++ | + | ++ | + | - | - | + | + | - | + | + | + | - | ++ |
| Sulfuric acid, 98% | - | - | ++ | - | - | - | ++ | - | + | - | - | - | - | - | - | - | - | - | - | + |
| Trichloroacetic acid, 25% | n.a. | - | ++ | ++ | - | - | ++ | - | + | - | - | - | - | - | - | - | - | + | - | + |
| **Bases** | | | | | | | | | | | | | | | | | | | | |
| Ammonia, 1N | ++ | - | ++ | + | ++ | ++ | ++ | - | ++ | - | - | - | - | - | - | - | - | + | ++ | ++ |
| Ammonium hydroxide, 25% | + | + | ++ | + | ++ | ++ | + | - | + | - | - | - | - | - | - | - | - | + | + | + |
| Potassium hydroxide, 32% | ++ | - | ++ | - | + | + | + | - | ++ | - | - | - | - | - | - | - | - | - | + | ++ |
| Sodium hydroxide, 32% | ++ | - | ++ | - | + | + | + | - | + | - | - | - | - | - | - | - | - | - | + | + |
| Sodium hydroxide, 1N | ++ | - | ++ | + | ++ | ++ | + | - | ++ | - | - | - | - | - | - | - | - | + | ++ | ++ |
| Aqueous solutions | | | | | | | | | | | | | | | | | | | | |
| Formalin, 30% | + | ++ | ++ | + | ++ | ++ | ++ | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Sodium hypochlorite, 5% | ++ | - | ++ | - | - | - | ++ | + | + | + | - | - | + | + | - | + | + | - | - | + |
| Hydrogen peroxide, 35% | ++ | - | ++ | - | - | - | ++ | + | ++ | + | - | - | + | + | - | + | + | - | - | ++ |
| **pH range** | | | | | | | | | | | | | | | | | | | | |
| pH 1-14 | - | - | ++ | - | - | - | ++ | - | ++ | | | | | | | | | | | |
| pH 1-13 | ++ | - | ++ | - | - | | ++ | - | ++ | | | | | | | | | | | |
| pH 3-14 | + | - | ++ | + | ++ | ++ | ++ | - | ++ | | | | | | | | | | | |
| pH 3-12 | ++ | - | ++ | ++ | ++ | ++ | ++ | + | ++ | | | | | | | | | | | |
| pH 4-8 | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | | | | | | | | | | | |

| **Legend:** | |
|---|---|
| Compatible | ++ |
| Limited compatibility | + |
| Not compatible | - |
| not analyzed | n.a. |

1) gamma irradiation feasible for Minisart® Air

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 want to filter by performing a trial filtration run before you start your actual filtration.

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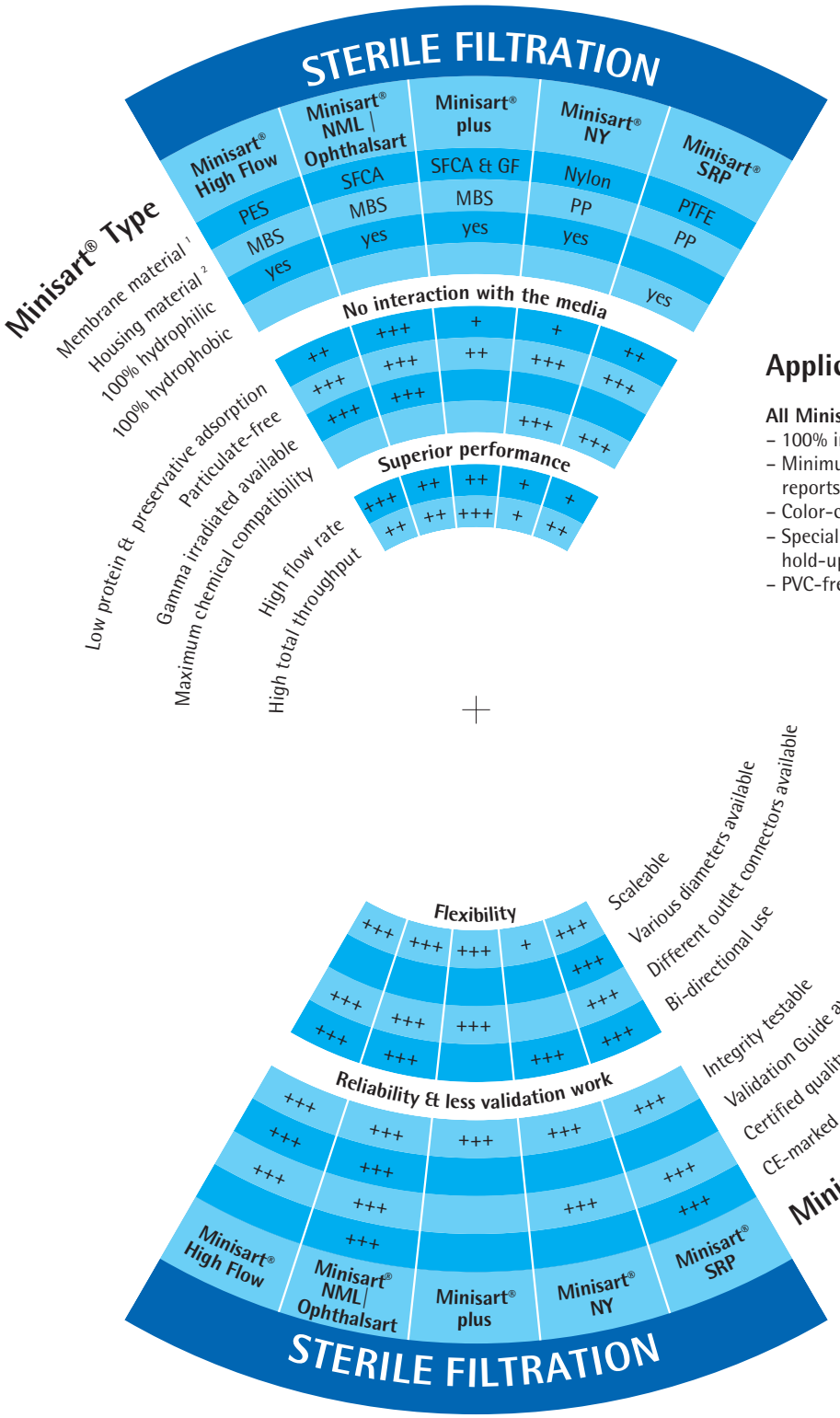
| 16596 | Minisart® HY | 0.2 µm | 19, 20, 48, 50 |
| 16596 | Minisart® Air | 0.2 µm | 19, 48 |
| 16599 | Minisart® HY | 0.2 µm | 20, 50 |
| 1751A | Minisart® Air | 0.2 µm | 21, 49 |
| 17528 | Ophthalsart | 0.2 µm | 11, 47 |
| 17558 | Minisart® SRP15 | 0.2 µm | 13, 20, 29 |
| 17559 | Minisart® SRP15 | 0.45 µm | 20, 30, 39 |
| 17573 | Minisart® SRP15 | 0.2 µm | 12, 13, 19, 20, 29 |
| 17574 | Minisart® SRP15 | 0.45 µm | 20, 30, 39 |
| 17575 | Minisart® SRP25 | 0.2 µm | 12, 13, 19, 20, 29, 48 |
| 17576 | Minisart® SRP25 | 0.45 µm | 20, 30, 39 |
| 17593 | Minisart® NML | 1.2 µm | 37, 40, 47, 49 |
| 17594 | Minisart® NML | 5 µm | 37, 40, 47, 49 |
| 17595 | Minisart® HY | 0.2 µm | 20, 50 |
| 17597 | Minisart® NML | 0.2 µm | 11, 13, 47, 49 |
| 17598 | Minisart® NML | 0.45 µm | 37, 39, 47, 49 |
| 17710 | Minisart® PA | 20 µm | 37, 47 |
| 1776B | Minisart® NY15 | 0.2 µm | 28 |
| 1776C | Minisart® NY15 | 0.45 µm | 28, 39 |
| 17761 | Minisart® RC15 | 0.2 µm | 27 |
| 17762 | Minisart® RC15 | 0.45 µm | 27, 39 |
| 17764 | Minisart® RC25 | 0.2 µm | 27 |
| 17765 | Minisart® RC25 | 0.45 µm | 27, 39 |
| 17820 | Minisart® SRP4 | 0.45 µm | 20, 30, 39 |
| 17821 | Minisart® RC4 | 0.2 µm | 27 |
| 17822 | Minisart® RC4 | 0.45 µm | 27, 39 |
| 17823 | Minisart® plus | 0.2 µm | 12, 13 |
| 17824 | Minisart® GF | – | 38, 40 |
| 17825 | Minisart® plus | 1.2 µm | 40 |
| 17829 | Minisart® plus | 0.45 µm | 38, 39 |
| 1784B | Minisart® NY25 X Plus | 0.2 µm | 28 |
| 1784C | Minisart® NY25 X Plus | 0.45 µm | 28,39 |
| 17840 | Acticosart | 0.45 µm | 50 |
| 17844 | Minisart® SRP4 | 0.2 µm | 13, 20, 29 |
| 17845 | Minisart® NY25 | 0.2 µm | 12, 13, 28 |
| 17846 | Minisart® NY25 | 0.45 µm | 28, 38, 39 |
| 17856 | Minisart® GF | – | 40 |
| 40078 | Minisart® HY | 0.2 µm | 20, 50 |
| 40080 | Minisart® HY Res | 0.45 µm | 20, 50 |




## Application Guide

**All Minisart® types are:**

- 100% integrity tested during manufacturing
- Minimum extractables, excerpts of test study reports can be requested f.o.c.
- Color-coded or their pore size is printed on
- Specially designed, to guarantee lowest hold-up volume
- PVC-free

**Legend:**

1) GF: Binder-free glass fiber depth filter | Nylon: Polyamide | PES: Polyethersulfone | PTFE: Polytetra-fluorethylene (hydrophobic material, hydrophilic after wetting with IPA) | RC: Regenerated Cellulose | SFCA: Surfactant-free Cellulose Acetate
2) MBS: Meta acrylate butadiene styrene | PP: Polypropylene
3) Non-sterile versions could be gamma irradiated
4) Minisart® Air is part of the fully validated Sterisart® NF system

\+ = good performance
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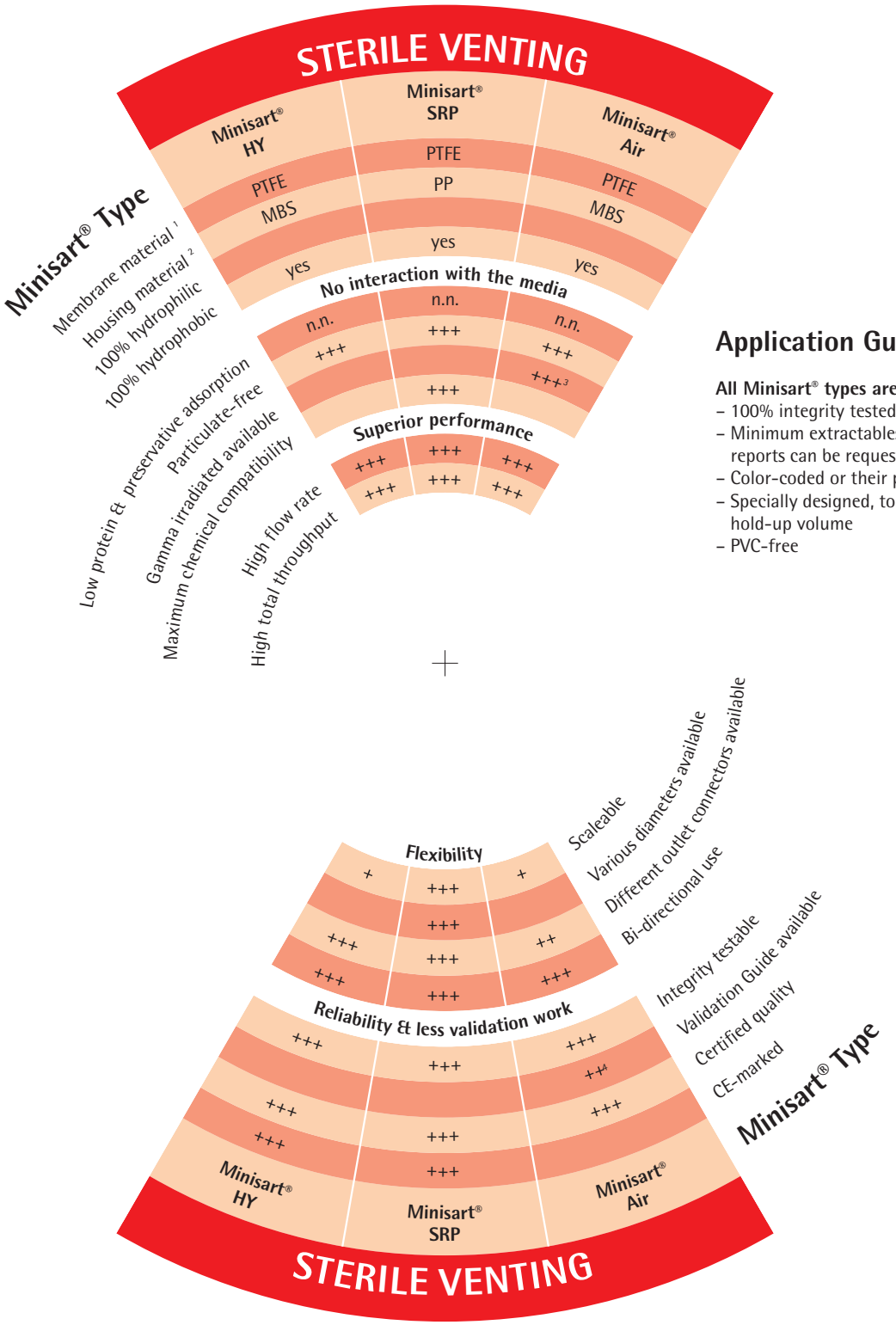


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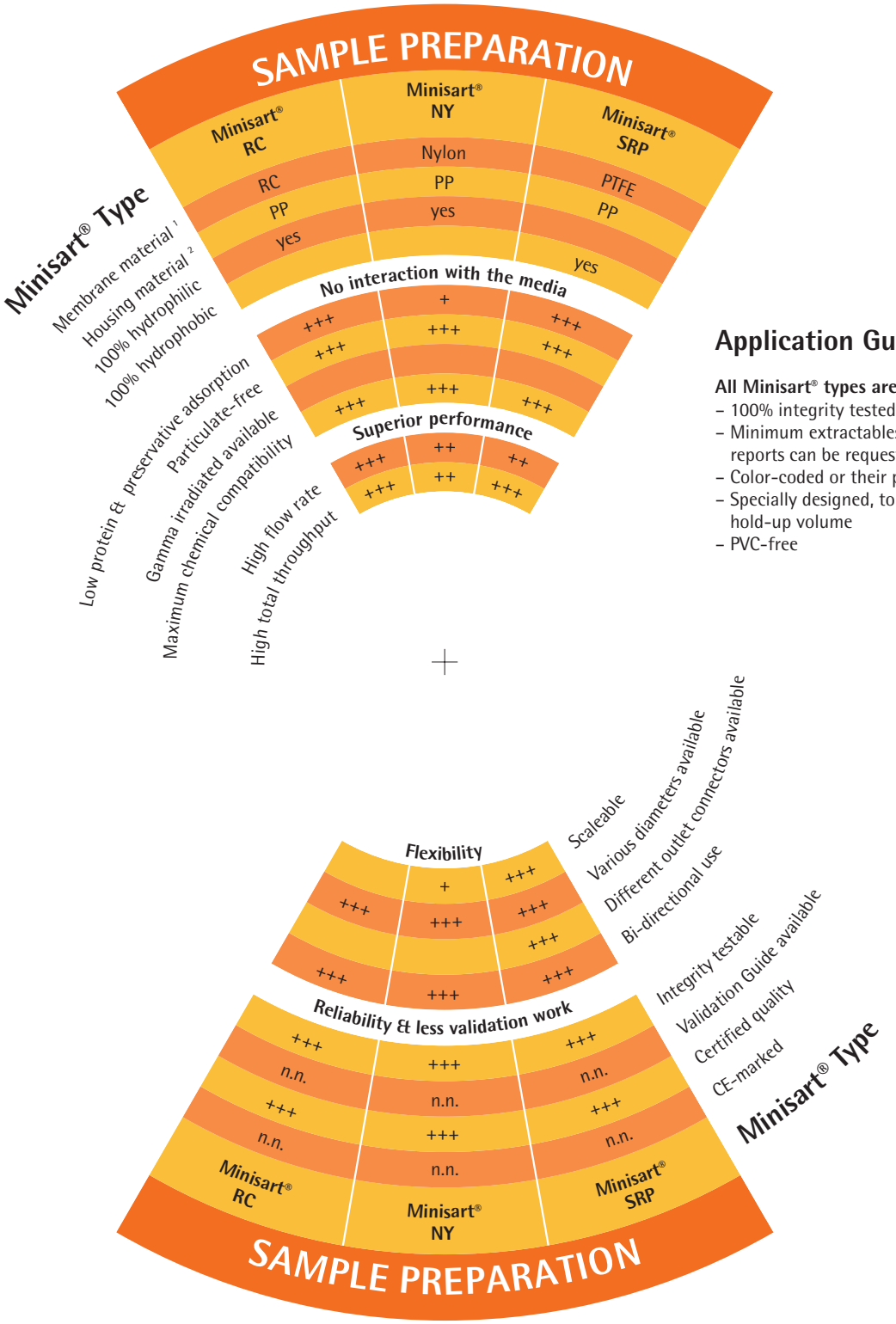


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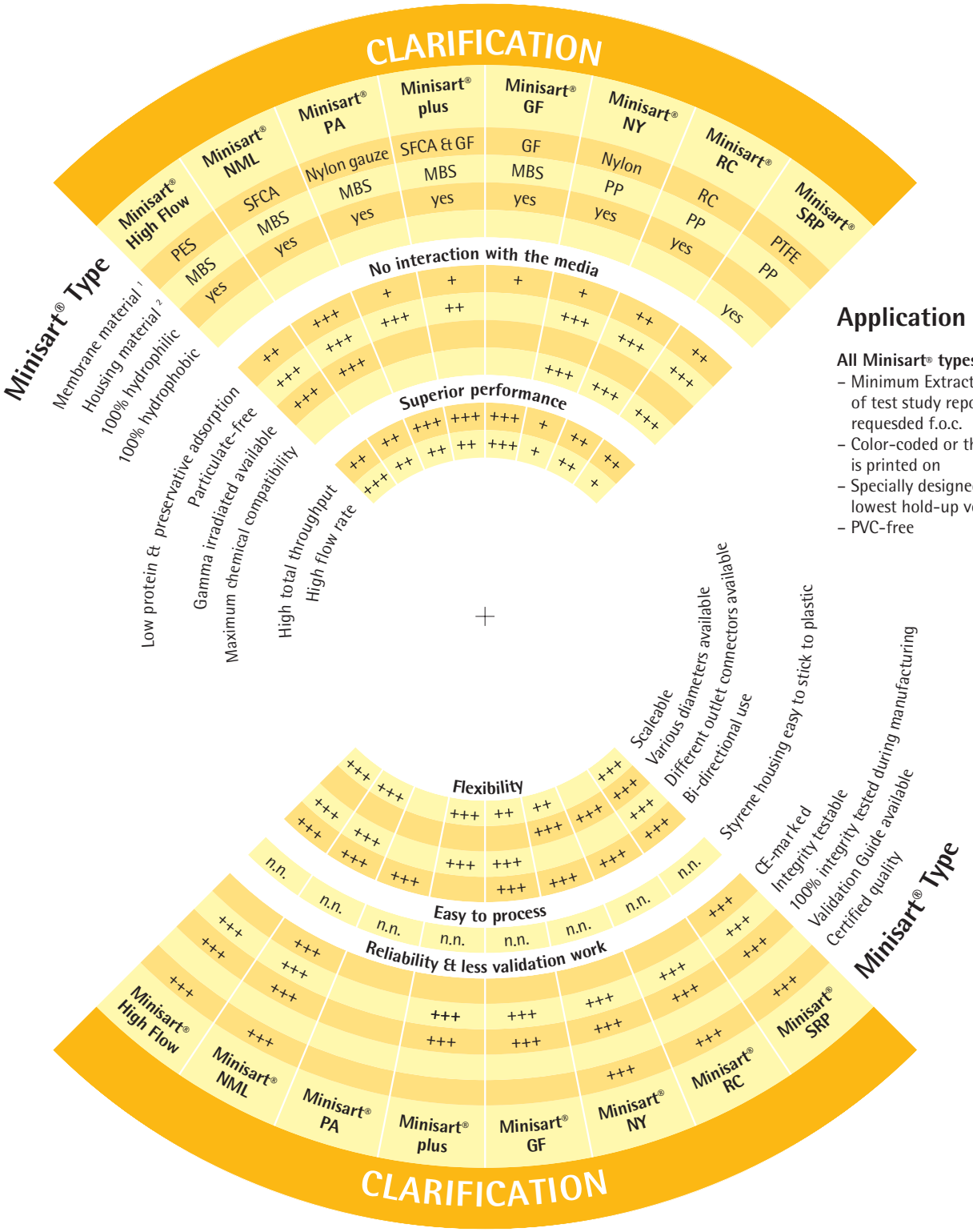


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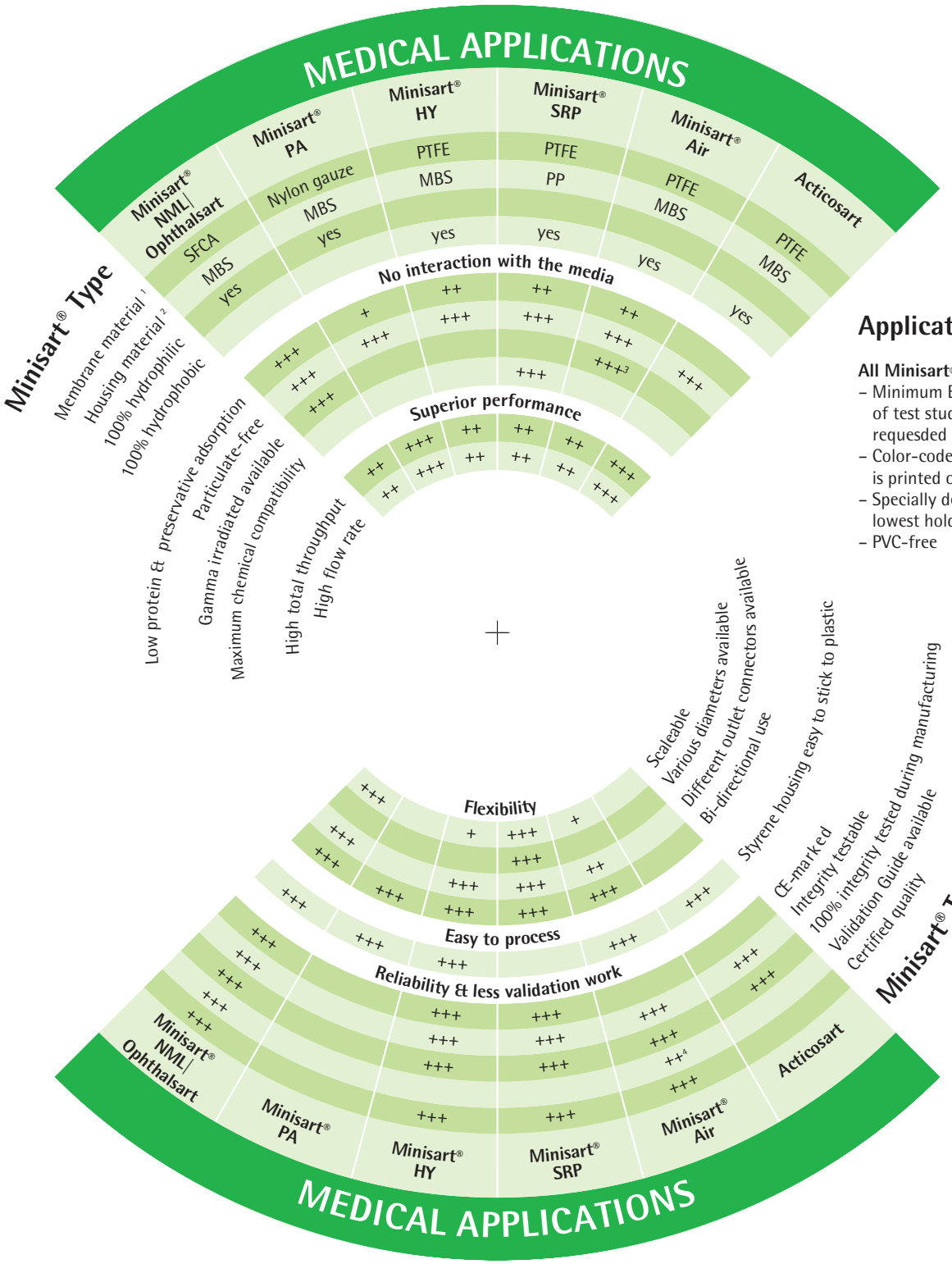


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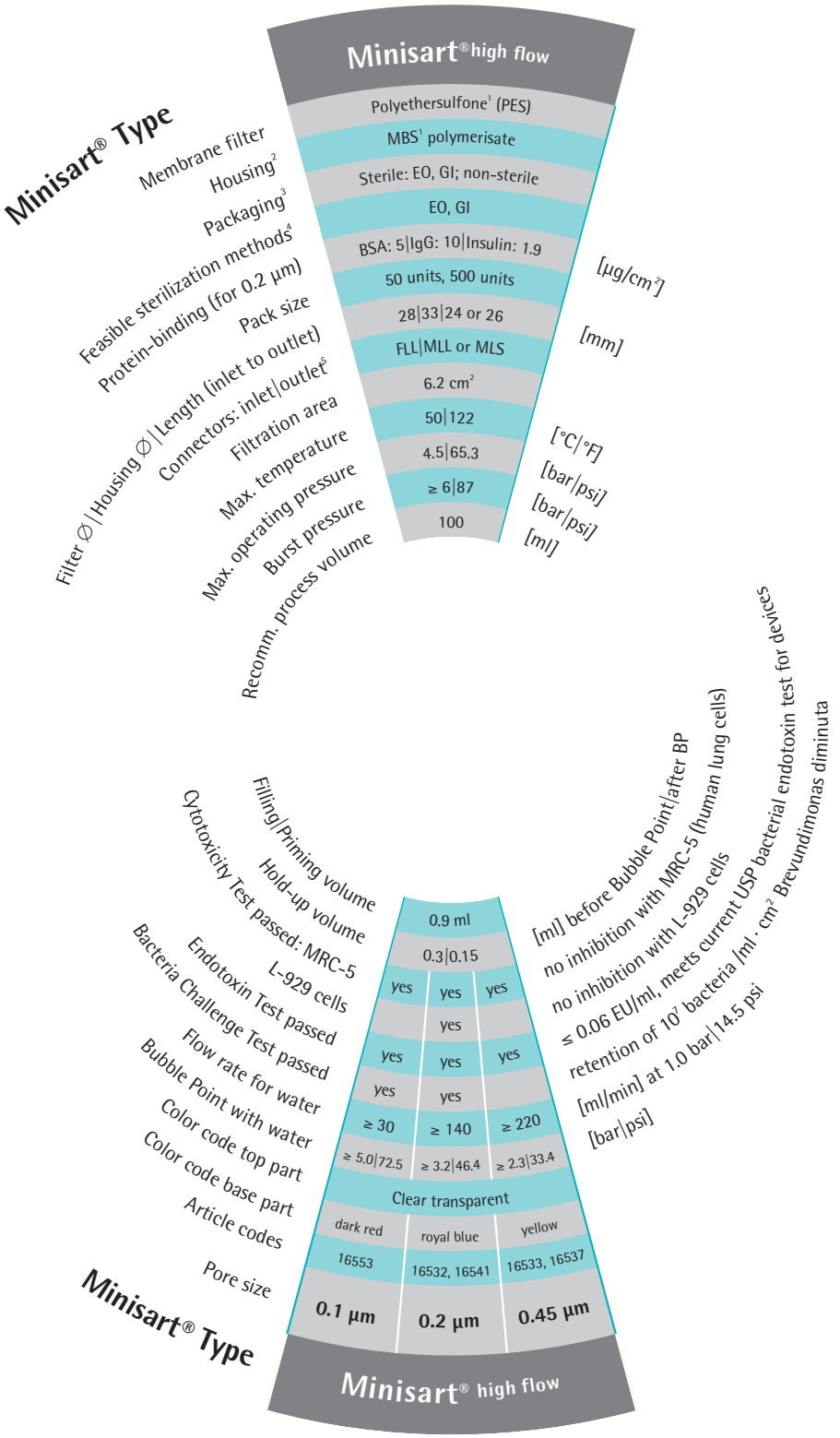


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2) MBS = Meta acrylate butadiene styrene
3) Sterile = individually, sterile packaged; EO = Ethylene oxide; GI = Gamma irradiation; non-sterile = bulk-packaged in PE bag
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5) FLL = Female Luer Lock; MLL = Male Luer Lock; MLS = Male Luer Slip (cone)

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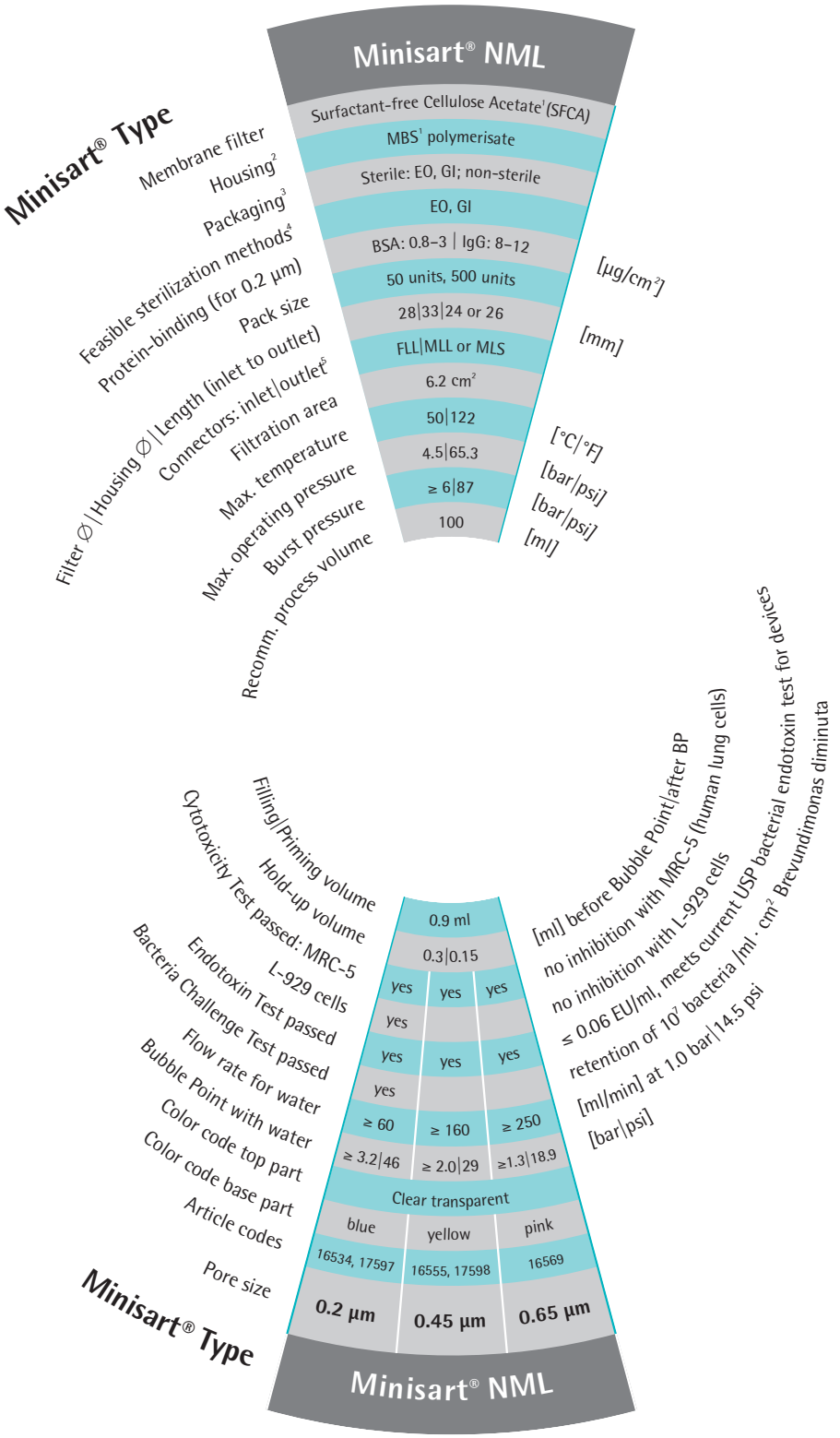


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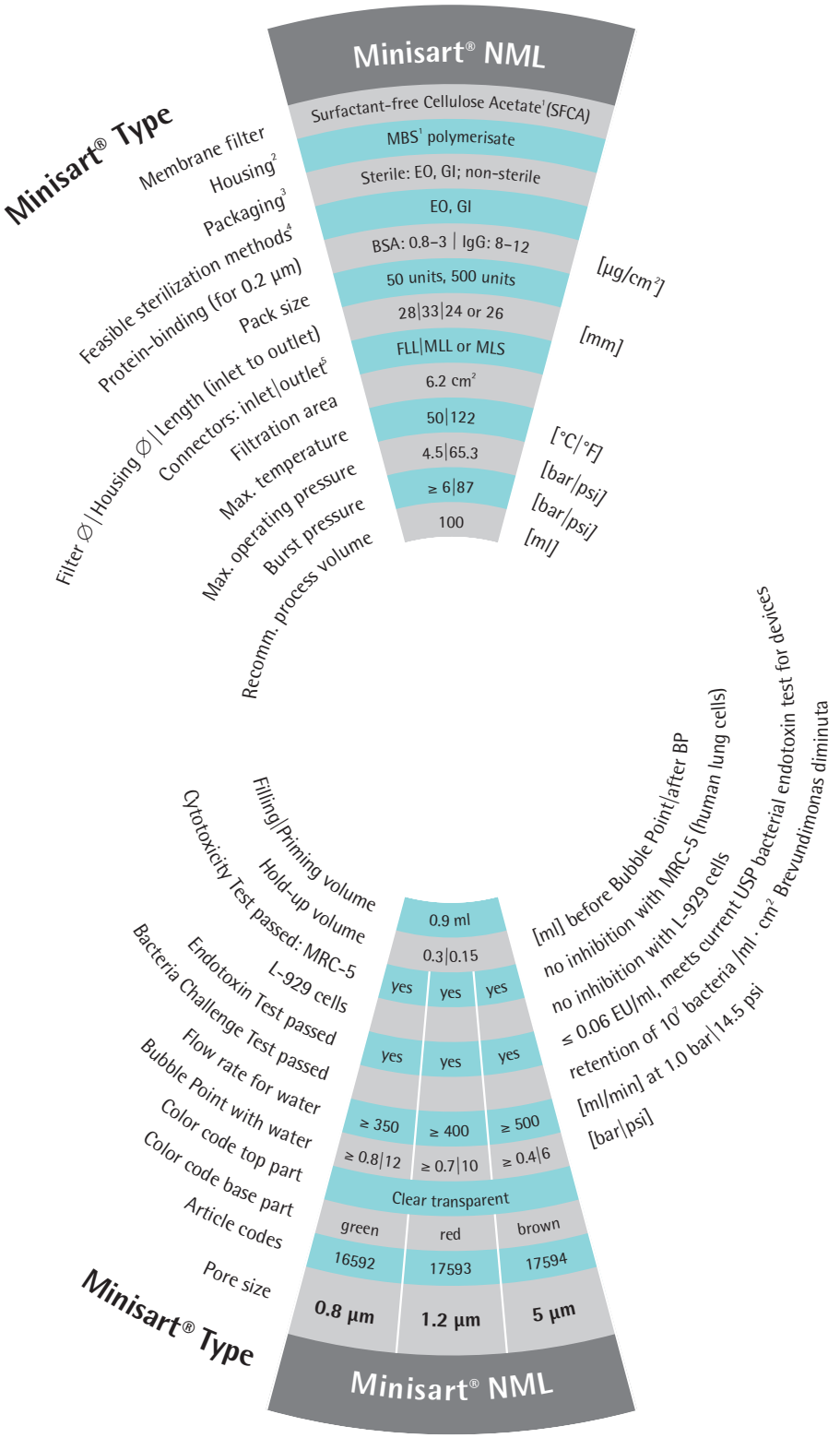


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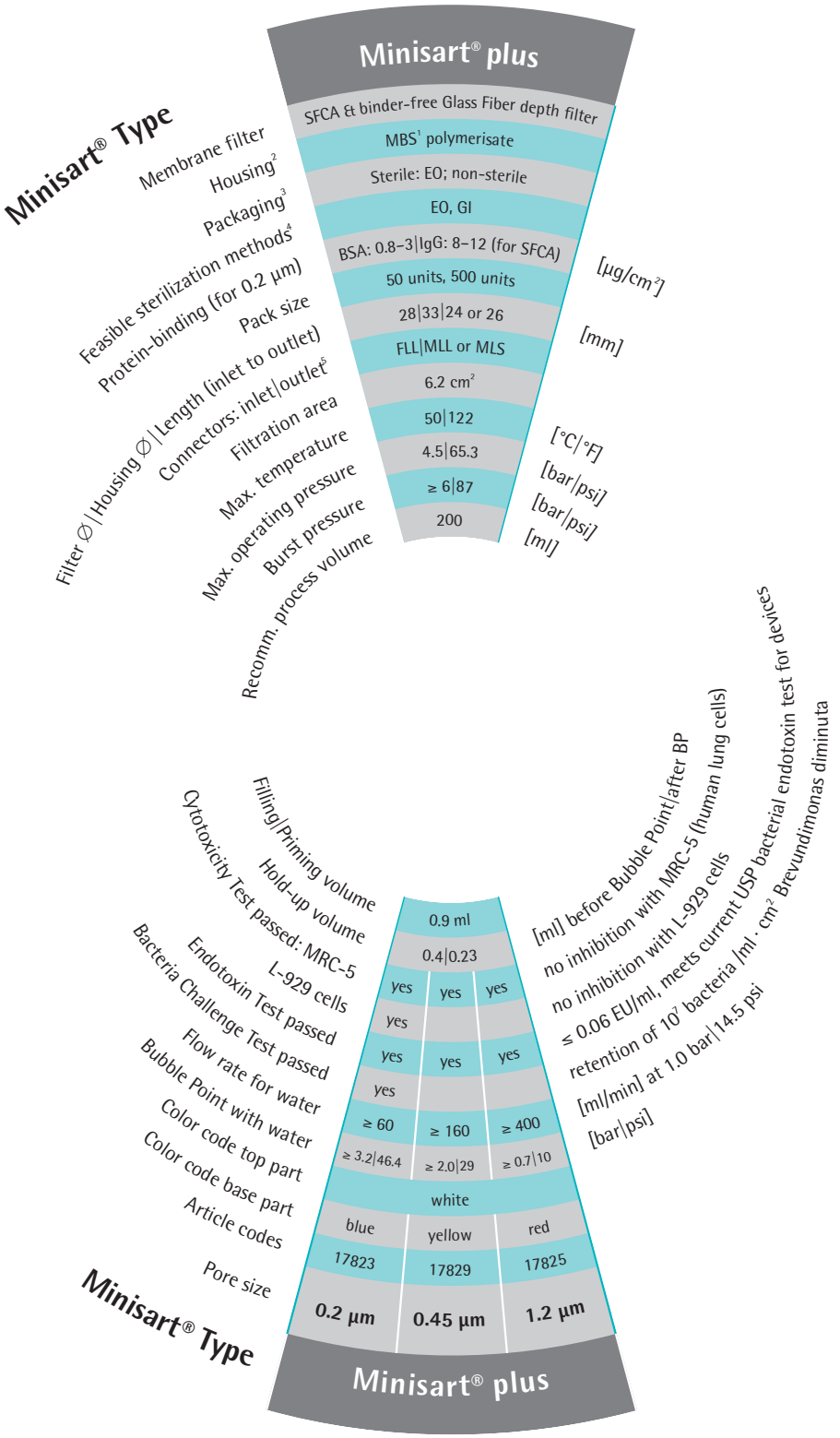


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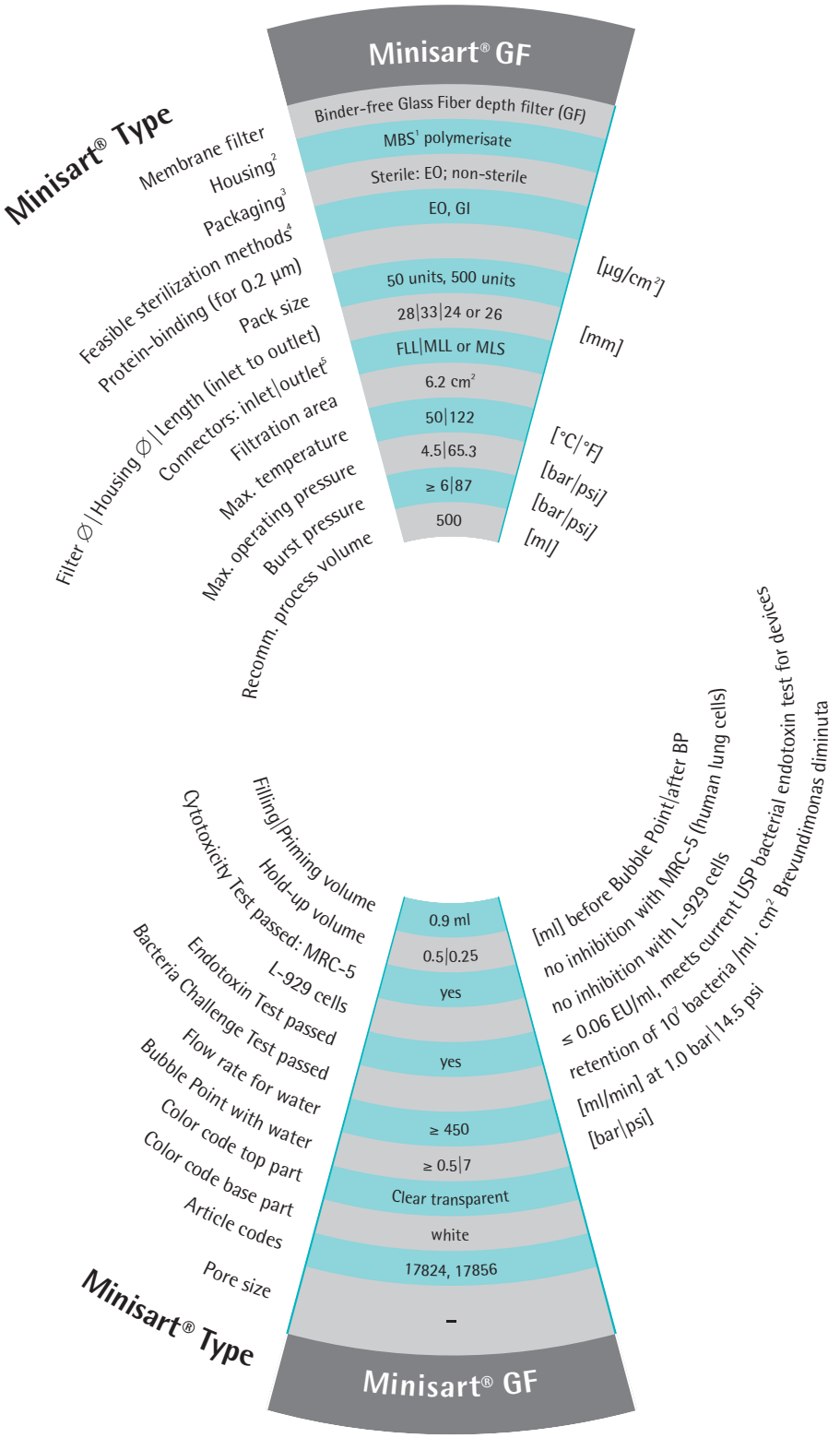


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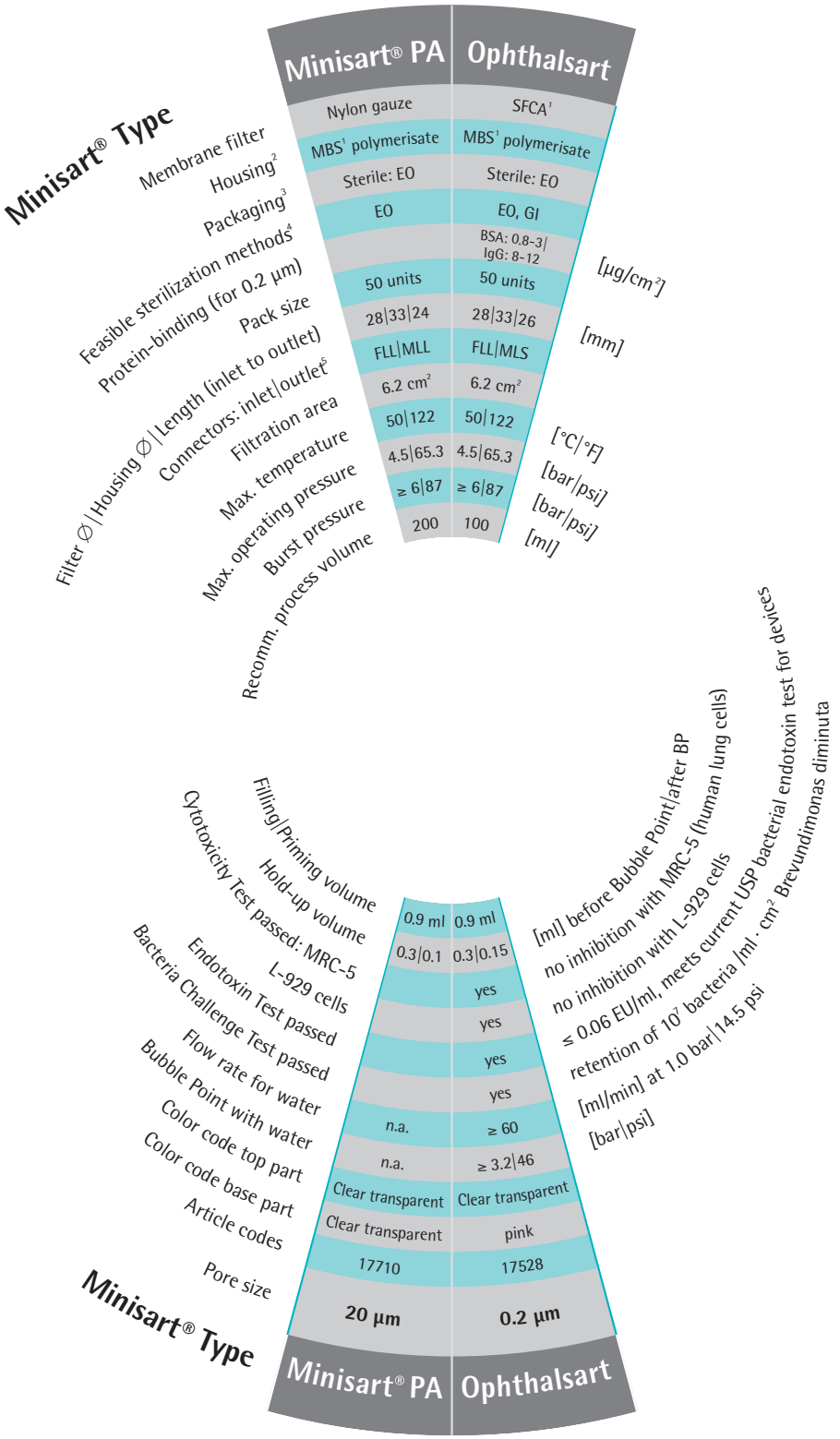


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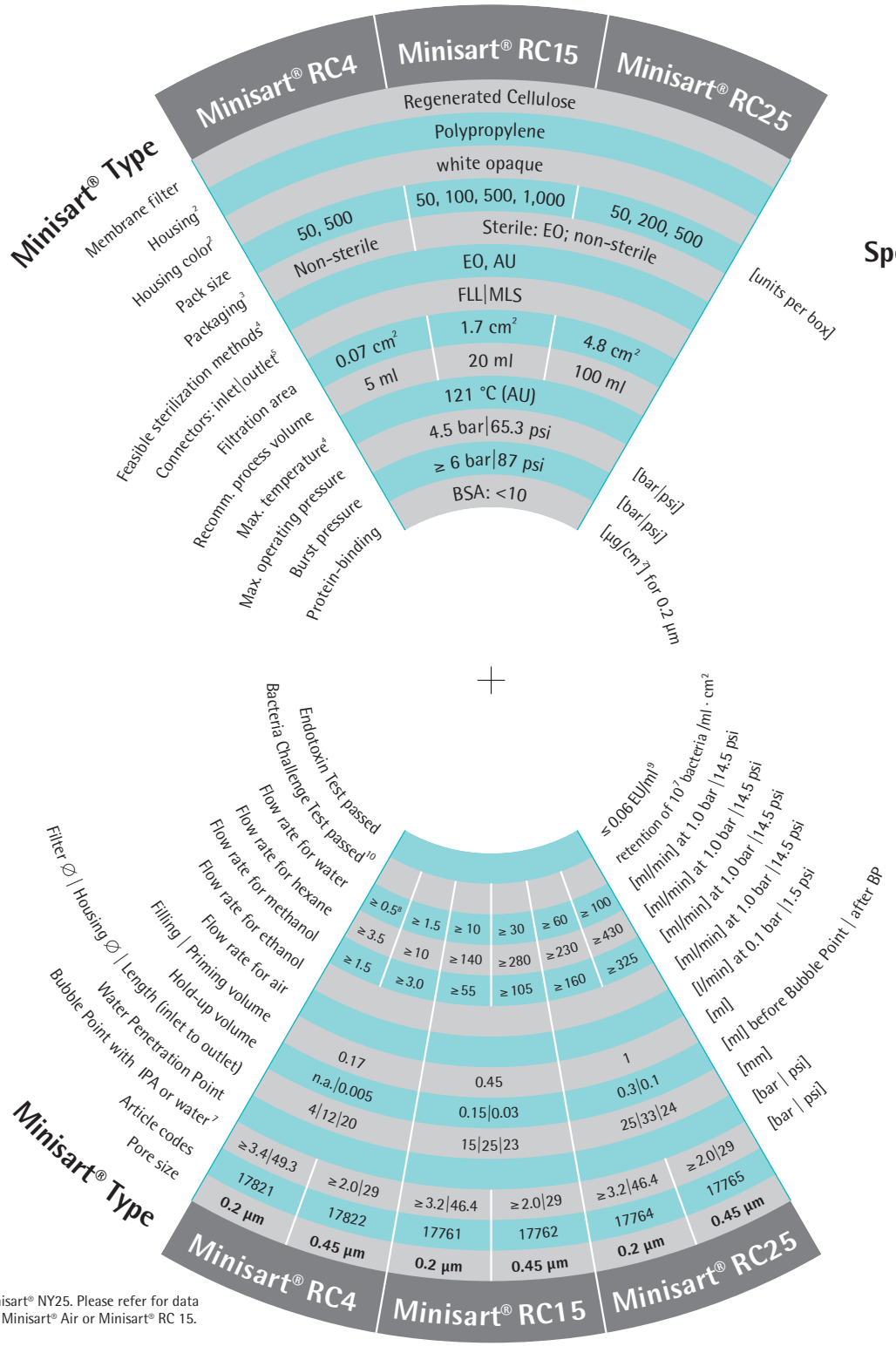


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1) On white opaque polypropylene housings the pore size is printed on.
1) For Minisart® RC4 and SRP4 the tray is color coded (blue = 0.2 µm, yellow = 0.45 µm)
3) Sterile = individually, sterile packaged; EO = Ethylene oxide;
1) GI = Gamma irradiation; non-sterile = bulk-packaged in PE bag
4) EO = Ethylene oxide; GI = Gamma irradiation; AU = autoclaving at 121 °C | 250 °F for 30 min
5) FLL = Female Luer Lock; MLL = Male Luer Lock; MLS = Male Luer Slip (cone); MS = Male Spike; TC = Tube connector
6) After gamma irradiation: 0.5 bar | 7.3 psi
7) Wetting fluid: IPA = Isopropyl alcohol (for hydrophobic membranes); water for hydrophilic membranes
8) At 3 bar | 43.5 psi; 9) Meets current USP bacterial endotoxin test for devices
10) Bacteria = Brevundimonas diminuta

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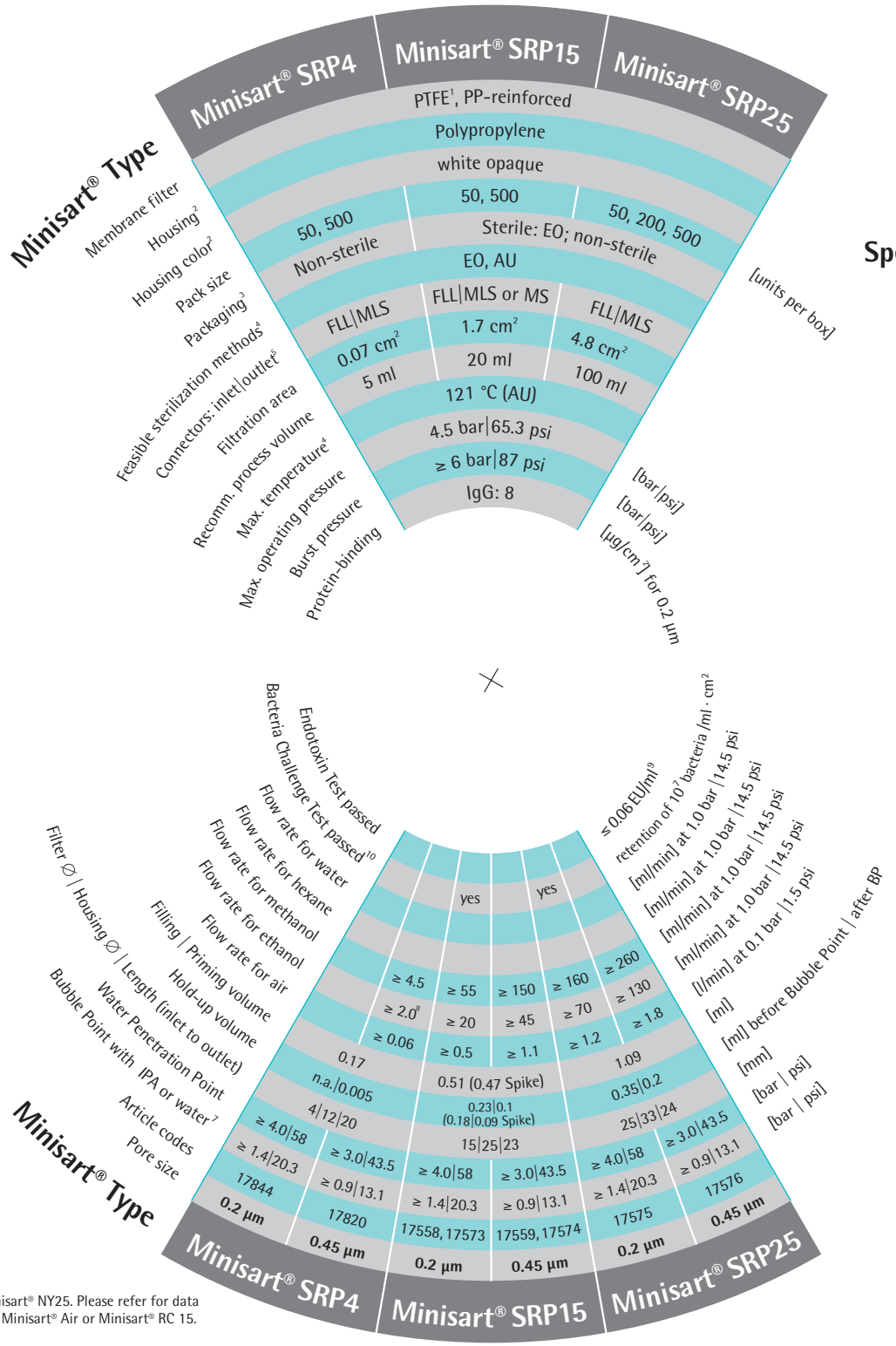


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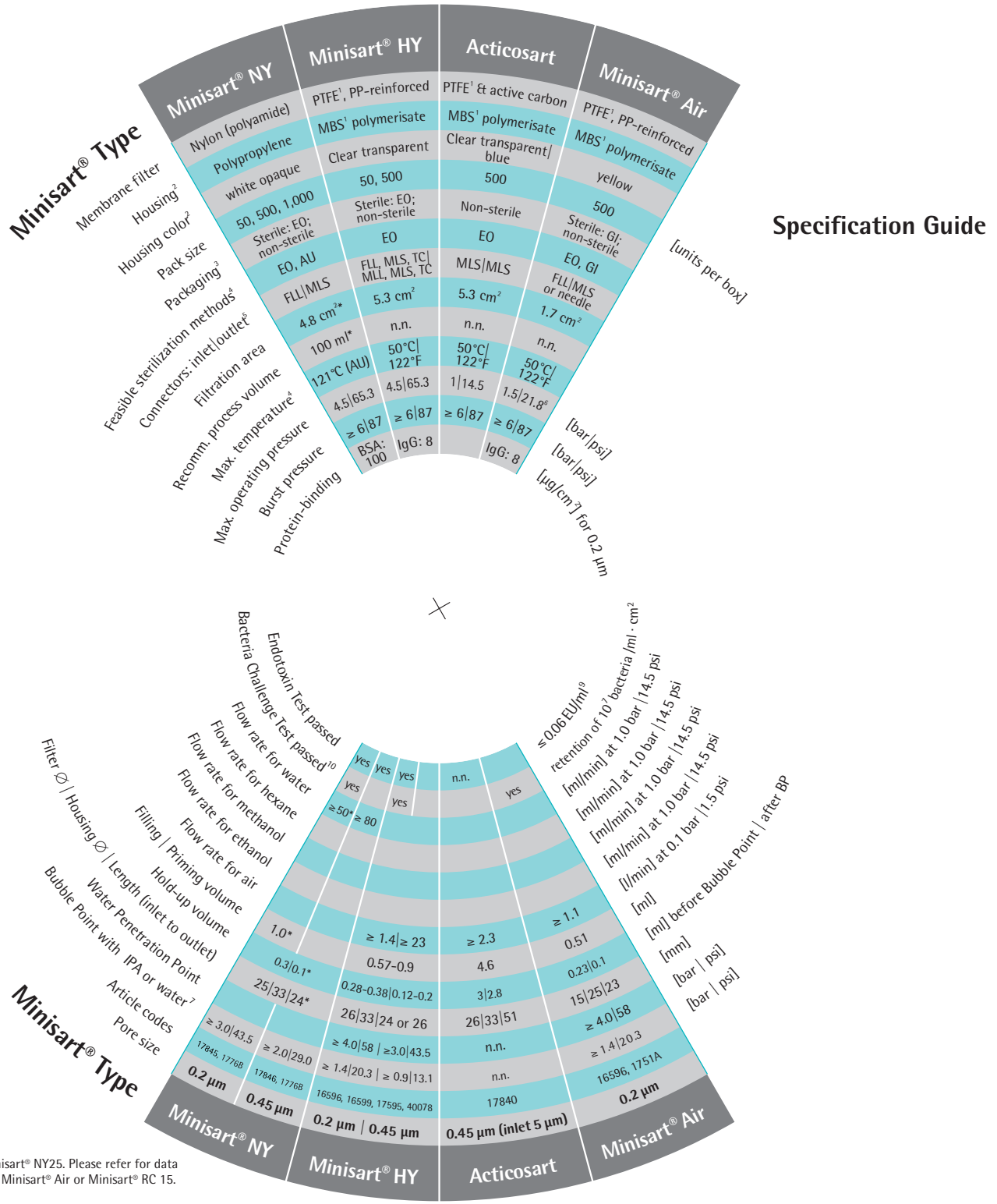


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