Gridded Membrane Filters from Cellulose Nitrate (Cellulose Ester) acc. to ISO Standards, Sterile and Individually Packaged, for Colony Counts

Sterile, individually packed filters have long become standard for routine microbiological quality control because of the user benefits they offer.

They are presterilized and ready-to-use and save preparatory time. As they are individually packed, they avoid the possibility of contamination of remaining filters in opened packs and conform with GLP, having filter identification and lot number printed on each individual envelope.

The increasing demand on these filters required the construction of a new packaging machine with ultra-modern stamping. Each membrane is checked to ensure it is not damaged in any way, is positioned correctly with no slippage under the edge seal, has perfect grid printing and is free of particles. Each envelope is checked for readable lettering. Quality control par excellence!

These membrane filters are in accordance with the following norms: ISO 7704, ISO 7899-2, ISO 8199, ISO 9308-1 and EN 12780. In addition to this they have been manufactured for use especially at the same time with Sartorius Nutrient Pads in accordance with the AFNOR (French Standards), the American Petroleum Institute, the American Society for Microbiology, the APHA Standard Methods, the Association of Official Analytical Chemists, the British Drinking Water Guideline, the British Standards, the DGHM (German Association of Hygiene and Microbiology), the DIN Guidelines (German Standards), the European Brewery Community, the European Drinking Water Guideline 98/83, the European Pharmacopoeia, the German Pharmacopoeia, the International Commission for Uniform Methods of Sugar Analysis, the International Dairy Federation, the International Fruit Juice Producers, the ISO Guidelines, the LMBG (German food law), the method described by Lanaridris & Lafon-Lafourcade, the method described in the journal of Food Protection, the method described in the journal of the Institute of Brewing, the methods of the Central European Brewery Commission, the MNO (Mineral|Table Water Guideline), the National Canners Association, the testing procedures for packaging stuff, the U.S. Environmental Protection Agency, the United States Pharmacopoeia, the US Department of Agriculture, the VLB (German Institute of Brewery), the Zentralblatt für Hygiene (Journal of Hygiene), the US Federal Drug Administration and Internal Standard Operation Procedures.

The membrane filters
All membranes are made of cellulose nitrate, a material which assures effective retention with high flow rates and optimum colony growth. The printed grid with a size of 3.1×3.1 mm makes the counting easier, especially for higher bacteria counts and for microcolonies, but does not influence the growth. The various filter colors allow the best contrast to the colonies and particles.

High flow membranes
The standard membrane filter for microbiological analysis is an 0.45 µm filter. One special variant is the High Flow membrane. It provides 30% higher flow rates in comparison to traditional 0.45 µm membranes. The special pore structure of the new 0.45 µm HighFlow membrane filters allows shorter filtration times due to higher flow rates and throughputs. As every Sartorius 0.45 µm membrane filter lot, these membranes are also tested and released according to ISO 7704.

Additional membrane filters
Cellulose nitrate (cellulose ester) membrane filters, gridded, non-sterile package (page 150).
Cellulose nitrate (cellulose ester) and cellulose acetate membrane filters, white, individually, sterile packaged (page 152).
Hydrophobic edge membranes are used mainly in the sterility testing of solutions containing antibiotics (page 154).

Microsart™ e.motion Dispenser

Fully automated membrane filter dispenser for individually sterile cellulose nitrate filter discs.

The membrane filters are automatically removed from their sterile package – either in a touch-free mode via an optical sensor or at the touch of a button. A pedal switch can be optionally connected to the dispenser. Thanks to their new motorized traction roller, each filter is quickly and reliably dispensed. Membranes that accidentally slide out of their packaging or that even get damaged in the process are now problems of the past.

The controller specially developed for the Microsart™ e.motion prevents unwanted dispensing of several membrane filters at a time – it's simple, "fail-safe," and fast.

The clear, compact design of the dispenser allows quick and easy cleaning. The Microsart™ e.motion has an interface port available so that other sensor systems can be connected to control the dispenser. The dispenser's low weight makes it easy to transport. Both its functions and design are ideal, giving you the versatility and flexibility you need in your lab.

Applications
Membrane filters for colony count, Particle testing and microscopy

Some of the advantages you will benefit from when using the Microsart™ e.motion dispenser:
- Fully automated membrane filter dispenser
- Works hands-free by an optical sensor
- Works by touch button
- Compact design
- Rapid and reliable transport due to sprocket feed roll technology
- Easy insertion of the filter band
- Easy-to-clean

Specifications of the Microsart™ e.motion dispenser

Dimensions (L × H × W) in mm	204 × 213 × 165
Weight	2.9 kg
Operating voltage	110 V/230 V optional
Frequency	50–60 Hz
Max. power	Consumption 10 W
Dispensing speed	0.5 sec
Dispenser delay	5 sec
Certificates	CE Mark and EMC Directive, European Standards EN 50081-1 and -2, EN 50082-1 and -2, EN 61010

Order number for Microsart™ e.motion dispenser

16712	Microsart™ e.motion dispenser, fully automated membrane filter dispenser. Not available in the U.S. and Canada
1ZE---0028	Pedal (foot switch) for Microsart™ e.motion dispenser

Microsart™ e.motion Membrane Filters

The membrane filter band specially designed for the Microsart™ e.motion can be conveniently inserted, and changed easily and rapidly as needed, even without having to completely use up a complete package quantity. Each box contains 100 membrane filters individually sealed on a special pleated band, and is designed so that it is easy to open and seal for storage. Microsart™ e.motion – reliable help in your lab.

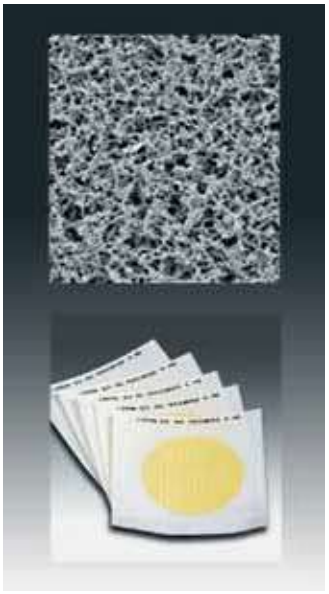
Some of the advantages you will benefit from when using the Microsart™ e.motion membrane filters:
- Outstanding recovery rates for microorganisms
- 0.45 µm are acc. to ISO 7704
- Multi-fit: Fits into various dispensers
- Protective paper-free
- Packaged on a special pleated band
- Product data are printed on
- High Flow membranes available
- Gamma irradiated, 25kGray

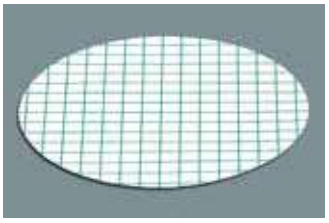
Specifications
Please refer to the membrane type: Cellulose nitrate (cellulose ester), gridded, individually, sterile packaged

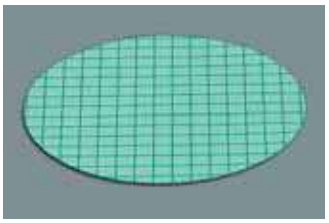
Order numbers for Microsart™ e.motion Membrane Filters
Diameter 47 mm or 50 mm, in pack of 3 × 100 membranes, individually, sterile packaged, without protective paper

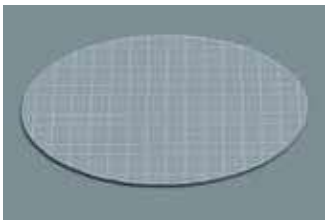
White | black	11407Z-47----SCM	0.2 µm
White | black	11407Z-50----SCM	0.2 µm
White | black	114H6Z-47----SCM	0.45 µm High Flow
White | black	114H6Z-50----SCM	0.45 µm High Flow
White | green	139H6Z-47----SCM	0.45 µm High Flow
White | black	11406Z-50----SCM	0.45 µm
White | black	11403Z-47----SCM	1.2 µm
White | black	11403Z-50----SCM	1.2 µm
White | black	11406Z-47----SCM	0.45 µm
White | green	13906Z-47----SCM	0.45 µm
White | green	13906Z-50----SCM	0.45 µm
Green | dark green	13806Z-47----SCM	0.45 µm
Green | dark green	13806Z-50----SCM	0.45 µm
Gray | white	13006Z-47----SCM	0.45 µm
Gray | white	13006Z-50----SCM	0.45 µm
Gray | white	13005Z-47----SCM	0.65 µm
Gray | white	13005Z-50----SCM	0.65 µm
Gray | white	13004Z-47----SCM	0.8 µm
Gray | white	13004Z-50----SCM	0.8 µm

Cellulose Nitrate (Cellulose Ester) Membrane Filters, Gridded, Individually, Sterile Packaged









Applications
Membrane filters for colony count, particle testing and microscopy

Some of the advantages you will benefit from when using this type of membrane filter:
- Outstanding recovery rates for microorganisms
- 0.45 µm are acc. to ISO 7704
- High Flow membranes available
- Three different colors available
- Certified quality
- Gamma irradiated, 25kGray

Specifications

Design	47 or 50 mm in diameter, white, grey or green and gridded
Growth Promotion Test acc. to ISO 7704	– No enhancement or inhibition by the grid lines – No enhancement or inhibition due to chemical extractables – No enhancement or inhibition by the sterilization process
Sterility test	Sterile
Thermal resistance	130°C max.
Thickness acc. to DIN 53105	115–145 µm
Chemical compatibility	Aqueous solutions (pH 4–8), hydrocarbons and several other organic solvents. Detailed information in section "Chemical Compatibility" under Cellulose Nitrate type 113 (page 119).

Typical performance rates for various pore sizes

Pore size		0.2 µm*	0.45 µm**	0.45 µm High Flow**	0.65 µm
Flow rate for water per cm^2 at 1 bar acc. to DIN 58355	in ml/min	20	70	100	130
Coliform retention	in %	100	100	100	n. a.
Recovery rate lot-released acc. to ISO 7704	in %	≥ 90	≥ 90	≥ 90	≥ 90

*) Pore size determined by quantitative retention of Brevundimonas diminuta in accordance with the ASTM Document F 838-83 (1993) Standard test method for determining bacterial retention of membrane filters utilized for liquid filtration.

**) Pore size determined by quantitative retention of Serratia marcescens in accordance with the Standard Methods of Water and Waste Water

White membrane with black grid, for detection of bacteria with dyed media, particle count & microscopy, type 114, individually, sterile packaged

Pore size	Order No.	Diameter	Pack size
0.2 µm	11407--47----ACN	47 mm	100
	11407--47----ACR	47 mm	1,000
	11407--50----ACN	50 mm	100
	11407--50----ACR	50 mm	1,000
0.45 µm	11406--47----ACN	47 mm	100
	11406--47----ACR	47 mm	1,000
	11406--50----ACN	50 mm	100
	11406--50----ACR	50 mm	1,000
0.45 µm High Flow*	114H6--47----ACN	47 mm	100
	114H6--47----ACR	47 mm	1,000
	114H6--50----ACN	50 mm	100
	114H6--50----ACR	50 mm	1,000
0.65 µm	11405--47----ACN	47 mm	100
	11405--50----ACN	50 mm	100
0.8 µm	11404--47----ACN	47 mm	100
	11404--47----ACR	47 mm	1,000
	11404--50----ACN	50 mm	100
1.2 µm	11403--47----ACN	47 mm	100
	11403--47----ACR	47 mm	1,000
	11403--50----ACN	50 mm	100
	11403--50----ACR	50 mm	1,000

White membrane with green grid, for detection of bacteria with dyed media, particle count and microscopy, type 139, individually, sterile packaged

0.45 µm	13906--47----ACN	47 mm	100
	13906--47----ACR	47 mm	1,000
	13906--50----ACN	50 mm	100
	13906--50----ACR	50 mm	1,000
0.45 µm High Flow*	139H6--47----ACN	47 mm	100
	139H6--47----ACR	47 mm	1,000
	139H6--50----ACN	50 mm	100
0.65 µm	13905--47----ACN	47 mm	100
1.2 µm	13903--47----ACN	47 mm	100

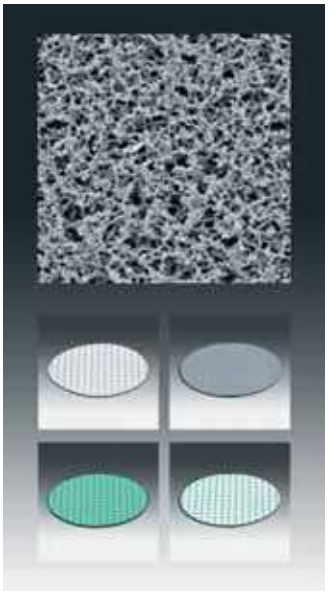
Green membrane with dark-green grid, providing optimal contrast to light-colored or transparent bacteria colonies, type 138, individually, sterile packaged

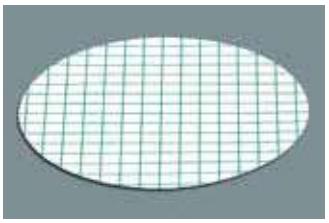
0.45 µm	13806--47----ACN	47 mm	100
	13806--47----ACR	47 mm	1,000
	13806--50----ACN	50 mm	100
	13806--50----ACR	50 mm	1,000

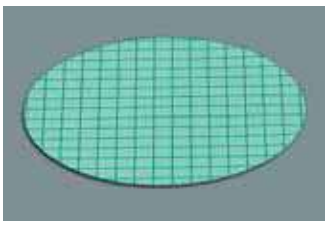
Gray membrane (after wetting, black) with white grid, for detection of yeasts and molds, particle count and microscopy, type 130, individually, sterile packaged

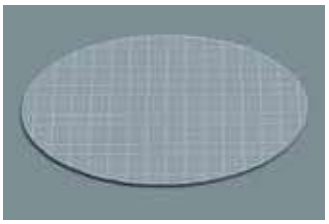
0.45 µm	13006--47----ACN	47 mm	100
	13006--47----ACR	47 mm	1,000
	13006--50----ACN	50 mm	100
	13006--50----ACR	50 mm	1,000
0.65 µm	13005--47----ACN	47 mm	100
	13005--50----ACN	50 mm	100
	13005--50----ACR	50 mm	1,000
0.8 µm	13004--47----ACN	47 mm	100
	13004--47----ACR	47 mm	1,000
	13004--50----ACN	50 mm	100

Cellulose Nitrate (Cellulose Ester) Membrane Filters, Gridded, Non-Sterile Packaged









Applications
Membrane filters for colony count, particle testing and microscopy

Some of the advantages you will benefit from when using this type of membrane filter:
- Outstanding recovery rates for microorganisms
- 0.45 µm are acc. to ISO 7704
- Three different colors available

Specifications

Design	25, 47 or 50 mm in diameter, white, grey or green and gridded
Growth Promotion Test acc. to ISO 7704	– No enhancement or inhibition by the grid lines – No enhancement or inhibition due to chemical extractables
Thermal resistance	130°C max.
Thickness acc. to DIN 53105	115–145 µm
Chemical compatibility	Aqueous solutions (pH 4–8), hydrocarbons and several other organic solvents. Detailed information in section "Chemical Compatibility" under Cellulose Nitrate type 113 (page 119).

Typical performance rates for various pore sizes

Pore size		0.2 µm*	0.45 µm**	0.65 µm
Flow rate for water per cm^2 at 1 bar acc. to DIN 58355	in ml/min	20	70	130
Coliform retention	in %	100	100	n. a.
Recovery rate lot-released acc. to ISO 7704	in %	≥ 90	≥ 90	≥ 90

*) Pore size determined by quantitative retention of Brevundimonas diminuta in accordance with the ASTM Document F 838-83 (1993) Standard test method for determining bacterial retention of membrane filters utilized for liquid filtration.

**) Pore size determined by quantitative retention of Serratia marcescens in accordance with the Standard Methods of Water and Waste Water

White membrane with black grid, for detection of bacteria with dyed media, particle count & microscopy, type 114, non-sterile

Pore size	Order No.	Diameter	Pack size
0.2 µm	11407--25------N	25 mm	100
	11407--47------N	47 mm	100
	11407--47------R	47 mm	1,000
	11407--50------N	50 mm	100
0.45 µm	11406--25------N	25 mm	100
	11406--47------N	47 mm	100
	11406--47------R	47 mm	1,000
	11406--50------N	50 mm	100
	11406--50------R	50 mm	1,000
0.65 µm	11405--47------N	47 mm	100
0.8 µm	11404--25------N	25 mm	100
	11404--47------N	47 mm	100
	11404--50------N	50 mm	100
1.2 µm	11403--25------N	25 mm	100
	11403--47------N	47 mm	100
	11403--50------N	50 mm	100

White membrane with green grid, for detection of bacteria with dyed media, particle count and microscopy, type 139, non-sterile

0.45 µm	13906--47------N	47 mm	100
	13906--47------R	47 mm	1,000
	13906--50------N	50 mm	100
	13906--50------R	50 mm	1,000

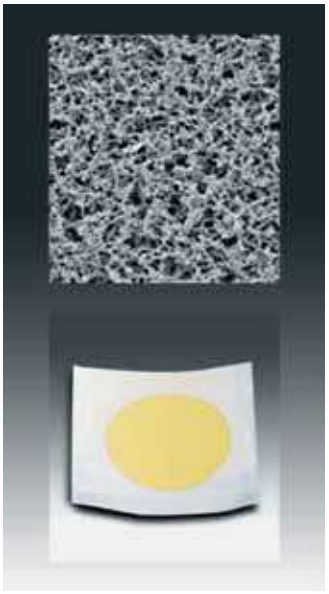
Green membrane with dark-green grid, providing optimal contrast to light-colored or transparent bacteria colonies, type 138, non-sterile

0.45 µm	13806--47------N	47 mm	100
	13806--47------R	47 mm	1,000
	13806--50------N	50 mm	100
	13806--50------R	50 mm	1,000

Gray membrane (after wetting, black) with white grid, for detection of yeasts and molds, particle count and microscopy, type 130, non-sterile

0.45 µm	13006--25------N	25 mm	100
	13006--47------N	47 mm	100
	13006--47------R	47 mm	1,000
	13006--50------N	50 mm	100
0.65 µm	13005--47------N	47 mm	100
	13005--50------N	50 mm	100
0.8 µm	13004--47------N	47 mm	100
	13004--50------N	50 mm	100

Cellulose Nitrate (Cellulose Ester) and Cellulose Acetate Membrane Filters, White, Individually, Sterile Packaged



Sterile, individually packed filters have long become standard for routine microbiological quality control because of the user benefits they offer. They are presterilized and ready-to-use and save preparatory time. As they are individually packed, they avoid the possibility of contaminating remaining filters in opened packs and conform with GLP, having filter identification and lot number printed on each individual envelope.

Materials
The membranes are made of even cellulose nitrate (cellulose ester), a material which assures effective retention with high flow rates and optimum colony growth or cellulose acetate, a material which combines high flow rates and thermal stability with very low adsorption characteristics.

Additional applications
11301, a white CN membrane filter with a pore size of 8 µm is used as a prefilter in a special prefilter attachment (16807) for bacteriological analyses. It retains the coarse suspended particles, whereas it allows microorganisms to pass through. These microbes are trapped on the surface of the underlying bacteria-retentive membrane filter (e. g. 0.45 µm).

11107, a white CA membrane filter with a pore size of 0.2 µm is the filter of choice for sterile filtration, such as nutrient media, buffer and sera. This membrane is validated by the Bacteria Challenge Test.

Applications
Membrane filters for colony count, sterility testing, particle testing and microscopy

Some of the advantages you will benefit from when using this type of membrane filter:
- Outstanding recovery rates for microorganisms
- Defined particle retention
- 0.45 µm are acc. to ISO 7704
- 0.2 µm are validated by BCT
- Certified quality
- Gamma-irradiated, 25kGray

Specifications

Design	47 or 50 mm in diameter, white
Growth Promotion Test acc. to ISO 7704	– No enhancement or inhibition by the sterilization process – No enhancement or inhibition due to chemical extractables
Sterility test	Sterile
Thermal resistance	CN: 130°C max. | CA: 180°C max.
Thickness acc. to DIN 53105	CN: 115–145 µm | CA: 120 µm (average value)
Chemical compatibility	Aqueous solutions (pH 4–8), hydrocarbons and several other organic solvents. Detailed information in section "Chemical Compatibility" under Cellulose Nitrate type 113 and Cellulose Acetate type 111 (page 119).

Cellulose nitrate membrane filters, white, for colony count, sterility testing, particle count & microscopy, type 113, individually, sterile packaged

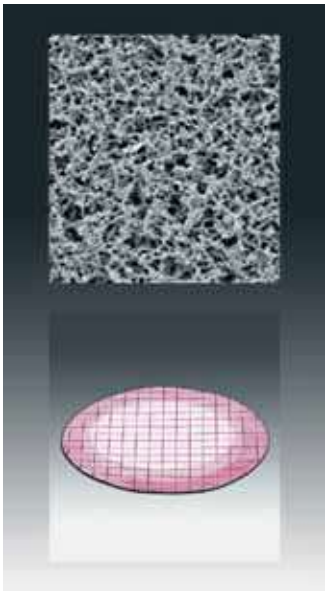
Pore size	Order No.	Diameter	Pack size
0.45 µm	11306--47----ACN	47 mm	100
	11306--50----ACN	50 mm	100
0.65 µm	11305--47----ACN	47 mm	100
	11305--50----ACN	50 mm	100
0.8 µm	11304--47----ACN	47 mm	100
	11304--50----ACN	50 mm	100
1.2 µm	11303--47----ACN	47 mm	100
	11303--50----ACN	50 mm	100
3 µm	11302--47----ACN	47 mm	100
	11302--50----ACN	50 mm	100
8 µm	11301--47----ACN	47 mm	100
	11301--50----ACN	50 mm	100

Cellulose acetate membrane filters, white, for colony count, sterility testing, particle count & microscopy*, type 111, individually, sterile packaged

0.2 µm	11107--47----ACN	47 mm	100
	11107--50----ACN	50 mm	100
0.45 µm	11106--47----ACN	47 mm	100
	11106--50----ACN	50 mm	100

* If cellulose nitrate is not compatible

Hydrophobic Edged Cellulose Nitrate (Cellulose Ester) and Cellulose Acetate Membrane Filters, Individually, Sterile Packaged & Non-Sterile



Hydrophobic edge membranes are used mainly for colony count and sterility testing of solutions containing substances with antibiotic characteristics. The hydrophobic edge avoids the penetration of any growth-inhibitory substance into the membrane clamp zone wherefrom it could not be rinsed out and the substance could inhibit microbial growth during incubation.

Materials
The membranes are made of even cellulose nitrate (cellulose ester), a material which assures effective retention with high flow rates and optimum colony growth or cellulose acetate, a material which combines high flow rates and thermal stability with very low adsorption characteristics.

Applications
Membrane filters for colony count and sterility testing

Some of the advantages you will benefit from when using this type of membrane filter:
- Outstanding retention rates for microorganisms
- 0.45 µm are acc. to ISO 7704
- 0.2 µm are validated by BCT
- Certified quality

Specifications

Design	25, 47 or 50 mm in diameter, white or white with black grid
Growth Promotion Test acc. to ISO 7704	– No enhancement or inhibition by the grid lines – No enhancement or inhibition due to chemical extractables – No enhancement or inhibition by the sterilization process
Sterility test	Sterile
Thermal resistance	CN: 130°C max. | CA: 180°C max.
Thickness acc. to DIN 53105	CN: 115–145 µm | CA: 120 µm (average value)
Chemical compatibility	Aqueous solutions (pH 4–8), hydrocarbons and several other organic solvents. Detailed information in section "Chemical Compatibility" under Cellulose Nitrate type 113 and Cellulose Acetate type 111 (page 119).

Cellulose nitrate membrane filters, white with black grid, 3 mm hydrophobic edge, for colony count & sterility testing, type 131, individually, sterile packaged

Pore size	Order No.	Diameter	Pack size
0.2 µm	13107--47----ACN	47 mm	100
	13107--50----ACN	50 mm	100
0.45 µm	13106--47----ACN	47 mm	100
	13106--50----ACN	50 mm	100

Cellulose nitrate membrane filters, white with black grid, 6 mm hydrophobic edge, for colony count & sterility testing, type 131, individually, sterile packaged

0.45 µm	13106--47----HEN	47 mm	100

Cellulose nitrate membrane filters, white with black grid, 3 mm hydrophobic edge, for colony count & sterility testing, type 131, non-sterile

0.2 µm	13107--25------N	25 mm	100
	13107--47------N	47 mm	100
	13107--50------N	50 mm	100
0.45 µm	13106--25------N	25 mm	100
	13106--47------N	47 mm	100
	13106--50------N	50 mm	100
8 µm	13101--47------N	47 mm	100
	13101--50------N	50 mm	100

Cellulose nitrate membrane filters, white, 3 mm hydrophobic edge, for colony count & sterility testing, type 131, non-sterile

8 µm	13101--50----AHN	50 mm	100

Cellulose nitrate membrane filters, white with black grid, 6 mm hydrophobic edge, for colony count & sterility testing, type 131, non-sterile

0.2 µm	13107--47----HCN	47 mm	100
0.45 µm	13106--47----HCN	47 mm	100

Cellulose acetate membrane filters, white with black grid, 3 mm hydrophobic edge, for colony count & sterility testing*, type 135, individually, sterile packaged

0.2 µm	13507--47----ACN	47 mm	100
0.45 µm	13506--47----ACN	47 mm	100
	13506--50----ACN	50 mm	100

Cellulose acetate membrane filters, white with black grid, 3 mm hydrophobic edge, for colony count & sterility testing*, type 135, sterile, packaged of 10 discs per sleeve

0.45 µm	13506--47----ALS	47 mm	100

Cellulose acetate membrane filters, white with black grid, 3 mm hydrophobic edge, for colony count & sterility testing*, type 135, non-sterile

0.2 µm	13507--47------N	47 mm	100
0.45 µm	13506--47------N	47 mm	100

Cellulose acetate membrane filters, white with black grid, 6 mm hydrophobic edge, for colony count & sterility testing*, type 135, non-sterile

0.45 µm	13506--47----HCN	47 mm	100

* If cellulose nitrate is not compatible