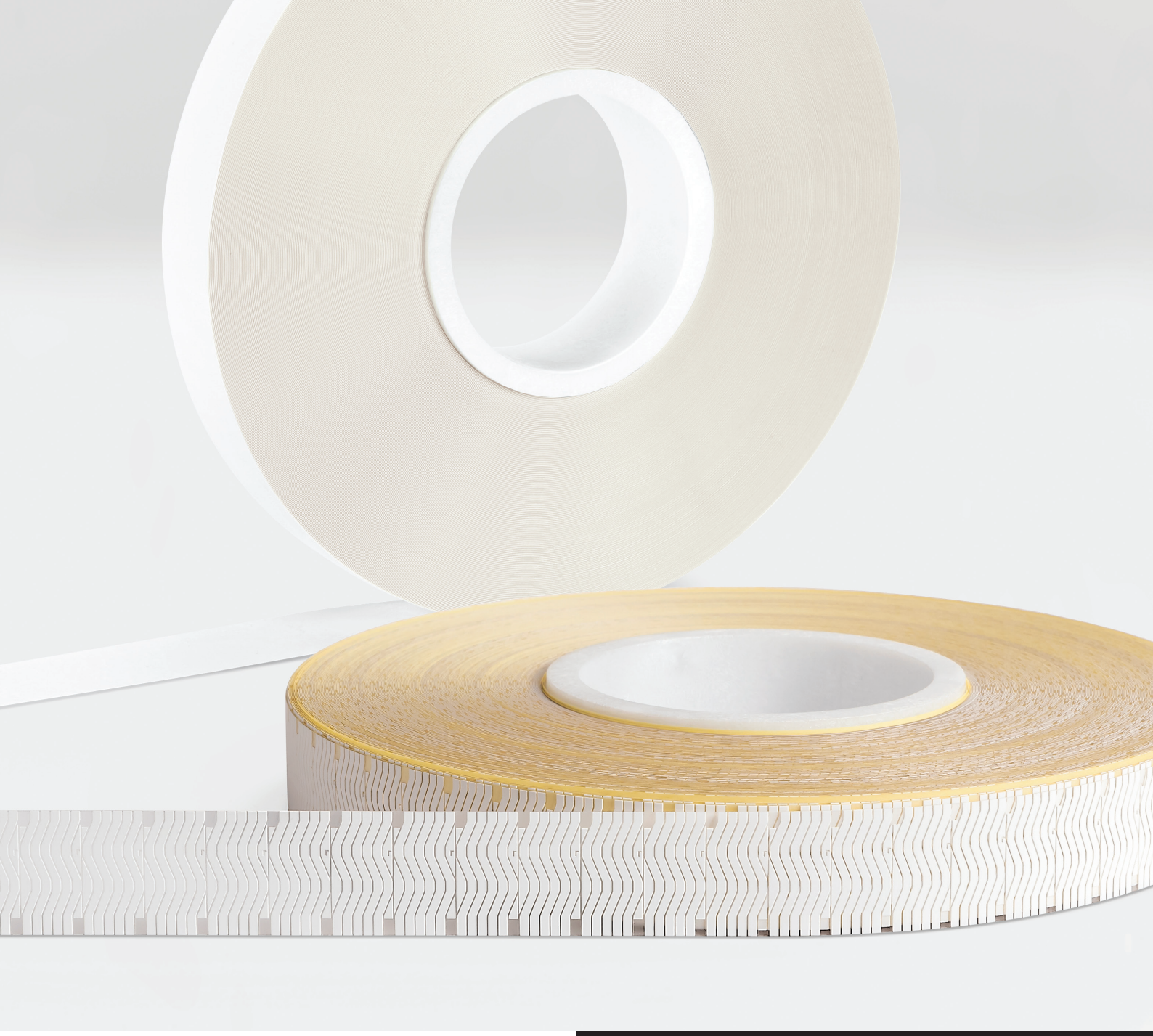


# Unisart® Nitrocellulose Membranes

## The Substrate of Choice for Protein Assays

Simplifying Progress

SARTORIUS

# Sartorius

## A Reliable Partner

Sartorius is a leading international provider of integrated solutions for the biopharmaceutical industry. With our extensive portfolio of products, technologies and services, we cover wide areas of the biopharmaceutical process chain, ranging from fermentation, cell cultivation, filtration and purification to media storage and transportation.

Being the first industrial manufacturer of nitrocellulose membranes, Sartorius has developed an unmatched expertise in the production of various high quality nitrocellulose matrices.

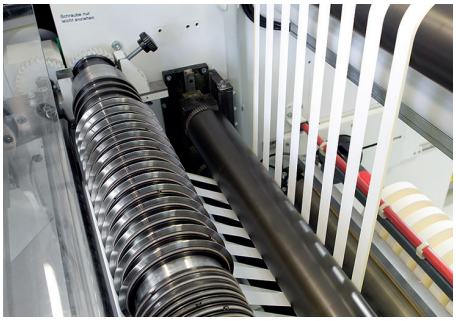
# Sartorius is …

**… Committed to the Industry**
Sartorius is the partner for developers and manufacturers of protein tests based on nitrocellulose substrate.

Our company is continuously improving the membrane portfolio to support our customers looking for a high quality, reliable and cost effective manufacturing of their assays and tests.

**… Focused on Quality**
Our products are developed, produced and distributed according to a Quality Management that is certified in compliance with ISO 9001.

All products must pass Sartorius's precisely defined in-house tests and therefore meet Sartorius's stringent quality control standards throughout all manufacturing steps.



**… the Technology Leader**
In-depth know-how in nitrocellulose membrane manufacturing as well as relevant application expertise are driving us to continuously improve our state-of-the-art manufacturing equipment, located in Göttingen, Germany.

This continuous thrive for improvement is resulting in a reliable supply of high quality nitrocellulose membranes, serving the demanding diagnostic and life science markets.

# Nitrocellulose

## The Substrate of Choice for Protein Assays

The popularity of the Unisart® nitrocellulose membranes as a major component of many rapid tests has been built on their prominent features.

**Features & Benefits**

- Availability on Large Scale
- Wide Range of Applications
- High Protein Binding
- 3D Structure: The 3D microporous matrix allows liquids to flow in all directions
- High inter- and intra- lot consistency
- Excellent Performance
- Complete Traceability
- Reliable Supply
- Quality made in Germany


Rohgas
Reingas

# The Unisart® Product Portfolio

**Unisart® CN Membranes for Lateral Flow Tests**
When reliable capillary flow time, homogenous thickness and defect-free surface quality need to be combined to obtain high quality lateral flow tests, then the Unisart® CN 95, CN 110, CN 140, CN 150 and CN 180 are the membranes of choice.

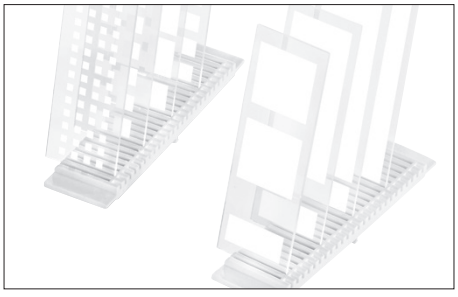
Please find more details and ordering information on page 8.

**Unisart StructSure® Membranes for Multiplex Assays**
These structured membranes have been developed through an innovative patterning process in order to better fulfill the need for rapid multiparamater tests.

Please find more information on page 14.

**Unisart® CN Membranes for Blotting and Line Immunoassay**
This format is used when many parameters need to be assessed for a particular disease on patient serum. Accordingly, the nitrocellulose membrane is printed with many lines or spots of different recombinant antigens to detect the corresponding antibodies in patient blood.

Please find more details and ordering information on page 18.



**Unisart® Microarray Slides**
On a Unisart® microarray slide, the multiplicity of protein spots displayed in a sophisticated pattern allow to look for various molecular interactions simultaneously. Therefore, protein arrays, considerably accelerate the quest for new drug targets and disease markers.

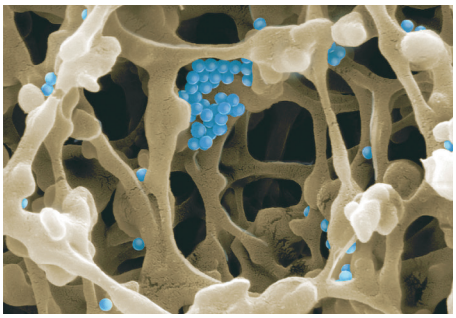
Please find more details and ordering information on page 22.

# Unisart® CN Membranes for Lateral Flow Tests

## Membranes for Lateral Flow Tests

The Unisart® membranes with large pores have been designed to be the best substrate for the 3 billion and more rapid lateral tests manufactured and used every year around the world.

The role of the nitrocellulose in a lateral strip is highly critical. The membrane acts as the main motor of the test, drawing the samples and conjugates from one end of the strip to the other one. Concurrently to their transport, the sample-conjugate complex can be captured by the reagents that are nested on the test and control lines. The Unisart® membranes have been developed to offer the features essential for highly reproducible readouts.



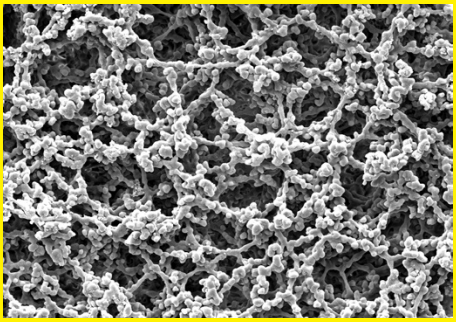
Although the affinity of the different molecules is a pivotal factor, the capillary flow rate and the surface quality of the membrane are also crucial parameters for a sensitive test. The Unisart® membranes have been engineered in order to show a clean and defined porous structure that leads to a consistent lateral wicking of samples and reagents. Their smooth and defect free surface allows for a consistent dispensing of sharp capture and control reagents lines.

New state of the art machines enable the production of large batches of our different Unisart® membranes with high consistency.

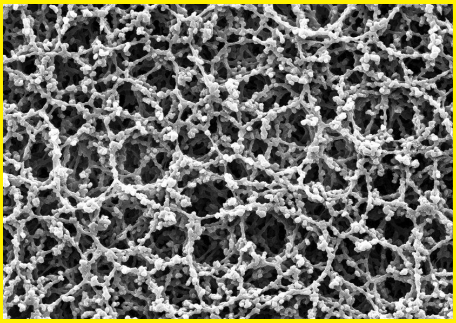
From many square meters of one batch down to the few square centimeters of a lateral strip, our stringent QC and labelling allow for a consistent membrane with a precise traceability.

The Unisart® membranes will perfectly fit all diagnostic manufacturer production needs from thousand strips on manual cards to million strips on reel to reel equipment. All production steps including laminating, dispensing, drying, blocking, assembling and packaging are considerably improved when Unisart® membranes are used as revealed by the absolute final yields.

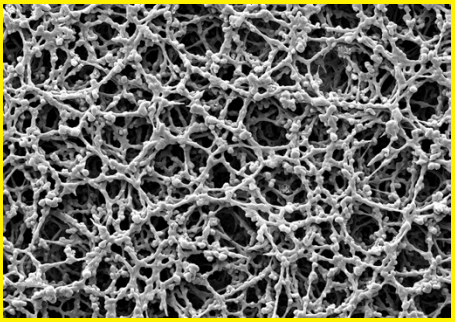
**SEM's**



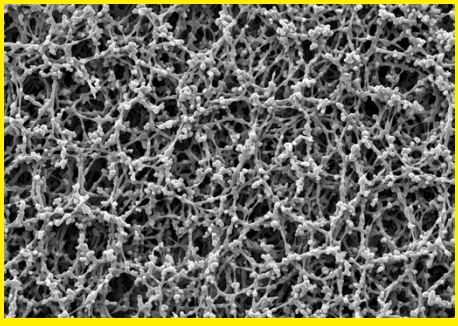
**CN 95**



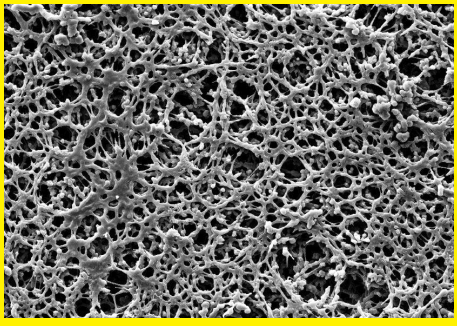
**CN 110**



**CN 140**



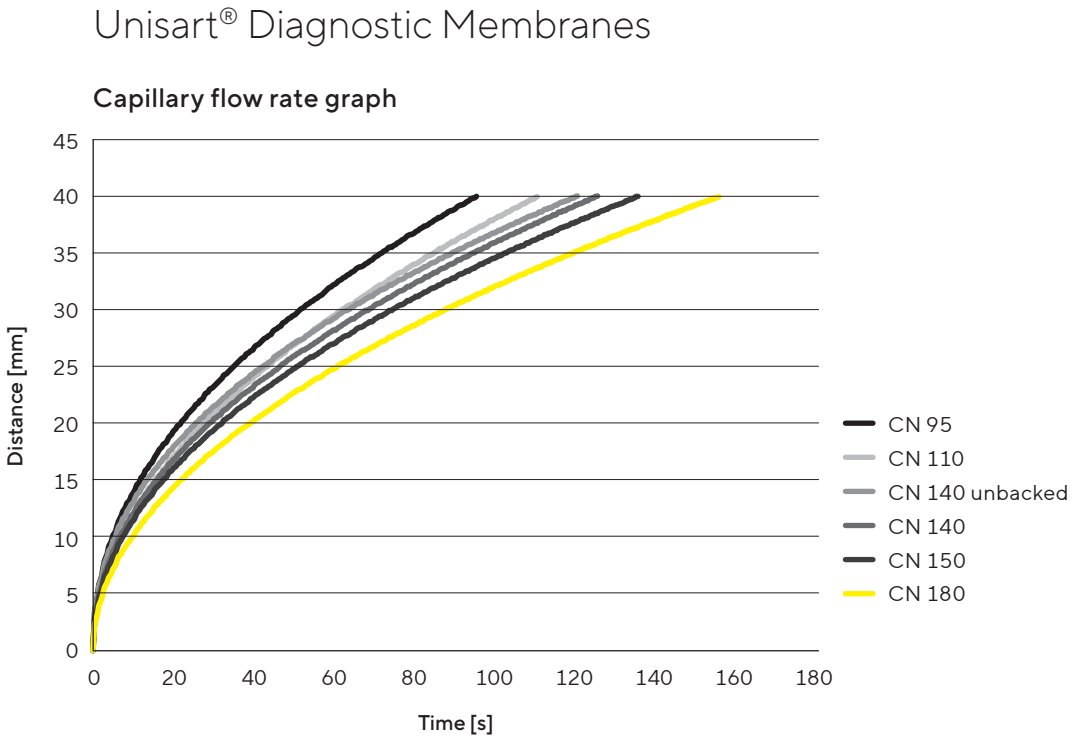
CN 150



CN 180

## Specifications & Characteristics

| Unisart® | CN 95 backed | CN 110 backed | CN 140 unbacked | CN 140 backed | CN 150 backed | CN 180 backed |
|---|---|---|---|---|---|---|
| Membrane Material | cellulose nitrate | cellulose nitrate | cellulose nitrate | cellulose nitrate | cellulose nitrate | cellulose nitrate |
| Backing | 100 µm polyester, clear | 100 µm polyester, clear | none | 100 µm polyester, clear | 100 µm polyester, clear; 100 µm polyester, white | 100 µm polyester, clear |
| Thickness (µm) | 240 - 270 | 185 - 215 | 120 - 160 | 225 - 255 | 240 - 280 | 225 - 255 |
| Capillary flow rate down web, purified water (s/40mm) | 65 - 115 | 90 - 130 | 90 - 150 | 95 - 155 | 90 - 180 | 135 - 175 |
| Visual appearance | All Unisart® membranes offer a white, flat and smooth surface, free of macroscopic defects and foreign matter. They are all 100 % inspected by backlight inspection. | | | | | |
| Wettability | Precise amount of anionic surfactant allows for fast wetting | | | | | |



## Choose the Best Membrane for your Application

| Unisart® | CN 95 backed | CN 110 backed | CN 140 unbacked | CN 140 backed | CN 150 backed | CN 180 backed |
|---|---|---|---|---|---|---|
| Backing | 100 µm clear | 100 µm clear | none | 100 µm clear | 100 µm clear, 100 µm white | 100 µm clear |
| Background clearing | very fast | very fast | fast | fast | fast | medium |
| Time-to-signal | fast | medium | medium | medium | medium | medium |
| Quick response tests | most suitable | suitable, depending on migration distance | suitable, depending on migration distance | suitable, depending on migration distance | suitable, depending on migration distance | suitable, depending on migration distance |
| Sensitivity | good | very good | very good | very good | very good, white backing perfectly suitable for immuno-fluorescent readout | very high |
| Viscous samples | very good | good | good | good | good | medium |
| Particle loaded samples | very good | good | good | good | good | medium |
| Backing as barrier against card glue | yes | yes | no, cards need to be selected carefully | yes | yes | yes |
| Contact dispensing equipment | suitable | suitable | suitable | suitable | suitable | suitable |
| Non- contact dispensing equipment | suitable | suitable | suitable | suitable | suitable | suitable |
| Reel- to- reel manufacturing | suitable | suitable | needs careful handling | suitable | suitable | suitable |

| Roll Specification | |
|---|---|
| Plastic roll core | 76.8 mm (3") |
| Certificate of analysis | provided with each delivery |
| Membrane width | 11 – 300 mm (± 0.5 mm) |

Membrane wound with yellow interleaving protection paper between the membrane layers.

# Ordering Information

| Unisart® Membrane | Polyester Backing | Width [in mm] | Length [in m] | Max. Splices | Units \| Box | Catalog Number |
|---|---|---|---|---|---|---|
| **CN 95 backed** | | | | | | |
| CN 95 | 100 µm clear | 20 | 50 | 0 | 5 rolls | 1UN95ER050020WSB |
| CN 95 | 100 µm clear | 25 | 50 | 0 | 5 rolls | 1UN95ER050025WSB |
| CN 95 | 100 µm clear | 18 | 100 | 3 | 5 rolls | 1UN95ER100018NTB |
| CN 95 | 100 µm clear | 20 | 100 | 3 | 1 roll | 1UN95ER100020NT |
| CN 95 | 100 µm clear | 20 | 100 | 0 | 5 rolls | 1UN95ER100020WSB |
| CN 95 | 100 µm clear | 20 | 100 | 3 | 3 rolls | 1UN95ER100020NTB |
| CN 95 | 100 µm clear | 22 | 100 | 3 | 5 rolls | 1UN95ER100022NTB |
| CN 95 | 100 µm clear | 25 | 100 | 3 | 1 roll | 1UN95ER100025NT |
| CN 95 | 100 µm clear | 25 | 100 | 0 | 5 rolls | 1UN95ER100025WSB |
| CN 95 | 100 µm clear | 25 | 100 | 1 | 5 rolls | 1UN95ER100025KSB |
| CN 95 | 100 µm clear | 25 | 100 | 3 | 5 rolls | 1UN95ER100025NTB |
| CN 95 | 100 µm clear | 27 | 100 | 3 | 5 rolls | 1UN95ER100027NTB |
| CN 95 | 100 µm clear | 28 | 100 | 3 | 5 rolls | 1UN95ER100028NTB |
| CN 95 | 100 µm clear | 29 | 100 | 3 | 5 rolls | 1UN95ER100030--B |
| CN 95 | 100 µm clear | 35 | 100 | 3 | 5 rolls | 1UN95ER100035NTB |
| CN 95 | 100 µm clear | 40 | 100 | 0 | 1 roll | 1UN95ER100040WS |
| CN 95 | 100 µm clear | 70 | 100 | 0 | 1 roll | 1UN95ER100070WS |
| **CN 110 backed** | | | | | | |
| CN 110 | 100 µm clear | 20 | 100 | 3 | 1 roll | 1UN11ER100020NT |
| CN 110 | 100 µm clear | 20 | 100 | 3 | 5 rolls | 1UN11ER100020NTB |
| CN 110 | 100 µm clear | 25 | 100 | 3 | 1 roll | 1UN11ER100025NT |
| CN 110 | 100 µm clear | 25 | 100 | 0 | 5 rolls | 1UN11ER100025WSB |
| CN 110 | 100 µm clear | 25 | 100 | 3 | 5 rolls | 1UN11ER100025NTB |
| **CN 140 unbacked** | | | | | | |
| CN 140 | none | 20 | 100 | 0 | 5 rolls | 1UN14AR100020WSB |
| CN 140 | none | 20 | 100 | 3 | 5 rolls | 1UN14AR100020NTB |
| CN 140 | none | 25 | 100 | 0 | 5 rolls | 1UN14AR100025WSB |
| CN 140 | none | 25 | 100 | 3 | 5 rolls | 1UN14AR100025NTB |
| CN 140 | none | 35 | 100 | 3 | 5 rolls | 1UN14AR100035NTB |
| CN 140 | none | 40 | 100 | 3 | 1 roll | 1UN14AR100040NT |
| CN 140 | none | 270 | 100 | 3 | 1 roll | 1UN14AR100270NT |

| Unisart® Membrane | Polyester Backing | Width [in mm] | Length [in m] | Max. Splices | Units \| Box | Catalog Number |
|---|---|---|---|---|---|---|
| **CN 140 backed** | | | | | | |
| CN 140 | 100 µm clear | 18 | 100 | 3 | 5 rolls | 1UN14ER100018NTB |
| CN 140 | 100 µm clear | 20 | 100 | 3 | 1 roll | 1UN14ER100020NT |
| CN 140 | 100 µm clear | 20 | 100 | 0 | 5 rolls | 1UN14ER100020WSB |
| CN 140 | 100 µm clear | 20 | 100 | 3 | 5 rolls | 1UN14ER100020NTB |
| CN 140 | 100 µm clear | 22 | 100 | 3 | 5 rolls | 1UN14ER100022--B |
| CN 140 | 100 µm clear | 25 | 100 | 3 | 1 roll | 1UN14ER100025NT |
| CN 140 | 100 µm clear | 25 | 100 | 0 | 5 rolls | 1UN14ER100025WSB |
| CN 140 | 100 µm clear | 25 | 100 | 3 | 5 rolls | 1UN14ER100025NTB |
| CN 140 | 100 µm clear | 28 | 100 | 3 | 5 rolls | 1UN14ER100028NTB |
| CN 140 | 100 µm clear | 29 | 100 | 3 | 5 rolls | 1UN14ER100030--B |
| CN 140 | 100 µm clear | 35 | 100 | 3 | 5 rolls | 1UN14ER100035NTB |
| CN 140 | 100 µm clear | 40 | 100 | 0 | 5 rolls | 1UN14ER100040WSB |
| CN 140 | 100 µm clear | 40 | 100 | 3 | 1 roll | 1UN14ER100040 |
| CN 140 | 100 µm clear | 50 | 100 | 0 | 5 rolls | 1UN14ER100050WSB |
| CN 140 | 100 µm clear | 70 | 100 | 0 | 1 roll | 1UN14ER100070 |
| **CN 150 backed** | | | | | | |
| CN 150 | 100 µm clear | 20 | 100 | 3 | 1 roll | 1UN15LR100020NT |
| CN 150 | 100 µm clear | 20 | 100 | 3 | 5 rolls | 1UN15LR100020NTB |
| CN 150 | 100 µm clear | 25 | 100 | 3 | 1 roll | 1UN15LR100025NT |
| CN 150 | 100 µm clear | 25 | 100 | 3 | 5 rolls | 1UN15LR100025NTB |
| CN 150 | 100 µm white | 25 | 50 | 0 | 5 rolls | 1UN15WR050025WSB |
| CN 150 | 100 µm white | 20 | 100 | 3 | 1 roll | 1UN15WR100020NT |
| CN 150 | 100 µm white | 20 | 100 | 3 | 5 rolls | 1UN15WR100020NTB |
| CN 150 | 100 µm white | 25 | 100 | 3 | 1 roll | 1UN15WR100025NT |
| CN 150 | 100 µm white | 25 | 100 | 3 | 5 rolls | 1UN15WR100025NTB |
| **CN 180 backed** | | | | | | |
| CN 180 | 100 µm clear | 20 | 100 | 3 | 1 roll | 1UN18ER100020NT |
| CN 180 | 100 µm clear | 20 | 100 | 3 | 5 rolls | 1UN18ER100020NTB |
| CN 180 | 100 µm clear | 20 | 100 | 3 | 1 roll | 1UN18ER100025NT |
| CN 180 | 100 µm clear | 25 | 100 | 3 | 5 rolls | 1UN18ER100025NTB |

Customized dimensions of Unisart® CN membranes are also available upon request.
For further information and customized dimension please contact us: Unisart@sartorius.com

# Unisart StructSure® Membranes

## The Next Generation of Lateral Flow Assays

Top Features of Unisart StructSure® Membranes:

### Multiplexing

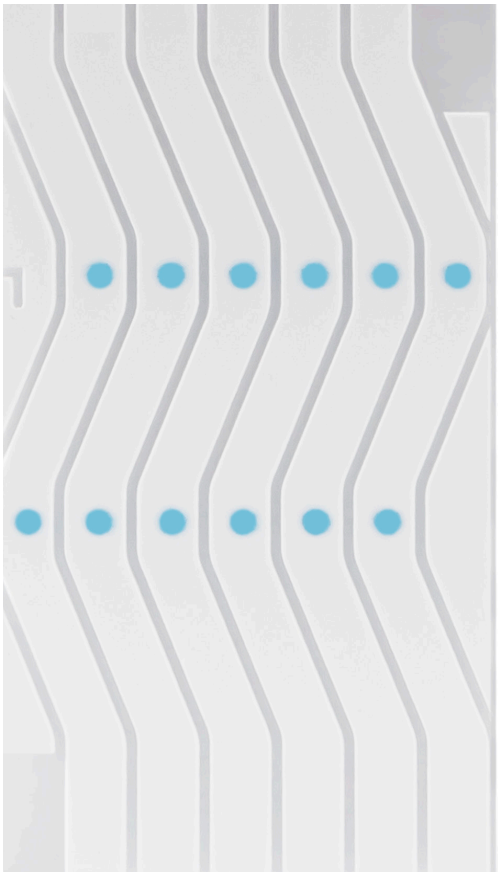
- Simultaneously detect multiple targets from a single source
- Run references parallel to samples
- Compatible with all Unisart® CN membrane types for standard or customized patterns

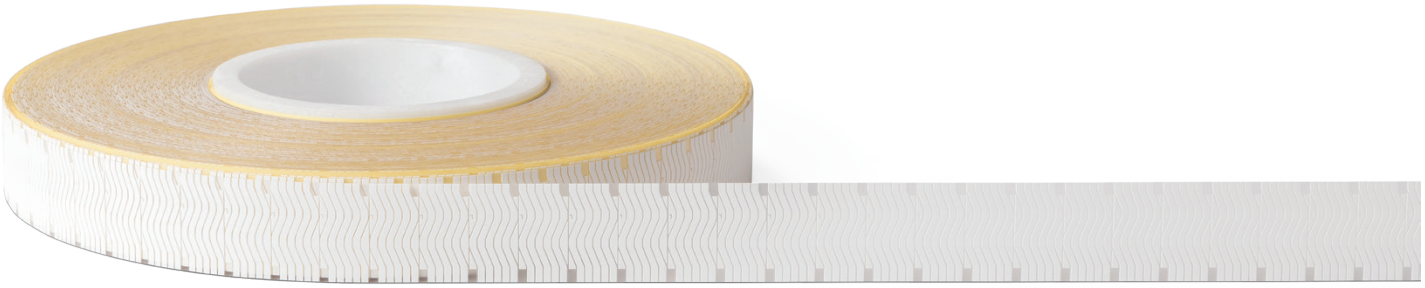
### Innovative Test Designs

- Multiple reaction zones in separate lanes without cross-reaction
- Semi-quantitative analysis (e.g., treatment monitoring)
- Analyze different test thresholds with high precision

### Miniaturization

- Increased capillary flow rate reduces readout time
- Requires less sample (e.g. spinal fluid, tear drops)
- Reduces usage of antibodies and assay components, leading to cost savings and enhanced sustainability





Unisart StructSure® membranes represent a cutting-edge technology platform for multiplexing, enabling the development of multiparameter lateral flow assays. Sartorius has pioneered an innovative process to engrave structures into nitrocellulose membranes, incorporating barriers that separate channels to prevent liquid overflow and cross-reactivity. This technology allows the creation of various patterns with multiple lanes and reaction zones.

Unisart StructSure® membranes facilitate test format miniaturization and simultaneous detection of various targets from a single source. Any membrane from the Unisart® CN portfolio can be used for multiplexing, providing high flexibility for advanced and innovative solutions.

## Performance Comparison: 3-Channel S-Shape Unisart StructSure® vs. Unpatterned Unisart® CN Membrane

**Faster Assay Times With Unisart StructSure®**

The S-shape Unisart StructSure® membrane demonstrates increased capillary flow rate with water, reaching the top of the channels in 31 seconds compared to 53 seconds for a membrane without channels, marking a 40 % speed increase (Fig.1). A similar trend is observed with high viscous plasma, achieving a 30 % increase.

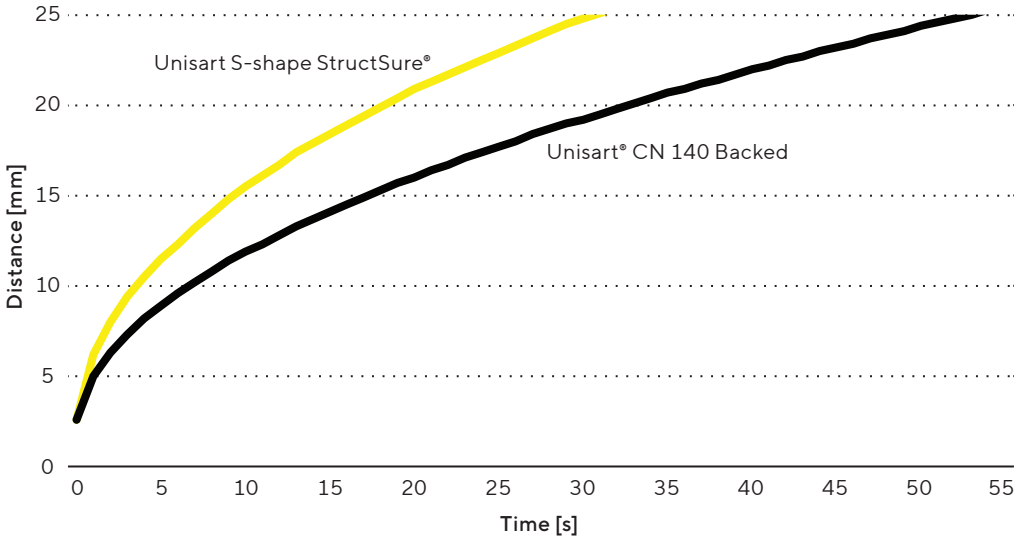



**Figure 1. Comparison of capillary flow rate**

## Enhanced Signal Intensity Allows Saving of Capture Molecules

Unisart StructSure® membranes deliver enhanced signal intensity in comparison to unpatterned Unisart® CN 140 backed membranes (Fig. 2). Protein concentrations of 1 mg/mL were spotted in triplicate with a volume of 0.045 µL on both membranes. The S-shape Unisart StructSure® membrane showed a 40 % increase in signal intensity, providing a robust solution for critical applications requiring fast and reliable results.

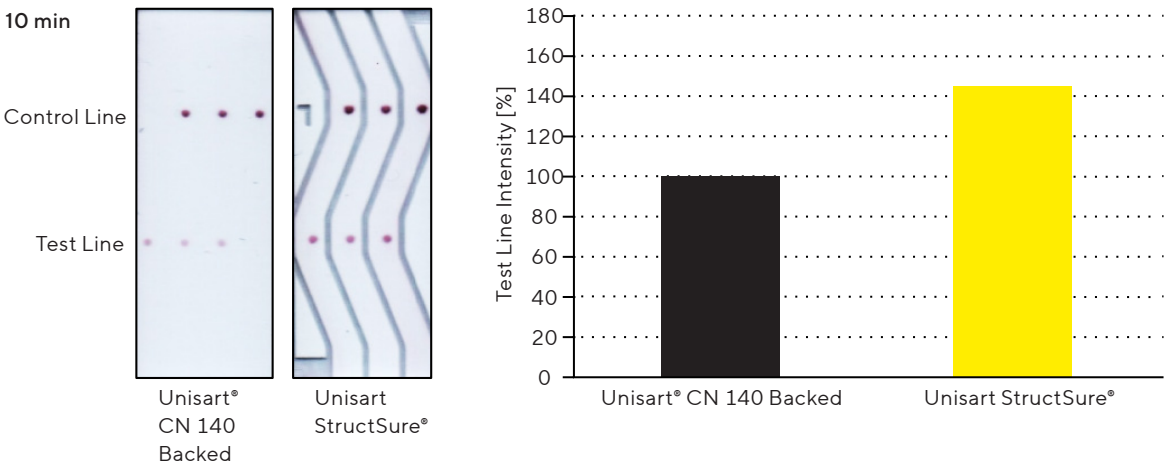



**Figure 2. Comparison of signal intensity.**
The normalized test line intensity of 3-channel S-shape Unisart StructSure® is depicted in relation to membrane without channels in percentage.

## Accurate and Reliable Multiple Target Determination

As an example for a multiplex infectious disease assay, rapid tests for flu A, flu B, and SARS-CoV-2 were combined on one 3-channel S-shape Unisart StructSure® membrane (Fig. 3).

The Unisart StructSure® membrane clearly separated the analytes, recognizing each target individually and in combination without cross-reactivity. This eliminates the need for channel-specific conjugates.

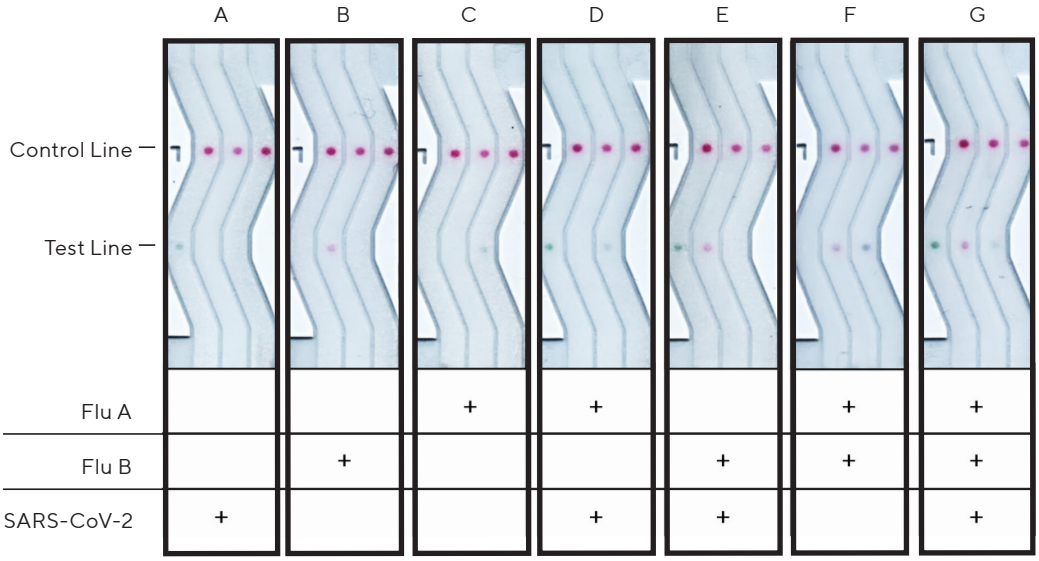
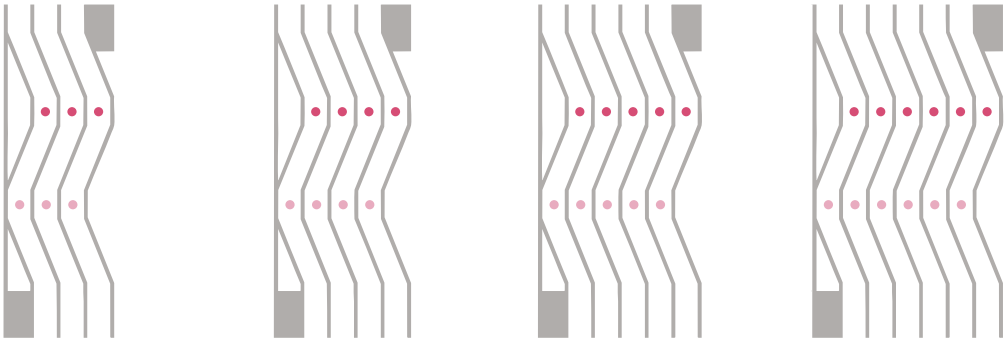



**Figure 3. Test performance of a multiplexed LFA.**
A cocktail conjugate comprising three differently colored beads conjugated to anti-Flu A, anti-Flu B and anti-SARS-CoV-2 antibodies was applied in this assay. Anti-flu A, anti-Flu B and anti-SARS-CoV-2 antibodies were dotted on the test line (1 mg/mL) and conjugated to NanoAct™ colored cellulose particles (green, red, and black, respectively; 330 nm; Asahi Kasei Corporation, Japan). Recombinant flu A, flu B and SARS-CoV-2 nucleoproteins were used as analyte, either individually (A – C) or in combination with each other (D -G). The test line signals were detected after 15 min.

# Unisart StructSure® Membranes Are the Perfect Tool for Multiparameter Lateral Flow Assays

Unisart StructSure® membranes represent the next generation of Unisart® CN membranes, enabling parallel testing of multiple targets under identical conditions. They are ideal for multiplexing and simultaneous separation of diverse analytes using a single cocktail conjugate and sample source. The innovative S-shape pattern induces special flow effects resulting in more controlled mixing and efficient binding. The cutting-edge technology improves test accuracy and reliability, making it ideal for semi-quantitative analysis and threshold testing.

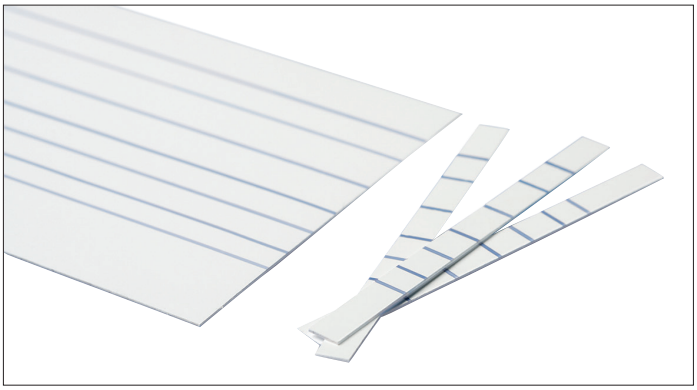


| | | 3-Channel S-shape Unisart StructSure® | 4-Channel S-shape Unisart StructSure® | 5-Channel S-shape Unisart StructSure® | 6-Channel S-shape Unisart StructSure® |
|---|---|---|---|---|---|
| **Quantity of structures per roll** | | 10,000 | 8,000 | 7,000 | 6,000 |
| **Width of channel** | | 2 mm | 2 mm | 2 mm | 2 mm |
| **Length of channel** | | 26.2 mm | 26.2 mm | 26.2 mm | 26.2 mm |
| **Width of structure** | | 8.2 mm | 10.2 mm | 12.2 mm | 14.2 mm |
| **Membrane type** | | Unisart® CN 140 backed | Unisart® CN 140 backed | Unisart® CN 140 backed | Unisart® CN 140 backed |
| **Backing** | | 100 µm polyester, clear | 100 µm polyester, clear | 100 µm polyester, clear | 100 µm polyester, clear |
| **Roll width** | | 25 mm | 25 mm | 25 mm | 25 mm |
| **Roll length** | | approx. 85 m | approx. 85 m | approx. 85 m | approx. 85 m |
| **Ordering Information** | 1 roll per pack | 3UN14ER103S01WS | 3UN14ER084S01WS | 3UN14ER075S01WS | 3UN14ER066S01WS |
| | 5 rolls per pack | 3UN14ER103S01WSB | 3UN14ER084S01WSB | 3UN14ER075S01WSB | 3UN14ER066S01WSB |

# Unisart® Membranes for Immunoassay and Blotting

**Immunoassay**
Line or dot blot strips are widely used for in vitro diagnostic tests. Many infectious diseases generate a complex immune response and require an antibody profiling of the patient serum. To do so, the different immuno-dominant antigens have to be applied in line or dots onto a uniform binding substrate. Today, long after the first membrane was used in blotting, the nitrocellulose membrane is still the best substrate for proteins.

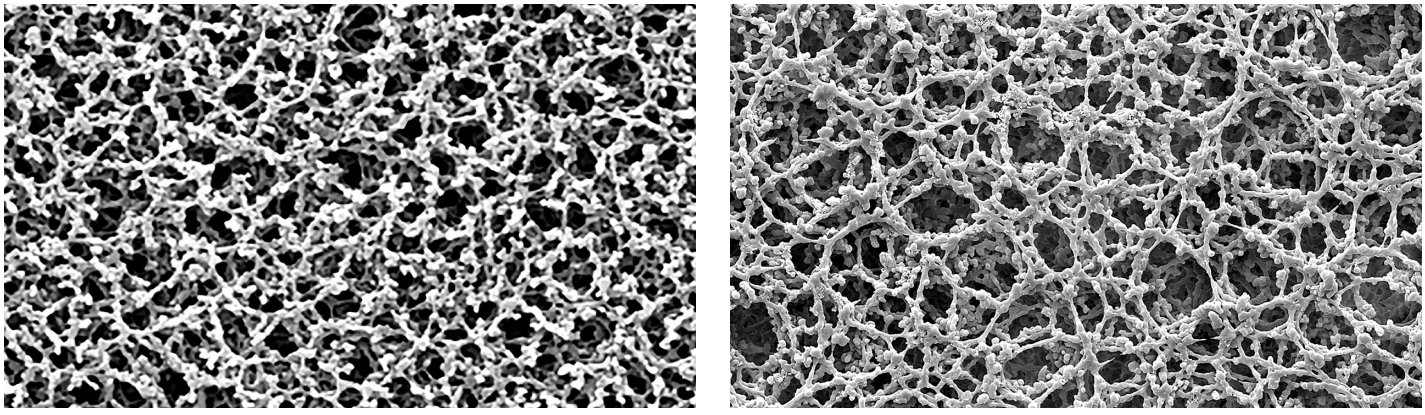
The Unisart® 0.22 µm and 0.45 µm nitrocellulose membranes have been designed to show exceptional consistency in IVD blot strips.



**Blotting**
The Unisart® 0.22 µm and 0.45 µm membranes are well adapted to all protein blotting systems including electro transfer, semi-dry, vacuum or simple capillary blotting. They can be easily cut to the desired dimensions. Under the electrical field and the capillary drive, proteins move out of the gel into the Unisart® membrane which captures them instantly.

The staining of the transferred proteins can easily be done with methods like Ponceau S or SyproRuby staining. After protein transfer, the Unisart® nitrocellulose can be processed according to standard immunostaining protocols.

The antibody-antigen complex can be revealed on the membrane with different detection methods based on colorimetric, chemiluminescent and flourescent signals. The label can be conjugated to specific molecules or even particles, similar to the one used in lateral flow immunoassays. Due to the production process, the non-supported nitrocellulose membranes like the Unisart® 0.22 µm and 0.45 µm, always present two different surfaces, the air and belt side. Each side shall be first evaluated to select the one of choice.



Scan Electron Microscope photo of the 0.22 µm membrane and 0.45 µm (@ 4000x)

### Line and Dot Printing

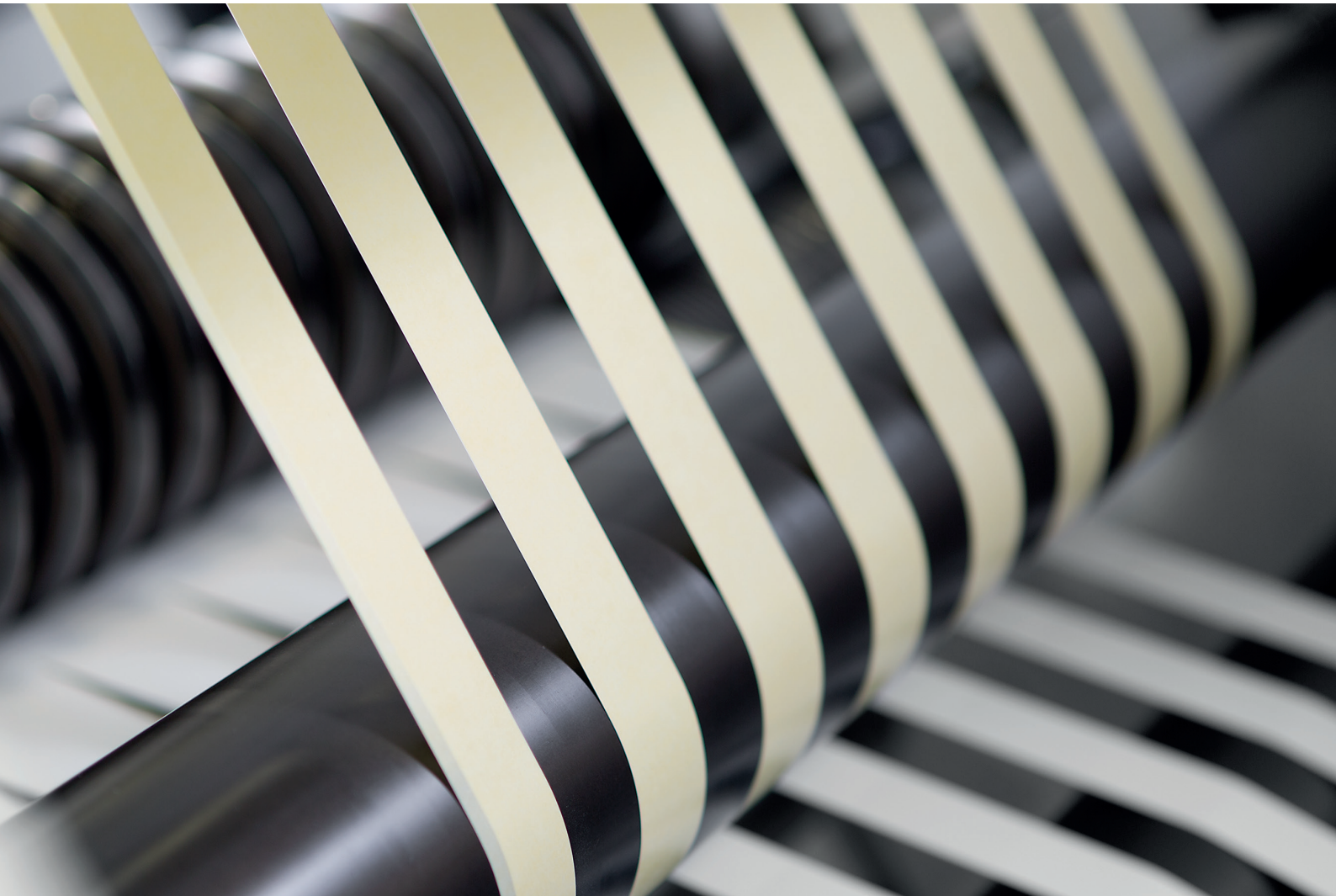
Today, most markers of interest can be generated through recombinant techniques in a pure state and large quantities. Consequently, these proteins can easily be dispensed in line or dots onto the membrane rather than to be transferred from a gel. The smooth surface of the Unisart® 0.22 µm and 0.45 µm allows for an easy dispensing either with contact tips or non-contact nozzles, allowing for sharp lines or spots.

The Unisart® 0.22 µm and 0.45 µm membranes show an optimized structure for blotting. The small pore size membranes allow for a high protein binding capacity onto the sponge like 3D matrix. Furthermore, the high ratio of pores allow for a fast flow through the membrane.

# Typical Parameter Value of the Unisart® 0.22 µm and 0.45 µm

| Unisart® Blotting Membrane | 0.22 µm | 0.45 µm |
|---|---|---|
| Flow rate for water [ml/(min. $cm^2$ bar)] | 27 | 70 |
| Bubble point with water [bar] | 4.4 | 2.4 |
| Extractable content in water [%] | < 1 | < 1 |
| Thickness [µm] | 120 | 130 |
| Burst pressure [bar] | 0.8 | 0.2 |
| Wetting with water [secs] | < 1 | < 1 |

Membrane wound with yellow interleaving protection paper between the membrane layers.
Unisart StructSure® membranes can also be designed on small pore size nitrocellulose
to create multiplex blot cards to better distinguish each test zone.



## Ordering Information

| Unisart® CN Blotting Membrane | Backing Polyester | Width [in mm] | Length [in m] | Max. Splices | Units \| Box | Catalog Number |
|---|---|---|---|---|---|---|
| 0.2 µm | none | 105 | 0.15 | n\|a | 100 | 11327-150-105--N |
| 0.2 µm | none | 135 | 0.15 | n\|a | 100 | 11327-150-135--N |
| 0.2 µm | none | 110 | 0.16 | n\|a | 100 | 11327-160-110--N |
| 0.2 µm | none | 230 | 0.22 | n\|a | 100 | 11327-230-220--N |
| 0.2 µm | none | 280 | 0.28 | n\|a | 100 | 11327-280-280--N |
| 0.2 µm | none | 110 | 0.47 | n\|a | 100 | 11327-470-110--N |
| 0.2 µm | none | 480 | 0.13 | n\|a | 500 | 11327-480-130--Q |
| 0.2 µm | none | 64.5 | 50 | 3 | 1 roll | 11327-----184 |
| 0.2 µm | none | 160 | 50 | 3 | 1 roll | 11327-----185 |
| 0.2 µm | none | 300 | 50 | 3 | 1 roll | 11327----------77 |
| 0.45 µm | none | 300 | 50 | 3 | 1 roll | 11306----------77 |

Customized dimensions of Unisart® CN membranes are also available upon request.
For further information please contact us: unisart@sartorius.com

# Unisart® Microarray Slides

## Unisart® Microarray slides are engineered for consistent protein microarrays

**Unisart® Microarray slides**
For the new generation of protein arrays, Sartorius has developed glass slides coated with a thin microporous nitrocellulose membrane.

Nitrocellulose membranes are the substrate of choice when it comes to protein-based assays. Widely used in electrophoresis blotting techniques and new rapid diagnostic immunoassays, the classical nitrocellulose membranes needed to be reengineered to best fit the protein array applications.

The Unisart® Microarray slides have an optimized nitrocellulose membrane with:

- A high signal to noise ratio (> 50) at very low protein concentrations (pg-fg)
- A very low background of the native array slide
- A perfect spot geometry

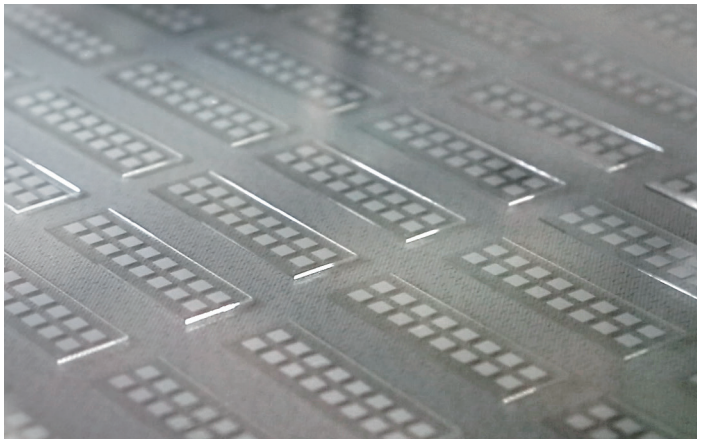
The inherent nitrocellulose properties like: a fast protein attachment without additional chemistry and a good preservation of functional structure as well as a high protein binding capacity per µm² add to the advantages of this particular substrate.

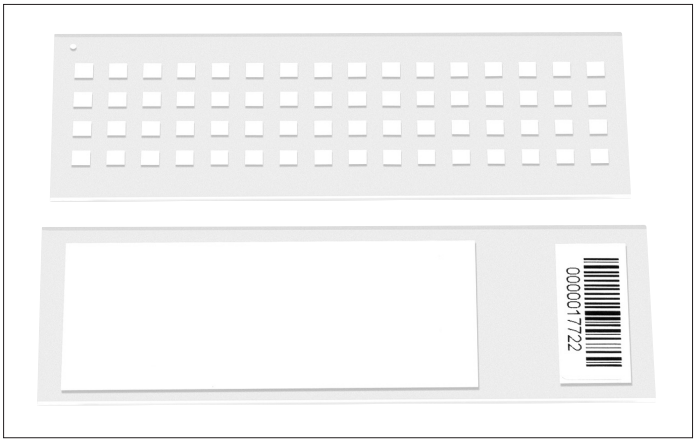
Modified glass surface has become the most widely used substrate for nucleic DNA arrays. However, proteins are very different from nucleic acids. They are heterogeneous with limited stability while DNAs are uniform and stable. Proteins easily lose their activity through denaturation and dehydration as DNAs keep their activity even when denatured. In addition, protein chemistry is more complex with limited amplification methods available. All these differences support the needs of an alternative solid substrate for protein-based arrays.

The Unisart® Microarray slides have been designed to be the best substrate for protein array application like:

**Forward Protein Array**
**(or Capture Protein Array)**
Small amount of pure known proteins are spotted onto the slide. More than 15,000 active spots can be created. Once placed in contact with one sample, it will allow for the simultaneous reaction of the sample with all the spotted molecules.

**Reverse Phase Protein Array**
**(or Lysate Protein Array)**
In a reverse phase protein microarray, multiple micro volume of cell lysate, tissue samples or even body fluids are spotted onto the slide. The reverse phase array is then incubated against one single specific marker, usually a high quality antibody.





After several years of development, a new manufacturing process has been designed. This new validated robotic equipment enables manufacturing the new Unisart® Microarray slides with an unmatched membrane consistency.

The new production process brings the following advantages:

- Tightest thickness specification with ± 1 µm maximum variation.
  A constant thickness will allow for an homogeneous membrane structure and thus a uniform protein binding and spot morphology.

- Consistent and larger batches.
  The new process enables the production of NC-coated slides on a continuous mode. This offers the guaranty for better intra- and inter lot consistency.

## Specifications

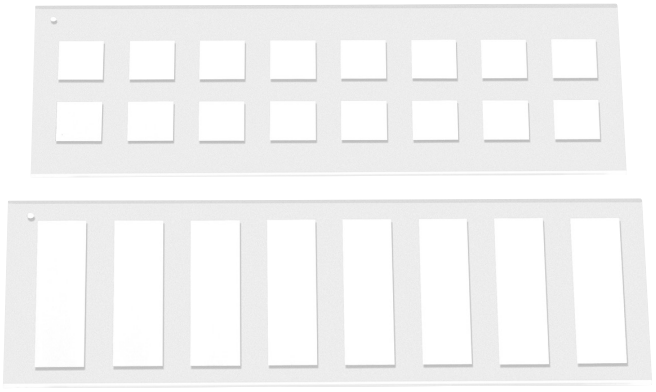
**Glass slide**
Dimensions are the industrial standard in order to fit with instruments used by the microarray society.

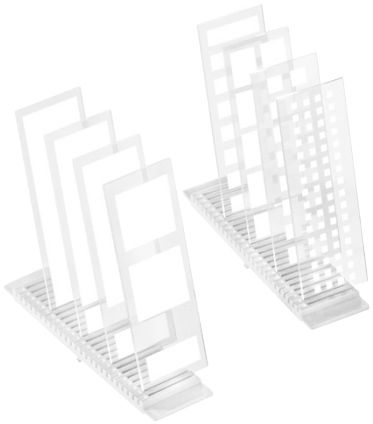
Material: borosilicate glass
Dimension:
Thickness: 1 mm ± 0.05
Length: 75.6 mm ± 0.15
Width: 25.0 mm ± 0.15

**Membrane pad**
Material: Nitrocellulose
Thickness in µm: 12.5 µm ± 2.5
Wetting time (2 µl test solution): 180 s

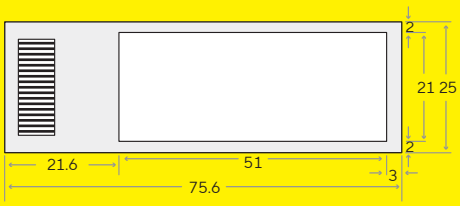
Cleanness:
Slides are 100 % visually inspected and show a white membrane, free of macroscopic defects, without visible marks, stains, dust or foreign matter.

Pad dimension:
According format, tolerance ± 0.2 mm



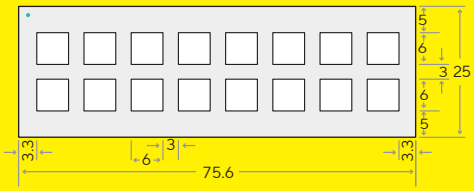


## Ordering Information



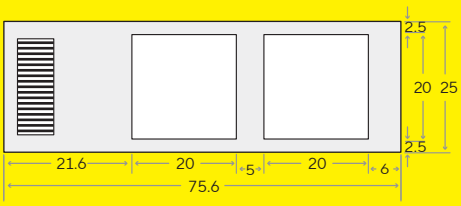

**Description**
Unisart® Microarray slide with one nitro-cellulose membrane pad 51 mm on 21 mm or 60 mm on 21 mm and a bar code label, box of 25 slides

**Catalog Number**
2UNY2GW060021M




**Description**
Unisart® Microarray slide with 16 nitrocellulose membrane pads 6 mm on 6 mm, box of 5 or 25 slides

**Catalog Numbers**
2UNY0GW00600616B
2UNY2GW00600616G




**Description**
Unisart® Microarray slide with two nitrocellulose membrane pads 20 mm on 20 mm and one bar code label, box of 25 slides

**Catalog Number**
2UNY2GW020020M2G

**Unisart® Microarray Slide with Custom Pad**
Various custom pads can be easily produced with the new manufacturing process. Pads can be of any size within the limit of the standard glass slide or within the 96 plate size.

Ask us for prototypes and a quote for minimum quantities:
unisart@sartorius.com

# Unisart® Nitrocellulose

## Storage, Handling and Shelf Life

**Storage and Handling**
Keep away from open fire, any sources of heat, light and chemical vapours of any kind. Constant temperatures between 15 – 25 °C and a relative humidity of maximum 60 % are best for storage and handling of the membrane. Very dry storage conditions might alter the wettability and handling properties of the membrane. This change is only temporarily and can be overcome by conditioning the membrane at rel. humidity between 40 – 60 % for approx. 12 hours before processing the membrane.

After unpacking the membrane, please avoid any direct contact to the membrane by using gloves. Please also avoid any direct contact of the membrane to materials that have the potential to release chemicals or additives into the membrane (e.g. cardboard, plastic ...). Adsorption or absorption of such substances may alter the membrane properties such as wettability. Nitrocellulose membranes are highly flammable. Always keep the membrane separated by the interleafing paper as originally supplied. A material safety data sheet accompanies each shipment of material. Please make sure that the membrane is always handled according to local laws.

**Shelf Life Information**
For Unisart® nitrocellulose-based substrates, the shelf life is:

- Unisart® Membranes for Lateral Flow:
  3 years after manufacturing
- Unisart® Membranes for Line Blot or Blotting Application: 3 years after manufacturing
- Unisart StructSure® Membranes:
  3 years after manufacturing
- Unisart® Microarray Slides:
  1 year after manufacturing

The shelf life is clearly labelled as “use before” or “expiry date” on each Certificate of Analysis. The certificate accompanies each box of product. The shelf life is only guaranteed for originally packed material. Once the Unisart® Membrane | Microarray slide has been built into an OEM device or has been altered in any way, it is highly recommended that the manufacturer of such devices determines the shelf life of the final device.

# Sales and Service Contacts

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