

Nitrocellulose coating

Nexterion® Slide NC



Overview

Type of coating	Immobilization method	Typical probes	Ordering information				
			Nexterion® product	Number of pads per slide	Barcode option	Item number	Slides per pack
Nitrocellulose 3-D structure	Passive absorption through non-specific interactions	Proteins	Slide NC-W	1	Label	1178057	20
			Slide NC-W 16	16	None	1178059	5

Key product features

- High binding capacity
- Excellent spot morphology
- Exceptional surface for long-term storage of many printed proteins
- Compatible with contact and non-contact microarray printers

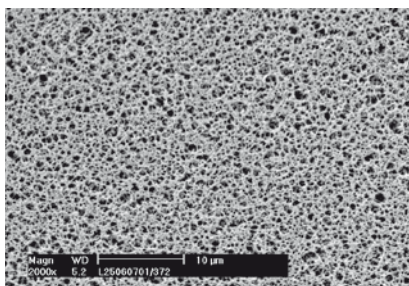
Introduction

Protein microarray technology provides a robust way to study protein function in a rapid, economical, and system-wide fashion. Protein microarrays are playing an increasingly important role in proteomic research, as well as moving into the areas of drug discovery and clinical diagnostics. For many of these protein array applications, the slide surface of choice is nitrocellulose. The unique properties of cellulose nitrate polymers, such as high affinity, and high capacity for protein binding, together with their micro-porous structure makes this material an ideal substrate for protein array applications.

To meet the needs of this rapidly expanding market, SCHOTT has joined forces with Sartorius Stedim Biotech, to develop a range of innovative nitrocellulose-coated microarray slides. Sartorius Stedim Biotech is the perfect co-development partner for this product line, as they have been manufacturing cellulose nitrate membranes for over seventy years. Nitrocellulose formulations from Sartorius Stedim Biotech have proven their reliability over the years, in Western Blots, and in diagnostic membranes, such as for pregnancy tests. The diagnostic membrane production expertise of Sartorius Stedim Biotech has been combined with SCHOTT's microarray slide production know-how to produce protein microarray slides of superior quality, with high reproducibility.

Immobilization surface

Scanning electron microscope photograph of SCHOTT Sartorius Stedim three-dimensional nitrocellulose surface illustrating the uniformity of the pore structure



The performance of nitrocellulose-coated slides is strongly dependent on the internal membrane structure as well as surface quality. The Nexterion® NC slides use a nitrocellulose coating developed by Sartorius Stedim Biotech specifically for protein microarray applications.

The three-dimensional structure and pore size has been optimized to offer a high binding affinity for proteins, and to better stabilize their active conformation. The SCHOTT nitrocellulose slide membranes are manufactured using a newly developed casting process, where solvents are evaporating from a mix of different cellulose nitrate polymers, and additives, to form the unique micro-porous structure. During manufacture, the thickness, and physical characteristics of the coating are tightly controlled, these together with a surface finishing process allow the reproducible manufacturing of slides with an outstanding consistency and performance.

Typical applications

• Sandwich arrays	• Cytokine detection	• Protein-DNA interactions
• Antibody profiling	• Protein binder arrays	• Biomarker profiling
• MicroSpot ELISA	• Protein substrate profiling	• Serological assays
• Reverse phase assays	• Protein activity screening	• Enzyme profiling

Suitable probe types

- Antibody
- Proteins
- Glycans
- Glycoproteins
- Lectins
- Antigens

Product details

High binding capacity

The three-dimensional micro-porous structure of nitrocellulose provides a much higher surface area for binding in comparison to two-dimensional organo-silane coatings. In addition, the nitrocellulose surface binds proteins in a non-covalent, but irreversible manner and the three-dimensional environment helps to maintain the proteins in their biologically active conformation.

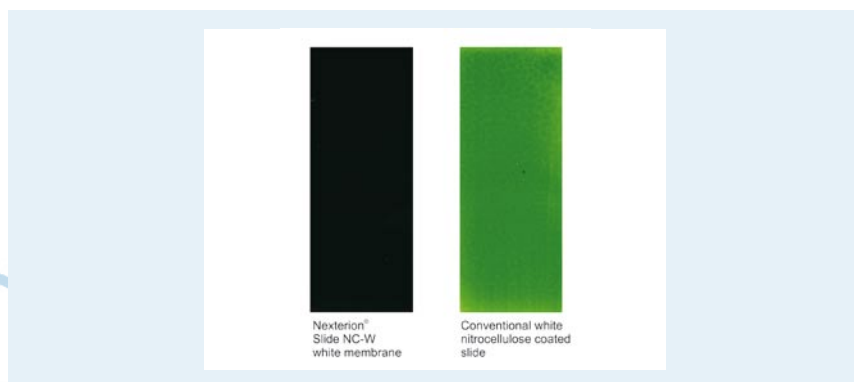
Robust and smooth membrane surface free of dust and defects

The surface of Nexterion® Slide NC is robust enough for use with contact printers, but is sufficiently absorbent to allow a high binding capacity and good spot morphology.

Excellent spot morphology

Nitrocellulose is naturally hydrophobic, and this can be a disadvantage in microarraying where it can lead to inconsistent sample volumes being deposited by contact printers. During manufacture the membranes are impregnated with a surfactant, to ensure an optimal surface for microarray printing. The surfactant type and concentration have been carefully selected to ensure a low auto-fluorescence, and to meet the requirements of consistent micro-spot printing.

Background signals of Nexterion® Slide NC-W in comparison to a commercially available nitrocellulose coated slide. Scanned with Axon Scanner Genepix 4000B, Scan parameters: 532 nm, laser power: 33%, PMT gain: 500



Instrument compatibility

The SCHOTT nitrocellulose slides are compatible with both contact and non-contact microarray printers. The membrane is compatible with all detection methods including fluorescent, chemi-luminescent, radiographic, and colorimetric.

Long term stability

Nexterion® NC slides are ready-to-use from the box, and are stable for over one year under ambient conditions.

It is well documented that nitrocellulose provides an excellent surface for the long-term storage of many printed proteins, especially for antibodies and antigens.

Compatible reagents

Process step	SCHOTT products
Spotting (Proteins)	Nexterion® Spot PB (1178050)

For blocking, hybridization and washing no pre-made Nexterion® reagents are available. Please check the appropriate slide protocol for recommendations.

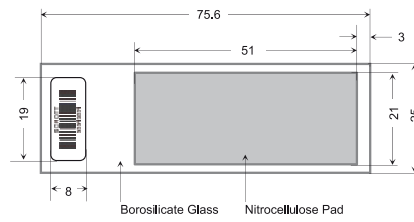
SCHOTT Nexterion® Slide NC product range

SCHOTT is offering a choice of either single pad, or 16-pads nitrocellulose-coated glass slides.

The conventional format for DNA arrays has become standardized around the microscopic glass slide, and now the same instrumentation is being used to print and scan protein microarrays. The dimensions of the glass slides used for the SCHOTT nitrocellulose slides are industry standard 75.6 x 25.0 x 1.0 mm. The glass is a high quality, extremely flat borosilicate glass with a low intrinsic auto-fluorescence.

The spacing and locations of the pads are exactly the same as industry standard nitrocellulose slides allowing the use of standard slide processing equipment.

Dimensions of Nexterion® Slide NC single pad

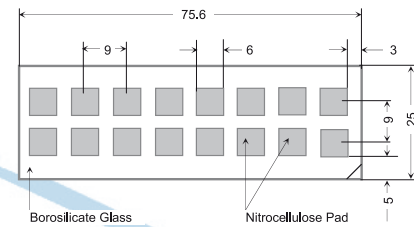


Single pad slides

Nexterion® Slide NC-W

White nitrocellulose-coated glass slides with a single pad 21 by 51 mm. Supplied with a code 128 label bar-code for ease of identification and reliable tracking.

Dimensions of Nexterion® Slide NC 16 pad



16-pad slides

Nexterion® Slide NC-W 16

White nitrocellulose-coated glass slides with 16 pads each 6 by 6 mm. Pad centre-to-centre spacing: 9 mm. Corner orientation mark.

The well spacing of the 16 array pads makes the NC slide fully compatible with standard microarray printing instruments.

Accessories

The use of either single-use gasket chambers, or re-usable silicone incubation chambers, is recommended for carrying out the post-printing incubation reactions.

Nexterion® MPX-4 tray holder for four slides (1180496)

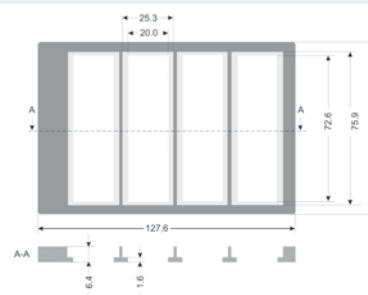
The Nexterion® MPX-4 tray is designed to hold up to four Nexterion® Slide NC 16-pad slides, together with the Nexterion® 16-well self-adhesive superstructures. The 9 mm pad spacing on the Nexterion® NC Slides allows the use



of automated liquid handling systems, or multi-channel hand-held pipettes. The external dimensions of the MPX-4 tray conforms to the SBS microplate standard allowing the high throughput processing of up to 64 arrays simultaneously.

SCHOTT Nexterion® MPX-4 tray for the rapid processing of up to 4 slides

Dimensions of SCHOTT Nexterion® MPX-4 tray



Compatible accessories

The dimensions and locations of the pads on the SCHOTT single-pad, and 16-pad slides are fully compatible with other commercially available incubation chambers

Item	SCHOTT product	Grace Biolabs*	Whatman**
Single pad slide incubation chamber	–	SecureSeal* Hybridization chambers Internal 53 x 22 mm Order code: SA2657	Single-Well Incubation Chamber Order code: 10486137
16-pad slide incubation chamber	–	1. ProPlate* slide module Order code: 204862 2. SecureSeal* Hybridization chambers 16 chambers 7 x 7 mm 9 mm spacing Order code: SA 16S-0.5	16-Well Array Incubation Chamber Order code: 10486046
Holder for processing single slides	–	–	Chip Clip** Slide-Holder Order code: 10486081
SBS compliant microplate holder for processing 4 slides	Nexterion® MPX-4 tray Reusable Order code: 1180496	Flexwell* slide tray Order code: 204970	FAST** Frame Multi-Slide. Plate Order code: 10486001

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