

Three-dimensional thin film coating

Nexterion® Slide P



Overview

Type of coating	Immobilization method	Typical probes	Ordering information			
			Nexterion® product	Barcode option	Item number	Slides per pack
Thin film 3-D polymer surface	Amine reactive chemistry Covalent binding	<ul style="list-style-type: none">• Amino-linked BACs, PACs• Antibodies• Proteins• Peptides• Glycans	Slide P	Laser	1167904	25

Key Product Features

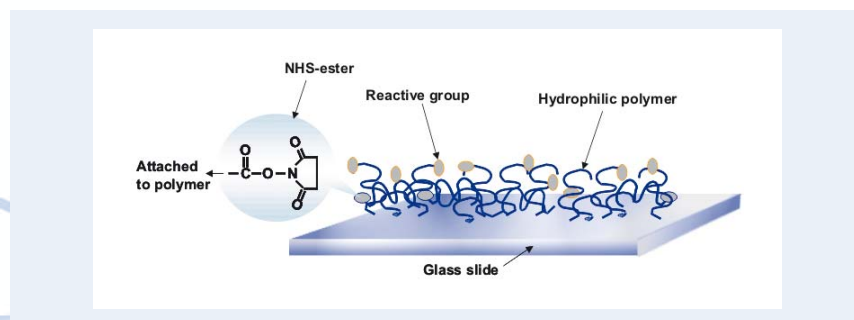
- Ideal substrate for printing amino-modified BACs and antibody microarrays
- High probe loading capacity
- Exceptionally wide dynamic range
- Extremely low non-specific binding characteristics
- Optimal preservation of native structure and biological activity of protein probes
- Compatible with all common microarray printers and scanners

Introduction

SCHOTT specifically developed Nexterion® Slide P as a dedicated slide surface for printing arrays for comparative genomic hybridization (aCGH), as it is ideally suited for the covalent immobilization of long amino-modified DNA molecules such as BAC and PAC clones. Nexterion® Slide P produces excellent signal-to-background ratios and an exceptionally wide dynamic range compared to conventional “two-dimensional” coatings through a unique combination of low non-specific binding characteristics, and high probe loading capacity. Since its introduction, the slide coating has also been successfully used for printing antibody and other protein arrays. The permeable, polymer coating has a large immobilization capacity, and helps to preserve the native three-dimensional structure of complex bio-molecules, thus maintaining conformation and functionality. The robust coating matrix is fully compatible with commercial microarray printers and scanners. Simple and robust protocols are available making Nexterion® Slide P easy-to-use.

Immobilization chemistry

The coating on the SCHOTT Nexterion® Slide P is a three-dimensional, hydrophilic polymer activated with N-Hydroxysuccinimide (NHS) esters to provide covalent immobilization of amine groups. All Nexterion® microarray slides are manufactured from a high quality, low-fluorescence glass coated with low-fluorescence coatings. However, the non-specific binding of assay components still remains an important contributor to the off feature background for many microarray applications. For most types of slide coatings the post-print processing protocol involves a method of adsorptive blocking to reduce non-specific binding, however, these procedures are difficult to perform in a consistent manner.



The Nexterion® Slide P coating has been engineered to exhibit an extremely low intrinsic non-specific background without the need for blocking. This was achieved by using a special polymer that is extremely resistant to non-specific binding. During in-house tests run by SCHOTT, Nexterion® Slide P had the lowest background signal of any microarray slide coating ever tested. The polymer coating has a three-dimensional structure; with NHS-ester reactive groups attached to a hydrophilic polymer backbone. The terminal amino group of amino-modified nucleic acids react immediately and irreversibly with the NHS-ester groups to form a covalent bond. Proteins and other complex bio-molecules bind via surface-exposed amino-groups. The polymer coating maintains the immobilized bio-molecules in a quasi-liquid environment that maintains the protein specificity and chemical conformation. The three-dimensional polymer structure, combined with the end-point attachment chemistry, orients the immobilized bio-molecules away from the glass facilitating the interactions of the attached bio-molecules with their binding targets in solution.

Typical applications

- Array comparative genomic hybridization (aCGH)
- Antibody profiling
- Protein expression profiling
- Functional protein arrays
- Characterization of binding molecules
- Biomarker discovery
- Substrate profiling

Suitable probe types

- Amino-modified BACs, PACs and PCR products
- Amino-modified oligonucleotides
- Antibodies
- Functional proteins such as enzymes or receptors
- Peptides
- Glycans

Highly reproducible coating

Nexterion® Slide P is fabricated using a proprietary thin-film deposition process developed by SCHOTT to produce a uniform and reproducible polymer coating on one side of a high quality borosilicate glass slide. All slides are individually examined for physical defects and the presence of particles before and after coating. The surface is applied in tightly controlled, class 100 clean room facility, resulting in coated slides with highly uniform surface properties and low auto-fluorescence.

Excellent spot morphology and signal-to-background ratios

Nexterion® Slide P provides excellent spot morphologies and reproducible spot sizes over a wide range of probe concentrations for protein, oligonucleotide and other bio-molecule microarray applications.

Packaging and storage

Nexterion® Slide P are packaged in chemically stable plastic boxes and sealed under an inert atmosphere. The slides are ready-to-use from the box, and are stable for 12 months in the sealed packaging when stored at -20°C .

Format

Nexterion® Slide P is available in packs of 25 slides with code 128 barcodes enabling automated sample tracking. The identical P coating is also available in a 16-well slide and 96-well microplate formats. For further information refer to the section on "Multi-well formats".

Protocols

Separate Nexterion® Slide P protocols are available for DNA and protein microarray applications.

Product details

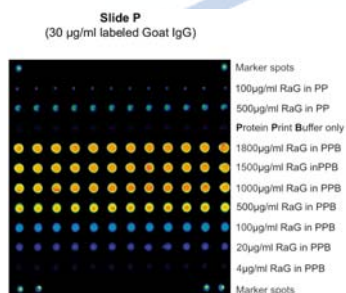


Figure shows scanned images of Nexterion® Slide P evaluated in an anti-IgG/IgG interaction study over a range of probe concentrations dissolved in Nexterion® Spot PB and a phosphate print buffer.

Compatible reagents

Process step	SCHOTT products	Alternatives	Recommended concentrations
Spotting (Protein)	Nexterion® Spot PB (1178050)	150 mM phosphate, pH 8.5, 0.01 % sarcosyl or Tween20®	Protein concentration 0.1 to 1 mg/mL
Spotting (DNA)	Nexterion® Spot (1066029)	100 mM borate (pH 8.0), 50 % DMSO	Oligonucleotides: 20 µM
Spotting (Peptides)		10–50 % DMSO	
Chemical deactivation of unreacted NHS-esters	–	25 mM ethanolamine in 100 mM sodium borate buffer (final pH 8.5)	
Incubation (Protein)	–	137 mM NaCl, 2.7 mM KCl, 4.3 mM Na ₂ HPO ₄ , 1.4 mM KH ₂ PO ₄ , pH 7.5 with 0.05 % Tween20®	
Hybridization (DNA)	Nexterion® Hyb (1066075) Nexterion® Oligo Hyb (1116890)	2x SSC containing 0.1 % SDS and 0.1 % salmon sperm DNA	

Important information about patents

Using arrays based on SCHOTT Nexterion® products for dual color analysis on a single array in which at least two different samples are labeled with at least two different labels may require a license under one of the following patents: U.S. patent nos. 5,770,358 or 5,800,992 or 6,225,625 and U.S. patent no. 5,830,645. Manufacturing and use of probe arrays may require a license under the following patents: U.S. patent no. 6,040,138 or 5,445,934 or 5,744,305 and under the following patents owned by Oxford Gene Technology Ltd. ("OGT"): European patent no. EP 0,373,203, U.S. patent nos. 5,700,637 and 6,054,270 and Japanese patent nos. 3393528 and 3386391 ("The OGT patents"). Other patents may apply. The purchase of SCHOTT Nexterion® products does not convey any license under any of the OGT patents or any of the other patents referred to. For all applications SCHOTT North America Inc. and SCHOTT Technical Glass Solutions GmbH make no representation or warranty that the practice of its technology and products or any improvement will not infringe or violate any domestic or foreign patent of any third party. Before making or using any oligonucleotide arrays you should contact OGT to discuss a licence. To inquire about licensing under the OGT patents, please contact OGT at licensing@ogt.co.uk.

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