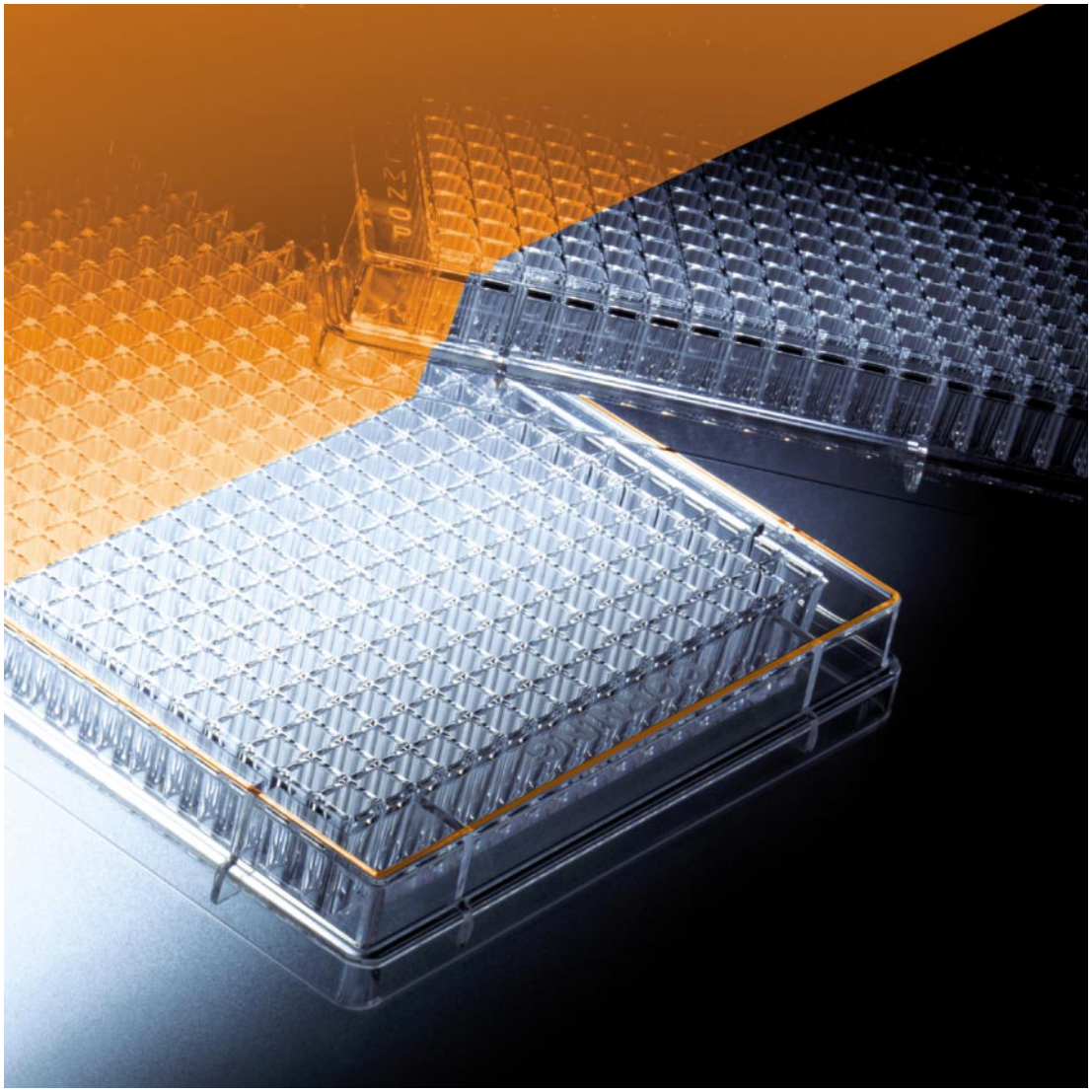
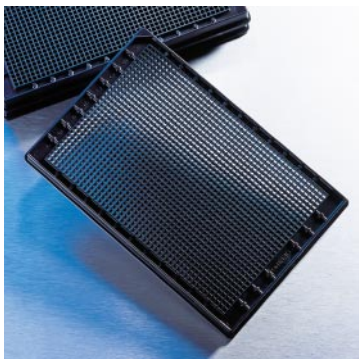
Corning® Nonbinding Surface (NBS™) Microplates

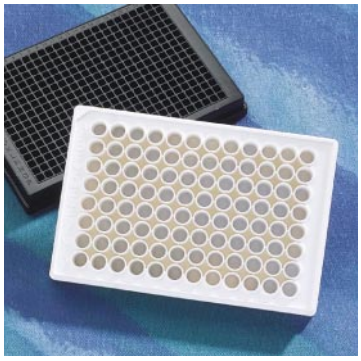
Improving assay sensitivity and performance

Corning NBS microplates improve assay performance for high-throughput screening applications.

- Reduce nonspecific binding for increased assay sensitivity
- Enhance signal-to-noise ratio at low concentrations
- Save on reagent costs
- Ideal for homogeneous and SPA assays
- Available in 96, 384, and 1536 well formats
- Automation-friendly microplates can be bar coded







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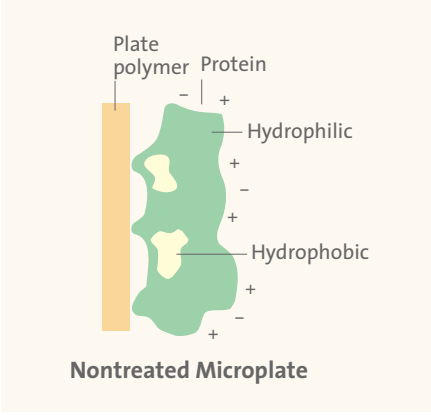
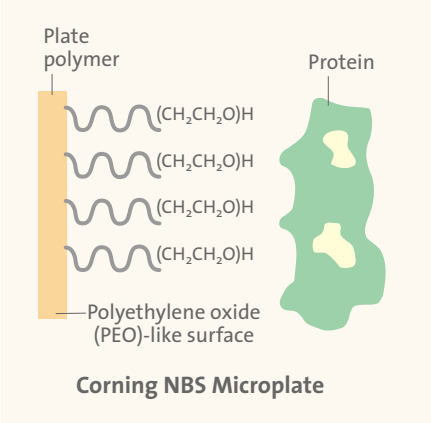
Key Features and Benefits of Corning® NBS™ Microplates

Features	Benefits
Nonbinding surface	◗ Reduces nonspecific binding of expensive reagents to microplate surface ◗ Improves signal and reduces background for homogeneous and SPA assays
Thermally stable from 4° to 37°C	◗ Consistent performance over a wide range of temperature and storage conditions
Chemically stable noncytotoxic surface	◗ Compatible with aqueous solutions with low levels (<20%) of organic solvents such as ethanol and DMSO
Meets SBS microplate standards	◗ Compatible with standard 96, 384, and 1536 well liquid handling and automation instrument ◗ Suitable for bar coding



Protein binds to untreated polystyrene through hydrogen bonding and other hydrophobic interactions.



Non-ionic hydrophilic layer on the well surface of NBS microplates reduces hydrophobic and ionic interaction with proteins.

NBS Microplates Reduce Protein and Nucleic Acid Binding

The non-ionic, hydrophilic surface of NBS microplates reduces binding of protein and nucleic acids over a wide molecular weight range. The surface is ideal for high-throughput homogeneous assays in which nonspecific binding to the microplate is reducing assay signal.

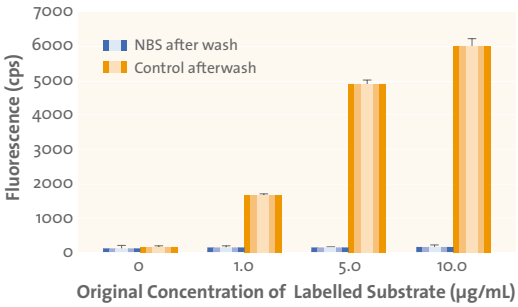
Comparison of protein and nucleic acid binding with various polymers

	Binding in ng/cm²				
	^{125}I-IgG	^{125}I-BSA	^{125}I-Insulin	^{32}P-oligo DNA	^{32}P-λ phage DNA
Polystyrene (PS)	400	450	310	22	6
Polypropylene	380	440	370	3	<2
NBS on PS	<2.5	<2.5	5	<2	<2

Based on a Scintillation Proximity Assay (SPA) using 100 µL/well in 96 well microplates. Contents were aspirated and washed 3 times with 200 µL/well of PBS, pH 7.4 (Ref. 1).

NBS Microplates Improve Signal in Fluorescent Polarization Assays

NBS microplates have been shown to improve signal-to-noise performance with fluorescent polarization assays. As a result, signal strength is enhanced without increasing reagent concentrations, which leads to greater cost savings. In addition, NBS microplates also increase the reliability of data by increasing assay sensitivity.

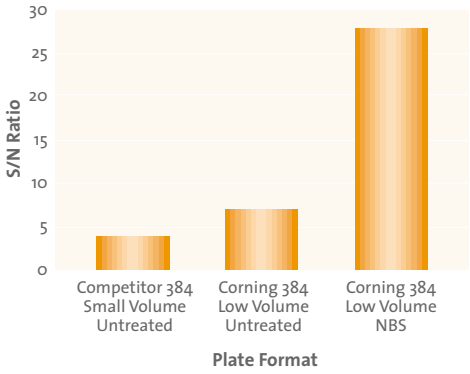


Significant reduction of substrate adsorption to NBS microplates versus untreated microplates

In a dilution assay, BODIPY FL casein substrate in digestion buffer was incubated for 30 minutes at RT in black 96 well Corning untreated and NBS microplates. The microplates were washed 3 times with PBS, pH 7.4, and digestion buffer. Levels of substrate remaining bound to wells were measured by fluorescence intensity. Results showed that minimal amounts of protein remained in the wells of NBS microplates at all concentration levels (Ref. 2).

NBS Microplates Enhance Assay Performance at Low Volumes

NBS microplates meet the demand for assay miniaturization without compromising assay integrity. At low assay volumes, decreased assay signal-to-noise ratios with standard microplates could require an increase in reagent concentrations, which is a costly solution. Reagent loss can be minimized with Corning NBS low volume 384 well microplates due to reduced nonspecific adsorption to well walls, as well as decreased fluid entrapment from the rounded well bottom.



Decreased nonspecific protein binding and enhanced assay signal at 5 µL assay volume with Corning® 384 well Low Volume NBS™ microplates

In a fluoresecent polarization assay, 0.125 pg/µL Streptomyces griseus protease was incubated with 100 pg/µL BODIPY FL casein in 5 uL volumes for 10 minutes at RT. Protease activity was measured as a reduction in mP units over time. The Corning Low Volume NBS microplate had over four times greater signal-to-noise ratio (as change in mP/avg SD) versus competitor untreated microplates. Similar results were observed at 1, 10, and 20 µL assay volumes (data not shown) (Ref. 3).

Frequently Asked Questions

What is Corning NBS surface?

NBS is a Corning proprietary surface technology that is based on a high molecular weight polyethylene oxide-containing polymer that is insoluble in water.

How stable is the surface to repeated use with aqueous solutions?

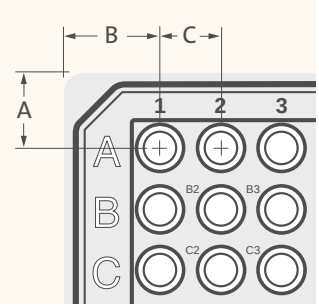
NBS is very stable to aqueous solutions, except those with high levels (>20%) of organic solvents (e.g., DMSO, ethanol).

Why do some customers prefer to use NBS microplates instead of untreated microplates?

Some customers using "sticky" proteins in assays reported significant protein losses to the plate surface. By switching to the Corning NBS microplates, they saw a notable improvement in assay signal and sensitivity. Other customers had developed a low volume assay and could only detect acceptable signals with the NBS microplates. The added benefit for them was the decreased reagent usage, which ultimately led to lower assay costs. An additional benefit of the NBS microplates is the reduction in air bubbles compared to untreated microplates.

Is there any expiration date for NBS microplates?

NBS microplates are best used within two years from date of manufacture.



Top view of Half Area 96 well microplate

Corning NBS Microplate Dimensions

(see illustration above for dimensions)

	Standard 96 well microplates	Half Area 96 well microplates	Standard 384 well microplates	Low Volume 384 well microplates	1536 black clear bottom microplates	1536 solid black and white microplates
Well volume (µL)	360	190 (solid)/ 210 (clear bottom)	112	35	12.8	12.8
Well diameter (top/bottom) (mm)	6.86/6.35	5.0/4.5	3.63/2.67 (width)	3.30/6.58	1.8/1.63	1.18/1.13
Well depth (mm)	10.67 (flat bottom)/ 11.30 (round bottom)	10.54 (solid)/ 11.47 (clear bottom)	11.43	6.58	4.8	4.8
Well A1 location (Row offset, A) (mm)	11.2	11.2	9.0	9.0	7.86	7.86
Well A1 location (Column offset, B) (mm)	14.3	14.3	12.1	12.1	11.0	11.0
Well center to well center distance (C) (mm)	9.0	9.0	4.5	4.5	2.25	2.25

Corning® NBS™ Microplates Ordering Information

Corning NBS microplates are available in 96, 384, and 1536 well formats. These microplates are nonsterile and have a flat bottom, unless otherwise indicated.

Cat. No.	Description	Qty/Pack	Qty/Case
96 Well NBS Microplates			
3544	384 well, black with clear bottom low volume plate	10	50
3574	384 well, white solid plate	10	50
3575	384 well, black solid plate	10	50
3641	96 well, clear solid plate	25	100
3650	96 well, black solid plate	25	100
3991	96 well black solid plate	5	25
3686	96 well black solid half area plate	25	100
3993	96 well black solid half area plate	5	25
3651	96 well, black with clear bottom plate	25	100
3881	96 well black with clear bottom half area plate	25	100
3600	96 well, white solid plate	25	100
3990	96 well white solid plate	5	25
3605	96 well, white solid plate, round bottom	25	100
3642	96 well white solid half area plate	25	100
3992	96 well white solid half area plate	5	25
3604	96 well, white with clear bottom plate	25	100
3820	384 well, black solid low volume plate, flat bottom	10	50
3824	384 well, white solid low volume plate, flat bottom	10	50
3995	96 well white with clear bottom plate	5	25
3884	96 well white with clear bottom half area plate	25	100
3994	96 well white with clear bottom half area plate	5	25
384 Well NBS Microplates			
3640	384 well, clear solid plate	25	100
3676	384 well black solid low volume plate, round bottom	25	100
3655	384 well, black with clear bottom plate	25	100
3653	384 well, white clear bottom	25	100
3673	384 well white solid low volume plate, round bottom	25	100
1536 Well NBS Microplates			
3728	1536 well, black solid plate, flat bottom	10	50
3729	1536 well, white solid plate, flat bottom	10	50
3895	1536 well, black with clear bottom plate	10	50

For additional product or technical information, please visit **www.corning.com/lifesciences** or call 1.800.492.1110. Outside the United States, please call 1.978.442.2200.

References

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2. Corning Non-Binding Surface Microplates for Fluorescent HTS Assays. www.corning.com/lifesciences. 2001.
3. Corning 384 Well Low Volume Microplate Performance in Miniaturized Assays. www.corning.com/lifesciences. 2001.
4. Corning Non-Binding Surface Treatment to Reduce Non-Specific Binding to Microplates www. corning.com/lifesciences. 1998.
5. Harris, A.., Cox, S.L., and Norey, C.G. High-throughput fluorescence polarization receptor binding assays using CyDye labelled non-peptide and peptide ligands and FARCyte fluorescence plate reader. Amersham Biosciences, Life Sciences News, Vol. 10. 2002.

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