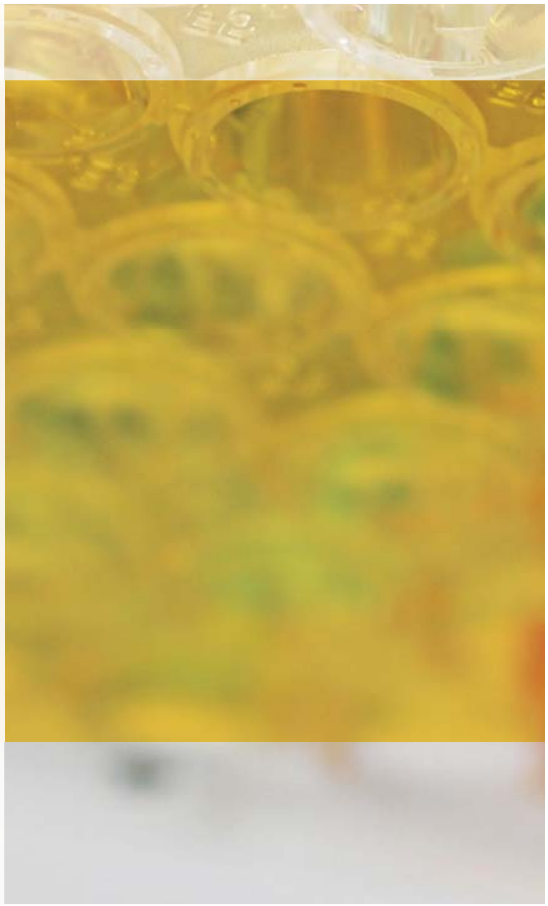
diagnostics | 136-159

The right surface for your assay.

In this section, you will find valuable information about products relating to passive binding surfaces for biomacromolecules, covalent coupling surfaces for smaller biomolecules, and affinity capture surface for affinity-tagged biomolecules. Immunoassay techniques are extremely sensitive and contain detection limits in the range of 10 fmol. In order to obtain accurate and reproducible results, it is essential that you choose the appropriate surface with optimized conditions.

By choosing a Thermo Scientific plate, you benefit from more than 30 years of industry-leading experience in immunoassay plate technology, and a broad range of surfaces and formats to optimize your assay.



For more information about Thermo Scientific diagnostic solutions visit:
thermoscientific.com/oemdiagnostic

Choice of Surface – Surfaces for passive adsorption

Whatever the format chosen, there are a number of choices to be made about the best type of surface for the application. The choice will depend on the assay component to be immobilized.

Surfaces for passive adsorption

Passive surfaces have a broad range of applications, as they can bind a variety of biomolecules, based on multiple weak molecular interactions forming a stable bond. Passive binding is therefore primarily suited for the immobilization of medium- to large-sized molecules, such as antibodies, which are capable of establishing several contact points. The exact molecular interaction sites are dependent on the specific matching of the biomolecule's properties with the polymer surface. A large variety of biomolecules can be stably immobilized on passive surfaces with good residual activity.

The family of Thermo Scientific passive surfaces vary in their degree of hydrophilicity and are organized into four different sub-groups: hydrophobic, slightly hydrophilic, hydrophilic, and very hydrophilic. A hydrophobic surface functions predominantly via hydrophobic binding. With the increased hydrophilicity caused by the incorporation of oxygen containing functional groups, electrostatic interactions can play a greater role in binding, thus influencing which types of biomolecules will bind strongly to the surface.

Hydrophobic

- These surfaces are typically used for the adsorption of hydrophobic molecules such as lipid rich biomolecules.

Slightly hydrophilic

- The slight hydrophilicity of these plates enhances their ability to bind a diverse range of biomolecules, including glycoproteins, serum containing samples and amphoteric molecules such as lipopolysaccarides. With these plates non-specific adsorption of serum containing samples are reduced, and this will improve the signal-to-noise (S/N) ratio and consequently, sensitivity levels.

Hydrophilic

- Optimized to bind high amounts of IgG (polyclonal), these plates are ideal for antibody sandwich assays (e.g. ELISAs). In addition, they show increased binding of many other proteins and biomolecules that possess hydrophilic/hydrophobic characteristics.

Very hydrophilic

- The most hydrophilic in our portfolio will bind many hydrophilic proteins with a high affinity to these plates. Binding does, however, tend to be more pH sensitive.

Table 1, Table 2 and Fig. 1 show the link between the surface and the affinity of the biomolecule.

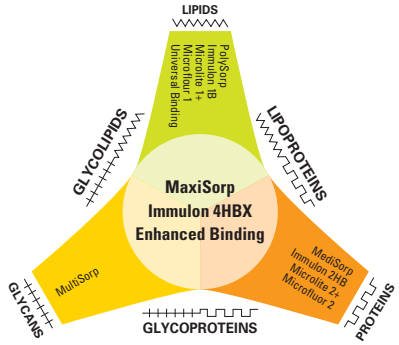
Table 1. General guidelines for the selection of passive surfaces for the immobilization of particular biomolecules.
BIOMOLECULE: The likelihood of effectively immobilizing a biomolecule on a particular surface is indicated in the table

Passive Category	Surface	Immunoglycoproteins	Proteins (water soluble)	Proteins (less water soluble)	Glycans
Hydrophobic	PolySorp	Fair	Fair	Very Good	Low
	Immulon 1 B	Fair	Fair	Very Good	Low
	Universal Binding (UB)	Fair	Fair	Very Good	Low
	Microlite 1+	Fair	Fair	Very Good	Low
	Microfluor 1	Fair	Fair	Very Good	Low
Slightly hydrophilic	Immulon 2 HB	Good	Good	Good	Fair
	Microlite 2+	Good	Good	Good	Fair
	Microfluor 2	Good	Good	Good	Fair
	MediSorp	Good	Good	Good	Fair
Hydrophilic	MaxiSorp*	Very Good	Very Good	Fair	Good
	Immulon 4 HBX	Very Good	Very Good	Fair	Good
	Enhanced Binding (EB)	Very Good	Very Good	Fair	Good
Very hydrophilic	MultiSorp	Low	Good	Fair	Good

** Optimized for IgG binding*

Choice of Surface – Surfaces for passive binding

Fig. 1



Surfaces for passive binding

Surface for passive binding

Schematic representation of the types of biomacromolecules, which can be bound to the available modified surfaces. E.g. if a lipid is to be bound, the hydrophobic surface Thermo Scientific Nunc PolySorp is most suitable. Based on the physiochemical characteristics of the biomolecule to be immobilized, a surface can be chosen which is appropriate for robust binding.
As is indicated in Fig. 1, Thermo Scientific Nunc MaxiSorp has the widest breadth applications, as it is capable of binding the greatest range of molecules.

Surface characteristics:

- Adsorb larger biomolecules
- Different molecular orientations are possible
- A variety of surfaces are available for performance optimization

Table 2. Passive binding surfaces characteristics

Name	Base Polymer	Hydrophilicity	Binding Preference	Key Applications	Features
○ PolySorp △ Immulon 1 B* △ Microlite 1+* △ Microfluor 1* △ Universal Binding (UB)	Polystyrene	–	Biomolecules that have hydrophobic domains, e.g. lipids, lipoproteins, large proteins	Coated antigen ELISA, FIA, LIA	- Lower binding of immunoglobulins: approx. 200-250 ng IgG/cm²
○ MediSorp* △ Immulon 2 HB* △ Microlite 2+* △ Microfluor 2*	Polystyrene	+	Biomolecules with hydrophilic/hydrophobic properties, e.g. medium to large proteins such as albumin. Amphiphilic biomolecules such as LPS	Antibody sandwich ELISA, coated antigen ELISA	- Binds proteins - Moderate binding of immunoglobulin: MediSorp 500-600 ng IgG/cm² Immulon 2 HB 350-450 ng IgG/cm² - Lower non-specific binding with samples containing serum or plasma vs. high binding plates
○ MaxiSorp* △ Immulon 4 HBX* △ Enhanced Binding (EB)*	Polystyrene	+ +	Biomolecules with hydrophilic/hydrophobic properties. Designed for high binding of IgG. Also high binding for many other proteins and biomolecules that have hydrophilic/ hydrophobic character	Antibody sandwich ELISA, FIA, LIA Coated antigen ELISA, FIA, LIA	- Effectively binds a broad range of proteins and biomolecules (broadest range) - High binding plate. Immunoglobulin capacity: approx. 600-650 ng IgG/cm²
○ MultiSorp	Polystyrene	+ + +	Hydrophilic biomolecules, e.g. glycoproteins	Coated antigen ELISA	- Protein binding is significantly influenced by pH over the range of 4-10. The pH profile should be examined

○ *Thermo Scientific Nunc*
△ *Thermo Scientific Microtiter*
** Release tested for binding reproducibility.*

Abbreviations:
FIA - Fluorescent Immunoassay
LIA - Luminescent Immunoassay
NA - Nucleic Acid
ELISA - Enzyme Linked Immuno Sorbent Assay
PCR - Polymerase Chain Reaction
LPS - Lipopolysaccharide
EDC - 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide
CV - Correlation of variation

Choice of Surface – Surfaces for covalent binding

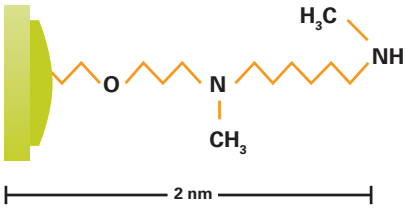


Fig. 2

Schematic chemical and physical configuration of the CovaLink NH surface. The NH groups are spaced from the polystyrene surface by 2 nm long (approximately), chemically defined spacer arms, covalently anchored to the surface using a patented method.

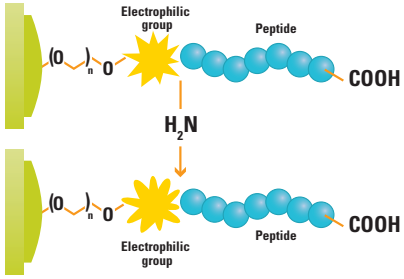


Fig. 3

Covalent coupling of a peptide to the Immobilizer Amino plate.

During a short incubation step, the peptide will bind to the electrophilic group.

Surfaces for covalent binding

Covalent coupling, is based on the formation of a single covalent bond between the polymer surface and the biomolecule. Small biomolecules can be immobilized using this technique, as can medium and large molecules that possess the appropriate functional group(s). Since coupling occurs via specific functional groups, biomolecular orientation can also be manipulated by the user.

Surface characteristics

- Strong covalent bonds firmly anchor biomolecules
- Compatible with vigorous washing
- Stability is provided
- Coating with lower amounts of reagent may be possible
- Control of molecular orientation

Thermo Scientific Nunc CovaLink

- The CovaLink™ surface is designed for coupling of molecules bearing a free carboxyl or phosphate group. Therefore, peptides, haptens and DNA can be coupled. The surface uses a spacer arm to increase accessibly, thereby enhancing overall surface reactivity (Fig. 2).

Thermo Scientific Nunc Immobilizer Amino

- The Immobilizer™ Amino surface forms stable covalent bonds between its electrophilic groups and the biomolecule's free amino acids or sulfhydryl groups. Using its unique spacer arm chemistry, the surface provides extremely low non-specific binding to improve assay sensitivity. With no need for an ancillary coupling agent, this surface can simplify your assay development by eliminating the need for a time-consuming blocking step (Fig. 3).

The Immobilizer Amino surface is ideal

- If your biomolecule does not bind well to a passive surface, and it possesses one or more free primary amino or sulfhydryl groups (peptides, oligonucleotides, proteins, proteoglycans)
- To obtain a highly sensitive assay with excellent reproducibility and low background
- To minimize the use of a coating reagent
- To reduce the number of steps required to prepare plates
- To avoid unwanted reactivity associated with a blocking reagent

▶ To help you find the best products for your applications, visit our online plate selection tool at: www.thermoscientific.com/plateguide

Covalent coupling surfaces

- The diagram shows the available surface modifications for directed binding of target biomolecules. In the case of Immobilizer Amino and CovaLink, a strong covalent bond is formed with the biomolecule being immobilized at the surface. The biomolecule must possess the correct functional group for covalent coupling. The relevant functional groups on the biomolecule are shown in Fig. 4.

Table 3 shows the link between the surface and the binding preference.

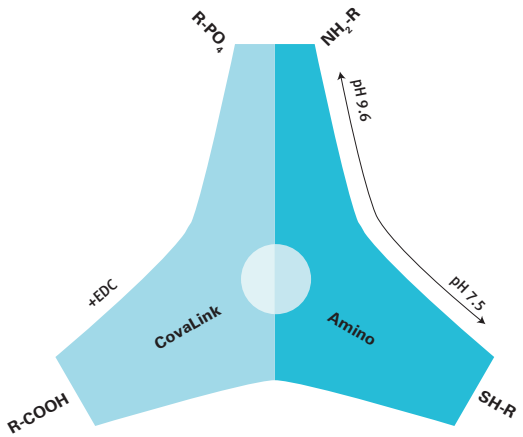


Fig. 4

Table 3. Covalent Coupling Surfaces

Name	Base Polymer	Structure	Binding Preference	Key Applications	Features
○ **CovaLink**	Polystyrene	Secondary Amine on a 2 nm spacer arm	Covalent coupling of biomolecules with -COOH or -PO_4-groups EDC used for activation of -COOH, PO_4-groups	Coated antigen ELISA, LIA, FIA	- Can link biomolecules via the COOH group (enables the detection of peptides that bind to an antibody via the NH_2 end) - Spacer arm technology for optimal orientation
○ **Immobilizer Amino***	Polystyrene	Reactive electrophilic group tethered on a spacer arm	Covalent coupling of biomolecules with free NH_2 and/or SH groups, e.g. proteins, peptides, aminated oligos	Coated antigen ELISA, FIA, LIA NA Hybridization assays Antibody sandwich ELISA, FIA, LIA	- Immobilize proteins and peptides that do not bind to passive surfaces - Stable covalent bond formation with free NH_2 or SH groups via spacer arm technology - NO BLOCKING REQUIRED - Simple one step protocol. Add coating solution and incubate - Can frequently reduce the amount of biomolecule needed for coating vs. passive plate - High signal-to-noise ratio

○ *Thermo Scientific Nunc*
△ *Thermo Scientific Microtiter*
** Release tested for binding reproducibility.*

Abbreviations:
FIA - Fluorescent Immunoassay
LIA - Luminescent Immunoassay
NA - Nucleic Acid
ELISA - Enzyme Linked Immuno Sorbent Assay
PCR - Polymerase Chain Reaction
LPS - Lipopolysaccharide
EDC - 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide
CV - Correlation of variation

Choice of Surface – Affinity capture surfaces

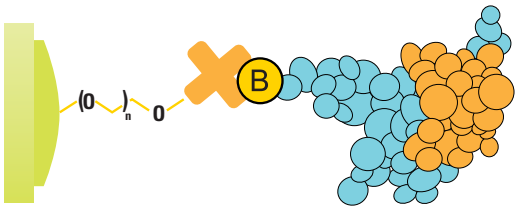


Fig. 5

Coupling of a biotinylated protein to the covalently bound streptadivin. After a pre-wash, simply add the biotinylated target molecule in an appropriate buffer. In a short incubation step, the biotinylated molecule will bind to the streptavidin molecule.

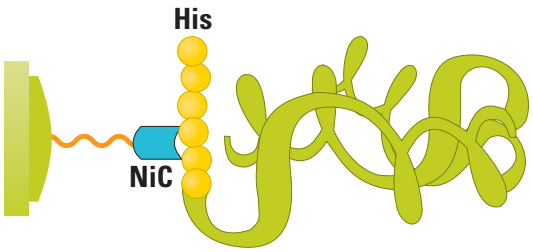


Fig. 6

Coupling of a 6x Histidine-tagged protein/peptide to the Immobilizer Nickel Chelate plate.

His = Histidine

NiC = Nickel Chelate

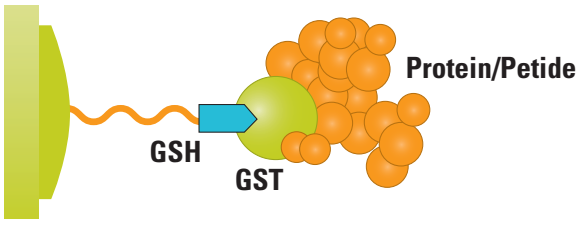


Fig. 7

Coupling of a GST-tagged protein/peptide to the Immobilizer Glutathione plates.

GSH = Glutathione

GST = Glutathione-S-transferase

Affinity capture surfaces

Affinity capture is based on the specific binding of a tagged biomolecule to its receptor. The plate surface is therefore developed with one of the binding pair (the receptor) immobilized on its surface, while the tag is linked to a biomolecule either by chemical coupling or by genetic engineering. The tagged biomolecule can then be captured on the plate surface with a high degree of specificity.

Surface characteristics

- Affinity capture surfaces have highly specific binding
- Reduced variability in molecular orientation
- Immobilizer surfaces improve S/N ratios
- Streptavidin biotin interaction can be exploited to immobilize a wide range of biomolecules (proteins, peptides, haptens, nucleic acids)

Passive Streptavidin

Streptavidin is passively coated on the plate with a biotin binding capacity of at least 13-20 pmol per well.

Immobilizer Streptavidin

The streptavidin protein molecules are covalently bound to the surface via a spacer arm to reduce leaching and enhance precision. The surface is also modified to minimize non-specific binding. As a result, a high S/N ratio is produced, for increased sensitivity. A biotin binding capacity of 20 pmol per well produces excellent analytical results (Fig. 5).

Immobilizer Nickel Chelate

A nickel chelate group is attached to the polymer surface via a spacer arm and will bind polyhistidine, which is typical genetically engineered into a fusion protein. The spacer arm design maximizes the reactivity of the surface, while minimizing non-specific binding, and covalent linkage significantly reduces leaching. The surface does not need to be blocked and therefore produces a high S/N ratio (Fig. 6).

Immobilizer Glutathione

A GST peptide, attached to the polymer surface via a spacer arm, will bind glutathione, which is typical genetically engineered into a fusion protein. The spacer arm maximizes surface reactivity while minimizing non-specific binding, and the covalent linkage reduces the occurrence of leaching. The surface does not need to be blocked and therefore a high S/N ratio is obtained (Fig. 7).

The diagram shows the available surface modifications for directed binding of target biomolecules.

Table 4 shows the link between the surface and the binding preference.

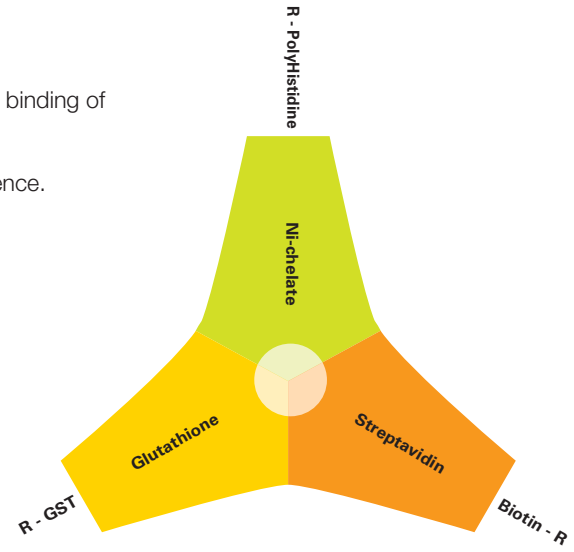


Fig. 8
Affinity capture surfaces

Table 4. Affinity Capture Surfaces

Name	Base Polymer	Structure	Binding Preference	Key Applications	Features
○ **Passively coated Streptavidin**	Polystyrene	Streptavidin passively coated	Biotinylated biomolecules	Immunoassays, protein-protein binding assays, PCR ELISA, NA Hybridization assays	- Passively coated Streptavidin - Biotin capacity: ≥13 pmol biotin per well - Stable at room temperature
○ **Immobilizer Streptavidin***	Polystyrene	Streptavidin covalently coupled to polystyrene surface via a spacer arm	Biotinylated biomolecules	Immunoassays, protein-protein binding assays, PCR ELISA, NA Hybridization assays	- NO BLOCKING REQUIRED due to unique surface chemistry - High sensitivity; very high signal-to-noise ratio - Stable at room temperature - Biotin capacity (20 pmol/well provides large dynamic range for analytical assays)
○ **Immobilizer Nickel Chelate***	Polystyrene	Nickel Chelate covalently coupled to polystyrene surface via a spacer arm	6-His tagged fusion proteins	Protein-protein and protein-nucleic acid binding assays, immunoassays	- High sensitivity; very high signal-to-noise ratio - NO BLOCKING REQUIRED due to unique surface chemistry - Stable at room temperature
○ **Immobilizer Glutathione***	Polystyrene	Glutathione covalently coupled to polystyrene surface via a spacer arm	Glutathione-S-transferase tagged fusion proteins	Protein-protein and protein-nucleic acid binding assays, immunoassays	- High sensitivity; very high signal-to-noise ratio - NO BLOCKING REQUIRED due to unique surface chemistry - Stable at room temperature

○ *Thermo Scientific Nunc*
△ *Thermo Scientific Microtiter*
** Release tested for binding reproducibility.*

Abbreviations:
FIA - Fluorescent Immunoassay
LIA - Luminescent Immunoassay
NA - Nucleic Acid
ELISA - Enzyme Linked Immuno Sorbent Assay
PCR - Polymerase Chain Reaction
LPS - Lipopolysaccharide
EDC - 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide
CV - Correlation of variation

Thermo Scientific Colormetric Assays Using Passive Adsorption

immuno plates, clear

Nunc™, Immulon™ and Microtiter™ clear plates are ideal for quantitative and qualitative solid phase immunoassays (e.g. ELISA and binding assays).

They offer four binding surfaces and three well shapes for reliable and reproducible results in colormetric assays. Each lot is functionally tested for IgG binding.

details

96-Well and 384-Well Solid Plates

- Clear polystyrene
- 3 well shapes available (flat, round or C-shaped)
- Choice of four surfaces for optimal binding
- Alphanumerically labeled rows and columns

Surfaces

- PolySorp, Immulon 1B, and Universal Binding (UB) for adsorption of hydrophobic molecules
- MediSorp and Immulon 2HB are slightly hydrophilic and bind a diverse range of biomolecules
- MaxiSorp, Immulon 4 HBX, and Enhanced Binding (EB) are hydrophilic and ideal for antibody sandwich assays
- MultiSorp is very hydrophilic and works well for glycans and water soluble proteins

Ordering Information: Please note that availability may vary by country. Cat. Nos. 467320, 456537, 460984, 439454 and 446612 include certificate.

For additional information about our Plates and Modules, please visit:
www.thermo.dirxion.com/immunoassaybrochure
www.thermo.dirxion.com/immunoassayguide

Colormetric Assays Using Passive Adsorption

Cat. No.	Brand	Well Shape	Surface	Design	Total Vol., µL	Max Working Vol., µL	Bar Code	No. per Pack	No. per Case
96-well Plates									
475094	Nunc	Flat-bottom	PolySorp	Pinchbar	400	350	No	5	60
456529	Nunc	Flat-bottom	PolySorp	Flange	400	350	No	10	180
446140	Nunc	C-shaped	PolySorp	Pinchbar	350	250	No	5	60
475434	Nunc	Round-bottom	PolySorp	Flange	300	250	No	5	60
3355	Immulon	Flat-bottom	1 B	High Flange	330	280	No	10	50
3555	Immulon	Round-bottom	1 B	High Flange	280	230	No	10	50
9502227	Microtiter	Flat-bottom	UB	High Flange	380	330	No	25	50
95029780*	Microtiter	Flat-bottom	UB	High Flange	380	330	No	1	40
467320***	Nunc	Flat-bottom	MediSorp	Flange	400	350	No	5	60
3455	Immulon	Flat-bottom	2 HB	High Flange	330	280	No	10	50
3655	Immulon	Round-bottom	2 HB	High Flange	280	230	No	10	50
456537***	Nunc	Flat-bottom	MaxiSorp	Flange	400	350	No	10	180
460984***	Nunc	Flat-bottom	MaxiSorp	Flange	400	350	Yes	10	180
439454**, ***	Nunc	Flat-bottom	MaxiSorp	Pinchbar	400	350	No	5	60
442404**	Nunc	Flat-bottom	MaxiSorp	Pinchbar	400	350	No	5	60
430341	Nunc	C-shaped	MaxiSorp	Pinchbar	350	250	No	5	60
446612***	Nunc	C-shaped	MaxiSorp	Pinchbar	350	250	No	5	60
449824	Nunc	Round-bottom	MaxiSorp	Flange	300	250	No	5	60
3855	Immulon	Flat-bottom	4 HBX	High Flange	330	280	No	10	50
95029330	Microtiter	Flat-bottom	EB	High Flange	380	330	No	25	50
467340	Nunc	Flat-bottom	MultiSorp	Flange	400	350	No	5	60
384-Well Plates									
8555	Immulon	Flat-bottom, 384	1 B	High Flange	120	100	No	10	50
464718	Nunc	Flat-bottom, 384	MaxiSorp	Pinchbar	120	100	No	10	30
8755	Immulon	Flat-bottom, 384	4 HBX	High Flange	120	100	No	10	50

** Sterile with lid*

***Sterile version with lid available, min order 30 cases*

****Certificate included*

Thermo Scientific Colormetric Assays Using Passive Adsorption

immuno breakable modules, clear

Our breakable modules come with a choice of four surfaces and a variety of wells and configurations, allowing for optimal choice of products for the specific assay.

They offer lot-to-lot reliability and well-to-well reproducibility. Choose between LockWell, BreakApart and Breakable 1 x 8 modules in standard 96-well frames.

details

- For solid phase immuno assays (e.g. ELISA)
- Choice of four surfaces for optimal binding
- Free-standing modules are easy to handle
- Alphanumeric system for easy orientation
- Fit standard equipment
- High optical quality for reliable results
- Polystyrene

Choice of Surface

- PolySorp™, Immulon™ 1B, and Universal Binding (UB) for adsorption of hydrophobic molecules
- MediSorp™ and Immulon 2HB are slightly hydrophilic and bind a diverse range of biomolecules
- MaxiSorp™, Immulon 4 HBX, and Enhanced Binding (EB) are hydrophilic and ideal for antibody sandwich assays
- MultiSorp is very hydrophilic and works well for glycans and water soluble proteins

Immuno Breakable Modules, Clear

Cat. No.	Brand	Well Design	Surface	Total Vol., µL	Max Working Vol., µL	Certified	No. per Pack	No. per Case
Framed Modules								
446442	Nunc	C8 LockWell	PolySorp	350	250	No	10	60
446477	Nunc	U8 LockWell	PolySorp	320	250	No	10	60
448496	Nunc	C8 Starwell, LockWell	PolySorp	330	200	No	10	60
473539	Nunc	C8 BreakApart	PolySorp	350	250	No	10	60
95029390	Microtiter	F8 Breakable	UB	400	350	No	25	50
95029430*	Microtiter	U8 Breakable	UB	350	250	No	25	50
446470	Nunc	C8 LockWell	MediSorp	350	250	Yes	10	60
446469	Nunc	C8 LockWell	MaxiSorp	350	250	Yes	10	60
446639	Nunc	U8 LockWell	MaxiSorp	320	250	Yes	10	60
448526	Nunc	C8 Starwell, LockWell	MaxiSorp	320	200	Yes	10	60
473768	Nunc	C8 BreakApart	MaxiSorp	350	250	Yes	10	60
95029180	Microtiter	F8 Breakable	EB	400	350	Yes	25	50
446490	Nunc	C8 LockWell	MultiSorp	350	250	No	10	60

** Min. order 100 cs.*

Accessories

Cat. No.	Brand	Description	No. per Pack	No. per Case
465404	Nunc	C8 LockWell Frame	10	60
431615	Nunc	C8 BreakApart Frame	5	60
430414	Nunc	BreakApart Push-out Tool	240	240
9503110	Microtiter	Strip Removal Tool	25	25

Thermo Scientific Colormetric Assays Using Passive Adsorption

immuno standard modules, clear

Nunc™, Immulon™ and Microtiter™ module plates are developed for ELISA techniques and fit standard equipment.

Their format provides flexible use of components with small sample sizes. The modules offer lot-to-lot reliability, well-to-well reproducibility and are backed by industry-leading quality standards and certifications.

Thermo Scientific standard modules are strip plates with solid modules that can be easily inserted and removed from their frame. This enhances the use of the plate with smaller sample sizes.

details

- Several strip formats: 8-well strip, 12-well strip, 16-well strip (two columns of 8 wells)
- Several well shapes: flat bottom, C bottom (radius edge), U shape wells, StarWell (wells have fins to increase the surface area and enhance performance)
- Several surfaces to maximize assay performance
- Modules remain in frame when inverted
- Stackable frame marked for lid orientation
- Polystyrene wells in polyethylene frame
- Ext. Dim.: 128 × 86 mm

Choice of Surface

- PolySorp™, Immulon 1B, and Universal Binding (UB) for adsorption of hydrophobic molecules
- MediSorp™ and Immulon 2HB are slightly hydrophilic and bind a diverse range of biomolecules
- MaxiSorp™, Immulon 4 HBX, and Enhanced Binding (EB) are hydrophilic and ideal for antibody sandwich assays
- MultiSorp is very hydrophilic and works well for glycans and water soluble proteins

Ordering Information: Free-standing modules. Frames and modules available separately. Sealing tape and strip caps are available. Color-coded modules are available on request. See your sales representative for additional details.

To help you find the best products for your applications, visit our online plate selection tool at: www.thermoscientific.com/plateguide

Thermo Scientific Colormetric Assays Using Passive Adsorption

Immuno Standard Modules, Clear

Cat. No.	Brand	Well Design	Surface	Total Vol., µL	Max Working Vol., µL	Certified	No. per Pack	No. per Case
Framed Modules								
467679	Nunc	F16 (2 x 8 wells)	PolySorp	400	350	No	10	60
466966	Nunc	U16 (2x 8 wells)	PolySorp	300	250	No	10	60
473717	Nunc	C12 (1 x 12 wells)	PolySorp	350	250	No	10	60
469078	Nunc	F8	PolySorp	400	350	No	10	60
444865	Nunc	C8	PolySorp	350	250	No	10	60
475086	Nunc	U8	PolySorp	300	250	No	10	60
441254	Nunc	C8 StarWell	PolySorp	380	250	No	10	60
6505	Immulon	F16 (2 x 8 wells)	1 B	330	280	No	25	100
6310	Immulon	F12	1 B	380	330	No	100	100
95029440*	Microtiter	U8	UB	350	250	No	5	50
467120	Nunc	F8	MediSorp	400	350	Yes	10	60
6506	Immulon	F16 (2 x 8 wells)	2 HB	330	280	No	25	100
6309	Immulon	F12	2 HB	380	330	No	100	100
467466	Nunc	F16 (2 x 8 wells)	MaxiSorp	400	350	Yes	10	60
473709	Nunc	C12 (1 x 12 wells)	MaxiSorp	350	250	Yes	10	60
468667	Nunc	F8	MaxiSorp	400	350	Yes	10	60
434797	Nunc	F8	MaxiSorp	400	350	No	20	120
445101	Nunc	C8	MaxiSorp	350	250	Yes	10	60
475078	Nunc	U8	MaxiSorp	300	250	Yes	10	60
441653	Nunc	C8 StarWell	MaxiSorp	380	250	Yes	10	60
6508	Immulon	F16 (2x8 wells)	4 HBX	330	280	No	25	100
6405	Immulon	F12	4 HBX	380	330	No	100	100
95029100	Microtiter	F8	EB	400	350	No	5	50
467140	Nunc	F8	MultiSorp	400	350	No	10	60
Unframed Modules								
469922	Nunc	F16 (2 x 8 wells)	PolySorp	400	350	No	80	320
469957	Nunc	F8	PolySorp	400	350	No	160	640
469329	Nunc	U16 (2 x 8 wells)	PolySorp	300	250	No	80	320
6301	Immulon	F12	1 B	380	330	No	320	320
6302	Immulon	F12	2 HB	380	330	No	320	320
469914	Nunc	F16 (2 x 8 wells)	MaxiSorp	400	350	Yes	80	320
469949	Nunc	F8	MaxiSorp	400	350	Yes	160	640
469264	Nunc	U16 (2 x 8 wells)	MaxiSorp	300	250	Yes	80	320
6404	Immulon	F12	4 HBX	380	330	No	320	320

** Min. order 100 cs.*

Frames, Accessories

Cat. No.	Brand	Description	No. per Pack	No. per Case
460348	Nunc	Frame for Nunc modules	5	60
6604	Immulon	Frame for 1 x 12		10
430082	Nunc	8-Well Strip Cap	12	120
430805	Nunc	8-Well Strip Cap, Sterile	12	120
9503110	Microtiter	Strip Removal Tool	25	25

Thermo Scientific Luminescence and Fluorescence Assays Using Passive Adsorption

immuno plates, white and black

Our white and black plates for quantitative and qualitative immunoassays, including ELISA and binding assays, are compatible with common instruments.

They offer lot-to-lot reliability and well-to-well reproducibility for optimal results.

details

- Plate has SBS footprint – fits standard equipment
- Available with flat-bottom or round wells
- Choice of three surface types for optimal binding
- Offered as black or white plates for optimal choice of application type
- Certified binding homogeneity/reproducibility

Choice of Surface

- PolySorp™, Microfluor 1, Microfluor 1+ and Universal Binding (UB) for adsorption of hydrophobic molecules
- MaxiSorp™ is hydrophilic and ideal for antibody sandwich assays
- Microfluor 2 and Microlite 2+ are slightly hydrophilic and bind a diverse range of biomolecules

White

- Gives maximum reflection
- Minimum autofluorescence and autoluminescence

Black

- Minimizes background in fluorescence reading
- Minimizes back-scattered light
- Minimizes crosstalk

Compatible Products: Compatible with lids for MicroWell™ plates, sealing tape and breathable membrane.

Thermo Scientific Luminescence and Fluorescence Assays Using Passive Adsorption, continued

Immuno Plates, White and Black

Cat. No.	Brand	Well Shape	Surface	Application	Total Vol., µL	Max Working Vol., µL	Color	No. per Pack	No. per Case
96-well Plates									
437112	Nunc	Flat-bottom	PolySorp	Fluorescence	400	350	Black	10	80
7605	Immulon	Flat-bottom	Microfluor 1	Fluorescence	330	280	Black	10	50
7705	Immulon	Flat-bottom	Microfluor 1	Fluorescence	330	280	White	10	50
7005	Immulon	Round-bottom	Microfluor 1	Fluorescence	280	230	Black	10	50
6905	Immulon	Round-bottom	Microfluor 1	Fluorescence	280	230	White	10	50
9502867	Microtiter	Flat-bottom RE	UB	Fluorescence	400	350	Black	25	50
95029840*	Microtiter	Flat-bottom	UB	Fluorescence	380	330	Black	1	40
437111	Nunc	Flat-bottom	MaxiSorp	Fluorescence	400	350	Black	10	80
7805	Immulon	Flat-bottom	Microfluor 2	Fluorescence	330	280	Black	10	50
7905	Immulon	Flat-bottom	Microfluor 2	Fluorescence	330	280	White	10	50
7205	Immulon	Round-bottom	Microfluor 2	Fluorescence	280	230	Black	10	50
7105	Immulon	Round-bottom	Microfluor 2	Fluorescence	280	230	White	10	50
7571	Immulon	Flat-bottom	Microlite 1+	Luminescence	330	280	White	10	50
9502887	Microtiter	Flat-bottom	UB	Luminescence	380	330	White	25	50
7572	Immulon	Flat-bottom	Microlite 2+	Luminescence	330	280	White	10	50
436111	Nunc	Flat-bottom	PolySorp	Fluorescence and Luminescence	400	350	White	10	80
436110	Nunc	Flat-bottom	MaxiSorp	Fluorescence and Luminescence	400	350	White	10	80
384-Well Plates									
460518	Nunc	Flat-bottom	MaxiSorp	Fluorescence	120	100	Black	10	30
460372	Nunc	Flat-bottom	MaxiSorp	Fluorescence and Luminescence	120	100	White	10	30

**Sterile with lid, min. order 100 cases*

Thermo Scientific Luminescence and Fluorescence Assays Using Passive Adsorption

immuno breakable modules, white and black

Thermo Scientific breakable modules for fluorescence and luminescence assays are easy to handle and ensure that each well is kept securely in place.

The white and black Immuno Breakable Modules are specifically designed for fluorometric and luminometric immunoassays. The unique design offers error-free flexibility; each well locks in the frame and maintains the same height to provide accurate reading and efficient washing.

details

- High-quality polystyrene wells
- Choice of two passive surfaces to enable assay optimization
- C8 Strips provide flexiblity with sample size and optimal washing performance
- Easy to handle; single well held as easily as strips
- Compatible with common instrumentation

Choice of Surface

- PolySorp™ and Universal Binding (UB) for adsorption of hydrophobic molecules
- MaxiSorp™ is hydrophilic and ideal for antibody sandwich assays

White

- White opaque and reflective surface
- Low cross talk and minimal background

Black

- Black opaque and light-absorbing surface
- Minimum cross talk and back-scattered light

Immuno Breakable Modules, Black and White

Cat. No.	Brand	Well Design	Surface	Total Vol., µL	Max Working Vol., µL	Application	Color	Certified	No. per Pack	No. per Case
Framed Modules										
446473	Nunc	C8 LockWell	PolySorp	350	250	Fluorescence	Black	Yes	10	60
95029800	Microtiter	F8 RE	UB	400	350	Fluorescence	Black	No	25	50
446471	Nunc	C8 LockWell	MaxiSorp	350	250	Fluorescence	Black	Yes	10	60
463200	Nunc	C8 LockWell	PolySorp	350	250	Luminescence	White	Yes	10	60
463201	Nunc	C8 LockWell	MaxiSorp	350	250	Luminescence	White	Yes	10	60
95029670	Microtiter	F8 RE	UB	400	350	Fluorescence and Luminescence	White	No	25	50

Accessories

Cat. No.	Brand	Description	No. per Pack	No. per Case
465404	Nunc	C8 LockWell Frame	10	60
9503110	Microtiter	Strip Removal Tool	25	25

Thermo Scientific Products –
meeting the challenges of science and industry

microplate instrumentation

The most complete solutions for all of your laboratory needs.

Thermo Scientific microplate instruments offer precise results and efficient performance, making them ideal for cell biology, molecular biology and immunology applications in the fields of cancer research, drug development, proteomics and genomics.

- Flexible, easy-to-use microplate washers support routine and varied research applications
- A choice of dedicated and multi-technology microplate readers offers a wide variety of applications
- Superior microplate incubator shakers deliver accurate temperature control and efficient orbital shaking
- Designed for ease of use, our microplate dispensers offer high-speed, continuous dispensing of various liquids

For more product information, go to:
www.thermoscientific.com/mpi

Luminescence and Fluorescence Assays Using Passive Adsorption

immuno standard modules, white and black

Thermo Scientific white and black standard modules are used for fluorescence and luminescence based immunoassays and binding assays and fit standard equipment.

They offer reliability and reproducible results and are backed by industry-leading quality standards and certifications.

details

- Modules are available in 8-, 12- or 16 (2 x 8) well strips either in frames or unframed for choice of optimal assay
- Flat-bottom or C-shaped wells
- Choice of three surface types for optimal binding
- White format gives highest possible signal reflection with low background fluorescence; recommended for epifluorescence
- Black format reduces back scatter light which may be encountered in epifluorescence
- Use transparent or clear format in Time Resolved Fluorescence applications only

Choice of Surface:

- PolySorp™ and Microlite™ 1+ for adsorption of hydrophobic molecules
- Microlite 2+ is slightly hydrophilic and binds a diverse range of biomolecules
- MaxiSorp™ is hydrophilic and ideal for antibody sandwich assay

Immuno Standard Modules, White and Black

Cat. No.	Brand	Well Design	Surface	Total Vol., µL	Max Working Vol., µL	Application	Color	Certified	No. per Pack	No. per Case
Framed Modules										
475523	Nunc	F16 (2x8 wells)	PolySorp	400	350	Fluorescence	Black	No	10	60
95029450	Microtiter	F8	UB	380	330	Fluorescence	Black	No	25	50
475515	Nunc	F16 (2x8 wells)	MaxiSorp	400	350	Fluorescence	Black	Yes	10	60
437702	Nunc	C8	PolySorp	350	250	Fluorescence and Luminscence	White	No	10	60
437591	Nunc	C8	MaxiSorp	350	250	Fluorescence and Lumiscence	White	Yes	10	60
Unframed Modules										
7566	Immulon	F12	Microlite 1+	380	330	Luminescence	White	No	320	320
7567	Immulon	F12	Microlite 2	380	330	Luminescence	White	No	320	320

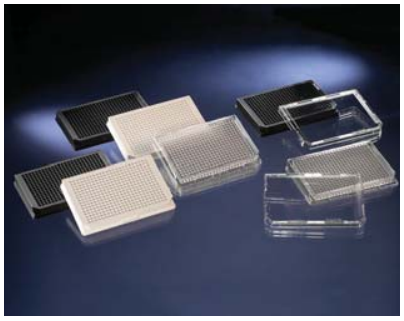
Frames

Cat. No.	Brand	Description
6604	Immulon	Frame for 1x12

For Accessories, please see pg. 148 Standard Modules, Clear

Thermo Scientific Covalent and Affinity Binding

immuno specialty surfaces



Nunc™ and Microtiter™ products include plates and modules with surfaces treated for covalent and affinity binding of target biomolecules.

details

Covalent Surfaces (CovaLink and Immobilizer Amino)

- Minimal leaching
- Withstand vigorous washing
- Coating with lower amounts of reagent may be possible
- Control of orientation

Affinity Capture Surfaces (Passive Streptavidin and Immobilizer Streptavidin, Nickel Chelate and Glutathione, BioBind)

- Highly specific binding
- Reduced variability in molecular orientation
- Immobilizer surfaces improve signal to noise ratios
- Streptavidin biotin interaction can be exploited to immobilize a wide range of biomolecules

Compliance: Immobilizer is a trademark of Exiqon A/S, Vedbaek, Denmark. The product is produced under license from Exiqon A/S and covered by EP 08 20483 and foreign application and patents.

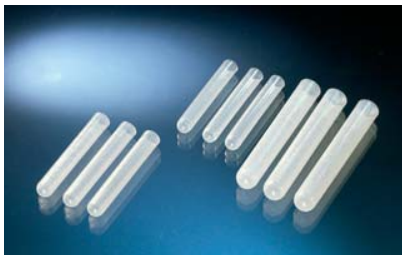
For additional information about our Plates and Modules, please visit:
www.thermo.dirxion.com/immunoassaybrochure
www.thermo.dirxion.com/immunoassayguide

Immuno Specialty Surfaces

Cat. No.	Brand	Type	Well Shape	Coating	Total Vol., µL	Coated Vol., µL	Color	No. per Pack	No. per Case
Covalent Surfaces									
436006	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Amino	400	100	Clear	5	30
436007	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Amino	400	100	White	5	30
436008	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Amino	400	100	Black	5	30
436023	Nunc Immobilizer	LockWell module C8 (x 12) in frame	Round-bottom	Amino	350	100	Clear	5	30
436013	Nunc Immobilizer	Solid module F8 (x12) in frame	Flat-bottom	Amino	400	100	Clear	5	30
436009	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Amino	120	50	Clear	5	30
436012	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Amino	120	50	Black	5	30
244105	Nunc	BreakApart module C8 (x12) in frame	Round-bottom	CovaLink	400	100	Clear	5	30
478042	Nunc	Solid module F8 (x12) in frame	Flat-bottom	CovaLink	400	100	Clear	5	30
479995	Nunc	Frame for CovaLink							
Affinity Surfaces									
236001	Nunc	Solid plate 96-well	Round-bottom	Streptavidin passively coated	350	200	Clear	1	15
236004	Nunc	Solid module C8 (x12) in frame	Round-bottom	Streptavidin passively coated	350	200	Clear	1	15
436014	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Streptavidin covalently coated	400	100	Clear	1	15
436015	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Streptavidin covalently coated	400	100	White	1	15
436016	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Streptavidin covalently coated	400	100	Black	1	15
436020	Nunc Immobilizer	Solid module F8 (x12) in frame	Flat-bottom	Streptavidin covalently coated	400	100	Black	1	15
436022	Nunc Immobilizer	LockWell module C8 (x12) in frame	Round-bottom	Streptavidin covalently coated	350	100	Clear	1	15
436017	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Streptavidin covalently coated	120	50	Clear	1	15
436018	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Streptavidin covalently coated	120	50	White	1	15
436019	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Streptavidin covalently coated	120	50	Black	1	15
95029293	Microtiter BioBind	Breakable module F8 (x12) in frame	Flat-bottom	Streptavidin covalently coated	400	200	Clear	1	5
95029263	Microtiter BioBind	Solid module F8 (x12) in frame	Flat-bottom	Streptavidin covalently coated	400	200	Clear	1	5
436024	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Ni Chelate	400	100	Clear	1	15
436027	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Ni Chelate	400	100	Black	1	15
436028*	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Ni Chelate	120	50	Clear	1	15
436031*	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Ni Chelate	120	50	Black	1	15
436032	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Glutathione	400	100	Clear	1	15
436033	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Glutathione	400	100	White	1	15
436034	Nunc Immobilizer	Solid plate 96-well	Flat-bottom	Glutathione	400	100	Black	1	15
436036*	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Glutathione	120	50	Clear	1	15
436038*	Nunc Immobilizer	Solid plate 384-well	Flat-bottom	Glutathione	120	50	Black	1	15

** Min order 20 cases*

Thermo Scientific Nunc Solid Phase and Liquid Phase Immunoassay Tubes



Certifications: MaxiSorp tubes are certified for IgG binding (tube to tube %CV less than 5%).

Nunc™ Immunoassay Tubes are ideal for ELISA, solid phase RIA and liquid phase RIA.

These products offer reliability and reproducible results, and are backed by industry-leading quality standards and certifications.

details

- Offered in choice of three surfaces: MiniSorp™, PolySorp™ and MaxiSorp™ for optimal binding
- Three tube sizes with stoppers available (ordered separately)
- Fit standard equipment

Choice of Surface

- PolySorp: Hydrophobic surface that preferentially binds biomolecules that have hydrophobic domains
- MaxiSorp: Hydrophilic surface that is optimized for binding IgG and also displays increased binding of many other proteins and biomolecules that possess hydrophilic/hydrophobic character.
- Mini-Sorp: Polyethylene-based material provides low-binding surface

Liquid Phase Immunoassay Tubes

- MiniSorp surface for low-binding liquid phase immuno assays
- For liquid phase immunoassays, including RIA, for storing of reagents or collecting chromatographiic fractions

Solid Phase Immunoassay Tubes

- PolySorp and MaxiSorp surfaces are available for choice of optimal binding
- For solid phase immuno techniques such as IRMA, ELISA and ILMA
- Certified binding homogeneity
- High-quality polystyrene for optimal quality
- Offered in two designs: StarTube or Standard (smooth); StarTube design provides higher sensitivity and fast assay times

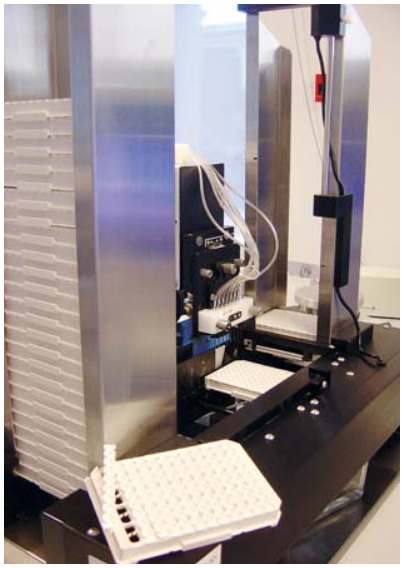
Immunoassay Tubes

Cat. No.	Brand	Type	Surface	O.D., mm	Total Vol., mL	Graduation Marking, mL	No. per Pack	No. per Case
Liquid Phase								
466982	Nunc-Immuno	Polyethylene Tube	MiniSorp	70 x 11	4.0	2.5	150	3600
443990	Nunc-Immuno	Polyethylene Tube	MiniSorp	75 x 12	5.0	2.5	100	3000
468608	Nunc-Immuno	Polyethylene Tube	MiniSorp	100 x 15	12.0	5 + 10	150	1200
Solid Phase								
476503	Nunc-Immuno	Polystyrene StarTube	PolySorp	75 x 12	5.0		100	3000
470319	Nunc-Immuno	Polystyrene StarTube	MaxiSorp	75 x 12	5.0		100	3000
444474	Nunc-Immuno	Polystyrene Tube	MaxiSorp	70 x 11	4.0		150	1800
444202	Nunc-Immuno	Polystyrene Tube	MaxiSorp	75 x 12	5.0		100	3000

Stoppers for Immuno Tubes

Cat. No.	Brand	Fits Tubes with O.D., mm	No. per Pack	No. per Case
341866	Nunc-Immuno	11	600	3600
348801	Nunc-Immuno	12	500	3000
343036	Nunc-Immuno	15	300	2400

Custom Capabilities



Thermo Scientific offerings include a range of customized options to meet your specific application requirements.

details

Color Coding

We may offer to supply Nunc modules as color coded modules upon request and with a minimum order size. Standard colors are available. For details, please contact you local Nunc brand distributor, or visit info.nunc@thermofisher.com.

- Standardized to facilitate easy identification of your assays
- Makes it possible to use different colors for patient identification in one frame
- High reliability when working with individual wells

Barcoding

For customized products (with a minimum annual quantity), we offer a choice of barcode options. A barcode provides a safe way to keep track of samples and helps reduce human errors. For details, please visit www.barcodeconfigurator.com and contact your local distributor.

- Improved accuracy
- Increased efficiency
- Higher safety levels
- Reduced costs

Custom Coating

We offer an extensive knowledge of surface treatment, capabilities and production skills. We can custom coat plates and modules based on custom-specific protocols. Add your reagents, and we provide the final coated plates with consistent, reproducible quallity, along with requested documentation. This provides you with the optimal flexibility in your production line. For more information, please visit www.thermoscientific.com/oemdiagnostics and contact you local Nunc brand distributor, or info.nunc@thermofisher.com.

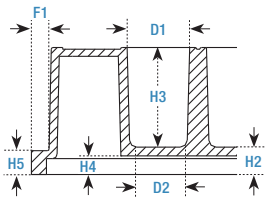
- LOT reservation service for consistency
- Frees up resources, saves cost and reduces investment
- Leverage proven strengths in surface treatment, surface capability and production

Well Drawings and Dimensions

H1 Total height of plate
H2 Vertical distance from inside well bottom to resting plane
H3 Inside depth of well
H4 Vertical distance from external well bottom to resting plane
H5 Height of flange (short side)
H6 Height of flange on the long side
D1 Well diameter, top
D2 Well diameter, bottom
F1 Depth of flange

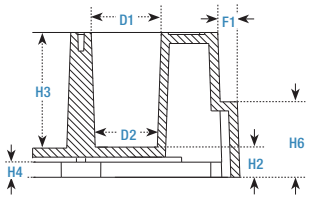
Note: All dimensions are nominal and in millimeters unless otherwise noted. Also, note that there might be minor dimensional differences between the different molds for the individual plate.

C96 MicroWell™ Plates
Polystyrene



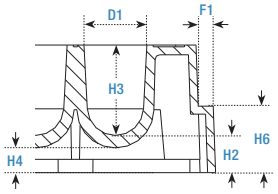
H1	H2	H3	H4	H5	H6	D1	D2	F1
14.0 ± 0.3	3.1	11.0	2.1	2.7		6.6	6.1	1.2

F96 MicroWell™ Plates
Polystyrene Clear



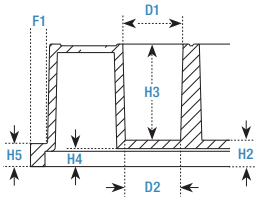
H1	H2	H3	H4	H5	H6	D1	D2	F1
14.4 ± 0.2	3.0	11.4	1.9	2.4	7.4	7.0	6.2	1.7

U96 MicroWell™ Plates
Polystyrene Clear



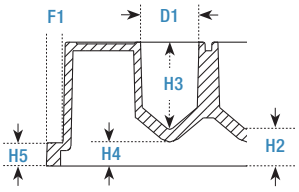
H1	H2	H3	H4	H5	H6	D1	D2	F1
14.5 ± 0.1	4.2	10.2	2.8	2.4	7.5	7.1	Round bottom	1.7

F96 MicroWell™ Plates
Polystyrene Clear



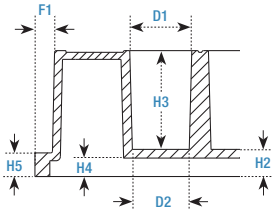
H1	H2	H3	H4	H5	H6	D1	D2	F1
14.5 ± 0.2	3.2	11.2	2.1	2.85 ± 0.15	7.05 ± 0.2	6.5	6.2	1.7

V96 MicroWell™ Plates
Polypropylene



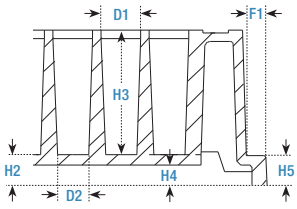
H1	H2	H3	H4	H5	H6	D1	D2	F1
14.4 ± 0.1	4.6	9.8	2.8	2.7		6.7	V-shapped	1.9

F96 MicroWell™ Plates
Polystyrene Black and White



H1	H2	H3	H4	H5	H6	D1	D2	F1
14.6 ± 0.3	3.6	11.2	2.1	2.7		7.05	6.55 ± 0.1	2.0

Immobilizer™ 384-Well Plates
Polystyrene



H1	H2	H3	H4	H5	H6	D1	D2	F1
14.4 ± 0.25	2.6	11.7	1.7	2.7		3.7	2.7	1.9

F-well (Flat bottom)
For monochromatic reading

C-well (Modified F with curved edges)
For improved washing

U-well (Round bottom)
For optimal washing

C8 StarWell (Flat bottom with curved edges and 8 ribs)
For increased surface/volume ratio and increased sensitivity

Approval Criteria

Thermo Scientific Nunc and Microtiter plate surfaces are release-tested using a binding assay that employs IgG or other appropriate biomolecule (for 96-well solid and module/strip plates).

Name	Surface	Specification
Nunc	MaxiSorp	Clear wells Well-to-well % CV of less than 5% for IgG binding: all results are ±10% from the mean for the lot Black and White wells Well-to-well % CV of less than 10% for IgG binding
	MediSorp	Well-to-well % CV of less than 5% for IgG binding: all results ±10% from the mean for the lot
	Immobilizer Amino	Well-to-well % CV of less than 5% for clear plates Well-to-well % CV of less than 10% for white and black plates
	Immobilizer Streptavidin	Well-to-well % CV of less than 10% for clear plates* Well-to-well % CV of less than 7.5% for white and black plates*
	Immobilizer Gluthatione	Well-to-well % CV of less than 5% for clear plates Well-to-well % CV of less than 10% for white and black plate
	Immobilizer Ni Chelate	Well-to-well % CV of less than 5% for clear plates Well-to-well % CV of less than 10% for white and black plates
	Passively coated Streptavidin	Capacity ≥ 13 pMol Biotin/well (Biotin-HRP)
	CovaLink NH Modules	Well-to-well % CV of less than 10% (clear 96 and strip plate) using a peptide binding assay: results ±15% from the mean for the lot
Microtiter	Immulon 1B Immulon 2HB Microlite 1+, Microlite 2+ Microfluor 1, Microfluor 2	Well-to-well % CV ≤ 8.5% for IgG binding
	Immulon 4HBX	Well-to-well % CV ≤ 5.5% for IgG binding
	Enhanced Binding (EB)	Well-to-well % CV less than 5% for IgG binding

**QC test of clear plates is based on a biotin binding test (more sensitive than the standard test for white and black plates)*