BRAND*plates*® microplates

Modern research methods require high-quality disposables. BRAND*plates*®, microplates from BRAND, can be used in all important fields of life science.

BRAND has applied its decades of experience in premium-quality molding of lab plastic consumables from pipette tips to volumetric plasticware to cuvettes to the challenges of microplate design. Plates are designed to minimize cross-contamination, ensure excellent recovery, and to offer many options in color, well-count, surface-treatment and well-shape.

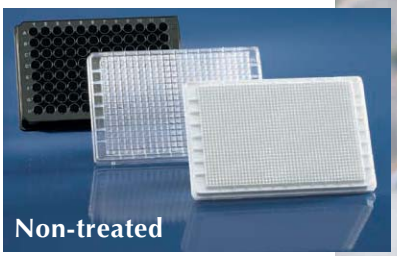
For this comprehensive line, nine different surfaces have been developed under state of the art production conditions.

The product line covers a multitude of standard applications (e.g., homogenous assays, screenings) as well as applications in the fields of immunology and cell culture technique.

Non-treated surfaces
pureGrade™
pureGrade™ *S*

Immunology surfaces
immunoGrade™
hydroGrade™
lipoGrade™

Cell culture surfaces
cellGrade™
cellGrade™ plus
cellGrade™ premium
inertGrade™



A comprehensive, premium-quality line of plates for cell culture and immunoassay.

BRAND®

BRAND*plates*® microplates

Surfaces

BRAND*plates*® microplates are offered with nine different surfaces. In addition to the two non-treated variants, there are three immunological types, and four different surfaces for cell culture applications available.

The surface modifications of the microplates are generated via a physical-chemical process that creates stable surfaces. All BRAND*plates*® microplates can be stored at room temperature.

Non-treated surfaces	
pureGrade™	non-treated, “medium binding,” non-sterile
pureGrade™ *S*	non-treated, “medium binding,” sterile
Immunoassay surfaces	
immunoGrade™	ideal for immobilization of IgG, “high binding,” non-sterile
hydroGrade™	hydrophilic, ideal for immobilization of hydrophilic molecules, non-sterile
lipoGrade™	hydrophobic, ideal for immobilization of hydrophobic molecules, non-sterile
Cell culture surfaces	
cellGrade™	standard tissue culture surface for the cultivation of adherent cell lines, sterile
cellGrade™ **plus**	surface for the cultivation of fastidious adherent cells making serum-reduced cultivation possible, sterile
cellGrade™ **premium**	surface treatment with similar properties to poly-D-lysine, serum-reduced or serum-free cultivation is possible, sterile
inertGrade™	surface that inhibits adhesion of cells, e.g., and reduces protein adsorption for cultivation of suspension and stem cells, sterile

Barcodes

BRAND can provide high-quality barcode labeling

ANSI-/SLAS-Standard

BRAND*plates*® microplates are manufactured according to the ANSI-/SLAS-standards 1 to 4 - 2004, to ensure compatibility for all processes, especially when automation is involved.

BRAND*plates*® microplates

Colors, wells and shapes

Non-treated surfaces
Immunoassay surfaces
Cell culture surfaces

- Standard, or transparent bottom
- Transparent, white or black
- Different bottom shapes: U-, V-, F-, C-bottom for 96-well format
- Free from endotoxins, DNase, DNA, RNase; non-cytotoxic

Non-treated surfaces

- 96-, 384-, and 1536-well formats
- Strip Plates available with and without grid
- Sterile and non-sterile
- Clearly distinguishable via color code: **gray** embossed alphanumeric coding for 96-well standard plates in white or black

Immunoassay surfaces

- 96- and 384-well formats
- Strip plates available with and without grids
- Modification via a physical-chemical process, good shelf life at room temperature
- Clearly distinguishable through the color code: **blue** embossed alphanumeric coding for 96-well standard plates

Cell culture surfaces

- 96-, 384-, and 1536-well formats
- Sterile according to Ph. Eur. and USP 29, SAL 10^{-6}
- Clearly distinguishable through the color code: **orange** embossed alphanumeric coding for 96-well standard plates

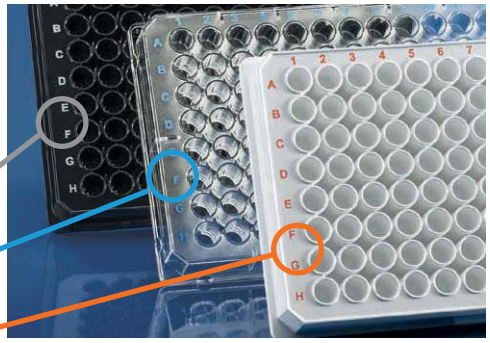
Color Codes—96-well plates

To enable an easy identification of the surface type and to facilitate the legibility of the alphanumeric coding BRAND*plates*® microplates in the 96-well standard format have a color-coded embossing.

Gray Coded Non-treated microplates for the most diversified applications

Blue Coded Microplates for immunoassays such as ELISA, RIA, FIA, etc

Orange Coded Microplates for cell culture applications

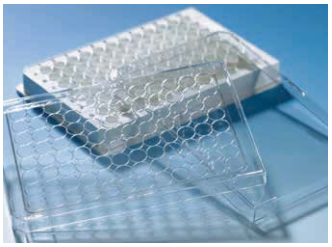


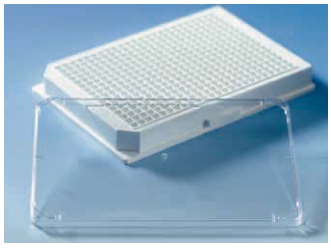
BRAND*plates*® microplates

Accessories

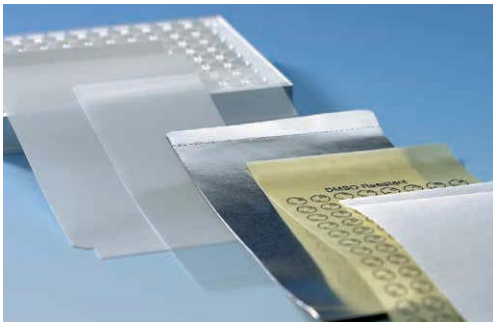
Lids

To protect samples, reaction batches or cell cultures from both contamination and evaporation, compatible lids are available for all BRAND*plates*® microplates. The lids are made of crystal-clear polystyrene. They are optimally matched to the corresponding BRAND*plates*® microplates, so that plates with lids can also be stacked. The cut-corner sets the orientation of the lid. For 96-well standard plates, lids with condensation rings are available.





Lids for microplates



Sealing films, Self-adhesive

In case the microplates need not only to be covered, but also securely sealed, self-adhesive sealing films are available. These film sheets can be easily applied on the plates and removed without the use of expensive equipment. They are available in different versions and are especially well-suited for storage or cell- and tissue-culture.

Roller

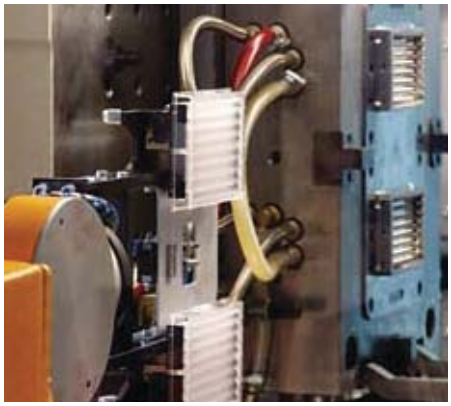
The self-adhesive films can be securely and easily applied with a roller. The hard rubber roller ensures that the film is attached to the plate with a uniform pressure. The rugged handle with comfort-grip lessens fatigue.

BRAND*plates*®
Microplates

Highest quality for reproducible results from test to test!
Modern research and development in the field of life science is not possible without high-quality plastic disposables. For more than 20 years BRAND has provided high performance products for many applications in the life science area.

In creating our disposable products for life sciences, we start with discussion of the needs of customers worldwide. Then we carefully construct the dies for injection molding, and select the raw materials used. We strictly control the entire manufacturing process and rely on external quality assurance laboratories so that you can alway count on the performance of BRAND*plates*® microplates.

Raw materials



The selection of the correct raw materials is a crucial step when manufacturing premium-quality products. Not only are the physical and chemical properties critical in the field of microplate production, the optical characteristics of the end product are also crucial.

Injection molding dies

The quality of the product is a direct reflection of the quality of the injection molding dies used. High performance machining allows optimal process management and leads to consistent quality from item to item.

The results are products with barely visible injection markings, without flash and perfect optical characteristics that meet the required tolerances on every item!

Clean room production

All microplates are produced in clean rooms from class 5 to 8 according to ISO 14644-1. To avoid microbiological and molecular biological contamination throughout the whole production line as much as possible the injection molding process, automatic embossing, surface treatment and packaging are organized using isolated manufacturing rooms and robotic support in a directly interlinked process.

Laboratory

After the products have left the closed production line, they are subjected to a variety of optical and functional examinations, before they are tested for molecular biological contamination. BRAND*plates*® microplates are regularly checked by independent, accredited test laboratories. With sensitive detection methods, depending on the intended use, the following criteria are tested:

- Endotoxins < 0.01 EU/ml
- DNA, DNase, RNase
- Cytotoxic substances according to DIN EN ISO 10993

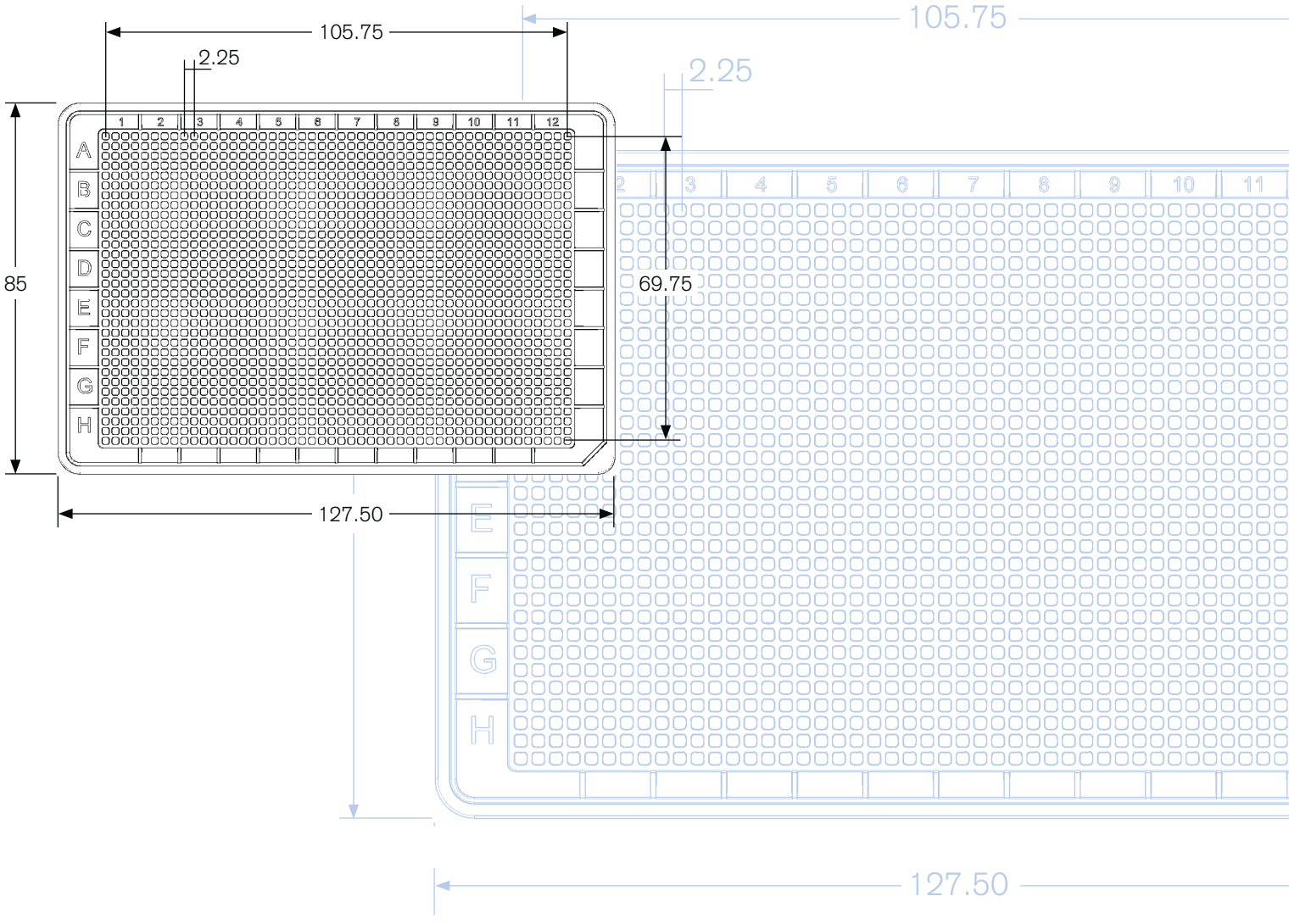
All sterilization is performed via β-radiation in a validated process according to ISO 11137 and the AAMI-guidelines. A SAL of 10^{-6} is guaranteed. The sterility meets the requirements of the Ph.Eur. and the USP 29.

Dimensions and tolerances
Modern laboratories demand the highest quality from their disposables. From 96-well microplates for standard analysis, immunology and cell culture, through 384-well microplates, up to high performance 1536-well format products, BRAND manufactures a broad product range under the most modern clean room conditions.

ANSI-/SBS-Standard

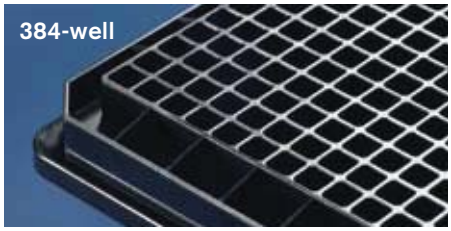
BRAND*plates*® microplates are manufactured according to the ANSI-/SBS-standards 1 to 4 - 2004, to ensure compatibility for all processes, especially when automation is involved. The standards set the most important dimensions with tolerances for 96-well, 384-well and 1536-well microplates.

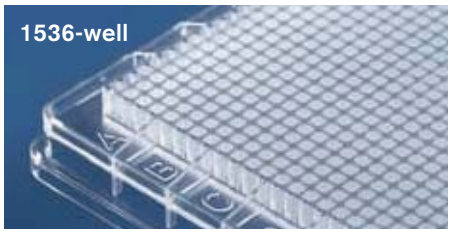
ANSI: American National Standards Institute
SBS: Society for Biomolecular Sciences



Characteristics of BRAND*plates*® Microplates

BRAND*plates*® microplates are available with a variety of different characteristics, such as plate type, material of construction and surface treatment. Different combinations of these characteristics create the broad product range of BRAND*plates*® microplates.





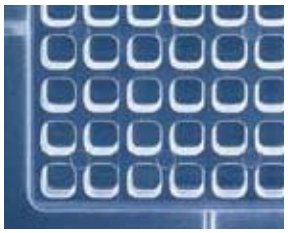
1. Wells

BRAND*plates*® microplates are offered in 96-, 384- and 1536-well formats. Well geometry is an important characteristic of these products.

BRAND*plates*® microplates with 96-well standard format are manufactured with a “chimney well” design. Each individual well is separated from each other with a gap to reduce cross contamination risk. In combination with the condensation rings of the lid, evaporation is reduced substantially.

In the 384- and 1536-well formats, rounded wells allow optimal uniform meniscus formation.

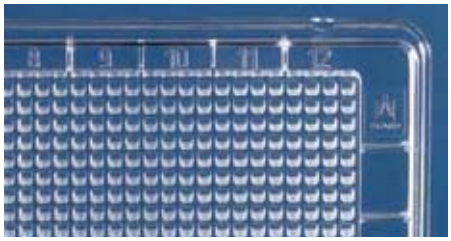
Chimney well



Rounded wells

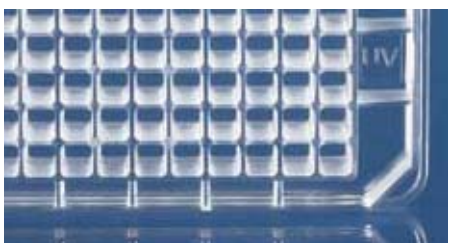
2. Materials

BRAND*plates*® microplates are manufactured from a number of different materials and can be used in a variety of different fields of application, depending on composition.



PS (Polystyrene)

Most types of BRAND*plates*® microplates are manufactured of polystyrene (PS). Uncolored PS provides a high transparency with optimal optical characteristics, making it especially suited for colorimetric assays and other optical measurements. Untreated PS is hydrophobic in nature. This surface characteristic can be modified specifically via physical-chemical treatments, so that a lot of new applications are possible (e.g., immunological analysis, cell culture, etc.), depending on the chosen process. BRAND’s modifications are stable at room temperature, and have a long shelf life.



UV-Polymer

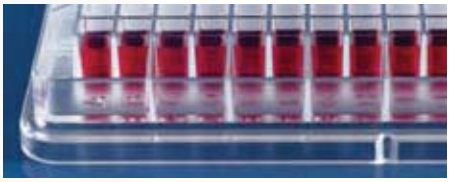
BRAND’s proprietary UV-polymer has superior optical characteristics and is transparent from 220 nm and above. For this reason, disposables made from this polymer are suitable for the determination of nucleic acid and protein concentrations at 260 and 280 nm, respectively. Furthermore, the UV-polymer has very good resistance against a number of chemicals, such as DMSO, acetone or dioxane, and is also an alternative to polypropylene plates for storage applications.

3. Plate Types

Construction and shape of the microplates define the different plate types.
BRAND microplates can be classified in three main types.

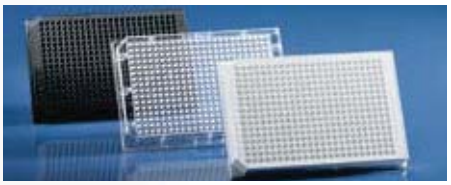
Standard microplates

Standard plates are available in all formats (96-, 384- and 1536-well). They are manufactured out of a single piece of polymer, either PS or UV-polymer, in transparent, or colored white or black, and are disposable.



Low volume microplates

Low volume microplates are available in the 384-well format in transparent, white or black. These plates have a constant format with a reduced working volume of only 30 µl per well. They are especially suited for the economical use of valuable reagents.

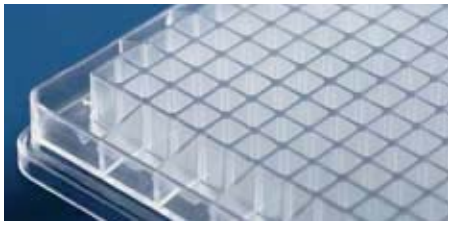


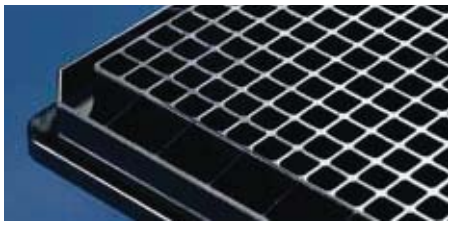
Microplates with transparent bottom

These plates are available in 96- and 384-well formats. They are manufactured out of white or black PS, with a transparent bottom made of PS.

In general these plates are suited for applications like luminescence or fluorescence measurements, when a transparent bottom is required. Because of the transparent bottom, the well contents can be seen readily and the plates can be used to perform transmitted light measurements. Furthermore, the plates can be examined directly under the microscope, which can be quite important, especially for cell-based assays. The pigmented upper structure reduces the crosstalk between the wells during detection.

4. Colors





The application to be performed in the plate generally determines the color of the plates used. A basic rule is: transparent for colorimetry; white for luminescence; and black for fluorescence.

Transparent

Transparent plates are especially suited for precise optical measurements because of their excellent optical characteristics. For this reason, they are used for colorimetric assays, but also find use in the fields of cell culture and storage. Transparent plates are available as standard or low volume.

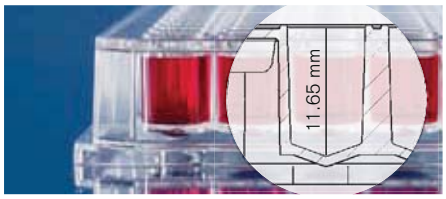
White

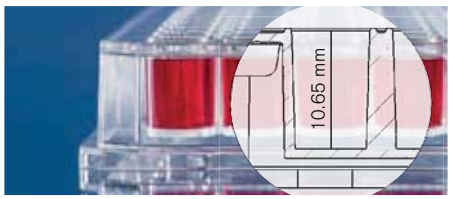
White pigmented plates are optimized for luminescence measurements. Because of the white coloration, the plates show a maximum reflection of the luminescence signals and minimize well-to-well crosstalk. White plates are available in standard, low volume, or with transparent bottom.

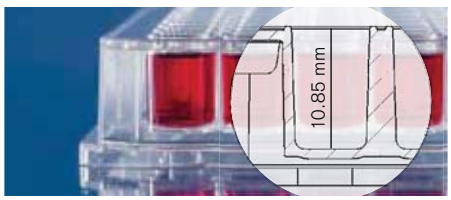
Black

Black pigmented plates are optimized for fluorescence measurements. The plates show a minimal auto-fluorescence because of the black pigmentation, especially in the lower wavelengths, as well as minimized crosstalk between the wells. Black plates are available as standard, low volume or with transparent bottom.

5. Bottom Shapes of 96-well Plates







96-well BRAND*plates*® microplates are offered with four distinct bottom shapes. (384-well and 1536-well microplates are only available with F-bottom)

U-bottom

Round-shaped well bottom. As wells with this bottom have no edges they are well suited for stirring and washing of samples. This bottom shape is used for agglutination and other assays requiring these tasks.

V-bottom

Conically-shaped well bottom. Sample recovery is maximized with this bottom shape. For this reason plates with V-bottom are especially suited for precipitation assays and storage.

F-bottom

Flat well bottom. The F-bottom is designed for precise optical measurements and is well suited for colorimetric determinations as well as microscopy applications. Additionally, the F-bottom is used for specific applications such as cell culture.

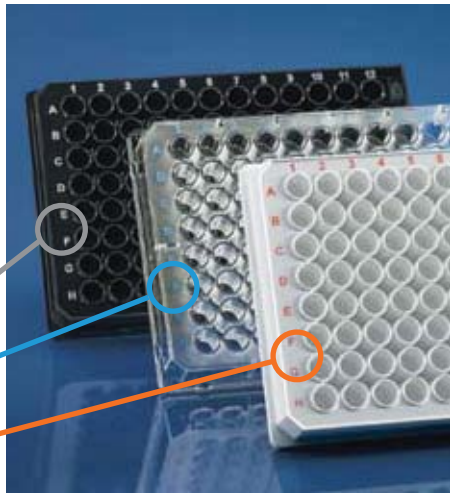
C-bottom

Flat bottom with curved edges. The C-bottom combines the advantages of U-bottom and F-bottom. Because of the curved edges, better sample mixing is obtained. The flat bottom in the middle area of the wells at the same time allows the realization of precise optical measurements. The C-bottom is specially suited for immunological assays, as sample stirring has a major impact on precise assay results as well as optical measurement to determine those results.

6. Color Codes 96-well Plates

To enable an easy identification of the surface type and to facilitate the legibility of the alphanumeric coding, most BRAND*plates*® microplates in the 96-well format have a color-coded embossing.

Grey coded	Non-treated standard microplates (no embossing on transparent plates)
Blue coded	Standard microplates for immunological applications
Orange coded	Standard microplates for cell culture applications



7. Surfaces

BRAND*plates*® microplates are offered with nine different surfaces. In addition to the two non-treated variants, there are three immunological types, and four different surfaces for cell culture applications available.

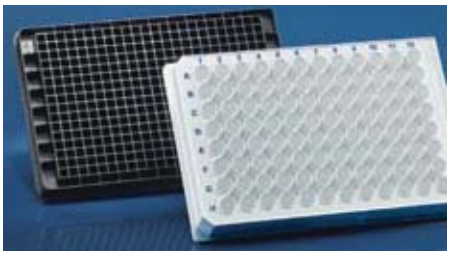
The surface modifications of the microplates are generated via a physical-chemical process, each with distinctive parameters. This kind of surface modification creates durable surfaces. All BRAND*plates*® microplates can be stored at room temperature.

Non-treated surfaces

pureGrade™	non-treated, non-sterile
pureGrade™ S	non-treated, sterile

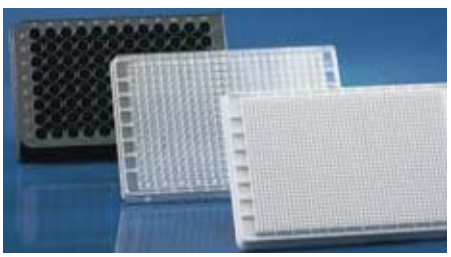
Immunoassay surfaces

immunoGrade™	ideal for immobilization of IgG, non-sterile
hydroGrade™	hydrophilic, ideal for immobilization of hydrophilic molecules, non-sterile
lipoGrade™	hydrophobic, ideal for immobilization of hydrophobic molecules, non-sterile



Cell culture surfaces

cellGrade™	standard surface for the cultivation of adherent cell cultures, sterile
cellGrade™ plus	surface for the cultivation of fastidious adherent cells making serum-reduced cultivation possible, sterile
cellGrade™ premium	surface treatment with similar properties to poly-D-lysine, serum-reduced or serum-free cultivation is possible, sterile
inertGrade™	surface that inhibits adhesion of cells, e.g., when working with cell suspensions, sterile



8. Barcode

While BRAND*plates*® microplates feature two large areas for identification marking for small volume manual use, robotic use of plates often requires the use of barcodes for identification. Upon request, BRAND can provide high-quality barcode printing directly to the plate. This two-color (black print on white background) process is durable and highly legible.

9. Lids and Films for Microplates

To protect samples from evaporation and contamination, different lids made of PS are available for all BRAND*plates*® microplates. The lids are perfectly matched to the different microplates and are available with and without condensation rings. The chimney well design of the 96-well standard plates in combination with the condensation rings substantially reduce the risk of contamination and evaporation.

BRAND*plates*®
Microplates

Information

Accessories and Technical Information

- Lids and sealing films
- Data sheets
- Customer support

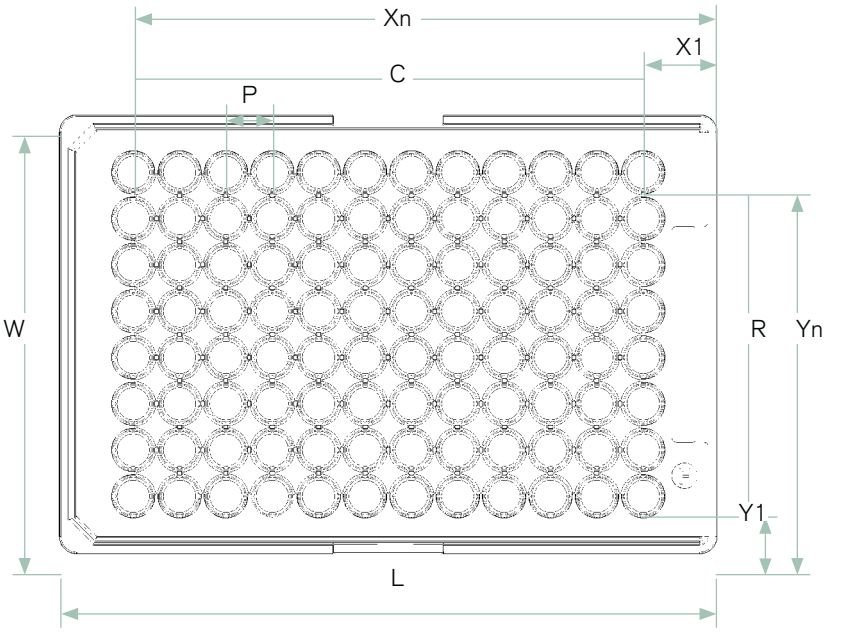
BRAND

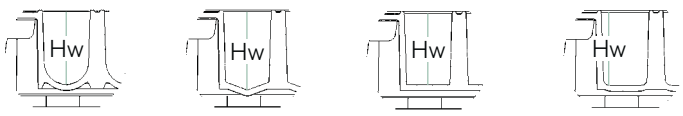
Technical Information about BRAND*plates*® Microplates

Dimensions of the microplates
All BRAND*plates*® microplates are manufactured according to the requirements of the ANSI-/SBS-standards 1 to 4 - 2004. This ensures the compatibility of the microplates when performing automated processes. For some automated systems, knowledge of the exact dimensions of the microplates is required.

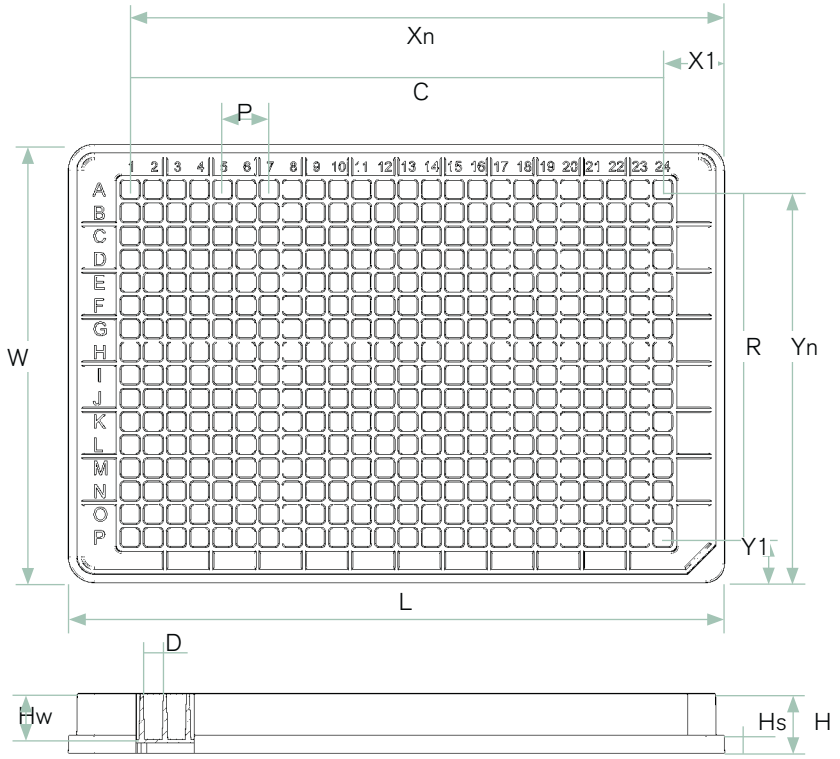
L	127.71 mm
W	85.43 mm
H	14.10 mm
Hs	2.45 mm
X1	14.36 mm
Xn	113.36 mm
Y1	11.22 mm
Yn	74.22 mm
P	9.00 mm
D	6.94 mm
Hw (U-bottom)	10.85 mm
Hw (V-bottom)	11.65 mm
Hw (F-bottom)	10.65 mm
Hw (C-bottom)	10.85 mm
C	12
R	8

96-well Standard Plates



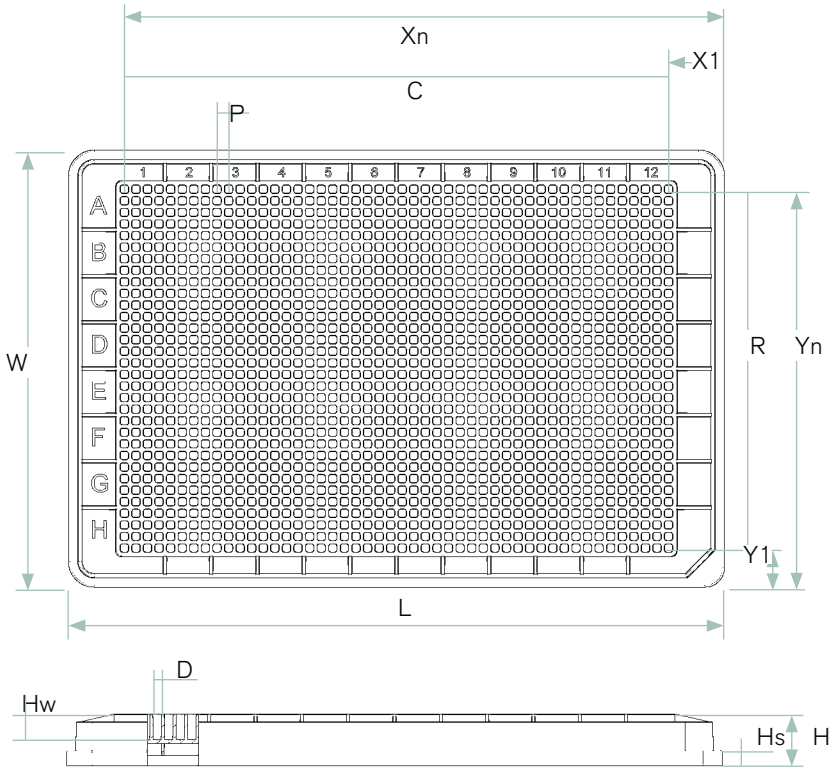


384-well Standard Plates



L	127.55 mm
W	85.05 mm
H	11.50 mm
Hs	3.50 mm
X1	12.03 mm
Xn	115.53 mm
Y1	8.78 mm
Yn	76.28 mm
P	4.50 mm
D	3.90 mm
Hw	8.85 mm
C	24
R	16

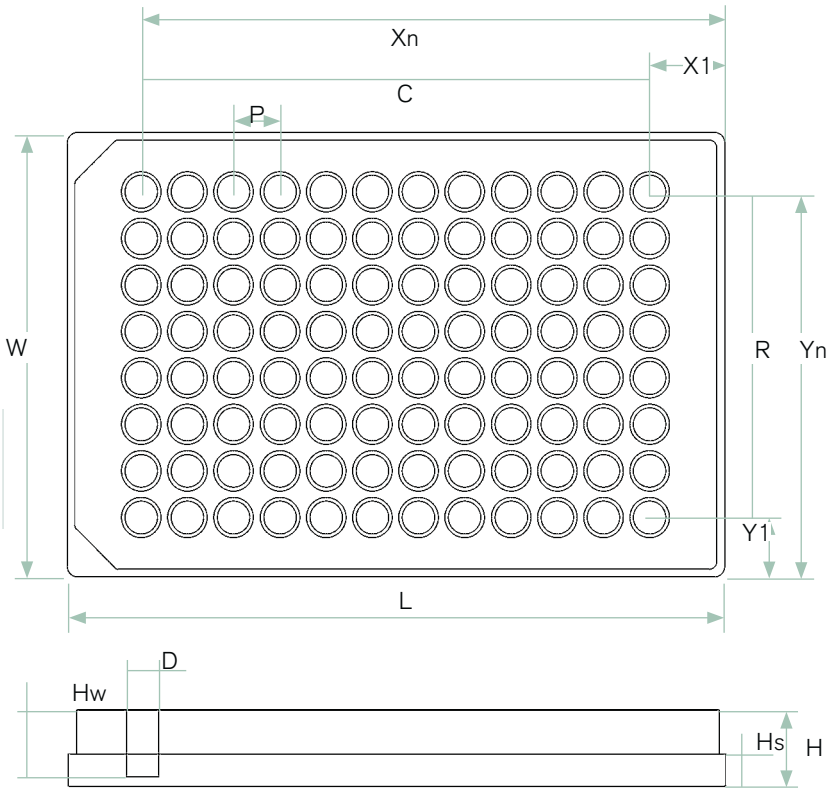
1536-well Standard Plates



L	127.50 mm
W	85.00 mm
H	10.00 mm
Hs	2.90 mm
X1	10.88 mm
Xn	116.63 mm
Y1	7.63 mm
Yn	77.38 mm
P	2.25 mm
D	1.70 mm
Hw	5.00 mm
C	48
R	32

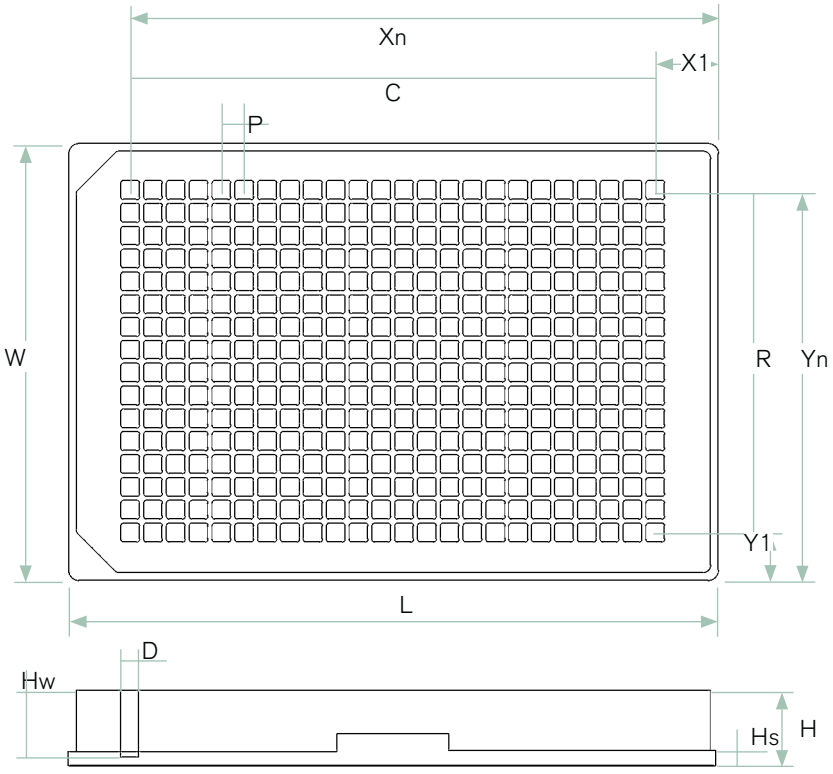
L	127.60 mm
W	85.60 mm
H	14.70 mm
Hs	6.40 mm
X1	14.40 mm
Xn	113.40 mm
Y1	11.50 mm
Yn	74.50 mm
P	9.00 mm
D	6.30 mm
Hw	11.15 mm
C	12
R	8

96-well Plates with Transparent Bottom

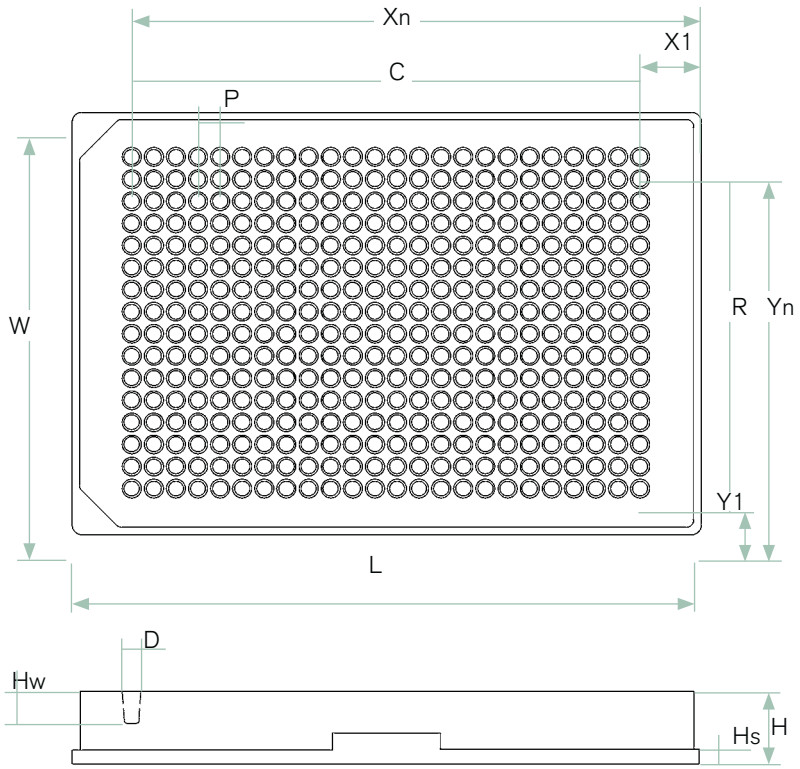


L	127.60 mm
W	85.60 mm
H	14.80 mm
Hs	2.75 mm
X1	12.10 mm
Xn	115.60 mm
Y1	9.10 mm
Yn	76.60 mm
P	4.50 mm
D	3.65 mm
Hw	11.95 mm
C	24
R	16

384-well Plates with Transparent Bottom



384-well Plates Low Volume



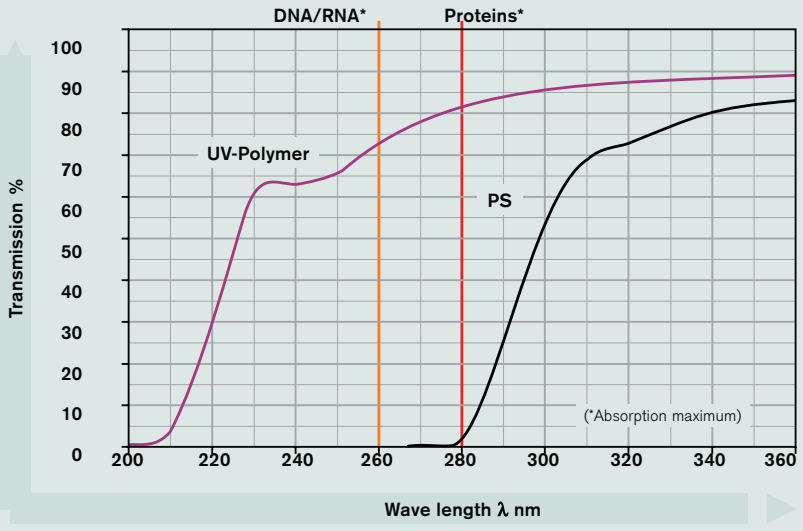
L	127.70 mm
W	85.70 mm
H	15.05 mm
Hs	6.25 mm
X1	12.10 mm
Xn	115.60 mm
Y1	9.10 mm
Yn	76.60 mm
P	4.50 mm
D	3.00 mm
Hw	6.50 mm
C	24
R	16

Resistance of Frequently Used Plastics

Media	UV-Polymer	PS	PP
Acetic acid, 100%	+	–	+
Acetone	+	–	+
Ammonia	+	+	+
Benzaldehyde	+	–	+
Benzene (Benzol)	–	–	+
Chloroform	–	–	–
Dioxane	+	–	+
DMF	+	–	+
DMSO (Dimethylsulfoxide)	+	–	+
Ethyl acetate	+	–	+
Hexane	–	–	+
Hydrochloric acid, 36%	+	+	+
Hydrofluoric acid, 10%	+	+	+
Isopropanol	+	+	+
Methanol	+	+	+
Nitric acid, 65%	+	–	–

Key: + = excellent chemical resistance; no damage from 30 days' exposure.
- = poor chemical resistance. Immediate damage may occur.

Transmission of PS and UV-Polymers



More detailed information about the physical characteristics, and a detailed table of the chemical resistance of different plastics can be found at www.brandtech.com.