

High Performance for Cell-based Assays

Within the drug discovery process, high content screening (HCS) uses sophisticated automated fluorescence microscopy, image acquisition, and analysis to uncover biologically relevant information from cells and compounds. A major challenge for cell-based imaging assays is selecting the ideal combination of plate type, magnification, and image quality that will yield reproducible and robust results. The Corning portfolio provides the highest quality microplates with the broadest range of options to meet this challenge.

Cell culture and plating techniques, the use of automation, and plate selection can all help reduce variability and improve results. The use of specialized microplates is especially critical for achieving optimal results. Key plate features include optimized flatness, thickness, film type, well bottom elevation, and surface type as they directly affect the optical quality, cell adherence, and well imaging access.

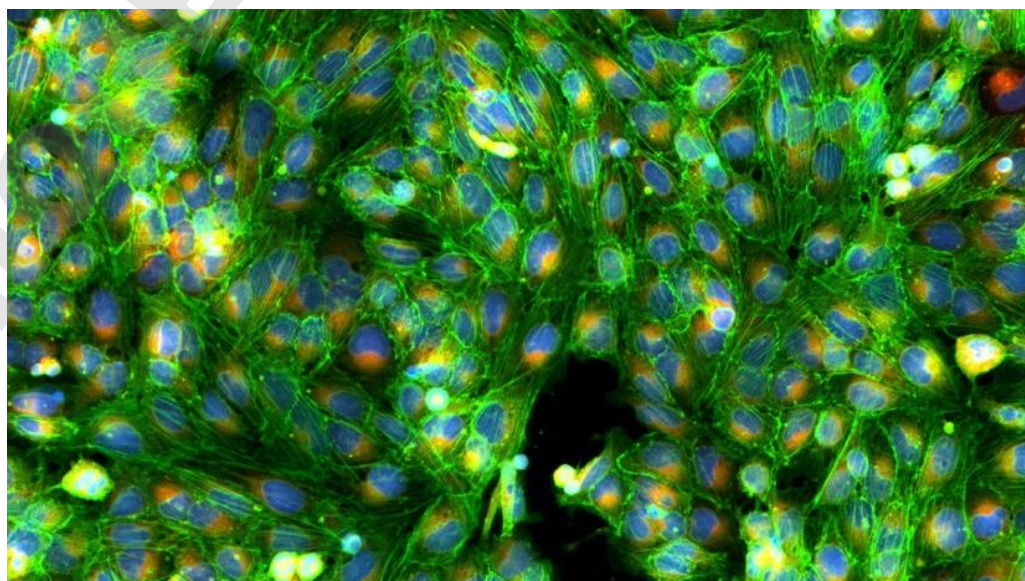
Enhance Process and Performance

Corning has been setting the standard for excellence in life sciences labware for over 85 years. We continue to be an industry leader focused on enhancing your assay process and performance with our cell culture products, microplates, and reagents. All Corning microplates adhere to strict manufacturing standards, process controls, and compliance testing to support consistent, reproducible performance.

Corning offers a variety of specialized microplates with a number of clear bottom substrate options to meet all your microscopy and high content imaging needs. They are organized into 3 groups:

- ▶ For 2X - 10X: Polystyrene microplates for standard microscopy and low magnification imaging
- ▶ For 10X - 32X: 384-well and half-area 96-well high content **standard base** microplates in glass and Cyclic Olefin Copolymer (COC) for increased chemical resistance and high resolution microscopy
- ▶ For 40X and over: 384-well and half-area 96-well high content **low bottom elevation** microplates in COC for use with high content imagers utilizing high magnification objectives with low numerical aperture immersion lenses

All COC and glass 384-well microplates feature a round well geometry that reduces reagent loss due to “wicking” and prevents cells from “clumping” in the corners.



Human osteosarcoma (U2OS) ZFN-engineered stable cell line co-expressing GFP- α -tubulin and RFP- β -actin from MilliporeSigma was imaged at 40X using a Corning 384-well high content low base COC microplate with Molecular Devices ImageXpress[®] Micro Confocal System.



Corning® High Content Screening Microplate Platform Options

	Polystyrene	Glass	Cyclic Olefin Copolymer (COC)	
			Standard Base	Low Base (low well bottom elevation)
96-well Microplates				
Not treated		■		
TC-treated	■		■	■
Coated	■	■	■	
384-well Microplates				
Not treated		■		
TC-treated	■		■	■
Coated	■	■	■	
1536-well Microplates				
Not treated				
TC-treated			■	
Coated			■	

High Content Image Analysis Applications

- ▶ High resolution and confocal imaging applications performed at high magnification
- ▶ Molecular localization
- ▶ Signal translocation (temporal changes)
- ▶ Low to high throughput screening applications, including:
 - Differentiation of primary cells
 - Assays for apoptosis
 - Cytotoxicity
 - Cell migration
 - Cell proliferation
 - Neurite outgrowth

Corning High Content Screening Solutions for Cell-based Assays

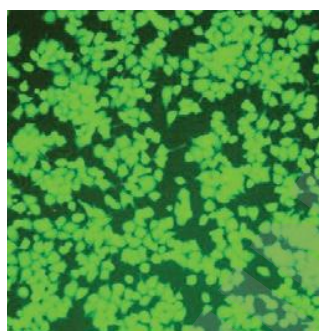


Falcon 96-well and 384-well microplates

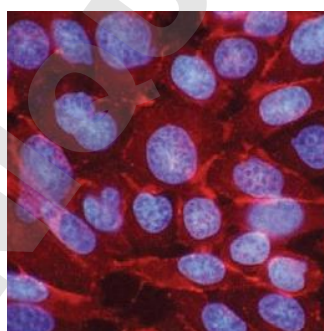
Polystyrene Microplates for Microscopy

Falcon® black/clear bottom, polystyrene microplates are made with crystal-grade virgin polystyrene and are well suited for standard fluorescent detection and imaging applications. The 190 µm thick microplate bottom enables clear viewing of cells using low to medium magnification objectives. The microplates are compatible with automation systems and meet standard ANSI/SBS footprint dimensions. Falcon black/clear bottom microplates are offered in standard 96-well and square 384-well formats in both not treated and tissue culture treated surfaces.

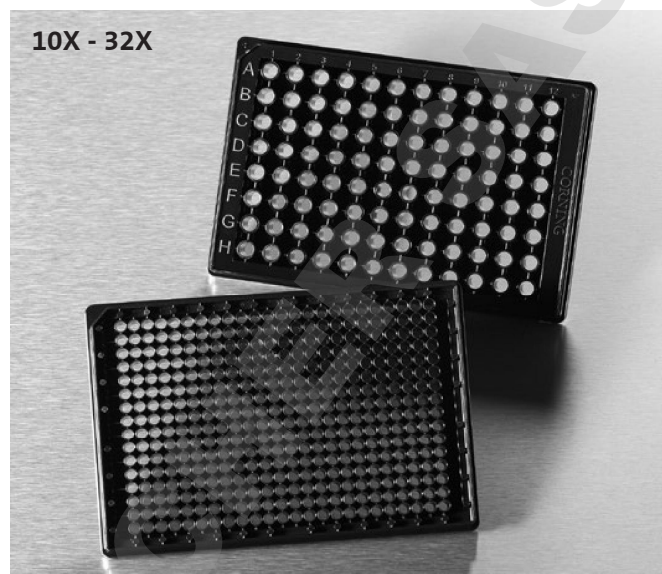
Corning® BioCoat™ Collagen- and PDL-coated surfaces are also available.



HEK-293 cells grown on Corning BioCoat Poly-D-Lysine (PDL) microplates. Poly-D-Lysine (PDL) is a synthetic polymer that enhances cell adhesion and protein absorption by altering surface charges on the culture substrate. Many transfected cells have been cultured successfully on PDL, as well as neuronal cell lines, primary neurons, and glial cells.



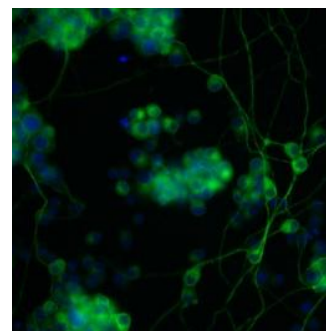
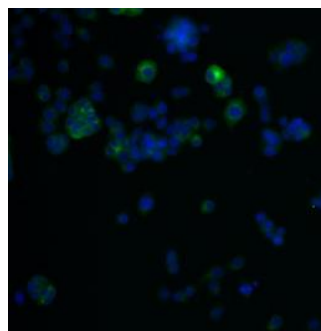
CHO-cells grown on Corning BioCoat Collagen microplates. Collagen I is an integral extracellular matrix protein that supports the framework holding cells and tissues together is routinely used in many cell culture applications. Typical examples of cells grown on Collagen I are endothelial cells (e.g., HUVEC), hepatocytes, muscle cells, PC12 cells, osteoclasts, or transfected HEK-293 cells.



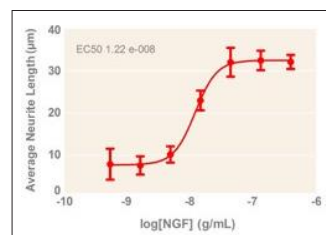
Corning 384-well and half area 96-well standard base high content COC microplates

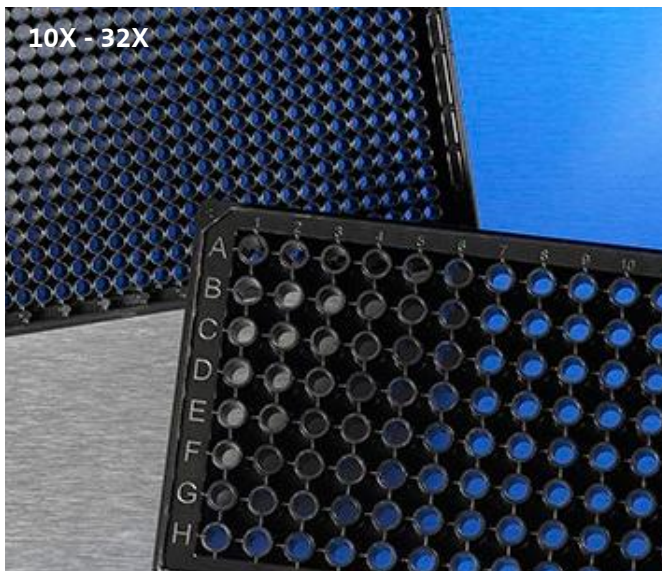
Standard Base High Content Cyclic Olefin Copolymer (COC) Microplates

With an ultra-clear 127 µm thick film bottom and excellent whole plate and intra-well flatness, Corning standard base high content microplates are ideal for high resolution cellular imaging applications. The microplates and film are manufactured from cyclic olefin copolymer (COC), which has excellent optical properties and mechanical stability as well as chemical resistance, low auto-fluorescence, and birefringence.



Analysis of neurite outgrowth. Representative micrographs of PC-12 cells grown on Corning BioCoat Poly-D-Lysine (PDL)-coated COC high content imaging microplates, after exposure to β-NGF for 7 days. Representative images demonstrate neurite outgrowth in the presence of 400 ng/mL (left) and 0 ng/mL (right) β-NGF. Neurites stained for β-Tubulin, class III (green), and nuclei stained with Hoechst (blue) and imaged with a 20X objective using the Thermo Scientific CellInsight™ Personal Cell Imager).

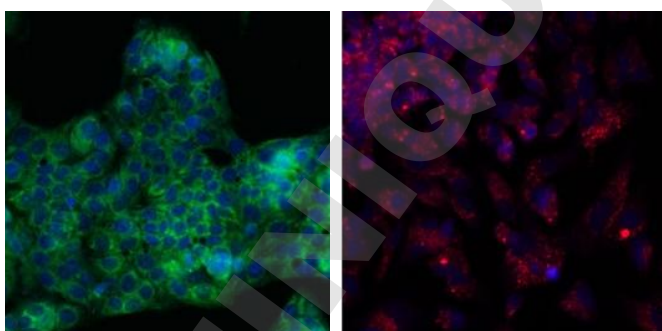




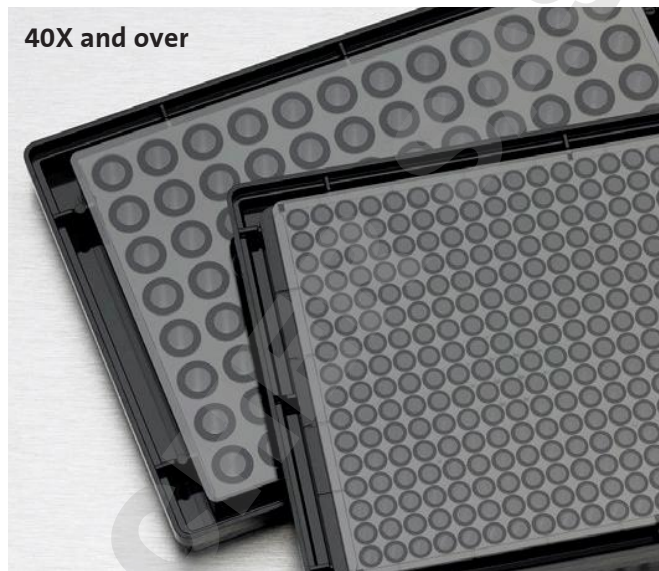
Corning 384-well and half area 96-well high content screening glass bottom microplates

High Content Screening (HCS) Glass Bottom Microplates

Corning® HCS glass bottom black microplates feature a scratch-resistant Corning Willow® glass bottom, which help to deliver high optical quality. This is ideal for high content cell-based assays performed using imaging systems. The 200 µm glass bottom provides a flat and optically clear surface that reduces autofocus time, increases throughput, and is ideal for imaging microscopy. Several pre-coated options are available for optimal cell growth.



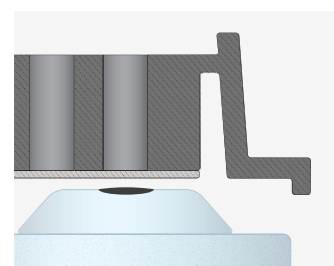
Representative stained HepG2 cells were grown on a Corning BioCoat™ high content screening microplate and were imaged using a 20X objective on a Thermo Scientific CellInsight™ Personal Cell Imager.



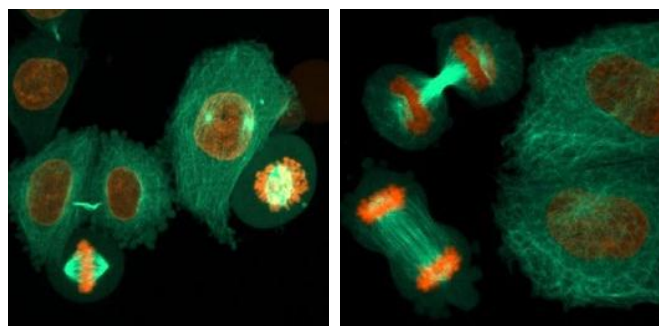
Corning 384-well and half area 96-well high content low base COC microplates

High Content Low Base COC Microplates

Corning low base microplates feature a low well bottom elevation of 0.3 mm that allows for unobstructed reading to the edge of the plate, ensuring you image all the wells, all the time.



With an ultra-clear film and excellent flatness, these microplates are ideal for high resolution cellular imaging applications. The microplate and film are manufactured from cyclic olefin copolymer, which has excellent optical properties, chemical resistance, and mechanical stability. The microplates have a well-established tissue culture-treated surface for the attachment and growth of anchorage-dependent cells.



Images provided by Ludwig Institute for Cancer Research, San Diego Branch using the Corning low base COC microplate on Yokogawa CV7000.

Specifications and Resources

Microplate Selection Guide for Microscopy and High Resolution Imaging

96-well Full and Half Area Microplates

Magnification	Falcon®	Corning®		Corning
	2X - 10X	10X - 32X		40X and over
Material of Construction	Polystyrene	COC standard base	Glass	COC low base
Microplate Bottom Thickness	190 µm	127 µm	200 µm	190 µm
Not treated	–	–	Cat. No. 4580	–
TC-treated	Cat. No. 353219*	Cat. No. 4680	–	Cat. No. 4517
Corning® BioCoat™ Collagen	Cat. No. 356649*	–	Cat. No. 4582	–
Corning BioCoat Fibronectin	–	–	Cat. No. 4584	–
Corning BioCoat PDL	Cat. No. 356640*	–	Cat. No. 4586	–

*Standard full area microplate.

384-well Microplates

Magnification	Falcon	Corning		Corning
	2X - 10X	10X - 32X		40X and over
Material of Construction	Polystyrene	COC standard base	Glass	COC low base
Microplate Bottom Thickness	190 µm	127 µm	200 µm	190 µm
Not treated	–	–	Cat. No. 4581	–
TC-treated	Cat. No. 353962	Cat. No. 4681	–	Cat. No. 4518
Corning BioCoat Collagen	Cat. No. 356667	–	Cat. No. 4583	–
Corning BioCoat Fibronectin	–	–	Cat. No. 4585	–
Corning BioCoat PDL	Cat. No. 356663	–	Cat. No. 4587	–

1536-well Microplates

Magnification	Falcon	Corning		Corning
	2X - 10X	10X - 32X		40X and over
Material of Construction	Polystyrene	COC standard base	Glass	COC low base
Microplate Bottom Thickness	190 µm	127 µm	200 µm	190 µm
Not treated	–	Cat. No. 4560	–	–
TC-treated	–	Cat. No. 4561	–	–
Corning CellBIND®	–	Cat. No. 4563	–	–
Corning BioCoat PDL	–	Cat. No. 4564	–	–

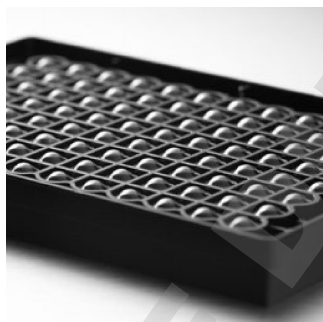
Custom coatings for all brands and sizes is available upon request.

Additional Resources

Additional resources can be found on www.corning.com/lifesciences.

- ▶ Instrument and Microplate Considerations to Improve Image Capture and Data Generation During High Content Screens (CLS-AN-081)
- ▶ Corning® Half Area 96-and 384-well Black Glass Bottom Microplates (CLS-AN-216)
- ▶ Corning High Content Imaging COC Microplates Prove to be Effective Tools for High Throughput Data Capture and Analysis (CLS-AN-232)
- ▶ Corning High Content Imaging COC Microplates for High Throughput Data Capture and Analysis (CLS-AN-239)
- ▶ Corning BioCoat™ High Content Imaging Glass Bottom Microplates Provide Enhanced Performance for Cell-based Assays (CLS-AN-244)
- ▶ Corning BioCoat High Content Imaging Glass Bottom Microplates for High Throughput Data Capture and Analysis (CLS-AN-303)
- ▶ Comparison of Ultra-Low Attachment Spheroid Microplates and Hanging Drop Microtissue Formation for High Content Screening (CLS-AN-325)

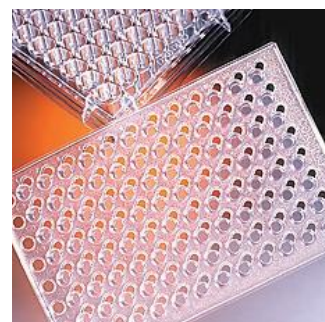
Additional Corning Solutions for HCS and Drug Discovery Applications



Corning spheroid microplates allow you to generate and analyze 3D multicellular spheroids in one microplate.



Corning Matrigel® matrix is a natural ECM-based hydrogel that is widely used in models for 2D and 3D cell culture *in vitro*, enabling you to improve attachment and differentiation of many cell types. Matrigel matrix can also be used to better mimic *in vivo* environments for 2D and 3D cell culture applications.



Transwell® permeable supports help produce a cell culture environment that more closely resembles an *in vivo* state allowing cells to carry out activities in a more natural manner. Design a variety of experiments using various pore sizes, membrane types, and coatings.

Visit www.corning.com/lifesciences or contact your local Corning representative to see all solutions for high content screening.



www.corning.com/lifesciences/solutions

At Corning, we continuously strive towards improving efficiencies and developing new products and technologies for life science researchers. From assay preparation to storage, our technical experts understand your challenges and your increased need for high-quality products.

It is this expertise, plus a 160-year legacy of Corning innovation and manufacturing excellence, that puts us in a unique position to be able to offer a beginning-to-end portfolio of high-quality, reliable life sciences consumables.

For more specific information on claims, visit the Certificates page at www.corning.com/lifesciences.

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