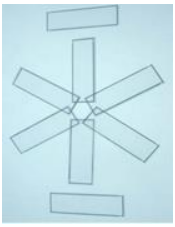
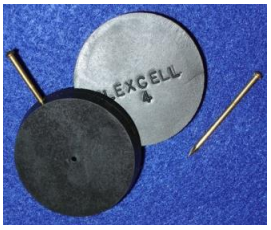
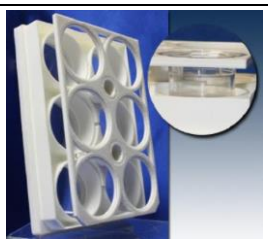
Dunn Labortechnik

Disposables and Consumables for Flexcell® Cellular Biomechanical Systems

2019



6- and 24-well Culture Plates: Grow and stretch your cells on six different matrix bonded growth surfaces (and untreated) for use with Flexcell's® Tension, Tissue Train® and Compression systems (pages 3 - 6).

Membranes: Six different matrix bonded growth surfaces (and untreated) for use with StageFlexer® and FlexFlow™, untreated membranes for use with StagePresser™ (pages 6 - 7).

Culture Slips®: Surface treated slides for use with Streamer® and FlexFlow™ (page 7).

FlexStop™: Provides a convenient negative control when testing mechanical load effects (page 8).

Transwell® Holder: Holds Transwells® to analyze cell migration in response to strain (page 8).

6-well BioFlex® Cell Seeder: Optimizes plating of cells to the central area of a 6-well BioFlex® membrane for uniform application of strain (page 8).

Matrix-Bonded and Charged Culture Plate Growth Surfaces

Flexcell's® unique culture plates provide researchers with matrix bonded growth surfaces that promote attachment and growth of a variety of cell types. Matrix coatings, such as type I collagen peptides, elastin, fibronectin (as RGD repeat peptides), and laminin (as YIGSR peptides), enhance attachment of specific cell types. These specialty growth surfaces help to better simulate the *in vivo* environment.

Flexcell® culture plates including BioFlex®, Tissue Train®, UniFlex® series culture plates, StageFlexer® membranes and Culture Slips® are available with the following treatments and also as untreated versions:

- Amino
- Collagen Type I
- Collagen Type IV
- Elastin
- ProNectin
- Laminin

NOTE: See the integrin table on the following page to match your cell's integrin panel with the appropriate growth surface.

Flexcell's® culture plates are stringently tested to assure the highest quality control and the best cell attachment and growth possible. Attachment factors are covalently bonded to the culture plate rubber membranes or plastics using our proprietary methods that result in optimal cell adherence and clarity for viewing cells. Culture plates are sterilized with gamma radiation and have a shelf life of one year.

The Flexcell® Tension System provides a strain component for dynamically culturing cells *in vitro*. Researchers use the Flexcell® culture plates together with the tension system to apply a defined, controlled, static or variable duration cyclic tension to cells.

The Flexcell® Streamer® applies fluid flow to cells in culture. Researchers use Culture Slips® together with the flow system to apply a controlled laminar, oscillatory, or pulsatile flow to cells.

Flexcell's® culture plates together with Flexcell's® systems for applying mechanical load provide the investigator with the ability to grow cells *in vitro* in a manner that better simulates an *in vivo* environment.

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Matrix-Bonded Growth Surfaces

Flexcell® culture plates are available with the following treatments:

<u>Genetic type I collagen</u> for improved attachment and adherence of cells including:

- Continuous cell lines
- Primary cells
- Osteoblasts
- Chondrocytes
- Tendon fibroblasts
- Aortic, venous, and capillary endothelial cells
- Lung type II epithelial cells
- Ligament fibroblasts
- Smooth, striated and cardiac
- Myoblasts
- Myocytes

<u>Fibronectin,</u> as RGD repeat peptides, and <u>ProNectin F</u> for the improved attachment of cells including:

- Fibroblasts
- Embryonic cells

<u>Laminin,</u> as YIGSR peptides, for the improved attachment of cells including:

- Glial cells
- Neurons
- Cells grown on type I collagen or ProNectin F
- Astrocytes

<u>Positively charged amino hydrophilic</u> for the improved attachment of cells including:

- Endothelial cells
- Smooth muscle cells

<u>Elastin</u> for the improved attachment of cells including:

- Endothelial cells
- Smooth muscle cells

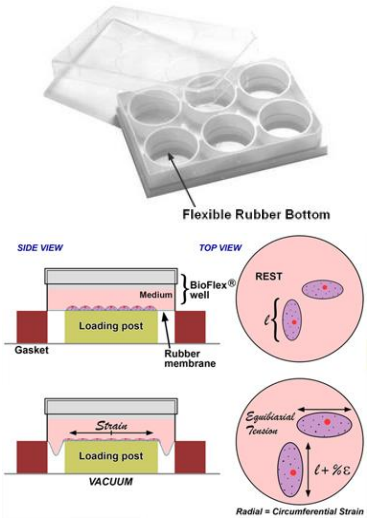
** See the integrin table below to match your cell's integrin panel with the appropriate growth surface.*

Vertebrate Integrins Grouped in Subfamilies Sharing a Common β Subunit			
Subunits		Ligands Sequenced	Minimal Sequence of Integrin Binding Site*
β_1^+	α_1	Collagen, Laminin	
	α_2	Collagen, Laminin	DGEA
	α_3	Fibronectin, Laminin, Collagen	RGD
	α_4	Fibronectin, VCAM-1	EILDV
	α_5	Fibronectin	RGD
	α_6^+	Laminin	
	α_7	Laminin	
	α_8	?	
	α_V	Vitronectin, Fibronectin	RGD
β_2	α_L	ICAM-1, ICAM-2	
	α_M	C3b component of complement (inactivated), Fibrinogen, Factor X, ICAM-1	
	α_X	Fibrinogen, C3b component of complement	GPRP
β_3^+	α_{IIb}	Fibrinogen, ProNectin F, von Willebrand factor, Vitronectin, Thrombospondin	RGD, KQAGDV
	α_V	Vitronectin, Fibrinogen, von Willebrand factor, Thrombospondin, Fibronectin, Osteopontin, Collagen	RGD
β_4^+	α_8^+	Laminin	
β_5	α_V	Vitronectin	RGD
β_6	α_V	Fibronectin	RGD
β_7	α_4	Fibronectin, VCAM-1	EILDV
	α_{IEL}	?	

6-well BioFlex® Culture Plates

Flexible bottomed culture plate used with BioFlex® Loading Stations™ for providing equibiaxial strain to cells in monolayer culture.

- Flexible silicone elastomer membrane.
- 6-well culture plate with total growth surface area of 57.75 cm^2 (9.62 cm^2/well).
- Optically clear for direct viewing of cells with inverted or upright microscopes.
  (membrane thickness: 0.020 inch/0.508 mm).
- Covalently bonded surfaces: Amino, Collagen (Type I or IV), Elastin, ProNectin (RGD), Laminin (YIGSR).
- Low autofluorescence for use in immunohisto-chemical assays or with fluorescent probes.
- Provides uniform radial and circumferential strains when used with cylindrical BioFlex® Loading Stations™.
- Available in cases of 10 and 40 plates.



Equibiaxial strain application to cells in a well of a BioFlex® culture plate

Cat. No.	Description		
BF-3001U	BioFlex® Culture Plate – Untreated		
BF-3001A	BioFlex® Culture Plate – Amino		
BF-3001C	BioFlex® Culture Plate – Collagen Type I		
BF-3001E	BioFlex® Culture Plate – Elastin		
BF-3001P	BioFlex® Culture Plate – ProNectin		
BF-3001L	BioFlex® Culture Plate – Laminin		
BF-3001C/IV	BioFlex® Culture Plate – Collagen Type IV		
BF-3001PL	Poly L-Lysine (NEW)		

24-well HT BioFlex® Culture Plates

High throughput flexible silicone elastomer bottomed culture plates to be used only with the 24-well HT Baseplate Kit.

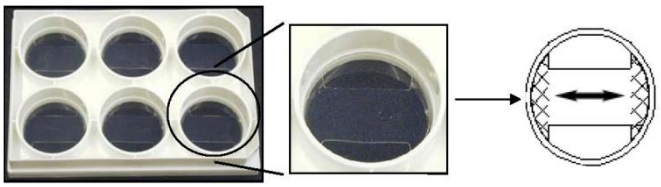
- Microplate reader compatible size and a total growth surface area of 37.47 cm^2 (1.56 cm^2/well).
- Optically clear for direct viewing of cells with inverted or upright microscopes (membrane thickness: 0.254 mm).
- Apply up to 8 % equibiaxial strain to cells in monolayer culture with Flexcell® Tension system and 24-well Loading Stations™.
- Covalently bonded surfaces: Amino, Collagen (Type I or IV), Elastin, ProNectin (RGD), Laminin (YIGSR)
- Available with black or white frame in cases of 10 and 40 plates.
- **Please note:** The use of the HT BioFlex® culture plates with the Flexcell FX-4000™/FX-5000™/FX-6000™ Tension System and Tissue Train® System requires the 24-well HT Baseplate Kit and may need a software update.

Cat. No. Black Frame	Cat. No. White Frame	Description		
HTPB-3001U	HTPW-3001U	HT BioFlex® Culture Plate – Untreated		
HTPB-3001A	HTPW-3001A	HT BioFlex® Culture Plate – Amino		
HTPB-3001C	HTPW-3001C	HT BioFlex® Culture Plate – Collagen Type I		
HTPB-3001E	HTPW-3001E	HT BioFlex® Culture Plate – Elastin		
HTPB-3001P	HTPW-3001P	HT BioFlex® Culture Plate – ProNectin		
HTPB-3001L	HTPW-3001L	HT BioFlex® Culture Plate – Laminin		
HTPB-3001C/IV	HTPW-3001C/IV	HT BioFlex® Culture Plate – Collagen Type IV		

6-well UniFlex® Culture Plates

Flexible bottomed culture plate used with Arctangle® Loading Stations™ to provide uniaxial strain to cells in monolayer culture.

- Compatible with the Flexcell® Tension and Tissue Train® systems.
- Relationship of strain to vacuum well characterized.
- Strain field represented by a 0.6" wide x 0.952" (3.68 cm^2) long centrally located rectangular region.
- Uniaxial strain varies by only +/- 1.5 % across the designated uniaxial strain region.
- Covalently bonded surfaces: Amino, Collagen (Type I or IV) Elastin, ProNectin (RGD), Laminin (YIGSR).
- Available in cases of 10 and 40 plates.



UniFlex® culture plate with schematic of the strain region

** Arctangle® Loading Stations™ required for correct application of uniaxial strain.*

Cat. No.	Description		
UF-4001U	UniFlex® Culture Plate – Untreated		
UF-4001A	UniFlex® Culture Plate – Amino		
UF-4001C	UniFlex® Culture Plate – Collagen Type I		
UF-4001E	UniFlex® Culture Plate – Elastin		
UF-4001P	UniFlex® Culture Plate – ProNectin		
UF-4001L	UniFlex® Culture Plate – Laminin		
UF-4001C/IV	UniFlex® Culture Plate – Collagen Type IV		

6-well Tissue Train® Circular Foam Culture Plates

Flexible bottomed culture plate used with BioFlex® Loading Stations™ for providing equibiaxial strain to circular 3D cell-seeded gel constructs.

- Create circular 3D cell-seeded gel constructs (no Trough Loader™ required).
- Apply a load regimen of biaxial cyclic strain to the cellular construct using a Tension or Tissue Train® system with cylindrical Loading Stations™.
- Matrix-bonded foam circular anchor for improved cell attachment.
- Observe cell responses in 3D matrix with phase contrast, fluorescence or scanning confocal microscopy.
- Monitor changes in cell shape, tissue organization, cell migration, division, gene expression, protein expression and secretion.
- Covalently bonded anchors: Amino, Collagen (Type I or IV), Elastin, ProNectin (RGD), Laminin (YIGSR).
- Available in cases of 10 and 40 plates.

Cat. No.	Description		
TTCF-5001U	Circular Foam Culture Plate – Untreated		
TTCF-5001A	Circular Foam Culture Plate – Amino		
TTCF-5001C	Circular Foam Culture Plate – Collagen Type I		
TTCF-5001E	Circular Foam Culture Plate – Elastin		
TTCF-5001P	Circular Foam Culture Plate – ProNectin		
TTCF-5001L	Circular Foam Culture Plate – Laminin		
TTCF-5001C/IV	Circular Foam Culture Plate – Collagen Type IV		

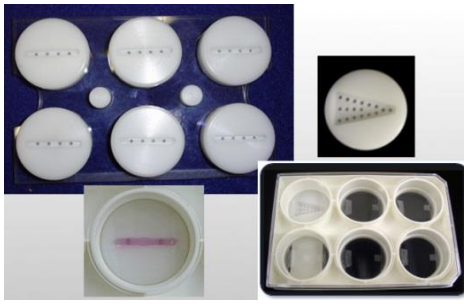
Please note that the cat. no. for these plates have changed.

6-well Tissue Train® Culture Plates

Flexible bottomed culture plate used with Arctangle® Loading Stations™ and Trough Loaders™ to apply uniaxial strain to 3D cell-seeded gel constructs.

- Create 3D cell-seeded constructs on a Tissue Train® plate using a Trough Loader™ or a Trapezoidal Trough Loader™ as a mold (Trough Loaders™ not included with the plates).
- Tissue Train® Plates available with either CEREX® (a non-woven nylon mesh) or foam (open-cell porous) anchor stems. Anchor material has not been found to affect the compaction kinetics of the collagen gel. However, the foam anchor stems allow for increased construct survival time as measured by time to construct failure/detachment from the anchors.
- Apply a load regimen of uniaxial cyclic strain to the cellular construct using a Flexcell Tension system and Arctangle® Loading Stations™.
- Observe cell responses in 3D matrix with phase contrast, fluorescence or scanning confocal microscopy.
- Covalently bonded anchors: Amino, Collagen (Type I or IV), Elastin, ProNectin (RGD), Laminin (YIGSR).
- Available in cases of 10 and 40 plates.

Tissue Train® and Trapezoidal Tissue Train® culture plates with the **foam anchor stems**



Representative image of 3D cell-seeded gel construct created in a Tissue Train® culture plate (left picture) and in a Trapezoidal TT® culture plate using a Trapezoidal Trough Loader™

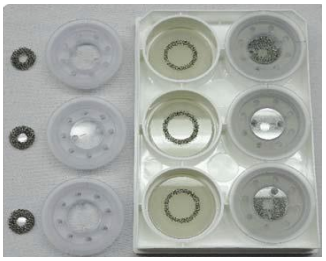
For use with (Linear) Trough Loaders™				
Cat. No. CEREX®	**Cat. No. Foam**	**Description**		
TT-4001U	TT-5001U	Tissue Train® Culture Plate – Untreated		
TT-4001A	TT-5001A	Tissue Train® Culture Plate – Amino		
TT-4001C	TT-5001C	Tissue Train® Culture Plate – Collagen Type I		
TT-4001E	TT-5001E	Tissue Train® Culture Plate – Elastin		
TT-4001P	TT-5001P	Tissue Train® Culture Plate – ProNectin		
TT-4001L	TT-5001L	Tissue Train® Culture Plate – Laminin		
TT-4001C/IV	TT-5001C/IV	Tissue Train® Culture Plate – Collagen Type IV		

For use with Trapezoidal Trough Loaders™				
Cat. No. CEREX®	**Cat. No. Foam**	**Description**		
TTTP-4001U	TTTP-5001U	Trapezoidal TT® Culture Plate – Untreated		
TTTP-4001A	TTTP-5001A	Trapezoidal TT® Culture Plate – Amino		
TTTP-4001C	TTTP-5001C	Trapezoidal TT® Culture Plate – Collagen Type I		
TTTP-4001E	TTTP-5001E	Trapezoidal TT® Culture Plate – Elastin		
TTTP-4001P	TTTP-5001P	Trapezoidal TT® Culture Plate – ProNectin		
TTTP-4001L	TTTP-5001L	Trapezoidal TT® Culture Plate – Laminin		
TTTP-4001C/IV	TTTP-5001C/IV	Trapezoidal TT® Culture Plate – Collagen Type IV		

6-well BioPress™ Culture Plates (BF-3000C)

Culture plate for use with the Flexcell® Compression system.

- Each well contains an acrylic piston used with a stationary platen (supplied with the Compression system, not included with the plates) to deform 3D tissue samples or cell seeded constructs using the FX-5000™ Compression system.
- Ring foam holders keep samples confined to central region of each well.
- All plates come pre-sterilized.
- Available in cases of 10 or 40 plates.



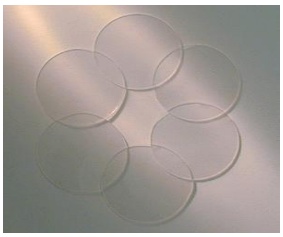
BioPress™ culture plate with acrylic pistons adhered to the silicone elastomer well bottom, foam sample holders (far left), and stationary platens (left of plate)

Cat. No.	Description		
BF-3000C	BioPress™ Compression Culture Plate		

StageFlexer® Membranes

Flexible growth surface for the StageFlexer® and FlexFlow™ devices.

- Option 1: Individually packaged **round**, flexible silicone rubber membranes (come in sterile culture dishes), **0.5 mm thick**, **43 mm diameter**, pre-cut for direct use with StageFlexer® (SF-3000) and FlexFlow™. Available in cases of 6 and 36 membranes.
- Option 2: Individually packaged and sterile **sheets**, flexible silicone rubber membranes **0.5 mm thick**, **89 mm x 134 mm**, to be cut for use with Flexcell's® microscopy devices. Available as single sheets.
- Clear for direct viewing of cells optically.
- Viscoelastic under mechanical loading.
- Same growth surfaces as the BioFlex® culture plates.
- Covalently bonded surfaces: Amino, Collagen (Type I or IV), Elastin, ProNectin (RGD), Laminin (YIGSR).



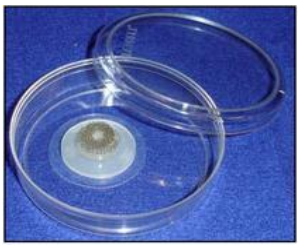
StageFlexer® Membranes, round, for use with StageFlexer® and FlexFlow™			
Cat. No.	**Description**		
SFM-U	StageFlexer® Membrane – Untreated		
SFM-A	StageFlexer® Membrane – Amino		
SFM-C	StageFlexer® Membrane – Collagen Type I		
SFM-E	StageFlexer® Membrane – Elastin		
SFM-P	StageFlexer® Membrane – ProNectin		
SFM-L	StageFlexer® Membrane – Laminin		
SFM-C/IV	StageFlexer® Membrane – Collagen Type IV		

StageFlexer® Membranes, sheets		
Cat. No.	**Description**	
SM2-1010U	StageFlexer® Membrane – Untreated	
SM2-1010A	StageFlexer® Membrane – Amino	
SM2-1010C	StageFlexer® Membrane – Collagen Type I	
SM2-1010E	StageFlexer® Membrane – Elastin	
SM2-1010P	StageFlexer® Membrane – ProNectin	
SM2-1010L	StageFlexer® Membrane – Laminin	
SM2-1010C/IV	StageFlexer® Membrane – Collagen Type IV	

StagePresser™ Membranes (SPM-3000)

Flexible growth surface for use with the StagePresser™ device.

- Each membrane contains an acrylic piston which is compressed against a stationary platen on the StagePresser™ device to deform 3D tissue samples or cell-seeded constructs.
- Ring foam holders keep samples confined to central region of each membrane.
- Each membrane comes individually packaged in a sterile cell culture dish.
- Available in cases of 6 membranes with piston and foam retainer.

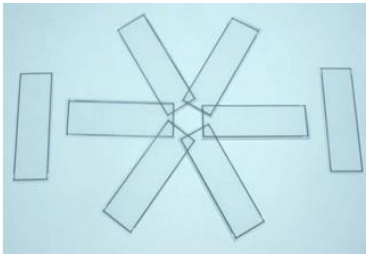


Cat. No.	Description		
SPM-3000	StagePresser™ Membrane (with piston and foam retainer)		

Culture Slips®

Surface treated slides for use with Streamer® and FlexFlow™.

- Available in two sizes:
  75 × 25 × 1,0 mm (for Streamer® or FlexFlow™),
  75 × 24 × 0,2 mm (for FlexFlow™ only).
- 75 × 25 x 1,0 mm Culture Slips® are rimmed with a 1,0 mm wide PTFE border to help limit cell culture growth to the portion of the slip exposed to fluid flow.
- Low autofluorescence.
- Matrix-treated to promote cell attachment.
- Covalently bonded surfaces: Amino, Collagen (Type I or IV) Elastin, ProNectin (RGD), Laminin (YIGSR).
- Delivered in sterile twin packs for one time immediate use.
- Available in cases of 6 and 36 culture slips.



Culture slips® 75 x 25 x 1mm for Streamer® or FlexFlow™			
Cat. No.	**Description**		
CS-U	Culture Slips® – Untreated		
CS-A	Culture Slips® – Amino		
CS-C	Culture Slips® – Collagen Type I		
CS-E	Culture Slips® – Elastin		
CS-P	Culture Slips® – ProNectin		
CS-L	Culture Slips® – Laminin		
CS-C/IV	Culture Slips® – Collagen Type IV		

Culture slips® 75 x 24 x 0.2 mm for FlexFlow™			
Cat. No.	**Description**		
FFCS-U	Culture Slips® – Untreated		
FFCS-A	Culture Slips® – Amino		
FFCS-C	Culture Slips® – Collagen Type I		
FFCS-E	Culture Slips® – Elastin		
FFCS-P	Culture Slips® – ProNectin		
FFCS-L	Culture Slips® – Laminin		
FFCS-C/IV	Culture Slips® – Collagen Type IV		

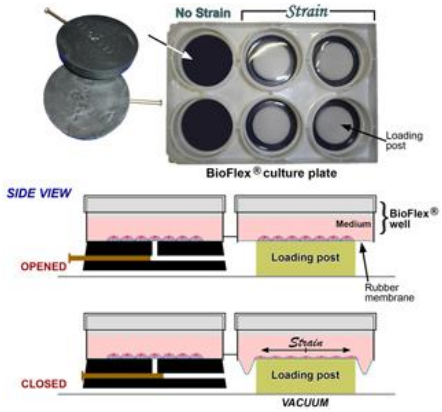
FlexStop™ (BFS-3000)

Be Selective! Use a FlexStop™ to block stretching.

- Reusable valved rubber stopper that inserts into the underside of a BioFlex® culture plate well to prevent vacuum-induced deformation.
- Provides a convenient negative control when testing mechanical load effects on cells in the same BioFlex® culture plate.
- Designed to work in conjunction with the BioFlex® culture plates and BioFlex® Loading Stations™.
- Also works with Tissue Train® und UniFlex® culture plates.

- FlexStop™ includes:
  - Twelve rubber stoppers
  - Twelve brass pins

Cat. No.	Description	
BFS-3000	FlexStops™	



Schematic of strain inhibition with the use of a FlexStop™ on the underside of a BioFlex® culture plate well

Flexcell® Transwell® Holder

Holds Transwells® to allow for cell migration and co-culture assays to be performed in Flexcell® culture plates.

- Analyze cell migration in response to strain.
- Available for 6- and 24-well Flexcell® culture plates.
- Compatible with standard Transwell® sizes for 6-well and 24-well culture plates.

Transwell® is a registered trademark of Corning® Inc.

Cat. No.	Description	
TW6-3000	Transwell® Holder for BioFlex® 6-well Culture Plates	
TW24-3000	Transwell® Holder for HT BioFlex® 24-well Culture Plates	

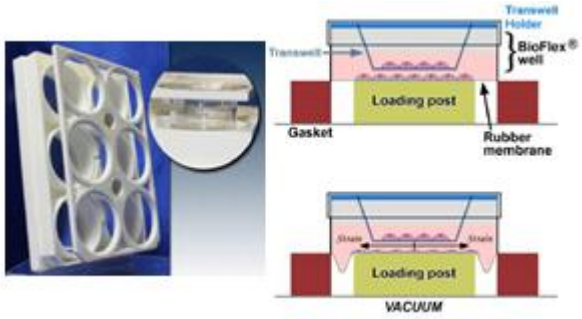


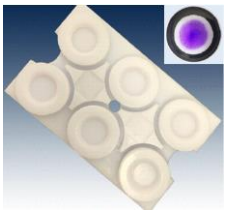
Diagram of a Transwell® Holder with a Transwell® supported above the rubber membrane in the well of a BioFlex® plate

6-well BioFlex® Cell Seeder

Optimizes plating of cells to the central area of a 6-well BioFlex® membrane for uniform application of strain.

- Confines cells during plating and adhesion to the central area of a well.
- Prevents the growth of the cells at the edges of the wells resulting in a well defined equibiaxial strain of all seeded cells.

Cat. No.	Description	
BFCS-1000	BioFlex® Cell Seeder (1 piece)	
BFCS-4000	BioFlex® Cell Seeder (set of 4)	



6-well BioFlex® Cell Seeder. Inset shows crystal violet stained monolayer plated using Cell Seeder over a 25 mm cylindrical loading post of the Flexcell® Tension System.

Price: Prices in Euro per unit, excluding VAT.

Freight charges: Germany: We charge Euro 20.00 for delivery. Large delivery on a palette: please enquire. Below a net order value of Euro 100.00 an additional charge of Euro 8.00 will apply. Other countries: please contact us for further information.

Payment terms: 30 days net or against pro forma invoice.

Prices are subject to change without notice. Prices supersede all prices in previous documents. No responsibility is taken for the accuracy of the information.

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