

# Life Sciences Films

*Material solutions that protect quality and efficacy in upstream and downstream bioprocessing*

We understand that keeping biopharmaceutical products and processes free of harmful chemical and environmental contaminants is paramount. Our advanced materials expertise, combined with quick-turn custom capabilities, enable us to provide single-use solutions that meet complex demands for material integrity across upstream and downstream applications, while achieving lead times that keep your processes running.

Our single-use, assemblies, including 2D and 3D bioprocess assemblies, motion bioreactor bags, microcarrier and cell separation systems, and single-use mixing systems, are made from various films that offer different advantages and compatibilities. Taking into consideration the uniqueness of different cells and liquids, mixing times, strength, security, and pliability requirements, our materials experts will help you select the right film for your application.

## HIGH PERFORMANCE MATERIALS FOR CLEAN AND ROBUST SOLUTIONS

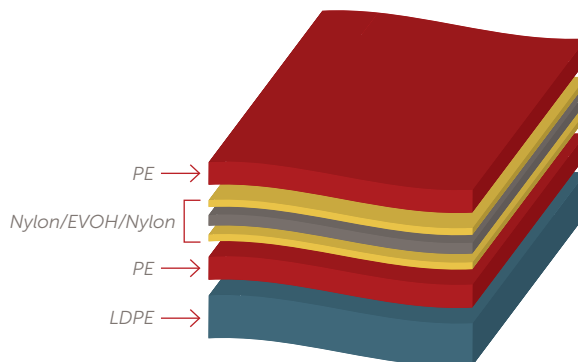
### Aramus 2D Single-Use Assemblies

Provide a new level of assurance for your frozen product storage, final fill, process sampling and archiving, peptide synthesis, and buffer and media prep processes.



### 2D Bioprocess Assemblies

Customizable 2D bioprocess assemblies are ideal for single-use biopharmaceutical applications including chromatography collection, formulation and fill, media and buffer storage, and more.



*Materials solutions that protect pharmaceutical products*

### 3D Bioprocess Assemblies

Customizable 3D multilayer bioprocess assemblies are ideal for medium to large, single-use biopharmaceutical applications including bulk sterile shipping, drug substance and excipient, waste collection, and more.



### Motion Bioreactor Bags

Custom solutions designed to your exacting standards for mammalian and plant culture lines or growing NS0 and other cholesterol sensitive clones.



### Microcarrier and Cell Separation System

Streamlined, completely sterile, single-use filter/mesh bag system provides flexible containment in upstream applications including separation of microcarrier beads, final product filtration, harvest, and more.



### Mixing System

This single-use bag system creates a completely sterile mixing and recirculation process from start to finish. Our mixing system is designed to store, recirculate, and mix all types of media within a sterile single-use bag.

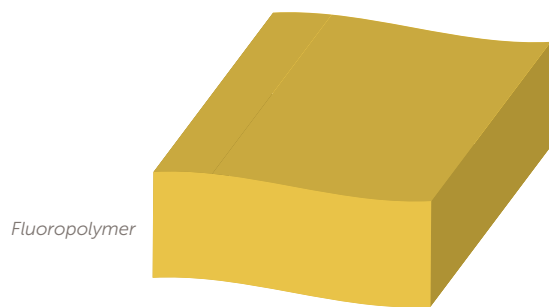


## MATERIALS OF CONSTRUCTION

### Aramus™ Single-layer Film

The Aramus film is designed with a single polymer material that does not contain binders, agents, or additives, and provides higher purity, lower extractables and leachables (E&L), and greater reliability in frozen applications down to  $-196^{\circ}\text{C}$  ( $-321^{\circ}\text{F}$ ).

This film is a great choice for all your critical process needs for 2D (20 mL – 50 L) storage bags. It provides robustness, low surface energy, low absorption, superior chemical compatibility, and critical process fluid cleanliness.



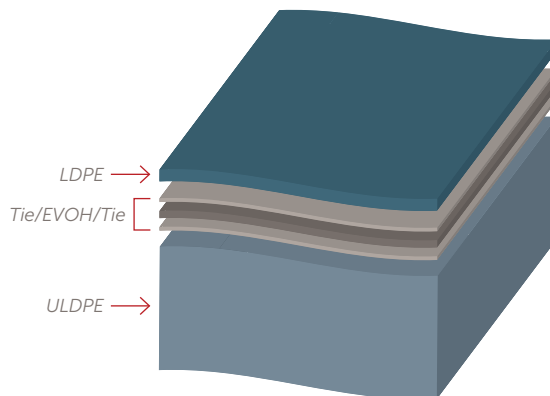
- One layer (8 mil thick) of high-grade, gamma-stable fluoropolymer
- Maintains flexibility and weld strength in liquid nitrogen ( $-196^{\circ}\text{C}$  [ $-321^{\circ}\text{F}$ ])
- Extreme chemical compatibility for the most challenging applications (DMSO, DMF, etc.)
- Gamma stable and autoclavable
- Fluid path layer: Fluoropolymer

### Flex 200 Film, Single-Ply, Multilayer

Designed to provide strength and low gas permeability, this film is well suited for growing mammalian and plant culture cell lines with extended rocking times.

Flex 200 film is most often selected when optical clarity is critical to the process optimization.

Common applications include fluid transfer, shipping, storage, mixing systems, sampling, bioreactors, media storage, and product storage containers.



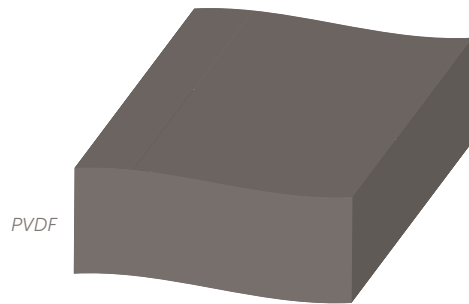
- Total 13 mil thickness
- Fluid path layer: ULDPE

### Flex 400 Film, Single-Ply Fluoropolymer PVDF

This single-ply design is extremely durable, autoclavable\*, and has non-cholesterol binding properties that yield superior results in growing NS0 and other cholesterol dependent clones.

Flex 400 can be used for a multitude of applications including processes with broad temperature ranges, high temperature and sterilization applications, cholesterol containing media storage, and processes where a low extractables profile is required.

Flex 400 is primarily selected for motion bioreactor designs where non-cholesterol binding properties are required. Compared to the Aramus film, this film can be made into face port configurations.



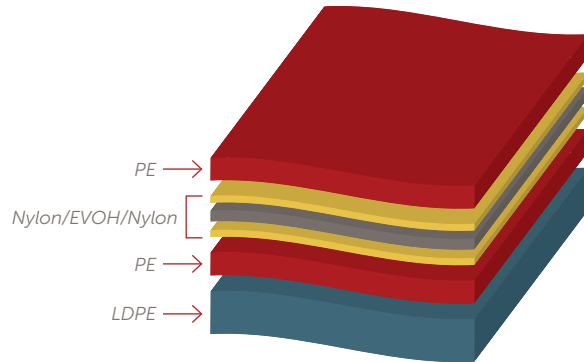
- 8 mil thickness
- Fluid path layer: PVDF

### Flex 100/150 Film, Double-Layer, Multi-Ply

This design provides strength and low gas permeability, which is well suited for growing mammalian and plant culture cell lines with extended rocking times.

Flex 100/150 film creates a more robust container by eliminating seams on the outside, which is ideal for shipping. The double-layer, multi-ply design helps reduce stress preventing container leak through under harsh conditions such as shipping 3D containers of fluid.

One key benefit of this film is scalability. Flex 100/150 film is available for use in large volume, 2D/3D configurations, and many other Entegris products. Common applications include fluid transfer, shipping, low, storage, mixing systems, sampling, bioreactors, media storage, and product storage containers.

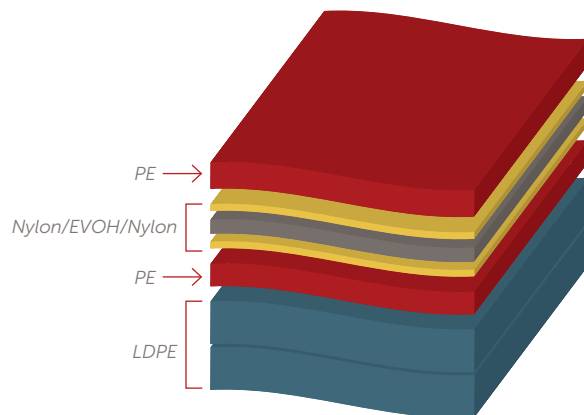


- Total 9 mil thickness
- Fluid path layer: LDPE

### Flex 100/100/150 Film, Triple-Layer, Multi-Ply

This film is designed with an additional layer of support, providing supplementary strength to protect your high dollar media products during processing or long shipping distances.

Flex 100/100/150 film is well suited for fluid transfer, extended shipping, intermediate storage, mixing systems, sampling, bioreactors, media storage, processing vessels, and product storage containers.



- Total 13 mil thickness
- Fluid path layer: LDPE

## Films Comparison

Film	Materials of construction	Thickness (mil)	Product contact layer	Gamma stable	Autoclavable	Temperature use range	Entegris Products
Aramus	Fluoropolymer	8	Fluoropolymer	Yes	Yes*	-196° to 121°C (-321° to 250°F)	<a href="#">Aramus 2D Bag Assemblies</a>
Flex 200	ULDPE/Tie/ EVOH/Tie/ LDPE	13	ULDPE	Yes	No	-40° to 60°C (-40° to 140°F)	<a href="#">2D Bioprocess Assemblies (face and edge port)</a> <a href="#">2D Motion/Rocker Bags</a> <a href="#">Microcarrier and Cell Separation System</a>
Flex 400	PVDF	8	PVDF	Yes	Yes*	-40° to 85°C (-40° to 185°F)	<a href="#">2D Bioprocess Assemblies</a> <a href="#">2D Motion/Rocker Bags</a>
Flex 100/150	LDPE, PE/ nylon/EVOH/ nylon/PE	8	LDPE	Yes	No	0° to 60°C (32° to 140°F)	<a href="#">2D Bioprocess Assemblies</a> <a href="#">3D Bioprocess Assemblies</a> <a href="#">Mixing System</a> <a href="#">Microcarrier and Cell Separation System</a>
Flex 100/ 100/150	LDPE, LDPE, PE/nylon/ EVOH/nylon/ PE	13	LDPE	Yes	No	0° to 60°C (32° to 140°F)	<a href="#">2D Bioprocess Assemblies</a> <a href="#">3D Bioprocess Assemblies</a> <a href="#">Mixing System</a>

\*Customers have had success autoclaving with Flex 400 and Aramus films. Entegris can provide a statement of guidelines for your autoclave application. Please contact Entegris for more information.

### FOR MORE INFORMATION

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