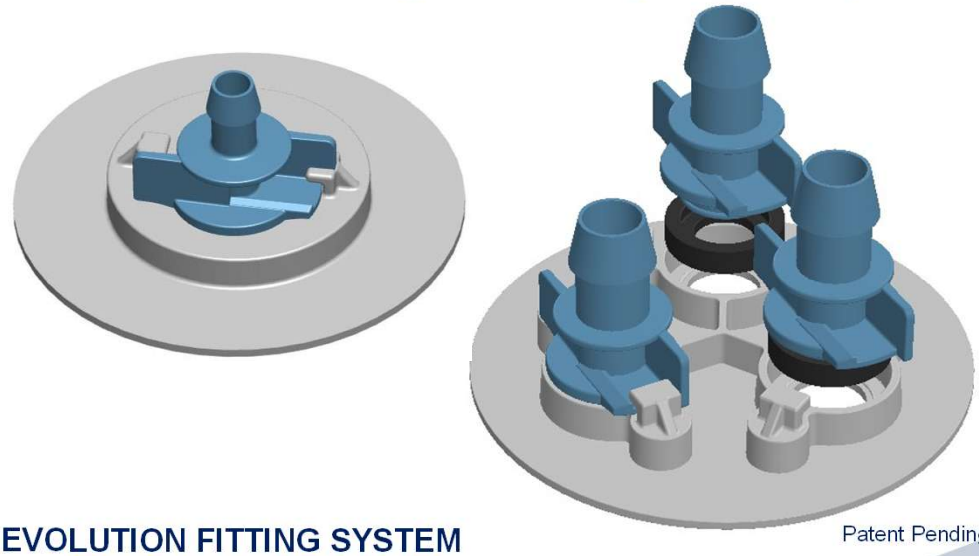
The Evolution 3D Bag Fitting System – Easy to Assemble Design for Single-Use Systems



Patent Pending

EVOLUTION FITTING SYSTEM

At Evolution, we understand that each end user wants to customize their bioprocessing bag and system to fit their specific needs and unique processes. We also understand that customization significantly increases unit costs and inventory. The patent-pending **Evolution 3D Bag Fitting System** allows for customization of standard configurable bioprocess bags at the time of the system assembly, leading to lower unit and inventory costs and faster delivery.

- Easily customize a bag by selecting and inserting the size and type of standard tube fitting your assembly needs.
- Stock standard bags and fittings rather than pre-built "configurations".
- Eliminate the need to modify pre-built bags with more tubing, reducers and connectors "just to make it work".

SUPPLY CHAIN BENFITS

- All raw materials and fittings are manufactured in the U.S. to reduce supply chain risk.
- Evolution has redundant molding capabilities for security of product supply.
- Evolution maintains 12-months of raw material inventory and stocks fittings for quick delivery.

OTHER BENEFITS

- Evolution's development team can assist original equipment manufacturers (OEMs) in incorporating this fitting system with their current single or multi-layer film.
- If your current bag fittings are using other resin grades, its highly likely we can mold Evolution Fittings with your "validated" molding grade resin.

Product Features & Benefits

- Leak-Free Connections
- Easy to Assemble
- Fits Common Tube Sizes
- Multiple Configurations
- USP VI Materials
- Molded in ISO 8 Clean Rooms
- Gamma & X-Ray Sterilizable
- Assembly tools not necessary
- Eliminates the need for pre-built bag configurations

Product Configurations

- Singe & Multiport Port Plates
- Tube Connectors from 1/4" to 1"
- Port Plugs for unused ports
- Compatible with various tube retainer options
- Works with Evolution's Retainer Ready Fitting System.

Applications

- Biopharmaceutical manufacturing and liquid storage systems
- All single-use assembly systems

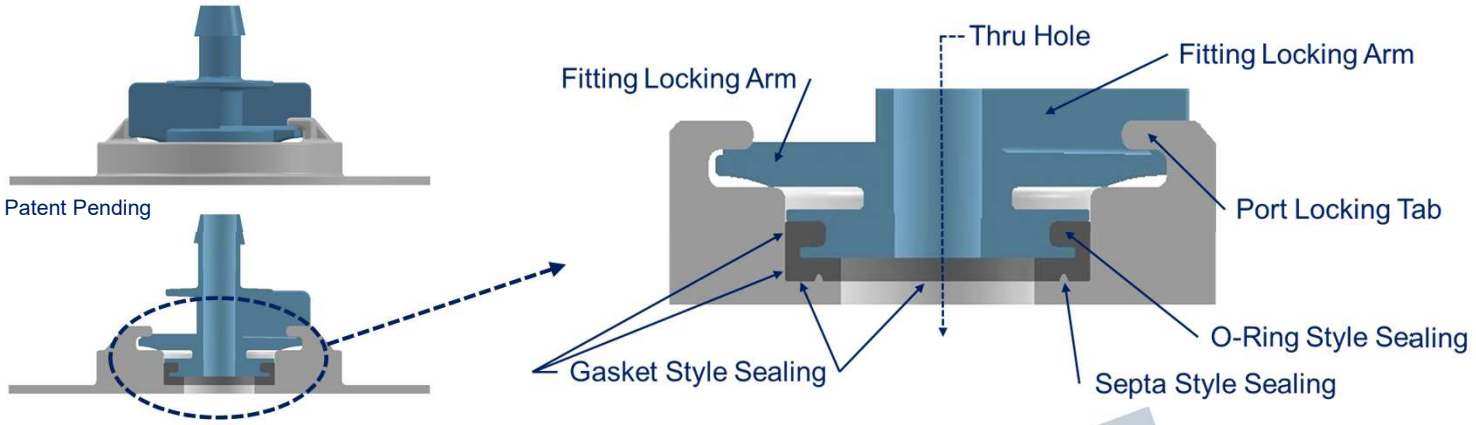
Coming Soon

- Dip Tubes for Bag & Bottles
- Sampling System
- 38mm Cap Fitting System
- Retainer Ready Fittings

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EVOLUTION LEAK-FREE FITTING DESIGN

Each Evolution 3D Bag Fitting utilizes a USP Class VI silicone gasket that maintains fluid integrity in the bag chamber, post-sterilization. When engaged and locked into place, the sealing surfaces are significant on both the face and perimeter of the fitting. Locking tabs permanently secure fittings to the bag and is evidenced by an audible "click". The ergonomic design makes for easy hand installation for assembly operators.

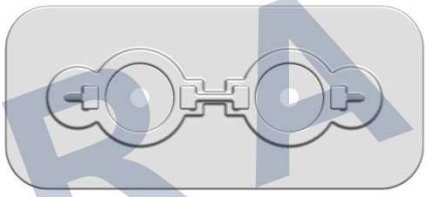


EVOLUTION 3D BIOPROCESS BAG "PORT PLATES"

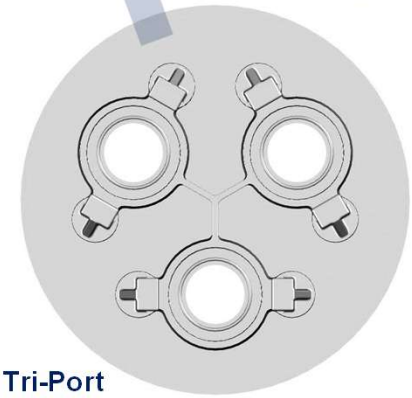
Evolution Port Plates can be thermally welded to most thermoplastic single or multi-layer film configurations available today. Once welded, the bag is fully customizable using any one of the many Evolution Fitting designs.



3D Bag Port Single



3D Bag Dual-Port



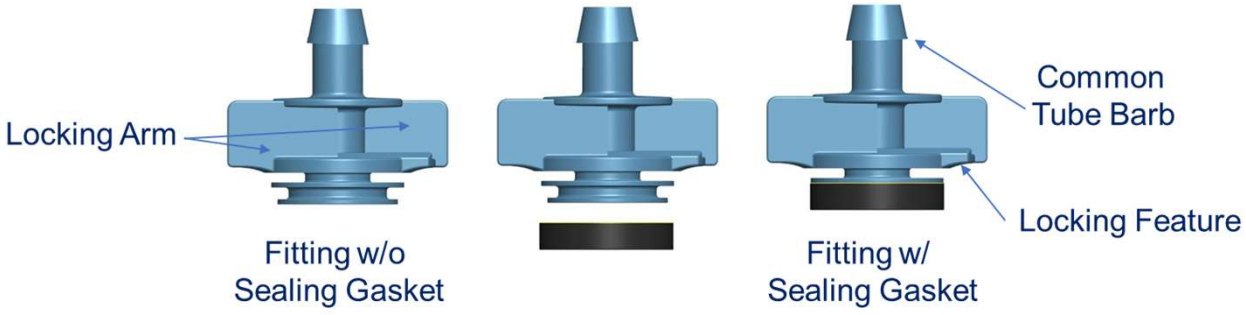
3D Bag Tri-Port

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EVOLUTION FITTINGS

Standard Tubing Connector Fittings

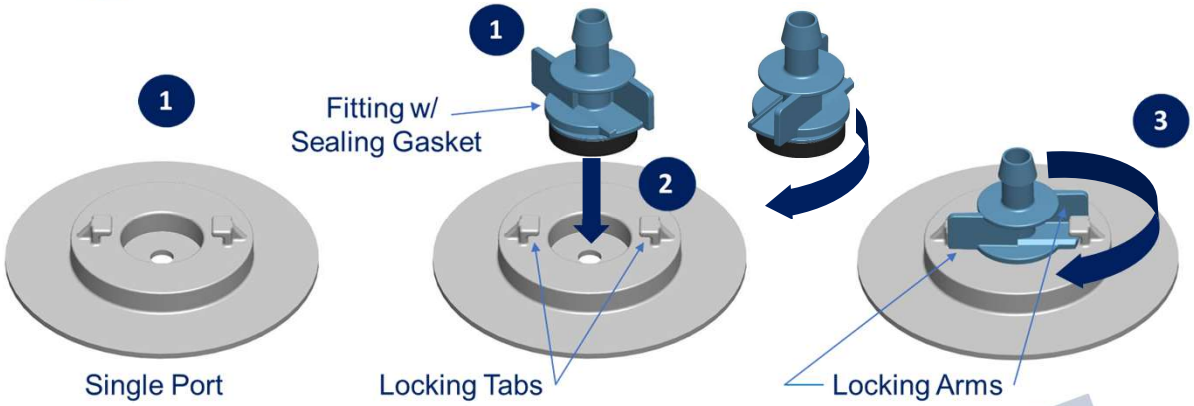
Standard tubing fittings for the Evolution 3D Bag Fitting System are available in 1/4", 3/8" and 1/2" ID for bag sizes 50L to 200L and 3/4" and 1" ID for bag sizes >200L. Each fitting comes with a Gasket installed. A Port Pug is available to close unused bag ports.



- Custom port and fitting designs available upon request

EVOLUTION 3D BAG FITTING SYSTEM ASSEMBLY PROCESS

1. Start with a Port enabled bag, select fitting type (size, configuration)
2. Insert fitting into the port until it stops
3. Rotate fitting 1/4 turn to lock in place (audible click). Repeat until all ports are filled with fittings.



EVOLUTION 3D BAG FITTING SYSTEM CONFIGURATIONS

Bag Sizes	Part Number	Description	Material	Tubing Size (ID x OD)	Color	Qty / Bag
Fittings						
50L-200L	FPXM-250-AS	1/4" Standard Fixed Port	Marlex 9006 PE	.250" x .375"	Translucent	25
50L-200L	FPXM-375-AS	3/8" Standard Fixed Port	Marlex 9006 PE	.375" x .500"	Translucent	25
50L-200L	FPXM-500-AS	1/2" Standard Fixed Port	Marlex 9006 PE	.500" x .750"	Translucent	25
50L-200L	PP60-200-AS	Port Plug, Large	Marlex 9006 PE	N/A	Translucent	25
> 200L	SFXL-500-AS	1/2" Standard Fixed Port	Marlex 9006 PE	.500" x .750"	Translucent	25
> 200L	SFXL-750-AS	3/4" Standard Fixed Port	Marlex 9006 PE	.750" x 1.0"	Translucent	25
> 200L	SFXL-100-AS	1" Standard Fixed Port	Marlex 9006 PE	1.0" x 1.375"	Translucent	25
> 200L	PP60-250-AS	Port Plug, X-Large	Marlex 9006 PE	N/A	Translucent	25
Ports						
50L-200L	PORT-1PL-PE	Single Port, Large	Marlex 9006 PE	N/A	Translucent	25
50L-200L	PORT-2PL-PE	Dual-Port, Large	Marlex 9006 PE	N/A	Translucent	25
50L-200L	PORT-3PL-PE	Tri-Port, Large	Marlex 9006 PE	N/A	Translucent	15
50L-200L	PORT-5PL-PE	Multi-Port, Large	Marlex 9006 PE	N/A	Translucent	15
> 200L	PORT-1PX-PE	Single Port, X-Large	Marlex 9006 PE	N/A	Translucent	25
> 200L	PORT-2PX-PE	Dual-Port, X-Large	Marlex 9006 PE	N/A	Translucent	25
> 200L	PORT-3PX-PE	Tri-Port, X-Large	Marlex 9006 PE	N/A	Translucent	15
> 200L	PORT-5PX-PE	Multi-Port, X-Large	Marlex 9006 PE	N/A	Translucent	15
Dip Tubes						
50L-200L	FDT1-250-PE	1/4" Flexible Dip Tube	Marlex 9006 PE	.250" x .375"	Translucent	25

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- For product samples, please see our web site www.evolutionls.com

MATERIAL TESTING

Requirements	Test Protocol	Value	Marlex 9006 (HDPE)	Momentive 2670 (LSR)
USP CLASS VI	USP <88>	Pass/Fail	Pass	Pass
Biological Reactivity Tests (in vivo)	USP <88> ,ISO 10993-11, 10, 6	Pass/Fail	Pass	Pass
Cytotoxicity (Bioreactivity in vitro)	USP <87> ,ISO 10993-5	Pass/Fail	Pass	Pass
Bacterial Endotoxin	USP <85>, EP 2.6.14	Pass/Fail	Pass	Pass
European Pharmacopeia	EP 3.1.3 & EP 3.1.5	Compliant	Yes	Yes
Particulate	USP <788>, ASTM E3230-20	Compliant	Yes	Yes

REGULATORY

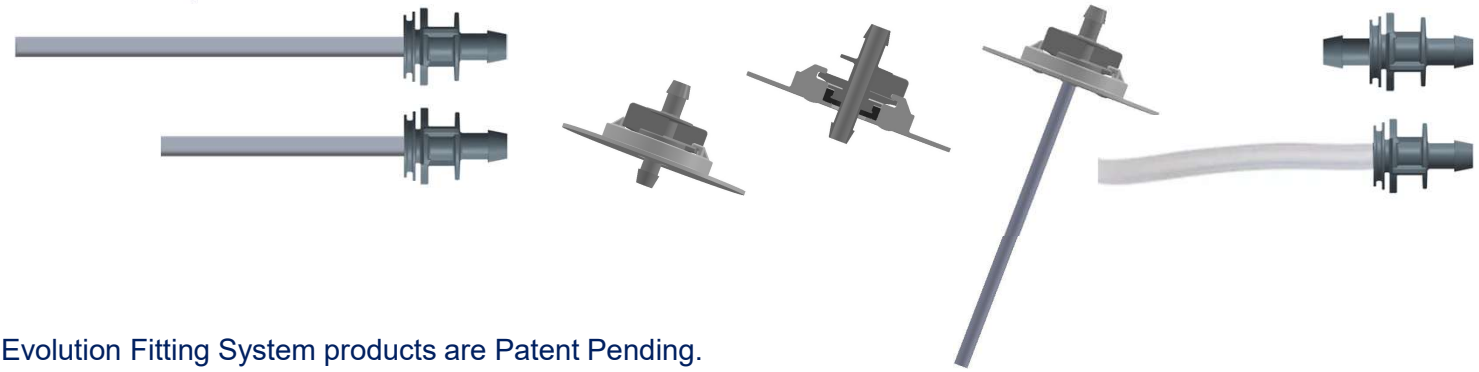
Requirements	Test Protocol	Value	Marlex 9006 (HDPE)	Momentive 2670 (LSR)
Heavy Metals, RoHS	USP <661>, IEC 62321	Pass/Fail	Pass	Pass
PFAS & Bisphenol A (BPA) Free	LC/MS/MS	Compliant	Yes	Yes
SVHC	< 0.1% Product Weight	Compliant	Yes	Yes
REACH	EC No. 1907/2006	Compliant	Yes	Yes

- For the full Validation Report or Guide, please submit your request via our web site www.evolutionls.com

EVOLUTION PRODUCTS COMING SOON

EVOLUTION DIP TUBES FOR BIOPROCESS BAGS, BOTTLES & CARBOYS

The Evolution team has designed both flexible and rigid dip tubes for common container types in combination with the Evolution Fitting Systems. Dip tubes, similar to all other Evolution Fittings, are inserted into the appropriate port and locked in place.



Evolution Fitting System products are Patent Pending.
Specific test results are made available by requesting Evolution's full validation data package.

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The statements in this document regarding product specifications are general in nature; a prospective buyer should request testing reports and additional information as well as closely examine the products to make its own determination as to the suitability of any product for its purposes. EDD disclaims all warranties, express, implied or statutory that are not expressly included in EDD's written terms and conditions.

PRODUCT WARRANTY: Evolution Design & Development (EDD) warrants these products to be free from defects in materials and workmanship for a period of twelve (12) months from the date of purchase by the original purchaser, subject to the warranty limitations in EDD's written Terms and Conditions. EDD's sole obligation with respect to any valid warranty claim will be the replacement of any product that EDD has determined does not meet the written product specifications provided to the customer.