

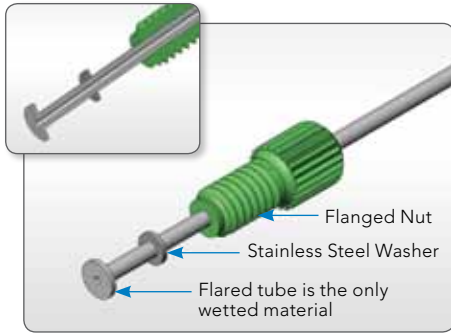
Upchurch Scientific®

Diagnostic Grade Connections

IDEX Health & Science engineers and technical specialists work with equipment manufacturers to optimize system connections and provide consistent flow control and internal volumes. Three distinct fittings systems, numerous tubing options, plus finishing and assembly processes combine to offer OEMs effective connections for their instruments.

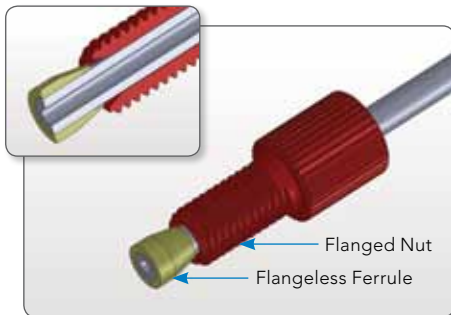


Fittings Systems Overview



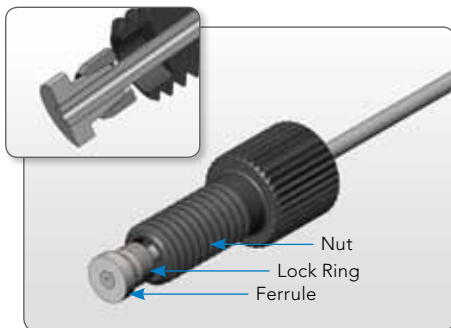
Flanged Fittings

Description	A nut and washer compress a flared tube against the bottom of the port.
Features	<ul style="list-style-type: none"> ▶ Several thread sizes, colors, materials available ▶ Designed for 1/16", 1/8", 3/16", 1/4", 5/16", 2 mm, 3 mm, and 4 mm OD tubing ▶ Available in pre-assembled flanged tubing assemblies
Benefits	<ul style="list-style-type: none"> ▶ Cost effective fitting ▶ No separate ferrule ▶ Chemically inert metal, polymer ▶ Very little tubing twist if used with a washer



Flangeless Fittings

Description	A nut and ferrule compress the OD of the tube to seal against the bottom of the port.
Features	<ul style="list-style-type: none"> ▶ Several thread sizes, colors, materials available ▶ Designed for 1/16", 1/8", 3/16", 1/4", 5/16", 2 mm, 3 mm, and 4 mm OD tubing ▶ Separate compression ferrule ▶ Advanced nut design compresses the ferrule against the tubing wall and the mating surface of the receiving port
Benefits	<ul style="list-style-type: none"> ▶ Cost effective fitting ▶ Easy to replace ferrule ▶ Eliminates tube flanging ▶ Rated to higher pressure than flanged fittings



Super Flangeless™ Fittings

Description	A nut compresses a lock ring onto a ferrule which attaches to the end of the tube, sealing against the bottom of the port.
Features	<ul style="list-style-type: none"> ▶ Several thread sizes, colors, materials available ▶ Designed for 1/32", 1/16", 1/8", 3/16", 2 mm, 3 mm, and 4 mm OD tubing ▶ Available in pre-assembled swaged tubing assemblies ▶ Swaged lock rings hold the ferrules in place and keep the nuts on the fitting—excellent for pre-made tubing assemblies
Benefits	<ul style="list-style-type: none"> ▶ Lock ring prevents tubing twist during installation ▶ Pre-swaged assemblies facilitate remaking connections ▶ Works well in vibration intensive applications ▶ Rated to higher pressure than flangeless fittings

Low-Pressure Fittings Families

Flared or Flanged



Flangeless



Super Flangeless™



Tubing OD

1/16"	10-32, 1/4-28, M6	1/4-28, M6, 5/16-24	6-32, 6-40, 10-32, 1/4-28, M6
2.0 mm	--	1/4-28, M6	1/4-28, M6
1/8"	1/4-28, M6, 5/16-24	1/4-28, M6, 5/16-24	1/4-28, M6, 5/16-24
3/16"	5/16-24	5/16-24	5/16-24
4.0 mm	5/16-24	5/16-24	5/16-24
1/4"	1/2-20	1/2-20	--

Materials

Ferrule: No ferrule - wetted material is the tubing, washer: 316 stainless steel

Nut: Polypropylene, Delrin, ETFE, PEEK

Colors: Standard Colors are: Natural, Black, Red, White, Green, Blue. Custom colors available upon request.

Polypropylene and ETFE

Polypropylene, Delrin, ETFE, PEEK

Standard Colors are: Natural, Black, Red, White, Green, Blue, Purple, Cream. Custom colors available upon request.

Polypropylene, PEEK and ETFE

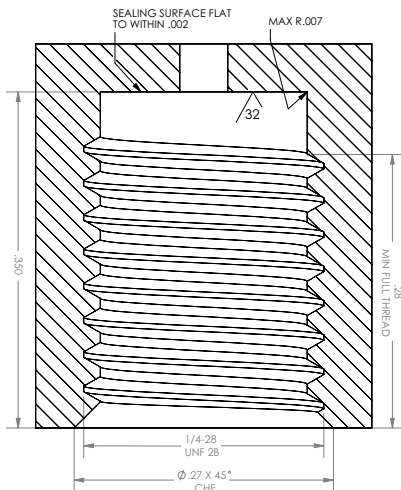
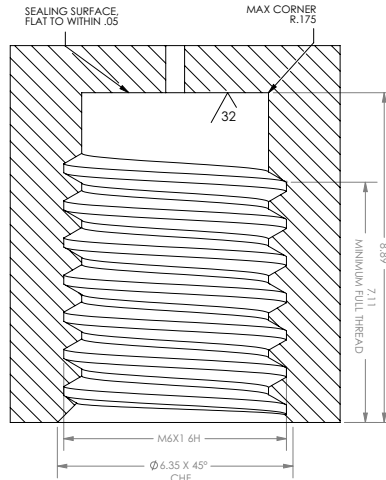
Polypropylene, Delrin, ETFE, PEEK

Standard Colors are: Natural, Black, Red, White, Green, Blue. Custom colors available upon request.

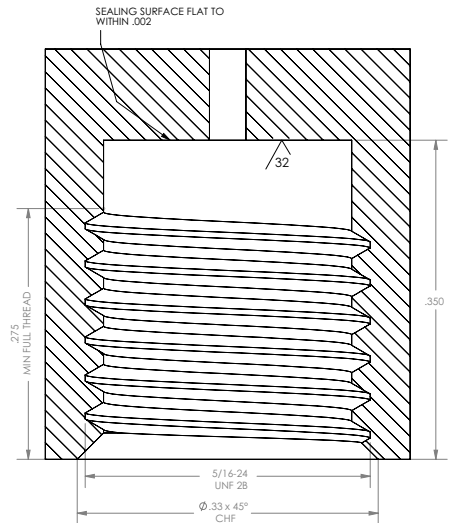
Pressure Rating	100 psi (7 bar)	100–1000 psi (7–69 bar)	200–5,000 psi (14–345 bar)
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Standard Port Drawings for Fitting Systems:

1/4-28 UNF 2B

M6 x 1 6H
(Metric dimensions)

5/16-24 UNF 2B



Additional standard port drawings can be found at:

https://www.idex-hs.com/support/upchurch/standard_port_drawings.aspx

Tubing Overview

OD	PTFE	FEP	PFA	ETFE
1/16"	ID's available: .020", .030"	.004"—.010", .020", .030"	.020", .030", .040"	.010", .020", .030", .040"
2.0 mm	ID's available: 1.0 mm	1.0 mm	--	--
1/8"	ID's available: .062"	.040", .062", .080"	.062"	.062", .093"
3/16"	ID's available: .125"	.125"	.125"	--
4.0 mm	ID's available: 3.0 mm	3.0 mm	--	--
1/4" OD	ID's available: .156"	.156", .188"	.188"	--
Typical Tolerances	± .002" OD and ID 1/16" OD; ± .004" OD and ID 1/8" OD	± .001" OD and ID 1/16" OD; ± .003" OD and ID 1/8" OD	± .001" OD and ID 1/16" OD; ± .003" OD and ID 1/8" OD	± .001" OD and ID 1/16" OD; ± .003" OD and ID 1/8" OD
Pressure Rating	725 psi (50 bar) 1/16" x .020"; 500 psi (35 bar) 1/8" x 1/16"	2,000 psi (138 bar) 1/16" x .020"; 500 psi (35 bar) 1/8" x 1/16"	2,000 psi (138 bar) 1/16" x .020"; 500 psi (35 bar) 1/8" x 1/16"	3,000 psi (207 bar) 1/16" x .020"; 1,000 psi (69 bar) 1/8" x 1/16"
Oxygen Permeability	2,000 cm ³ /m ² *24h*atm	748 cm ³ /m ² *24h*atm	881 cm ³ /m ² *24h*atm	100 cm ³ /m ² *24h*atm
Flexural Modulus (resistance to kink)	72,000 psi	90,000 psi	85,000 psi	145,000 psi
Refractive Index (clarity)	1.37	1.33	1.34	1.40

Additional sizes, colors and materials are available upon request.



Tubing Assemblies Overview

End Connections	Identification Types	Identification Methods	Bundling	Tube Forming	Tubing End Preparation
Flanged	Private Label	Heat Shrink	Spiral Wrap	Strain Relief	Precision Cut Ends
Flangeless	Part Number	Pad Printing	Branching	Coils for movement	Thermoformed Tips
Super Flangeless™	Serializing	Flags	Sheath tubes	Coiled for controlled fluid reservoir (volume or pressure)	Slitting for Sectioned Ends
Barbed				Instrument routing	
You Specify*					

*IDEX Health and Science works with other popular connections suppliers to incorporate any connection style into your tubing assembly.

Material Reference Information

Polypropylene

Polypropylene is used across many industries as a good, general-use polymer. It offers resistance to many standard chemical solutions across the full pH range, making it a product of choice for many applications. There are chemicals that will interact with polypropylene, either degrading it, discoloring it, or causing it to crack, and as such, it is important to ensure that the chemical solutions being used are compatible with this polymer. Such chemicals include chlorinated and aromatic solutions, as well as some organic solvents.



Delrin® (Polyoxymethylene)

Delrin is a rugged polymer that serves as an excellent choice for long-term mechanical stability for products such as fittings and threaded adapters. It is important to note that Delrin, while being strong mechanically, cannot tolerate to be in the presence of acidic or basic solutions for long periods of time, as the polymer will degrade. It is best to use Delrin with neutral pH aqueous solutions or organic solutions for guaranteed best performance.

Fully Fluorinated Resins

The fluoropolymer family includes PTFE, FEP and PFA, polymers that share the excellent resistance to chemicals, low friction and thermal insulation properties. Because of relative softness and low durability, these polymers are generally used for low pressure applications. PTFE is a thermoset material, and as such cannot be injection molded or thermoformed, but offers a highly inert tubing flow path with very low coefficient of friction. FEP and PFA are thermoplastics that are extruded into tubing that can then be thermoformed into 2D and 3D shapes and injection molded into fittings. FEP and PFA are more transparent than PTFE and has lower gas permeability.

Tefzel® ETFE (Ethylene TetrafluoroEthylene)

Tefzel is a molecular relative of PTFE, and as such, is highly chemically resistant. It has proven to be an excellent material for sealing surfaces and for applications where aggressive solvents are being used and durable tubing is necessary for the application. Tefzel is also used for threaded products, particularly in our low pressure line of products and adapters. Please note that caution must be taken when using some chlorinated solvents with Tefzel, as they may interact and degrade or swell the polymer slightly.

Delrin® and Tefzel® are registered trademark of E.I. du Pont de Nemours and Company
 Omnifit® is a registered trademark of Omnifit Ltd.
 PEEK™ polymer is a trademark of Victrex plc.
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