

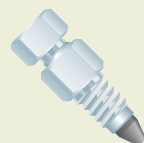
Upchurch Scientific® Fittings & Connectors for Ultra-High Performance Liquid Chromatography

Upchurch Scientific Very High Pressure (VHP) fittings and connectors offer an increased ability to withstand the demanding requirements of today's Ultra-High Performance Liquid Chromatography (UHPLC) instruments, where system pressures exceed 9,000 psi. This robust line of products effectively handles system stresses due to the elevated pressures and offers a wide selection of options for different applications.

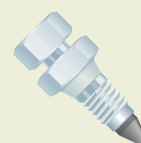
Reusable VHP Fittings

- ▶ Allows for up to ten repeat assembly cycles with no damage to the tubing and no impact on pressure holding ability or carry-over
- ▶ VHP-300, VHP-305 and VHP-310 can be used up to 30,000 psi with additional torque (see chart below), but reusable lifetime decreases to 5 cycles
- ▶ Available in 10-32 coned threads for 1/16" OD tubing and M4 coned threads for 1/32" OD tubing
- ▶ Materials of construction: 316 stainless steel (SS) and proprietary PEEK™ polymer blend (PK)
- ▶ Patent pending design

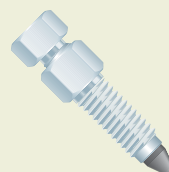
Reusable VHP Fittings



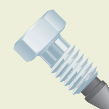
VHP-300
10-32 VHP Fitting
For 1/16" OD tubing



VHP-310
10-32 VHP Fitting
For 1/16" OD tubing



VHP-305
10-32 VHP Fitting
For 1/16" OD tubing



VHP-320
10-32 VHP Fitting
For 1/16" OD tubing



VHP-325
10-32 VHP Fitting
For 1/16" OD tubing



VHP-920
M4 VHP Fitting
For 1/32" OD tubing

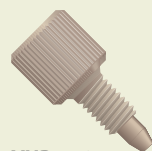
Reusable Very High Pressure (VHP) Fittings

Part Number	Description	Pressure Rating	Required Torque	For Tubing Size	Head Geometry	Reusable?	Threads	Material	Fitting Length
VHP-300	VHP Fitting	20,000 psi (1,380 bar)/ 30,000 psi (3,070 bar)	10"lbs (1.13 N-m)/ 14"lbs (1.58 N-m)	1/16" OD	1/4" Hex	Yes	10-32 Coned	SS/PK	0.80" (2.0 cm)
VHP-305	VHP Fitting	20,000 psi (1,380 bar)/ 30,000 psi (3,070 bar)	10"lbs (1.13 N-m)/ 14"lbs (1.58 N-m)	1/16" OD	1/4" Hex	Yes	10-32 Coned	SS/PK	1.10" (2.8 cm)
VHP-310	VHP Fitting	20,000 psi (1,380 bar)/ 30,000 psi (3,070 bar)	10"lbs (1.13 N-m)/ 14"lbs (1.58 N-m)	1/16" OD	8mm Hex	Yes	10-32 Coned	SS/PK	0.80" (2.0 cm)
VHP-320	VHP Fitting	25,000 psi (1,720 bar)	10"lbs (1.13 N-m)	1/16" OD	1/4" Hex	Yes	10-32 Coned	SS/PK	0.60" (1.5 cm)
VHP-325	VHP Fitting	25,000 psi (1,720 bar)	10"lbs (1.13 N-m)	1/16" OD	1/4" Hex	Yes	10-32 Coned	SS/PK	0.85" (2.2 cm)
VHP-920	VHP Fitting	20,000 psi (1,380 bar)	8"lbs (0.90 N-m)	1/32" OD	4mm Hex	Yes	M4 Coned	SS/PK	0.60" (1.5 cm)

All-Polymer VHP Fittings

- ▶ 100% Polymer Fitting
- ▶ Available in 10-32 coned threads for 1/16" OD tubing and M4 coned and 6-32 coned threads for 1/32" OD tubing, plus MicroFerrule design for 1/32" and 360µm OD tubing
- ▶ Natural PEEK VHP-150 designed for VHP Ion Chromatography applications
- ▶ Materials of construction: Proprietary PEEK™ polymer blend (PK) and PEEK™
- ▶ Pressure rated up to 15,000 psi add (1,035 bar)

Polymer VHP Fittings



VHP-150
10-32 Fitting
For 1/16" OD tubing



UH-904
M4 VHP Fitting
For 1/32" OD Tubing



PK-112
VHP MicroFerrule
For 1/32" OD tubing

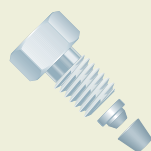


PK-152
VHP MicroFerrule
For 360 µm OD tubing

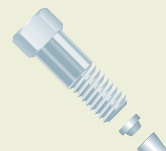
All-Stainless Steel VHP Fittings

- ▶ Double compression ferrule design
- ▶ Available in 10-32 coned threads for 1/16" OD tubing and M4 coned threads for 1/32" OD tubing
- ▶ Pressure rated to 30,000 psi add (2,070 bar)

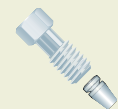
Stainless Steel VHP Fittings



VHP-200
10-32 VHP Fitting
For 1/16" OD tubing



VHP-205
10-32 VHP Fitting
For 1/16" OD tubing



VHP-900
M4 VHP Fitting
For 1/32" OD tubing

Polymer Very High Pressure (VHP) Fittings

Part Number	Description	Pressure Rating	Required Torque	For Tubing Size	Head Geometry	Reusable?	Threads	Material	Fitting Length
VHP-150	VHP Fitting	10,000 psi (690 bar)	2"lbs (0.23 N-m)	1/16" OD	Standard Nut Knurl	Yes	10-32 Coned	PEEK	0.80" (2.0 cm)
PK-120BLK	VHP Fitting	8,000 psi (550 bar)	8.0"lbs (0.90 N-m)	1/16" OD	Standard Nut Knurl	Yes	10-32 Coned	PK	0.80" (2.0 cm)
UH-904	VHP Fitting	15,000 psi (1,035 bar)	4.0"lbs (0.45 N-m)	1/32" OD	Headless Nut Knurl	Yes	M4 Coned	PK	0.60" (1.5 cm)
PK-126	VHP Fitting	15,000 psi (1,035 bar)	3.0"lbs (0.34 N-m)	1/32" OD	Micro Nut Knurl	Yes	6-32 Coned	PK	0.54" (1.4 cm)
PK-416	Female Nut for MicroFerrule	15,000 psi (1,035 bar)	4.0"lbs (0.45 N-m)	1/32" OD	Female Nut Knurl	Yes	5/16-24	PK	0.35" (.90 cm)
PK-416BLK	Female Nut for MicroFerrule	15,000 psi (1,035 bar)	4.0"lbs (0.45 N-m)	360µm OD	Female Nut Knurl	Yes	5/16-24	PK	0.35" (.90 cm)
PK-112	VHP MicroFerrule	15,000 psi (1,035 bar)	--	1/32" OD	--	Yes	5/16-24 Coned	PK	0.56" (1.4 cm)
PK-152	VHP MicroFerrule	15,000 psi (1,035 bar)	--	360µm OD	--	Yes	5/16-24 Coned	PK	0.54" (1.4 cm)

Stainless Steel Very High Pressure (VHP) Fittings

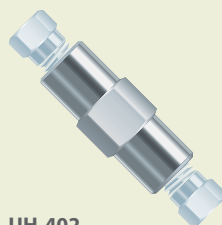
Part Number	Description	Pressure Rating	Required Torque	For Tubing Size	Head Geometry	Reusable?	Threads	Material	Fitting Length
VHP-200	VHP Fitting	30,000 psi (2,070 bar)	20"lbs (2.25 N-m)	1/16" OD	1/4" Hex	No	10-32 Coned	SS	0.40" (1.0 cm) (nut only)
VHP-205	VHP Fitting	30,000 psi (2,070 bar)	20"lbs (2.25 N-m)	1/16" OD	1/4" Hex	No	10-32 Coned	SS	0.67" (1.7 cm) (nut only)
VHP-200-01	VHP Ferrule	30,000 psi (2,070 bar)	--	1/16" OD	--	No	10-32 Coned	SS	0.175" (0.44 cm)
VHP-900	VHP Fitting	30,000 psi (2,070 bar)	14"lbs (1.58 N-m)	1/32" OD	4mm Hex	No	M4 Coned	SS	0.48" (1.2 cm) (nut only)
VHP-900-01	VHP Ferrule	30,000 psi (2,070 bar)	--	1/32" OD	--	No	M4 Coned	SS	0.170" (0.43 cm)

VHP Connectors

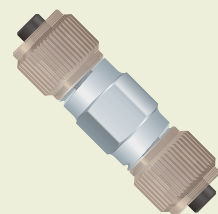
- Unions, tees and crosses for 1/16", 1/32" and 360µm OD tubing
- Materials of construction: 316 stainless steel (SS) for bodies, PEEK and proprietary PEEK polymer blend (PK) for included fittings
- Pressure rated to 15,000 psi add (1,035 bar) (micro versions) and 30,000 psi add (2,070 bar) (1/16" OD versions)

The VHP Connectors are designed to be used with the fittings featured in this product data sheet. There are several configurations for connecting different sizes of tubing with the ability to withstand very high pressures. The pressure ratings of the connectors are driven by the pressure ratings of the fittings included. Find additional information on the fittings used on the first and second pages of the data sheet.

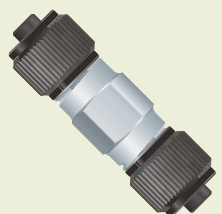
VHP Connectors



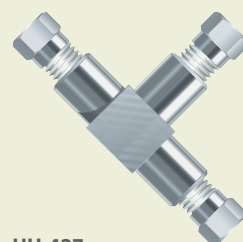
UH-402
UHP Union for 1/16" OD tubing
with fittings included



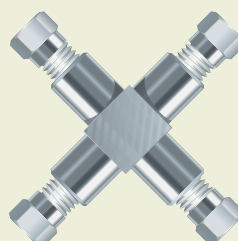
UH-432
UHP MicroTight Union
for 1/32" OD tubing
with fittings included



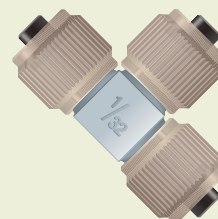
UH-436
UHP MicroTight Union
for 360 µm OD tubing
with fittings



UH-427
UHP Tee for 1/16" OD tubing
with fittings included



UH-429
UHP Cross for 1/16" OD tubing
with fittings included



UH-700
UHP MicroTee for 1/32" OD tubing
with fittings included

Very High Pressure (VHP) Connectors

Part Number	Material	Pressure Rating	For Tubing Size	Reusable?	Threads	Material	Includes
UH-402	VHP Union	30,000 psi (2,070 bar)	1/16" OD	No	10-32 Coned	SS	VHP-200 (2)
UH-432	VHP Microunion	15,000 psi (1,035 bar)	1/32" OD	Yes	5/16-24 Coned	SS/PK	PK-112 (2), P-416 (2)
UH-436	VHP Microunion	15,000 psi (1,035 bar)	360µm OD	Yes	5/16-24 Coned	SS/PK	P-152 (2), P-416BLK (2)
UH-632	VHP Microunion	15,000 psi (1,035 bar)	1/32" OD	Yes	6-32 Coned	SS/PK	PK-126 (2)
UH-630	VHP Adapter	8,000 psi (550 bar)	1/32" OD to 1/16" OD	Yes	6-32, 10-32 Coned	SS/PK	PK-126 (1), PK-120BLK (1)
UH-427	VHP Tee	30,000 psi (2,070 bar)	1/16" OD	No	10-32 Coned	SS	VHP-200 (3)
UH-429	VHP Cross	30,000 psi (2,070 bar)	1/16" OD	No	10-32 Coned	SS	VHP-200 (4)
UH-700	VHP Microtee	15,000 psi (1,035 bar)	1/32" OD	Yes	5/16-24 Coned	SS/PK	PK-112 (3), P-416 (3)
UH-702	VHP Microcross	15,000 psi (1,035 bar)	1/32" OD	Yes	5/16-24 Coned	SS/PK	PK-112 (4), P-416 (4)
UH-750	VHP Microtee	15,000 psi (1,035 bar)	360µm OD	Yes	5/16-24 Coned	SS/PK	P-152 (3), P-416BLK (3)
UH-752	VHP Microcross	15,000 psi (1,035 bar)	360µm OD	Yes	5/16-24 Coned	SS/PK	P-152 (4), P-416BLK (4)

VHP Fittings Tightening Tools

- Configured for the optimum torque to provide assurance of a strong connection
- Prolongs the lifetime of reusable fittings by not overtightening
- Available for multiple fitting head styles



Very High Pressure (VHP) Fittings Tightening Tools

Part Number	Description	Fitting Head Geometry	Torque Delivered
VHP-1000	VHP Torque Tool	1/4" Hex	10"lbs (1.13 N-m)
VHP-2000	VHP Torque Tool	1/4" Hex	14"lbs (1.58 N-m)
VHP-3000	VHP Torque Tool	8mm Hex	10"lbs (1.13 N-m)
VHP-4000	VHP Torque Driver	Extender Tool 1/4" Drive	Adjustable between 2.0 and 10"lbs (0.23 - 1.13 N-m)
VHP-9000	Open End Wrench	4mm Hex	N/A
P-291	Extender Tool to Torque 1/4" Male Hex Driver	Standard Nut Knurl	N/A
P-292	Extender Tool to Torque 1/4" Male Hex Driver	Headless Nut Knurl	N/A
P-279	Extender Tool to Torque 1/4" Male Hex Driver	Micro Nut Knurl	N/A
P-278	Extender Tool to Torque 1/4" Male Hex Driver	Female Nut Knurl	N/A

The Upchurch Scientific Brand VHP Fittings have been tested thoroughly to generate the pressure rating and torque required in the specifications above. All testing was performed with water at room temperature on 316 annealed stainless steel tubing with an outer diameter measuring $.0635" \pm .001"$ for 1/16" OD fittings, $.0322" \pm .001"$ for 1/32" OD tubing and $363\mu\text{m} \pm 10\mu\text{m}$ for 360 μm OD tubing. Because of our dedication to providing the highest quality, safest products on the market, we have included a safety factor in our pressure ratings, and request adherence to the User Instructions included with the products.

Additional information available on the VHP Fittings and Connectors Line:

- Product Specification Sheets for each of the products listed in this brochure
- "Troubleshooting UHPLC Connections Challenges" white paper
- Please contact IDEX Health and Science with any questions on the products included in this data sheet, questions on customizing the fittings seen here, or to place an order

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