Thermo Scientific Dionex nanoViper Fingertight Fitting System

nano LC Made Easy

The Thermo Scientific™ Dionex™ nanoViper™ is a fingertight UHPLC fitting system that is virtually dead-volume-free by design. It offers nano LC connections that never fail and brings a peace of mind appreciated by novice, as well as the most experienced users.

nanoViper fittings are an integrated part of the nano and capillary workflows we provide, and eliminate the assembly of PEEK™ sleeve connections. This fingertight system comes preassembled on connection tubings and columns to ensure system setup is never difficult.

- Connection tubing with nanoViper fittings are available in many internal diameters and lengths
- Nano and capillary LC columns have integrated nanoViper connections
- Avaible individually or as complete application kits

Features

- Provides virtually zero-dead-volume connections
- Supports backpressures up to 100 MPa (1,000 bar/12,600 psi)
- Suitable for temperatures up to 80 °C
- Works with virtually any valve, and any column, from any manufacturer
- Easy to use with fingertight design
- Paves the way for the easy, tool-free nano LC setup of any application

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Designed for Optimal Performance

The most difficult step in setting up a nano LC application are the connections of tubing and, especially, the column. Any dead volume will have immediate consequences on the performance of the nano LC system, such as gradient delay, peak broadening, or the complete absence of peaks. See Figure 1 and Figure 2 for details on conventional and nanoViper fittings, respectively.

Advantages of nanoViper compared to conventional fittings

nanoViper fittings eliminate the considerable drawbacks conventional fittings present to ensure maximum performance.

- No need to align the nut, ferrule, sleeve and capillary simultaneously to minimize dead volumes as nanoViper fittings are preassembled.
- Always corrects alignment so it cannot leak by undertightening or crush a capillary due to overtightening.
- No tools are required, literally UHPLC is at your fingertips
- It seals directly at the bottom of the connection port, not where the ferrule grabs.
- Guaranteed UHPLC compatible due to production QC
- Eliminates wear on connection ports from the use of metal ferrules

nanoViper fittings unify robust performance, ease of use, and universal compatibility to help all nano LC users, no matter what level of experience.

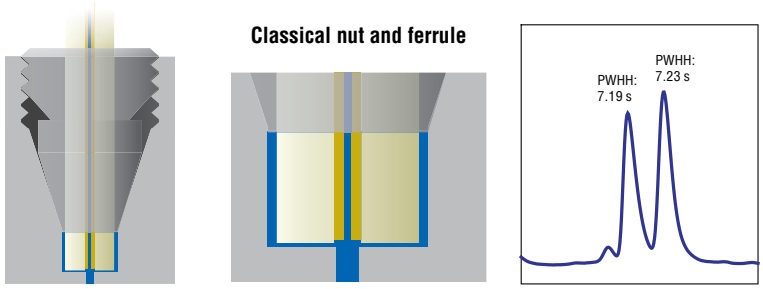

Figure 1. Classical connections in nano LC involve either PEEKsil™ or fused silica in PEEK™ sleeves. These connections consist of a nut, ferrule, sleeve, and fused silica, which all need to be assembled correctly. The sealing is at the ferrule, which theoretically leaves a large potential dead volume. Apart from the risk of dead volume (an extreme case indicated above), there is also a risk of damaging the fused silica tubing or column at the point where the ferrule is compressed. The ferrule has to hold the tubing in the sleeve and seal of the connection.

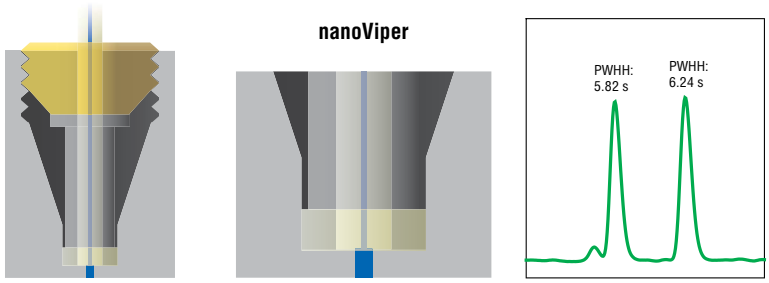

Figure 2. nanoViper connections come preassembled and high pressure tested. The fittings do not “grab” the tubing at a single point. It seals at the tip and not with a ferrule. Nor does it “grab” the tubing at a single point. It is this feature that gives nanoViper fittings their UHPLC, virtually dead-volume-free capabilities.

The theoretical performance effect between the two example chromatograms is about 20% increase in peak capacity!

Connections at Your Fingertips

nanoViper connections provide UHPLC compatibility with fingertight connections up to 100 MPa (1000 bar) every time.

Figure 3 shows pressure consistency and stability between different columns using nanoViper connections. All columns reach the set pressure easily and maintain it without any fluctuations.

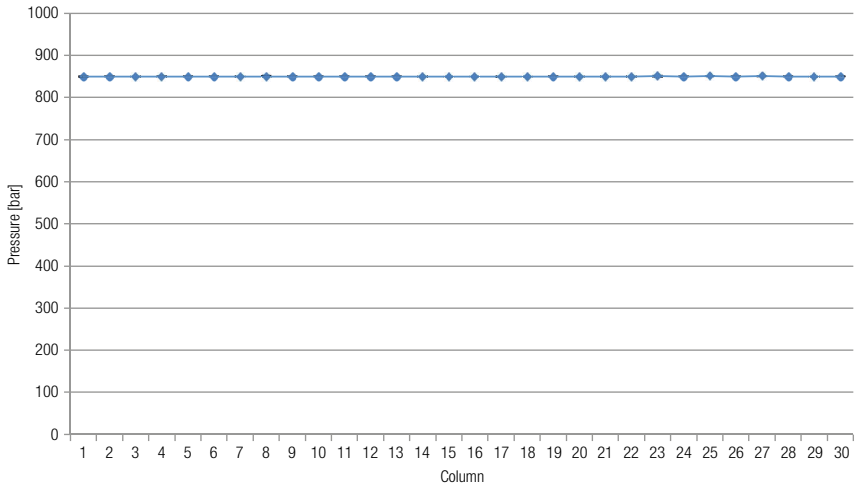

Figure 3. Pressure stability of nanoViper. Each of the 30 columns was pressurized from 0 to 850 bar and kept the 850 bar stable for 1 hour. The graph shows the average pressure for each of the columns during the hour.

Integrating connections

The benefits of nanoViper fittings are readily shown in Figure 4 using trapping column configurations. Two versions are commonly used, the nanotrap and the cartridge design.

The upper left side figure (A) shows the nanotrap trapping column with a PEEK sleeve assembly on both ends. On the upper right side (B), the column has a nanoViper connection on both ends, which come assembled as single entities.

Instead of assembling seven components, now only two fingertight connections are required for perfect nano LC analysis.

In the lower left corner (C), the cartridge design trapping column used four connections and where the potential for dead volume could arise. Alternatively, the lower right corner (D) shows it with the preassembled nanoViper tubing, all of the potential for dead volume is eliminated.

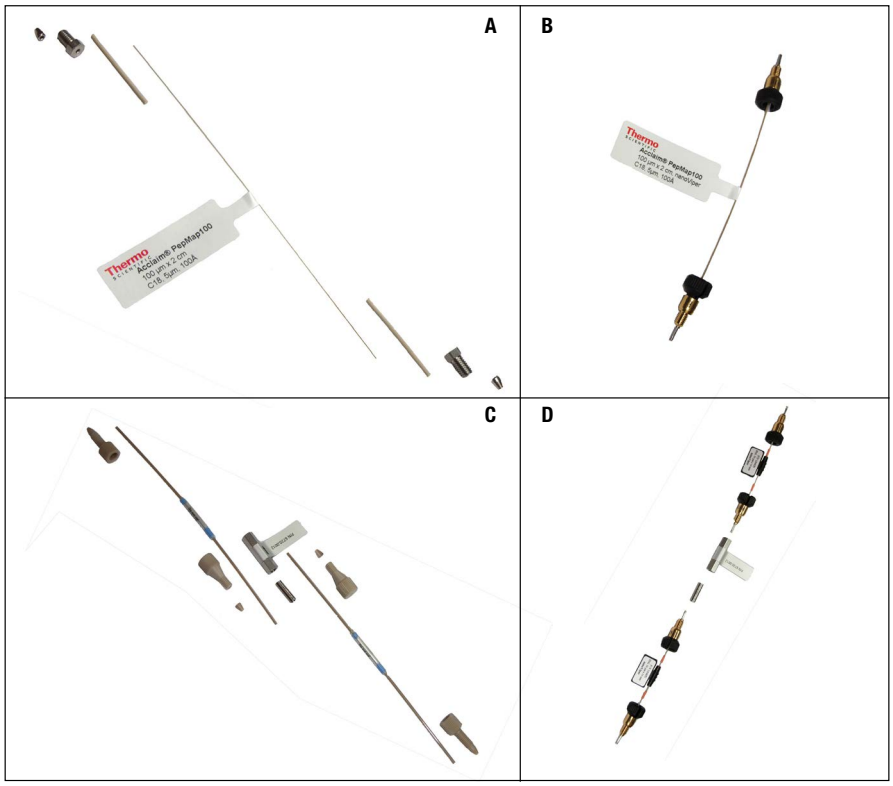

Figure 4. Comparison of trapping columns without (A, C) and with (B, D) nanoViper connections.

SPECIFICATIONS	
Connection principle	Fingertight
Outer diameter	0.79 mm (1/32")
Maximum pressure	1,000 bar (14,500 psi)
Inner diameter	Various from 20 µm to 150 µm
Tubing type	PEEK shielded fused silica or integrated with nano LC columns
Temperature compabitility	80 °C
Available lengths	Various from 7–95 cm
Wetted materials	PEEK, Fused silica

Table 1. Available nanoViper connection tubing matrix.

Length (mm)	ID (µm)				
	20	50	75	100	150
70	6041.5120	6041.5123	6041.5126	6041.5810	6041.5817
150	6041.5121	6041.5124	6041.5127	6041.5811	6041.5818
250	-	-	6041.5730	6041.5812	6041.5819
350	6041.5240	6041.5540	6041.5735	6041.5813	6041.5820
450	-	-	-	6041.5814	6041.5821
550	6041.5260	6041.5560	6041.5760	6041.5815	6041.5822
650	6041.5275	6041.5575	6041.5775	-	-
750	6041.5280	6041.5580	6041.5780	6041.5816	6041.5823
950	6041.5122	6041.5125	6041.5128	-	-

Table 2. Common nanoViper nano LC columns*.

Column Type	ID	Stationary Phase	Length	P/N
Separation	75 µm	2 µm C18 100 Å	15 cm	164534
			25 cm	164536
			50 cm	164540
		3 µm C18 100 Å	15 cm	164568
			25 cm	164569
			50 cm	164570
Trap	75 µm	3 µm C18 100 Å	2 cm	164535
	100 µm	5 µm C18 100 Å	2 cm	164564

*Visit www.thermoscientific.com/nanoViper or contact your local sales representative to learn more about the available nanoViper columns

Ordering Information

APPLICATION KITS	
Available Application Kits	**Part Number**
RSLCnano Direct Injection nano LC kit	6720.0300
RSLCnano Direct Injection capillary LC kit	6720.0305
RSLCnano Preconcentration nano LC kit	6720.0130
RSLCnano Preconcentration capillary LC kit	6720.0315
RSLCnano Preconcentration monolithic LC kit	6720.0320
RSLCnano 2D salt plugs kit	6720.0325
RSLCnano Automated off line SCX-RP peptides kit	6720.0325
RSLCnano Tandem nano LC kit	6720.0330
RSLCnano Automated off line RP-RP peptides kit	6720.0340
RSLCnano OQ/PQ kit, NCS, NCP	6720.0360
RSLCnano EASY-Spray connection kit	6720.0395

ACCESSORIES	
Common nanoViper Accessories	**Part Number**
Trap column tubing with nanoViper fittings. 30 µm ID x 10 cm L (set of 2) Used with cartridge trap columns, backwards compatible	164648
Viper bling plug	6040.2303
Zero-dead-volume connections for Viper and nanoViper tubing	6040.2304

www.thermofisher.com/nanoViper

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