

Tubing/fitting combinations

FESTO



Well combined: tubing/fitting combinations for all applications!

Precise selection of the right tubing/fitting combination is above all dependent on the application. Applications often have a single feature that quickly defines the right selection.

The overview below of our most popular tubing/fitting combinations will help you to make the right choice quickly and reliably. Standard colours for tubing are shown in the table to the right, and additional colours are available in the modular system.

Tubing

Designation	Polyurethane (PU)					Polyethylene (PE)		Polyamide (PA)				PFA**	PTFE***
	PUN/ PUN-DUO	PUN-H/ PUN-H-DUO	PUN-CM	PUN-VO	PUN-VO-C	PEN	PLN	PAN	PAN-R	PAN-VO	PAN-MF	PFAN	PTFEN
Operating medium	Compressed air, vacuum	Compressed air, vacuum, water*	Compressed air, vacuum	Compressed air, vacuum, water*	Compressed air, vacuum, water*	Compressed air, vacuum, water*	Compressed air, vacuum, water*	Compressed air, vacuum	Compressed air, vacuum	Compressed air, vacuum, water*	Compressed air, vacuum	Compressed air, vacuum, water*	Compressed air
Temperature [°C]	-35 ... +60	-35 ... +60	-35 ... +60	-35 ... +60	-35 ... +60	-30 ... +60	-30 ... +80	-30 ... +80	-30 ... +80	-30 ... +90	-60 ... +100	-20 ... +150	-20 ... +150
Temperature-dependent operating pressure [MPa]	-0,095 ... +1	-0,095 ... +1	-0,095 ... +1	-0,095 ... +1	-0,095 ... +1	-0,095 ... +1	-0,095 ... +1,4	-0,095 ... +1,9	-0,095 ... +3,5	-0,095 ... +1,2	-0,095 ... +3,1	-0,095 ... +1,6	-0,095 ... +1,2
Resistant to chemicals	-	+	+	+	+	++	++	+	+	+	+	+++	+++
Food-grade****	-	+++ FDA- and EU-listed material	-	-	-	-	+++	-	-	-	-	+++ FDA-listed material Regulation (EC) 1935/2004	+++ FDA-listed material
Resistant to hydrolysis	+	++	++	++	++	+++	+++	++	++	++	++	+++	+++
Fire test	-	-	-	UL 94 DIN 5510-2	UL 94 DIN 5510-2	-	-	-	-	UL 94	-	UL 94	UL 94
Halogen-free	+++	+++	+++	+++	+++	+++	+++	+++	+++	-	+++	-	-
Flexibility	+++	+++	++	++	++	++	+	++	+	++	+	+	+
Special feature	Wide choice of variants	Resistant to hydrolysis	Antistatic	Flame-retardant	Resistant to welding spatter	Suitable for use with energy chains	Weather resistant	High load bearing capacity	Suitable for pressure up to 3,5 MPa	Resistant to welding spatter	DIN 73378 Automotive approval	Highly resistant to chemicals	Highly resistant to chemicals

Fittings

Designation	Plastic				Metal			
	QS(M)	NPKA	NPQP	QS-VO	NPQM	NPQH	NPCK	NPQR
Operating medium	Compressed air, vacuum, water*	Compressed air, vacuum, water*	Compressed air, vacuum	Compressed air, vacuum, water*	Compressed air, vacuum, water*	Compressed air, vacuum, water*	Compressed air, vacuum, water*	Compressed air, water
Temperature [°C]	-10 ... +80	-10 ... +60	-20 ... +60	0 ... +60	-20 ... +70	0 ... +150	-20 ... +120	-20 ... +150
Temperature-dependent operating pressure [MPa]	-0,095 ... +1,4	-0,095 ... +1	-0,095 ... +1	-0,095 ... +1	-0,095 ... +1,6	-0,095 ... +2	-0,095 ... +1,2	-0,095 ... +1,6
Housing material	PBT and nickel-plated brass	POM and PA66	PP	PBT	Nickel-plated brass	Nickel-plated brass	Stainless steel	Stainless steel
Thread	M, G and R thread	G thread	R thread	G and R thread	M and G thread	M and G thread	M and G thread	M and G thread
Resistant to chemicals	+	++	+++	+	+	++	+++	+++
Food-grade****	-	+++ FDA-listed material	+++ FDA-listed material	-	-	+++ FDA-listed material Regulation (EC) 1935/2004	+++ FDA-listed material	+++ FDA-listed material Regulation (EC) 1935/2004
Corrosion resistance class (CRC)	1	4	4	1	1	3	4	4
Special features	Wide choice of variants	Cleanroom-compatible, 100% polymer	Highly resistant to chemicals	Resistant to welding spatter	Robust	Resistant to high temperatures	Clean Design	High resistance to corrosion

* Other media on request

** Perfluoroalkoxy alkane

*** Polytetrafluoroethylene

**** Suitable for use with food in accordance with supplementary material information/declaration of conformity
→ www.festo.com/supportportal

Our recommendations:
tubing/fitting combinations at a glance

PEN	QS		60 °C -10 °C	1 MPa
PUN	QS		60 °C -10 °C	1 MPa
PAN	QS		80 °C -10 °C	1,4 MPa

Standard

Suitable for a wide range of tasks and attractively priced. Flexible thanks to high levels of resistance, easy to install thanks to optimised bending radii. High level of abrasion resistance in dynamic applications.

Maximum flexibility in standard applications thanks to an extremely wide range of options for combining the different types.

Meets all requirements, even for standard applications with increased pressure and temperature ranges.

Standard



High pressures

PAN-MF	NPQM		70 °C -20 °C	1,6 MPa
PAN-R	NPQH		80 °C 0 °C	2 MPa

Meets DIN standard 73378: ideal for use in mobile pneumatics. Suitable for increased temperature ranges combined with high pressure ranges.

Powerful in pressure ranges up to 2 MPa, for example in applications with the pressure booster DPA.

High pressures



Resistant to chemicals, food-safe** and hydrolysis-resistant**

PLN	NPQP		60 °C -20 °C	1 MPa
PUN-H	NPKA		60 °C -10 °C	1 MPa
PFAN	NPQH		150 °C 0 °C	1,6 MPa
PFAN	NPQR		150 °C -20 °C	1,6 MPa
PFAN	NPCK		120 °C -20 °C	1,2 MPa

Resistant to cleaning agents, FDA compliant and economical. Can be used instead of the combination with stainless steel fittings.

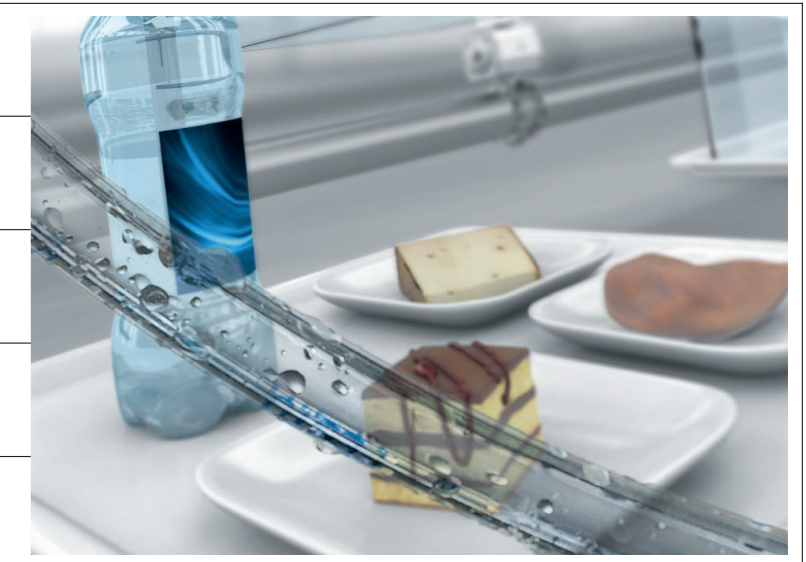
Resistant to hydrolysis and suitable for water applications. Combination suitable for use in cleanrooms, FDA-compliant and corrosion resistant because it's 100% polymer. Very easy to install thanks to the "one click principle".

For high temperatures up to 150°C. Food-safe****, FDA-compliant and resistant to cleaning agents.

Optimised design, fewer edges where dirt can collect – all at an attractive price. For high temperatures up to 150°C. Pressure range up to 1,6 MPa. Highest level of corrosion resistance (CRC 4).

Easy to clean thanks to the union nut's edge-free design. Maximum resistance to corrosion (CRC 4) and FDA-compliant. Suitable for a wide range of media.

Resistant to chemicals, suitable for the food industry and hydrolysis-resistant



Antistatic

PUN-CM	NPQM		60 °C -20 °C	1 MPa
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Anti-static tubing plus solid metal fitting: maximum protection for electrical and electronic components.

Antistatic

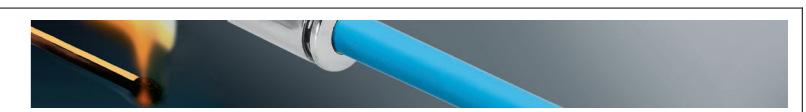


Flame-retardant

PUN-VO	NPQM		60 °C -20 °C	1 MPa
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Its flame-retardant properties provide a high level of safety in areas where there is a risk of fire. The tubing has been tested to DIN 5510-2.

Flame-retardant



Resistant to welding spatter

PUN-VO-C	NPQH		60 °C 0 °C	1 MPa
PAN-VO	QS-VO		60 °C 0 °C	1 MPa

Ideal for applications involving welding spatter. Reliable thanks to a tubing wall thickness of 2 mm for all diameters.

Safe even in the immediate vicinity of welding spatter thanks to the double-walled tubing with special fitting.

Resistant to welding spatter



Everything from a single source – for the ideal combination

Faster and easier: the product finders and the modular tubing system

How do I find the right tubing for my applications? And which fittings match the tubing?

It's easy with Festo's integrated Product Finders for tubing and fittings in the Online Shop. We ask you all the necessary questions so you can make the right selection.

Here's how it works:

Launch the Product Finder. Select the technical features, step-by-step, on the left-hand side. A choice of suitable products that match those features will then automatically be displayed on the right-hand side. Logic checks ensure that only correct configurations are accepted.

Or:

Get started straightaway via the following links:

→ www.festo.com/productfinder/tubing

→ www.festo.com/productfinder/fittings

Even more individual: the modular tubing system.

Lots of colours, individualised printing and labelling, lengths and package quantities as required.

At a glance: one-way flow control valves and installation accessories



VFOE



GRLA-(RS)B



GRLA-(RS)D



GRLA-RS-B



VFOF



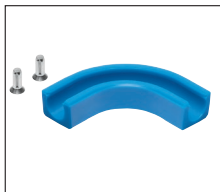
CRGRLA



VFOH



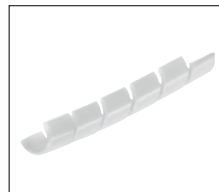
Sealing ring
assortment



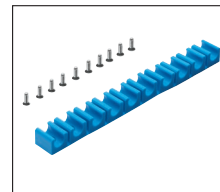
Tubing support
PKS



Tubing support
NPAW



Spiral wrap for tubing
PKB



Multi-tube holder
KK



Pipe and tubing cutter
ZRS



Tip:

Use our tools, for example for physical units for calculating the flow rate:

→ www.festo.com/CalculationTools

www.festo.com