

Tubing/fitting combinations

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Durable and reliable – tubing/fitting combinations from Festo

At Festo, we have the perfect solution for every application so you can find the right tubing/fitting combination for your needs. The high-quality fittings and tubing complement each other perfectly. Their features and outstanding quality ensure a long service life with minimal leakage.

The overview will help you to make the right choice quickly and reliably. Many of our tubes are available in a practical 50 m box and on reels in bulk packs. We also offer custom printing and packaging labels.

Tubing

Designation	Polyurethane (PU)						Polyethylene (PE)	
	PUN-H ★ PUN-H-DUO	PUN-H-F	PUN-H-SF	PUN-CM	PUN-V0	PUN-V0-C	PEN	PLN
Operating medium ¹	Compressed air, vacuum, water	Compressed air, vacuum, water, oxygen	Compressed air, vacuum, water	Compressed air, vacuum	Compressed air, vacuum, water	Compressed air, vacuum, water	Compressed air, vacuum, water	Compressed air, vacuum, water
Temperature [°C]	-35 ... +60	-35 ... +60	-35 ... 80	-35 ... +60	-35 ... +60	-35 ... +60	-30 ... +60	-30 ... +80
Temperature-dependent operating pressure [MPa]	-0.095 ... +1	-0.095 ... +1	-0.095 ... 1.3	-0.095 ... +1	-0.095 ... +1	-0.095 ... +1	-0.095 ... +1	-0.095 ... +1.4
Resistant to chemicals	+	+	+	+	+	+	++	++
Food-safe ²	+++	+++ FDA-listed material Regulation (EC) 1935/2004	+++	–	–	–	–	+++
Resistant to hydrolysis	++	++	++	++	++	++	+++	+++
Fire-tested	UL 94 HB	UL 94 HB	UL 94 HB	–	UL94 V-0...V-2 ³	UL94 V-0...V-2 ³	–	–
Halogen-free	+++	+++	+++	+++	+++	+++	+++	+++
Flexible	+++	++	+++	++	++	++	++	+
Special feature	Wide choice of variants	For contact with food	Robust and flexible	Antistatic	Flame-retardant	Resistant to welding spatter	Suitable for use with energy chains	Weather-resistant

Designation	Polyamide (PA)				Perfluoroalkoxy alkane	Polytetrafluoroethylene
	PAN	PAN-R	PAN-V0	PAN-MF	PFAN	PTFEN
Operating medium	Compressed air, vacuum	Compressed air, vacuum	Compressed air, vacuum, water	Compressed air, vacuum	Compressed air, vacuum, water	Compressed air
Temperature [°C]	-30 ... +80	-30 ... +80	-30 ... +90	-60 ... +100	-20 ... +150	-20 ... +150
Temperature-dependent operating pressure [MPa]	-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-safe ²	–	–	–	–	+++ FDA-listed material Regulation (EC) 1935/2004	+++ FDA-listed material
Resistant to hydrolysis	++	++	++	++	+++	+++
Fire-tested	–	–	UL 94 V-0 (Sheathing)	–	UL 94 V-0	UL 94 V-0
Halogen-free	+++	+++	–	+++	–	–
Flexible	++	+	++	+	+	+
Special feature	High load bearing capacity	Suitable for pressures 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) ★	NPQE-F1A	NPQP	QS-V0	NPQM	NPQH	NPCK	NPQR
Operating medium	Compressed air, vacuum, water	Compressed air, vacuum	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	-5 ... +60	-20 ... +60	0 ... +60	-20 ... +70	0 ... +150	-20 ... +120	-15 ... +150
Temperature-dependent operating pressure [MPa]	-0.095 ... +1.4	-0.095 ... +0.8	-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	PBT, high-alloy stainless steel	PP	PBT	Nickel-plated brass	Nickel-plated brass	Stainless steel	Stainless steel
Thread	M, G and R thread	M, G and R thread	R thread	G and R thread	M and G thread	M and G thread	M and G thread	M and R thread
Resistant to chemicals	+	+	+++	+	+	++	+++	+++
Food-safe ²	–	+	+++ 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	1	4	1	1	3	4	4
Special features	Wide choice of variants	Recommended for battery manufacturing	Highly resistant to chemicals	Resistant to welding spatter	Sturdy	High temperature resistance	Clean design	Highly resistant to corrosion

¹ Other media possible on request

² See supplementary information on materials/declaration of conformity for information on suitability for use in the food industry → www.festo.com/supportportal

³ UL94 V-0 (for test specimen 3 mm thick), UL94 V-2 (for test specimen 0.75 mm thick)

Tubing + fitting				Standard
PUN-H ★ 	QS ★ 	 60 °C -10 °C	 1 MPa	Maximum flexibility in standard applications thanks to an extremely wide range of options for combining the different types. PUN-H is also available in translucent colours.
PEN 	QS ★ 	 60 °C -10 °C	 1 MPa	Suitable for a wide range of tasks and attractively priced. Flexible thanks to highly resistant materials, easy to install thanks to optimised bending radii. High level of abrasion resistance in dynamic applications.
PAN 	QS ★ 	 80 °C -10 °C	 1.4 MPa	Meets all requirements, even for standard applications with increased pressure and temperature ranges.
High pressures				
PUN-H-SF 	NPQR 	 80 °C -20 °C	 1.3 MPa	The tubing is resistant to kinking and hydrolysis and is suitable for water applications. Can be used in areas with higher pressure ranges and humidity.
PAN-MF 	NPQM 	 70 °C -20 °C	 1.6 MPa	Meets DIN standard 73378: ideal for use in mobile pneumatics. Suitable for increased temperature ranges combined with high pressure ranges.
PAN-R 	NPQH 	 80 °C 0 °C	 2 MPa	Powerful in pressure ranges up to 2 MPa, for example in applications with the pressure booster DPA.
Food-safe ² , resistant to chemicals and hydrolysis				
PUN-H-F  	NPQR 	 60 °C -20 °C	 1 MPa	Food-safe to Regulation (EC) No. 1935/2004 and FDA-listed materials. Can be used in the food and packaging industry in combination with fittings NPQR or NPQH. The tubing is hydrolysis-resistant and is suitable for water applications.
PLN 	NPQP 	 60 °C -20 °C	 1 MPa	Resistant to cleaning agents. Easy-to-clean and economical combination, made from material listed for use in the food zone. Can be used instead of the combination with stainless steel fittings.
PFAN  	NPQH 	 150 °C 0 °C	 1.6 MPa	For high temperatures up to 150 °C. Food-safe ² , FDA-listed material and resistant to cleaning agents.
PTFEN 	NPCK 	 120 °C -20 °C	 1.2 MPa	Easy to clean thanks to the union nut's edge-free design. Maximum corrosion resistance (CRC 4) and FDA-listed material. Suitable for a wide range of media.
For battery manufacturing				
PUN-H ★ 	NPQE-F1A 	 60 °C -5 °C	 0.8 MPa	Recommended for production systems for manufacturing Li-ion batteries. Metals with more than 1% by mass of copper, zinc or nickel are excluded from use.
Antistatic				
PUN-CM 	NPQM 	 60 °C -20 °C	 1 MPa	Antistatic tubing plus solid metal fitting for maximum protection for electrical and electronic components.
Flame-retardant				
PUN-V0 	NPQM 	 60 °C -20 °C	 1 MPa	Very safe in areas where there is a risk of fire thanks to flame-retardant properties. The tubing has been tested to DIN 5510-2.
Resistant to welding spatter				
PUN-V0-C 	NPQH 	 60 °C 0 °C	 1 MPa	Ideal for applications with welding spatter. Reliable thanks to a tubing wall thickness of 2 mm for all diameters.
PAN-V0 	QS-V0 	 60 °C 0 °C	 1 MPa	Safe even in the immediate vicinity of welding spatter thanks to double-walled tubing with special fitting.

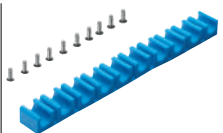
More than tubing and fittings: Additional components at a glance

				
One-way flow control valve VFOE ★	One-way flow control valve GRLA-(RS)D ★	One-way flow control valve GRLA-(RS)B	One-way flow control valve VFOH	One-way flow control valve CRGRLA
Compact, attractively priced solution for standard applications	Reliable, precise adjustment characteristics, wide choice of variants	Robust, can be adjusted with/without tools	Easy-to-clean design, increased corrosion protection	Stainless steel design, highly resistant to corrosion

				
One-way flow control valve VFOF-LE-BAH	One-way flow control valve VFOF-CE-BAH	One-way flow control valve GR-QS	Check valve HGL-B ★	Check valve HA
Combination of one-way flow control valve, piloted check valve and exhaust function		In-line installation	Pneumatically piloted	In-line installation

				
Check valve VBNF-LBA	Check valve VBNF-CBA	Ball valve QHS-QS	Shut-off valve HE	Pressure regulator MS2 ★
Combination of piloted check valve and exhaust function		Choice of installation variants	2/2-way or 3/2-way valve, manually actuated	Lightweight and small

				
Silencer UC ★	Sealing ring OL	Pipe and tubing cutter ZRS	Tubing support PKS	
Improved noise emissions	Captive design	Clean, right-angled cut, no crimping	Prevents kinking	

	
Spiral wrap for tubing PKB	Multi-tube holder KK
Tidy installation	For bundling tubing

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