

Plastic tubing, standard O.D.

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star!

Key features

Application



The requirements for pressure, temperature, flexibility and environmental influences differ from one industry sector to the next. Users frequently underestimate the risks: around 90% of all cases of damage can be traced back to the wrong choice of tubing or tubing materials. This doesn't only result in energy losses, but also in machine downtimes. It is therefore really important to find a reliable and cost-effective product that prevents the tubing getting damaged during operation.

Summary of tubing/fitting combinations

Applications	Tubing	Fitting	Description
Standard	PUN-H	QS	Maximum flexibility in standard applications thanks to an extremely wide range of options for combining the different types.
	PAN	QS	Meets all requirements, even for standard applications with increased pressure and temperature ranges.
	PEN	QS	Suitable for a wide range of tasks and attractively priced. Can be widely used thanks to materials with good resistance, easy to install. High level of abrasion resistance in dynamic applications (e.g. in energy chains).
High pressures	PAN-MF	NPQM	The tubing meets DIN standard 73378: ideal for use in mobile pneumatics. Suitable for increased temperature ranges combined with high pressure ranges.
	PAN-R	NPQH	Powerful in pressure ranges up to 20 bar, for example in applications with the pressure booster DPA.
	PUN-H-SF	NPQR	For applications with extended requirements to robustness, flexibility and pressure resistance. The tube is maximally flexible, resistant to kink and hydrolysis. The combination is suitable for applications with high humidity.
Chemical-resistant, hydrolysis-resistant	PLN	NPQP	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.
	PUN-H	NPCK	Hydrolysis-resistant and suitable for water applications. Corrosion-resistant and made from material listed for use in the food zone.
	PUN-H-F	NPQR	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. Extremely flexible and thus easy to install.
	PFAN/PTFEN	NPQH	For high temperatures up to 150°C. Resistant to cleaning agents and made from material listed for use in the food zone.
	PFAN/PTFEN	NPCK	Easy to clean thanks to the union nut's edge-free design. Maximum corrosion resistance (CRC 4), highly resistant to aggressive acids and alkalis, made from material listed for use in the food zone. Suitable for a wide range of media.
PFAN	NPQR	Food-safe to Regulation (EC) 1935/2004 and made from FDA-listed material. For high temperatures up to 150°C. Pressure range up to 1.5 MPa. Maximum corrosion resistance (CRC 4).	
Antistatic	PUN-CM	NPQM	Antistatic tubing plus solid metal fitting: maximum protection for electrical and electronic components.
Flame-retardant	PUN-VO	NPQM	Very safe in areas where there is a risk of fire thanks to flame-retardant properties.
Resistant to welding spatter	PUN-VO-C	NPQH	Ideal in the vicinity of welding spatter and safe thanks to an increased tubing wall thickness for all diameters.
	PAN-VO	QS-VO	Safe even in the vicinity of welding spatter thanks to double-walled tubing with special fitting.
Battery production	PUN-H	NPQE-F1A ¹⁾	Suitable in battery production areas, ideal in combination with push-in connector NPQE-F1A.

1) F1A = Free of copper, zinc and nickel

Note

Ambient conditions and the medium to be transported can have a considerable effect on the service life of plastic tubing. Based on experience, Festo recommends the following time specifications for using plastic tubing in general and in safety-related applications:

- For general applications, a minimum service life of 10 years can be expected.
- We recommend that for safety-related applications the tubing is inspected regularly, at least every 12 months.
- For applications that have an effect on the material, inspections must be carried out at suitable intervals. We recommend that the interval between inspections should be no more than 6 months, at most half of the period in which failures can occur.

Technical data

Note

Tubing that is too long, diameters that are too small, and bending radii that are too small result in flow rate losses. One of the most important rules when selecting tubing is therefore that it should be as long as necessary and as short as possible. Make sure, therefore, that in practice tubing is loosely installed and is not stretched.

Tools for bundling tubing or for avoiding bending/pinching the tubing are available as accessories:

- Tubing strap PB
- Spiral tubing binder PKB
- Tubing support NPAW
- Tubing support PKS
- Multi-tube holder KK

Other accessories include connecting tools for tubing:

- Pipe and tubing cutter ZRS
- Tubing cutter PAN-VOS for flame-retardant plastic tubing PAN-VO
- Connecting pliers ZMS/disconnecting pliers ZDS for connecting/disconnecting the plastic tubing and barbed fitting

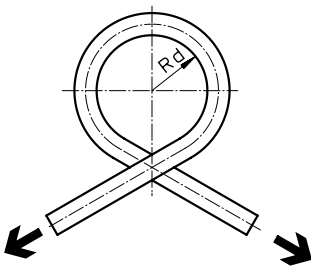
Suitability for contact with food



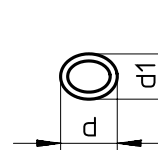
Tubing PFAN and PUN-H-F are suitable for contact with food. They have the necessary declaration of conformity in accordance with EU Regulation (EC) No. 1935/2004.

Measurement method

Flow-relevant bending radius R_d



The tube is bent in the direction of its own curve until the tubing outer diameter is flattened by 5%. R_d is then calculated mathematically. The flow rate is not reduced until R_d is reached.

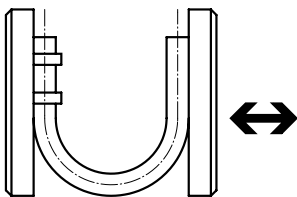


Cross-section flattened by bending the tube.

d = non-deformed tubing O.D.

d_1 = deformed tubing O.D.

Minimum bending radius R_{min}



The tubing fixed to the base plate is bent until the deformation results in a kink. The measured value is the minimum bending radius R_{min} . This R_{min} results in significant reductions in the flow rate.