

Tubes Guide / Fittings Guide

Specifications

Type	PUT/PUTL/PUTSP/MPUT	PUBY/PUTYL	PUNN/PUNNL	PUTHP/PUHPL
Material	Polyurethane	Soft Polyurethane	Nylon (Polyamide)	Nylon (Polyamide)
Applicable Fluid	Air, Water, Vacuum	Air, Vacuum	Oil, Air, Water, Vacuum	* Refer to Operating Temperature Range
Operating Temperature Range	-5~60°C, 0~40°C, -5~60°C	-5~60°C, -5~60°C	-5~40°C, -40~100°C, 0~80°C, -5~100°C	-40~120°C (Air, Oil), 0~80°C (Water)
Burst Pressure	3.0MPa	1.7MPa	Depends on size.	Depends on size. Refer to specification table.
Max. Operating Pressure	0.8MPa, 0.3MPa	0.4MPa	Depends on size.	Depends on size. Refer to specification table.
Operating Vacuum Level	-	-100kPa	-	-
Features	<ul style="list-style-type: none"> Highly water resistant. More flexible than Nylon Tubes with smaller bend radius. Excellent mechanical (especially wear resistance) strengths. 	<ul style="list-style-type: none"> Flexibility similar to the Silicon Tubes and easier to handle than the Polyurethane Tubes. Excellent mechanical (especially wear resistance) strengths. 	<ul style="list-style-type: none"> Highly oil resistant, and best for oil tubing. Excellent mechanical (especially wear resistance) strengths. 	<ul style="list-style-type: none"> Available for oil supplying or oil hydraulic plumbing. It can take the place of copper pipes.

Type	PUTNS/PUNSL	PUMF/PUMFL/PUMSP	PUNTS/PUNSL	PUNFN/PUNFLN
Material	Nylon	Polyurethane (Multi-core Type)	Incombustible Polyurethane	Soft Polyurethane
Applicable Fluid	Air, Water, Vacuum	Air, Vacuum	Air, Water, Vacuum	Air, Vacuum
Operating Temperature Range	-15~90°C (Antifreeze)	-5~60°C	-5~60°C, 0~50°C, -5~60°C	-15~50°C
Burst Pressure	2.0MPa	3.0MPa	3.0MPa	1.3MPa
Max. Operating Pressure	1.0MPa, 0.3MPa	0.8MPa	0.8MPa, 0.3MPa	0.4MPa
Operating Vacuum Level	-	-100kPa	-	-100kPa
Features	<ul style="list-style-type: none"> Excellent in pressure, abrasion, weather and low temperature resistance, as well as softness. It is suitable for high pressure pipeline in narrow pitch. 	<ul style="list-style-type: none"> Suitable for multiple tubing to double acting cylinders, etc. It is easy to peel and connectable to joint without any pre-processing. 	<ul style="list-style-type: none"> Connectable to joints without being covered or peeled. Quickly carbonize upon contact with hot sputter to prevent fusion pitting. More flexible and easier to handle than the Flame Retardant Nylon Tubes. 	<ul style="list-style-type: none"> Very excellent in softness. Thus, this tube is the best suited for compactly connecting to swivels around the actuators or the other parts which require limited bending radius.

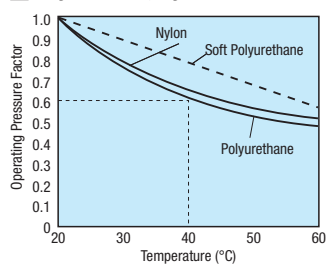
Type	PUAS/PUASL	PORF/PORFL	PUNTF/PUNTL/PUNFN	PUNTF/PUNTL/PUNFN
Material	Conductive Polyurethane	Polyolefinic Resin	Fluororesin	Fluororesin (ETFE)
Applicable Fluid	Air, Vacuum	Air, Water, Vacuum	Air, Water, Vacuum	Air, Water
Operating Temperature Range	-5~60°C	-20~60°C, 0~40°C, -20~60°C	-65~260°C	-20~80°C
Burst Pressure	3.0MPa	2.0MPa	Depends on size. Refer to specification table.	Refer to specification table.
Max. Operating Pressure	0.8MPa	0.5MPa	Depends on size. Refer to specification table.	Refer to specification table.
Operating Vacuum Level	-	-100kPa	-	-
Features	<ul style="list-style-type: none"> Electrically conductive tube is suitable for applications where static electricity is undesirable. Surface resistivity is 10¹⁹ (Ω) or less. 	<ul style="list-style-type: none"> Clean and conforms to the Food Sanitation Laws (except oil-processed foods). (Health, Labor and Welfare Ministry Notification No. 370) Highly water resistant and non-hydrolyzable. Low specific gravity, and light weight. Disposable by combustion without emitting harmful gases. Suitable for uses in food, beverage, physicochemical and other industries. 	<ul style="list-style-type: none"> Excels in heat and low temperature resistance. Inactive to most of corrosive gases, chemicals and solvents. Highly weather resistant, and does not deteriorate with time. Incombustible. No toxic substances released. 	<ul style="list-style-type: none"> Excels in chemical resistance. Good clarity allows visual checks of contents. Compliant to Health, Labor and Welfare Ministry Notification No. 20 under Food Sanitation Laws of Japan

Type	PUNTFB/PUNFBL/PUNTFG/PUNTFGL	PUNTC/PUNTCL
Material	Fluoro Rubber	Silicon Rubber
Applicable Fluid	Oil, Air, Water	Water, Pure Water, Beverage, etc.
Operating Temperature Range	-20~180°C	-30~150°C
Burst Pressure	Depends on size. Refer to specification table.	-(Elastic body. Not available under pressure.)
Max. Operating Pressure	Depends on size. Refer to specification table.	-(Elastic body. Not available under pressure.)
Operating Vacuum Level	-	-(Elastic body. Not available under pressure.)
Features	<ul style="list-style-type: none"> Excellent in heat resistance, oil resistance, weather resistance and chemical resistance. Excellent resistance in the environment of ozone and light. 	<ul style="list-style-type: none"> Compliant to Food Sanitary Act (MHLW Notification No. 201) Excels in heat and low temperature resistance. Retains the characteristics as an elastic body within the above temp. range.

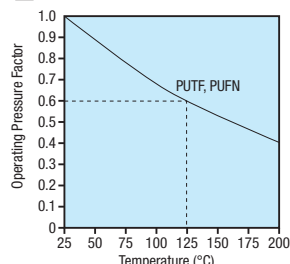
Correction Factor for Temperature-Dependent Tube Burst Pressure (Reference)

Temperature-Dependent Maximum Operating Pressure (MPa)
 = Max. Operating Pressure x Correction Factor
 (Ex.) PUT6-20 (Polyurethane Tube) used at 40°C
 → 0.8(MPa) x 0.6 = 0.48MPa

Polyurethane, Nylon



Fluororesin



Polyolefin

Ambient Temperature	20°C or Less	30°C	40°C	50°C	60°C
Correction Factor	1	0.9	0.7	0.6	0.5

Chemical Resistance of Tubes (Reference)

The list below is for reference only and not guaranteed.

	Mineral Oil	Water	Hydrochloric Acid (10% RT)	Ammonia Water	Gasoline	Organic Solvent
Polyurethane Tubes	○	○	△	△	○	△
Soft Urethane	○	○	△	△	○	△
Nylon Tubes	○	○	△~X	○	○	△
Soft Nylon Tubes	○	○	X	△	○	△
Sputtering Resistant Tubes	○	○	○	○	○	△
Antistatic Tubes	○	○	△	△	○	△
Polyolefin	X	○	○	○	X	X~○
Fluororesin Tubes	○	○	○	○	○	○
Silicon Tubes	X	○	○	○	X	△

○ = Excellent. Little affected.
 ○ = Good. Affected or swollen to some extent but usable depending on conditions.
 △ = Unsuitable. Evidently affected.
 X = Not Usable. Dissolve
 (RT is for ambient temperature = 20°C, % is concentration of solution.)

List of Couplings for Tubes

Applicable Fluid	Connection Shape	Applicable Plumbing Components, Fittings	Operating Temperature Range	Operating Vacuum Level	Max. Operating Pressure	Pages
Air		One-Touch Couplings	0~60°C	-100kPa	0.9MPa	P.1299~1303
Air		Miniature One-Touch Coupling Connectors	0~60°C	-100kPa	1MPa	P.1305
Air		Miniature Couplings	0~50°C	-100kPa	0.5~1MPa	P.1306
Air		Compressed Air Fittings	-10~60°C	-100kPa	0.8MPa	P.1304
Air, Water	One-Touch	All Stainless Steel One-Touch Couplings	-15~120°C	-100kPa	1MPa	P.1311
Air, Water		Heat-Resistant One-Touch Fittings	0~100°C	-100kPa	1MPa	P.1312
Air		Rotary Joints / High Rotary Joints	0~60°C	-100kPa	1MPa	P.1310
Air, Water, Chemicals		Couplings for Clean Applications One-Touch Couplings	0~80°C	-100kPa	0.9MPa	P.1313
Super Pure Water, Acid, Alkali, Organic Solvent		Fluororesin Couplings	0~100°C	-	0.2~0.8MPa	P.1315
Air, Water, Oil	Nut-Tightened	Couplings with Tube Insert	0~60°C *It differs depending on the current fluid.	-100kPa	It applies to Max. Operating Pressure of tubes.	P.1309
Air, Water		Couplings for Tubes	0~80°C *It differs depending on the current material.	-100kPa	It applies to Max. Operating Pressure of tubes.	P.1307

○ Select tubes and fittings in accordance with the tube O.D.
 ○ For use of one-touch couplings, if water is used as fluid, use of Tube Inserts in P.1298 is recommended for preventing tubes from dropping out.
 ○ When using Couplings with Tube Insert in P.1309 or Coupling for Tubes in P.1307, make sure that both the O.D. and I.D. of tubes conform with the applicable spec.
 ○ For fittings other than coupling for tubes (such as screw, welded fittings for pipes), refer to the "Pipes / Fittings / Hoses / Valves" index in P.1179.