

Tubing-characteristics

Choose the right tubing for your application

Tubing type	Silicone	Santoprene / PharMed	Tygon	Viton / Fluran F-5500	Norprene A60G																																											
Advantages	Excellent biocompatibility <ul style="list-style-type: none"> • Almost no loosening of plasticizers and additives • Odourless, non-toxic • Mildew insusceptible • Ideal for low temperatures • Waterproof and resistant to ozone, radiation and sunlight 	Ideal for non-toxic and non-haemolytic cell cultures and tissues <ul style="list-style-type: none"> • Impervious to normal light and UV radiation • Can be welded, glued and shaped • Very long life • Low gas permeability • Suitable for medical and food applications 	The ideal tubing for high demands <ul style="list-style-type: none"> • Clear hose with long service life • High chemical compatibility • Tasteless • Good dielectric properties • Low gas permeability • Suitable for medical and food applications 	Excellent resistance to corrosive media in the high temperature range <ul style="list-style-type: none"> • Highly resistant to chemicals • Excellent resistance to corrosive media • High temperature solvents and oils • Low gas permeability 	Ideal for industrial applications. Heat and ozone resistant <ul style="list-style-type: none"> • Good resistance to acids and bases • Can be welded, glued and shaped • Does not age • Non-oxidizing • Good dielectric properties • Long life • Low gas permeability 																																											
Restrictions	Not suitable for concentrated solvents, oils, acids or diluted caustic soda lye. Relatively high gas permeability	The additions can be detached	Not suitable for human blood and tissue parts	Limited lifetime	The additions can be detached																																											
Physical properties	Polydimethylsiloxane with silica and silicone oil additives. Excellent compression resistance, translucent, white	polypropylene elastomer excellent tensile strength opaque, beige	Flexible, soft Clear transparent	fluoropolymer elastomer opaque black	polypropylene elastomer excellent tensile strength opaque, black																																											
Temperature range	-50°C to +230°C	-50°C to +135°C	-50°C to +74°C	-40°C to +200°C	-60°C to +130°C																																											
Resistance	<table border="0"> <tr><td>Acid</td><td>Fair</td></tr> <tr><td>Alkali</td><td>Fair</td></tr> <tr><td>Organic Solvents</td><td>Not recommended</td></tr> <tr><td>Pressure</td><td>Fair</td></tr> <tr><td>Vakuum</td><td>Good</td></tr> <tr><td>viskose Medien</td><td>Good</td></tr> <tr><td>sterile Medien</td><td>Good</td></tr> </table>	Acid	Fair	Alkali	Fair	Organic Solvents	Not recommended	Pressure	Fair	Vakuum	Good	viskose Medien	Good	sterile Medien	Good	<table border="0"> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Not recommended</td></tr> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Excellent</td></tr> <tr><td>Good</td></tr> </table>	Good	Good	Not recommended	Good	Good	Excellent	Good	<table border="0"> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Not recommended</td></tr> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Excellent</td></tr> <tr><td>Good</td></tr> </table>	Good	Good	Not recommended	Good	Good	Excellent	Good	<table border="0"> <tr><td>Excellent</td></tr> <tr><td>Excellent</td></tr> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Fair</td></tr> </table>	Excellent	Excellent	Good	Good	Good	Good	Fair	<table border="0"> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Not recommended</td></tr> <tr><td>Fair</td></tr> <tr><td>Good</td></tr> <tr><td>Good</td></tr> <tr><td>Excellent</td></tr> <tr><td>Not recommended</td></tr> </table>	Good	Good	Not recommended	Fair	Good	Good	Excellent	Not recommended
Acid	Fair																																															
Alkali	Fair																																															
Organic Solvents	Not recommended																																															
Pressure	Fair																																															
Vakuum	Good																																															
viskose Medien	Good																																															
sterile Medien	Good																																															
Good																																																
Good																																																
Not recommended																																																
Good																																																
Good																																																
Excellent																																																
Good																																																
Good																																																
Good																																																
Not recommended																																																
Good																																																
Good																																																
Excellent																																																
Good																																																
Excellent																																																
Excellent																																																
Good																																																
Good																																																
Good																																																
Good																																																
Fair																																																
Good																																																
Good																																																
Not recommended																																																
Fair																																																
Good																																																
Good																																																
Excellent																																																
Not recommended																																																
Classification	USP Klasse VI FDA 21 CFR 177.2600 USDA Standard	USP class VI FDA 21 CFR 177.2600 (nur Pharmed) 3ARPA und NSF	USP class VI FDA	n.i.	n.i.																																											
Sterilization	Radiation or autoclaving in steam; <u>not</u> by Ethylene oxide	Radiation or autoclaving in steam	Autoclaving in steam (max. 30 min. at 121°C) or ethylene oxide	Autoclaving in steam (max. 30 min. at 121°C) or ethylene oxide	Not recommended																																											
Permeability	<table border="0"> <tr><td>CO₂</td><td>1200</td></tr> <tr><td>H₂</td><td>16170 x 10⁻¹¹</td></tr> <tr><td>O₂</td><td>200</td></tr> <tr><td>N₂</td><td>80</td></tr> </table>	CO ₂	1200	H ₂	16170 x 10 ⁻¹¹	O ₂	200	N ₂	80	<table border="0"> <tr><td>1200</td></tr> <tr><td>772 x 10⁻¹¹</td></tr> <tr><td>200</td></tr> <tr><td>80</td></tr> </table>	1200	772 x 10 ⁻¹¹	200	80	<table border="0"> <tr><td>563</td></tr> <tr><td>362 x 10⁻¹¹</td></tr> <tr><td>124</td></tr> <tr><td>67</td></tr> </table>	563	362 x 10 ⁻¹¹	124	67	<table border="0"> <tr><td>38</td></tr> <tr><td>24 x 10⁻¹¹</td></tr> <tr><td>14</td></tr> <tr><td>5</td></tr> </table>	38	24 x 10 ⁻¹¹	14	5	<table border="0"> <tr><td>1200</td></tr> <tr><td>772 x 10⁻¹¹</td></tr> <tr><td>200</td></tr> <tr><td>80</td></tr> </table>	1200	772 x 10 ⁻¹¹	200	80																			
CO ₂	1200																																															
H ₂	16170 x 10 ⁻¹¹																																															
O ₂	200																																															
N ₂	80																																															
1200																																																
772 x 10 ⁻¹¹																																																
200																																																
80																																																
563																																																
362 x 10 ⁻¹¹																																																
124																																																
67																																																
38																																																
24 x 10 ⁻¹¹																																																
14																																																
5																																																
1200																																																
772 x 10 ⁻¹¹																																																
200																																																
80																																																

Manufacturer data, use it only as selection assistance for a test attempt.

$\frac{\text{Gasvolume (cm}^3\text{)} \times \text{wall-thickness (cm)}}{\text{Cross-section area } \emptyset \text{ (cm}^2\text{)} \times \text{Time (sec)} \times \text{decrease of pressure (cmHg)}}$