

Special Purpose High Performance Hoses

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The features of silicone rubber help solve problems that demand elastomers to stay strong and flexible after long exposure to high and/or low temperatures. Component parts incorporating silicone are being used in every major industry from healthcare to aerospace and are lasting longer with improved performance and reliability. Fresh applications for silicone are continually arising and samco's technical service and facilities for making prototype/low volume hoses provides a valuable service to designers seeking components to perform beyond the limits of conventional elastomers.

Various types of silicone rubbers, constructions and reinforcements are available providing a choice of hose specification to suit a particular requirement. **Hose bores from 6.3Mm to 304mm, current hose length 1 metre. (Special orders up to 4 metres can be considered).**

Standard Glass/Nomex Reinforced Silicone Hose And Elbows:

Construction multiple ply knitted glass or nomex impregnated silicone (the number of plies is regulated by the bore size). Alternatively multiple ply knitted glass/nomex/wire reinforced impregnated silicone as recommended for vacuum/turbo (315 deg c cont.) Applications. Smooth inner to encourage flow or to resist material/product adhesion, smooth covered convoluted outer for a clean and easily maintained exterior finish with inbuilt flexibility.

Pressure Range

Pressures range dependent on bore and hose construction but a 'house' standard for hoses with glass reinforcement is 10bar working.

It is normal practice to apply a safety factor of between 4:1 and 5:1 when designing new applications and bore sizes/design pressure ratings may require additional reinforcing plies, up to 7 has been known. Alternative constructions are available to meet higher working pressures and our technical sales department will be pleased to make recommendations.

Temperature Range

Standard construction to -50°C to 200°C. High temperature silicones with glass braiding -50°C to 250°C continuous. Nomex braiding, 315°C. Low temperature compounds available down to -100°C working.

Hose kits available to suit most types of commercial fleet vehicles.

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Typical Physical Properties Of The Cured Silicone Rubber Compound - Standard Hoses

Average Values:	Change After Ageing For 168 Hours At 150°C	Resistance To Fluids Change After Immersion	Change After Ageing For 168 Hours At 150°C In Astm No 1 Oil For 70 Hours At 175°C	Change After Immersion In Astm No 3 Oil For 70 Hours At 175°C	Change After Immersion In 50/50 Mixture Of Glycol Water For 7 Days At Br Point
Hardness	60/65° shore 'A'	+5°	-6°	-20°	
Tensile Strength	7.0 Mpa (minimum)	-15%	-10%	-32%	
Elongation At Break	230% (minimum)	-22%	-15%	-20%	
Compression Set 22 Hours @: 150°C	30% (maximum)				
Tear Strength N/Mm	6.8				
Specific Gravity	1.15 to 1.23				
Volume Swell			+5%	+40%	2%
Brittle Point					-70°C

Minimum Recommended Bend Radii- Straight Hose (smooth in/smooth out)

Hose Bore (mm)	Min inside bend radius (mm)	Hose Bore (mm)
9.5	60	31.8
12.7	80	35.0
16.0	100	38.0
19.0	125	41.3
22.3	145	44.5
25.4	165	47.7
28.6	185	50.8

The minimum bend radii in the table are based on the point where ovality becomes perceptible to the eye. Tighter radii can be achieved by variation in ply construction and reinforcement. Sizes from 6mm to 314mm bore available to special order.

Wire reinforcement can be incorporated into the construction to improve resistance to kinking, particularly on large bore sizes, and to prevent collapse where vacuum conditions are encountered. Pages 3 and 4 of this data sheet details flexible hose constructions with wire, or nylon reinforcing helix to satisfy more severe bend radii conditions.

Please see Data Sheet 3 for food/medical grade hygienic hose variants.

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Convolutd, Nylonic And Castellated Mandrel Built Hoses

Inner liners of smooth finish to resist material or product adhesion.

Convolutd

The most flexible standard construction providing good minimum bend radii throughout the bore size range. For bore sizes greater than 76.3mm (3") please contact our Technical Sales Department.

Nylonic

Particularly suitable for applications where relatively small bore flexible hoses are required, with a smooth bore to maximise fluid flow. The external helix also affords protection from light mechanical abrasion.

Castellated

A very flexible construction with smooth bore, and designed to eliminate the need for cuffed ends. Hoses can be supplied as piece parts, or in standard 1m lengths for customers to cut to size. Popular bore sizes can be supplied in 3m lengths.

Typical Physical Features			
	Convolutd	Nylonic	Castellated
Normal length range Following table sizes Popular sizes	Up to 1000mm Up to 2000mm	Up to 1000mm Up to 2000mm	Up to 1000mm Up to 2000mm
Construction - 3 ply polyester	Yes	Yes	Yes
Helix support	Steel Wire	Nylon	Steel Wire
Supplied with cuffed ends	Yes	Yes	Not Required
Smooth bore	No	Yes	Yes
Temperature range (°C)	-50 to 170	-40 to 120 160 intermittent	-50 to 170
Typical burst pressure range: from to	21.1 kg/cm2 (300 psi) 10.55 kg/cm2 (150 psi)	21.1 kg/cm2 (300 psi) 10.55 kg/cm2 (150 psi)	21.1 kg/cm2 (300 psi) 10.55 kg/cm2 (150 psi)

Cuffed End (standard length)
19mm to 30mm bore = 50mm
31mm to 50mm bore = 60mm
51mm to 70mm bore = 70mm
71mm plus bore = 80mm
Yes
-40 to 120 160 intermittent
21.1 kg/cm2 (300 psi) 10.55 kg/cm2 (150 psi)

Note:

Where design constraints dictate limitations, cuff lengths can be manufactured to suit customer requirements.

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Support Helix

Nylonic:

3mm diameter nylon cord semi-encapsulated externally.

Convoluted and Castellated

Galvanised semi-spring steel wire to BS3592 Part 2. 1.2mm diameter up to 35mm (13/8") bore, and 1.6mm diameter from 38mm (1½") bore up to 76.3mm (3") bore.

Abrasion Collars And Guards

Where there is a danger of abrasion externally convoluted type can be protected with a loose plastic helix which locates in the spiral form.

For severe external abrasion conditions annular synthetic rubber collars can be moulded at intervals along the hose length.

Inside Bend Radi				
(mm)	Convoluted	Nylonic	Castellated	(mm)
19	32	64	38	50
22	35	76	45	50.8
22.3	35	76	45	52
25	38	85	51	52.5
25.4	38	89	51	54
27	40	100	55	55
28.6	41	105	57	57
30.2	46	110	60	60
31.8	48	121	64	60.4
34	50	134	68	63
35	51	140	70	63.6
38	57	153	76	65
40	62		80	66.8
41.3	64		83	70
42	66		85	71.5
44	70		89	73
44.5	70		89	75
45	72		91	76.3
47.7	76		95	

Hose kit available to suit most types of comercial fleet vehicles.