

# CHARACTERISTICS OF FLEXFAB SILICONE PRODUCTS

The uniqueness of silicone rubber provides its users with mechanical, thermal, electrical and chemical attributes not found in other elastomers. Resistant to hostile environments and damaging elements; strong yet flexible; long service life; the key ingredients in setting silicone rubber products above the rest.

From flexible hose, duct and sleeves, high temperature gaskets, electric heat tapes, conveyor belting, etc. . . . silicone rubber products and fabricating have proven to provide above average protection from potentially harmful elements.

- Resistant to a wide range of temperature extremes. (See Table A.)
- Resistant to hardening, cracking, ozone attack, corona.
- Resistant to moisture, steam, dust, aging, various pressure ranges.
- Resistant to chemicals, solvents, fuels, oils. (See Table B.)
- Retains its flexibility in hostile engine environments.
- Can be easily compounded to a wide range of elongation, durometer, tensile strength, tear strength. (See Table C for tensile strength.)
- Good compression set values. (Compared to conventional rubber hose, silicone hose will not take a set as easily. Leakage under clamps is reduced.)
- Excellent electrical insulating properties.
- Longer life than that of conventional synthetic rubber hose.

## SILICONE FLAMMABILITY

Since silicone elastomers are often used in applications which are exposed to fire hazard, we include this guide for your information, but not as a performance guarantee.

**Ignition** — inorganic (silica) base retards ignition.

**Fire Growth** — non-flammable silica forms protective crust when material is exposed to flame.

**Flame Spread** — protective crust reduces melting and dripping.

**Heat Release** — lower than with other elastomers.

**Smoke** — releases only a light, non-toxic silica dust.

**Fire Gases** — protective crust retains gases.

**Oxygen Depletion** — low combustion uses little oxygen.

**Ease of Extinguishing** — Self-extinguishes when flame is removed.

TABLE A: CONTINUOUS OPERATING TEMPERATURE VS. SERVICE LIFE\*

Temperature, degrees C (F)	Service Life, hours	Temperature, degrees C (F)	Service Life, hours
150 C (302 F)	15,000	316 C (602 F)	100
200 C (392 F)	7,500	370 C (698 F)	1/4 to 1/2
250 C (482 F)	2,000		

\*Length of time for a silicone rubber original elongation 300% to reach 50% elongation.

TABLE B: RESISTANCE OF SILICONE RUBBER AND FLUOROSILICONE RUBBER TO EFFECTS OF CHEMICALS, SOLVENTS, FUELS, AND OILS

Reagent	Silicone rubber, volume change, percent	Fluorosilicone rubber, volume change, percent
<b>Acid solutions (Tested 7 days at room temperature)</b>		
10% hydrochloric acid	0 to 2	nil
Concentrated hydrochloric acid	0 to 15	+10
10% nitric acid	1 to 10	nil
Concentrated nitric acid	-10 to -5	+5
10% sulfuric acid	1 to 5	nil
Concentrated sulfuric acid	decomposed	decomposed
Concentrated acetic acid	5 to 18	+25
<b>Alkali solutions (tested 7 days at room temperature)</b>		
10% ammonium hydroxide	nil	nil
Concentrated ammonium hydroxide	0 to 7	+5
10% sodium hydroxide	0 to 3	nil
50% sodium hydroxide	0 to 9	nil
<b>Solvents and fuels (tested 7 days at room temperature)</b>		
Acetone	15 to 25	+180
Carbon tetrachloride	over 150	+20
Ethyl alcohol	0 to 20	+5
Iso-octane	over 150	+20
Xylene	over 150	+20
Reference Fuel B	over 150	+20
Jet fuel JP-4	over 150	+10
<b>Oils (tested 70 hours at 150 C [302 F])</b>		
ASTM No. 1 oil	5 to 10	nil
ASTM No. 3 oil	35 to 60	+5
Mil-O-7808 oil (PQ 8365)	10 to 30	+8
Hydraulic fluid Mil-O-5606 (PQ 4226)	Over 100	+6
Oronite 8200 (silicate ester)	over 150	+5
200 fluid, 100 centistokes (silicone fluid)	28 to 35	nil
Skydrol 500 (phosphate ester), 70 hours at 100 C (212 F)	10 to 20	+25

TABLE C: EFFECTS OF TEMPERATURE ON TENSILE STRENGTH OF SILICONE RUBBER AND BUTYL, POLYACRYLIC, AND EPDM RUBBERS. "AT TEMPERATURE" TESTING.

	0	500 (3.4 MPa)	1000 (6.9 MPa)	1500 (10.3 MPa)	2000 (13.8 MPa)
<b>ORIGINAL TESTED AT 25 C (77 F)</b>					
BUTL					
POLYACRYLIC					
EPDM					
SILICONE					
<b>AFTER 15 MIN. AT 225 C (437 F) TESTED AT 225 C (437 F)</b>					
BUTL					
POLYACRYLIC					
EPDM					
SILICONE					
<b>AFTER 4 HRS. AT 225 C (437 F) TESTED AT 225 C (437 F)</b>					
BUTL					
POLYACRYLIC					
EPDM					
SILICONE					

NOTE: For reference only. Contact Flexfab Technical Service for specific recommendations.

**FLEXFAB** <sup>®</sup> Incorporated

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