Information About *Dow Corning*® 510, 550 and 710 Fluids

Type
Phenylmethyl polysiloxane

Physical Form
Silicone fluid

Special Properties
Heat resistance; high flash points; low volatility; radiation resistance

Primary Uses
Hydraulic arrestors (snubbers); hydraulically actuated valves and instruments used in nuclear plants; other applications where radiation exposure exists

DESCRIPTION

Dow Corning® 510, 550 and 710 Fluids have radiation resistance of approximately 1.7 x 10^8 rads.

Dow Corning 510 Fluid is available in a viscosity range of 50 to 30,000 cs, *Dow Corning* 550 Fluid has a viscosity of 125 cs and *Dow Corning* 710 Fluid has a viscosity of 500 cs. *Dow Corning* 550 and 710 Fluids can be blended to provide any viscosity between 125 and 500 cs.

Other characteristics include:

- Thermal stability – *Dow Corning* 510, 550 and 710 Fluids demonstrate exceptional high-temperature stability during continuous use at 232°C (450°F); these materials are also suitable for low-temperature applications requiring pour points as low as -57°C (-70°F)
- A phenyl group on the polymer chain
- Chemical inertness – Silicone fluids, including *Dow Corning* 510, 550 and 710 Fluids are inherently inert, resulting in no corrosion of metals or adverse effect on the seals commonly used in the construction of snubbers, valves and instruments
- Ability to swell silicone rubber
- Low flammability – *Dow Corning* 510, 550 and 710 Fluids exhibit a flash point in excess of 274°C (525°F), a fire point of 343°C (650°F) minimum and an autoignition temperature in excess of 482°C (900°F)
- Compressibility – The relatively high compressibility of these fluids makes them ideal for use in shock absorbing and motion dampening applications (see Table I)
- Heat transfer – Because of their excellent oxidation and temperature resistance, these fluids can be used to transfer heat; heat conductivity is relatively constant over a wide temperature range
- Compatibility – *Dow Corning* 510 Fluid is incompatible with both *Dow Corning* 550 and 710 Fluids; however, *Dow Corning* 550 and 710 Fluids are compatible and miscible with each other – compatibility with other silicone fluids should be determined before use

LIMITATIONS

These products are neither tested nor represented as suitable for medical or pharmaceutical uses.

USES

Dow Corning 510, 550 and 710 Fluids are ideally suited for applications such as hydraulic arrestors (snubbers), hydraulically actuated valves and instruments used in nuclear plants, and other applications where exposure to radiation is a possibility.

SHIPPING LIMITATIONS

None.

STORAGE AND SHELF LIFE

When stored in their original, unopened containers at 25°C (77°F), *Dow Corning* 510 and 550 Fluids have no known limits to useful life. When stored in its original, unopened

Table I: Compressibility of *Dow Corning* 510, 550 and 710 Fluids

Fluid	Pressure, psi	Compression, %	Bulk Modulus
Dow Corning 510 Fluid, 100 cs	5,000	2.80	179,000
	20,000	7.95	253,000
Dow Corning 550 Fluid	1,000	0.50	200,000
	5,000	2.30	217,000
	10,000	3.95	253,000
	20,000	6.50	308,000
Dow Corning 710 Fluid	5,000	1.70	294,000
	10,000	3.15	317,000
	20,000	5.50	364,000

TYPICAL PROPERTIES
These values are not intended for use in preparing specifications.

	Dow Corning 510 Fluid	*Dow Corning* 550 Fluid	*Dow Corning* 710 Fluid
Viscosity at 25°C (77°F), cs	50, 100, 500, 30,000	125	500
Viscosity/Temperature Coefficient	0.655	0.76	0.79
Specific Gravity at 25°C (77°F)	0.985, 0.992, 0.997, 0.990	1.07	1.11
Color, APHA	20, 20, 20, 50	40	40
Flash Point, °C (°F), minimum	274 (525)	308 (586)	302 (575)
Fire Point, estimated, °C (°F)	>343 (>650)	>343(>650)	>343 (>650)
Autoignition Temperature, estimated, °C (°F)	482 (900)	482 (900)	487 (910)
Pour Point, estimated, °C (°F)	-57 (-70)	-50 (-58)	-22 (-8)
Specific Heat at 100°C (212°F)	0.405	0.396	0.391
Thermal Conductivity at 50°C (122°F), g-Cal/cm^2-sec-°C	0.00036	0.00035	0.00035
Volatile Content, % by weight after 4 hr at 250°C (482°F)	2.5	2.1	3.0
Radiation Resistance, rads	1.7 x 10^8	Similar	Similar

[1]The melt point temperature is a typical value and may vary somewhat due to molecular distribution (especially 50 cs or less). If melting point is critical to your application, then several lots should be thoroughly evaluated.

[2]Due to different rates of cooling, this method may yield pour points lower than the temperature at which these fluids would melt.

Specification Writers: Please obtain a copy of the Dow Corning Sales Specification for this product and use it as a basis for your specifications. It may be obtained from any Dow Corning Sales Office, or from Dow Corning Customer Service in Midland, MI. Call (517) 496-6000.

container at or below 32°C (90°F), *Dow Corning* 710 Fluid has no known limit to its useful life. Dow Corning warrants product shelf life up to 60 months from date of manufacture.

PACKAGING
Dow Corning 510 Fluid is available in 8-, 40- and 440-lb (3.6-, 18.1- and 200-kg) containers. *Dow Corning* 550 and 710 Fluids are available in 9-, 45- and 485-lb (4.1-, 20.4- and 220-kg) containers. All weights, net.

SAFE HANDLING INFORMATION
PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY WRITING TO DOW CORNING CUSTOMER SERVICE, OR BY CALLING (517) 496-6000.

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