Shin-Etsu Silicone

Silicone Fluid

(For North & South America)

Adding Value to Products and Increasing Their Reliability

Shin-Etsu silicone fluids are typically clear, transparent liquids. The product types range from free flowing, water-like fluids to viscous, syrup-like fluids. These silicone fluids are resistant to high and low temperatures, water, and chemicals. They have excellent electrical properties, and they possess mold releasability, water repellency, and defoaming characteristics not found in ordinary mineral and synthetic oil products.

Shin-Etsu silicone fluids meet a wide variety of needs in applications ranging from electronics, transport machinery, office appliances, cosmetics, and textiles.

With our wide range of silicone products, Shin-Etsu meets the diverse needs of many industries.

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PRODUCT TYPES

Silicone fluids are classified into two types: straight silicone fluids and modified silicone fluids.
This catalogue describes Shin-Etsu's straight silicone fluid products.

- **Silicone fluid**
  - **Straight silicone fluid**
    - **Dimethyl silicone fluid**
    - **Methylphenyl silicone fluid**
    - **Methylhydrogen silicone fluid**
  - **Modified silicone fluid***
    - **Reactive silicone fluid**
    - **Nonreactive silicone fluid**

* Please refer to our modified silicone fluids catalogue.

Straight silicone fluids

Uses	Products		Features
General	DM-FLUID	Dimethyl silicone fluid	The most typical type of silicone fluid oil product. Viscosity : 0.65 to 1,000,000 mm^2/s (0.65 to 1,000,000 cSt*)
Paint additives	F-6W-9		Effective for enhancing glazing and preventing orange peel and silking in paints.
Water repellency processing	F-9W-9	Methylhydrogen silicone fluid	Highly water repellent. Suitable for processing glass, metal, fibers, and powders.
Low-temperature applications	F-5W-0	Methylphenyl silicone fluid	For low-temperature applications (−60°C to +200°C).
High-temperature applications	KF-54	Methylphenyl silicone fluid	For high-temperature applications (−30°C to +250°C). Suitable as a heating medium in open systems.
	KF-965	Dimethyl silicone fluid	For high-temperature applications. (−50°C to +250°C). Suitable as a heating medium in closed systems.
	KF-968		For high-temperature applications (−50°C to +250°C). Suitable as a heating medium in open systems.
Oil diffusion pump applications	HIVAC F-4 HIVAC F-5	Methylphenyl silicone fluid	Good oxidative stability and chemical resistance. For high-level vacuums of 10^{-7} to 10^{-12} Torr. ** HIVAC F-5 can reach higher levels of vacuum.
Cosmetic additives	KF-56A	Methylphenyl silicone fluid	Alcohol-soluble.
	KF-995	Cyclic dimethyl silicone fluid	Volatile. No residue after volatilization, so provides smooth textures.

* "cSt" is an abbreviation for "centistokes," a unit of kinematic viscosity. The kinematic viscosity is calculated by dividing the absolute viscosity (expressed in centipoise) by the density. The measurement of viscosity is based on the principle that the time required for a fluid to flow down a capillary tube is determined by the viscosity of the fluid. Except for the low-viscosity products, the specific gravity of KF-96 is nearly 1 at 25°C, so the value of the viscosity is almost the same whether expressed in centistokes or centipoise.

The kinematic viscosity and absolute viscosity can be converted using the following formulas:

$$\text{Kinematic viscosity (stokes)} = \frac{\text{Absolute viscosity (g/cm}\cdot\text{sec)}}{\text{Density (g/cm}^3\text{)}} = (\text{cm}^2/\text{sec}),\ (\text{centistokes} = \frac{\text{cm}^2}{\text{sec}/100} = \text{mm}^2/\text{s})$$

Absolute viscosity (poises) = Kinematic viscosity (cm^2/sec) x Density (g/cm · sec)

1 stoke = 100 centistokes
1 poise = 100 centipoises

** "Torr" is a unit indicating the level of vacuum.

CHARACTERISTIC PROPERTIES

1. Appearance	Silicone fluid is typically a clear, transparent, odorless liquid. Silicone fluid products come in many types, from free-flowing, water-like oils to viscous, syrup-like fluids.
2. Heat Resistance	Silicone fluid is extremely stable against thermal oxidation. For example, the dimethyl silicone fluid DM-FLUID experiences hardly any change when exposed to air temperatures below 150°C. Methylphenyl silicone fluid exhibits even better heat resistance than dimethyl silicone fluid and can be used for long durations in environments reaching 250°C.
3. Low-Temperature Resistance	Silicone fluid has excellent low-temperature resistance. DM-FLUID maintains fluidity even at –50°C. Methylphenyl silicone fluid was specially developed for low-temperature applications, so it remains fluid even in environments of –65°C. Since the viscosity of silicone fluid varies little regardless of the temperature, these products are suitable for applications in cold regions.
4. Viscosity Stability	Because silicone fluid shows little change in viscosity due to changes in temperature, it is very suitable for applications sthat rely on the viscous properties of the fluid. DM-FLUID have the highest stability of any silicone fluid; no comparable products are available.
5. Thermal Conductivity and Specific Heat	The thermal conductivity of dimethyl silicone fuild is lower than that of regular organic compounds and is only one-fourth that of water. Although the thermal conductivity increases with higher viscosities, it becomes nearly stable at viscosities aboe 100 mm^2/s (100cSt). The specific heat of silicone fluid is approximately one-third that of water, although this varies somewhat depending on the viscosity. The specific heat is comparable to that of the organic compounds with the lowest specific heat values.
6. Chemical Stability	Silicone fluid is extremely inert chemically and is virtually unaffected by 10% alkaline squeous solutions or 30% acid aqueous solutions under ambient temperatures. However, a viscosity increase and gelation occur even if trace amounts of acid or alkaline are introduced at high temperatures. Silicone fluid suffers almost no effect from the presence of most metals, including aluminum and stainless steel. However, lead, selenium, and tellurium can cause gelation. Precautions must therefore be taken during handling.
7. Corrosion and Effects on Other Materials	Silicone fluid does not have any adverse effect on most substances, including metals. However, it may reduce the volume and weight of some rubber and plastic compounds due to extraction of the plasticizers when subjected to high temperatures. This tendency is especially strong for low-viscosity fluids. Particular care must be taken when silicone fluid comes into contact with rubber sealing materials.
8. Surface Tension	The surface tension of silicone fluid is much lower than that of water or ordinary synthetic oils. Because silicone fluids can spread easily over various surface textures, they are widely used as mold releasing agents, defoamers, and ingredients for cosmetics.
9. Mold Releasability and Nonadhesiveness	The application of silicone fluid to mold surfaces prevents the adhesion of other materials, thereby enhancing mold releasability. Because they have excellent heat resistance and because they do not contaminate the mold or molded materials, silicone fluids are widely used as mold releasing agents.

10. Defoamabiliity	The introduction of trace amounts of silicone fluid produces a superior defoaming effect. Silicone fluid is used primarily for the defoaming of oil-based foaming fluids.
11. Water Repellency	An excellent and durable water-repellent coating can ben obtained by baking glass, ceramic, or fiber with DM-FLUID or F-9W-9 at a high temperature. This process is also effective for enhancing powder fluidity and preventing coagulation.
12. Physiological Effects	Generally, silicone fluid is physiologically inert and has a very high level of safety for living organisms.
13. Electrical Properties	The electrical properties of silicone fluid are extremely stable with respect to variations in temperature and frequency. Silicone fluid also withstands dielectric breakdown better than mineral oil. However, as with ordinary insulation oils, the electrical insulation properties of silicone fluid are susceptible to humidity and moisture absorption, so contact with moisture must be adequately controlled.
14. Resistance to Shear Stress	When a synthetic or mineral oil is passed through narrow spaces under pressure, the oil's molecular structure is destroyed by shear stress, resulting in a lower viscosity. Silicone fluids resist such shear destruction, and dimethyl silicone fluids with viscosities below 1,000 mm^2/s (1,000 cSt) exhibit almost no change in viscosity. Depending on the shearing speed, the nominal viscosity of high-viscosity fluids may experience some decrease. However, this is not due to the destruction of the DM-FLUID molecules, so the viscosity returns to its former level when the shearing effect is removed. Silicone fluids are over 20 times more resistant to shear than the top-quality petroleum-type oils.
15. Compressibility	Unlike mineral oil, silicone fluid does not solidify when subjected to pressure, and it exhibits extremely high compressibility. In fact, silicone fluid has a much higher compressibility when compared with other types of petroleum and synthetic lubricants, so it has many applications as a damper medium.
16 Solubility	Silicone fluid is very soluble in hydrocarbon solvents such as benzene, toluene, xylene, ligroin, and mineral spirits as well as in chlorinated hydrocarbons such as methylene chloride, 1-1-1 trichloroethane, and chlorobenzene. However, it is insoluble in ethanol, methanol, and water. (KF-56A is soluble in ethanol.)
17. Lubricity	Although silicone fluid has many good properties that make it suitable for use as a lubricant, such as its stable viscosity and its resistance to both high and low temperatures, its poor boundary lubrication properties on steel-steel interfaces limit its use as a lubricant for such applications. However, silicone fluid does provide good lubrication for steel-bronze, steel-aluminum, steel-zinc, and wood-wood interfaces and for various combinations of plastics.
18. Radiation Resistance	Methylphenyl silicone fluid is superior to dimethyl silicone fluid in resistance to radiation. A higher number of phenyl radicals results in better stability. Due to this property and its resistance to high and low temperatures, methylphenyl silicone fluid is widely used in the high-temperature sections of radiation-related equipment.

PRODUCT FEATURES

Mold releasing agent for rubber products

Damping/vibration reduction for instruments

1 General Uses DM-FLUID

DM-FLUID is the most typical dimethyl silicone fluid. Many types of this transparent, odorless fluid are available, ranging from free flowing, water-like fluids to viscous, syrup-like fluids. The product is classified into three types according to viscosity: L (low viscosity; 0.65 to 5 mm^2/s), M (intermediate viscosity; 10 to 5,000 mm^2/s), and H (high viscosity; 6,000 to 1,000,000 mm^2/s).

The standard viscosity of this product is in the range of 0.65 to 1,000,000mm^2/s (0.65 to 1,000,000 cSt), with 27 types available altogether.

2 Low Temperature Resistance F-5W-0

F-5W-0 is a methylphenyl silicone fluid in which some of the methyl groups of dimethyl silicone fluid are replaced by phenyl groups. This clear, odorless fluid has excellent low-temperature characteristics and maintains fluidity at temperatures as low as –65°C.

Applicattions: Damping, vibration reduction, and lubricants for instruments that are used in low-temperature environments. Cosmetic additives.

3 Heat Resistance KF-54

KF-54 is a methylphenyl silicone fluid in which some of the methyl groups of dimethyl silicone fluid are replaced by phenyl radicals. KF-54 contains more phenyl radicals than

Applications		DM-FLUID of dimethyl silicone fluids			F-5W-0 and KF-54 methylphenyl silicone fluids	F-9W-9 methyl-hydrogen silicone fluid	Modified silicone fluids*1	Benefits
		L	M	H				
Electronics and information industries	Fuser oil for copiers	●	●	●				Mold releasability and heat resistance
	Stress relief agents for semiconductor sealants						●	
	Fire retardation for computer housings, etc.			●				
Electronics and energy industries	Transformer oil		●					Electrical insulation, high/low temperature resistance, nonflammability, chemical stability, physiological inertness, etc.
	Condenser oil		●					
	Breaker insulation oil		●					
	Damper oil			●				
	Environmentally friendly electric wiring			●				
	Heating medium for solar systems	●	●					
Chemical industry and paints	Adding lubricity to synthetic resins		●	●	●		●	Interface properties, lubricity, defoaming, etc.
	Improved molding of synthetic resins		●	●	●		●	
	Mold releasing during molding of plastic and rubber		●	●	●		●	
	Glazing		●		●		●	
	Heating medium		●		●			
	Defoaming during manufacture of plastic and latex		●				●	
	Defoamer		●		●		●	
	Paint additive		●		●		●	

*1 Please refer to our catalogue on modified silicone fluids.

F-5W-0 and has excellent heat resistance properties. In open systems, this product can be used at temperatures ranging from –30°C to +250°C and is capable of withstanding temperatures up to +300°C for short durations.
Applications: Oil baths, heating mediums, and damping and vibration reduction oils for instruments to be used in high-temperature evironments. Cosmetic additives.


Vibration reduction oil for compact disks

KF-965, KF-968

These two products are produced by special processing of dimethyl silicone fluid. They have excellent heat resistance and exhibit less heat deterioration than DM-FLUID. KF-965 and KF-968 can withstand prolonged temperatures of +250°C in closed systems and opened system respectively and are capable of withstanding temperatures up to +300°C for short durations. KF-968 has a greater transparency than KF-965.
Applications: Oil baths, heating mediums, and vibration reduction oils for instruments to be used in high-temperature environments. Mold releasing agents for molten metal.


Prevention of toner adhesion on copier rolls

4 Water Repellency Processing F-9W-9

F-9W-9 is a methylhydrogen silicone fluid in which some of the methyl groups of dimethyl silicone fluid are replaced by hydrogen. A clear coating with good water repellency, mold releasability, and lubricity is obtained by baking this product onto the surface of various materials.
Applications: Water repellency processing of textiles, glass, metal, and ceramic materials. Enhancement of fluidity in various inorganic powders.


Hairbrush lubrication
(silicone fluid impregnated plastic)

Applications		DM-FLUID of dimethyl silicone fluids			F-5W-0 and KF-54 methylphenyl silicone fluids	F-9W-9 methyl-hydrogen silicone fluid	Modified silicone fluids*1	Benefits
		L	M	H				
Chemical industry and paints	Resin modification (silicone modification)			●			●	Interface properties, lubricity, defoaming, etc.
	Anticlouding and antistatic agent		●		●		●	
	Urethane foam stabilizer						●	
Cosmetics and household products	Shampoo and hair rinse		●				●	Physiological inertness, transparency, odorlessness, water repellency, lubricity, etc.
	Hair lotion						●	
	Antiperspirant	●	●					
	Foundation					●		
	Lip gloss				●			
	Skin cream		●		●		●	
	Milky lotion		●					
	Face lotion	●	●					
Construction and civil engineering	Water repellency for autoclaved lightweight concrete (ALC)		●			●	●	High/low temperature resistance, weather resistance, water repellency, shininess, shear resistance, compressibility, etc.
	Water repellency for siding boards		●			●	●	
	Water repellency for insulation materials		●			●	●	
	Vibration damping			●				
	Furniture polish		●				●	
Vehicles	Damper oil		●	●				Low variation in viscosity due to temperature change, shear resistance, high compressibility, high/low temperature resistance, shininess, water repellency, etc.
	Viscous coupling oil		●	●				
	Fan coupling oil		●	●				

*1 Please refer to our catalogue on modified silicone fluids.

PRODUCT FEATURES

Paint additives

High temperature heating medium

5 Paint Additives F-6W-9

F-6W-9 is a clear, transparent dimethyl silicone fluid. The addition of a trace amount of this product to paint enhances paintability and prevents pigment floating and orange peel. It also improves the luster of the paint.

6 Resin Additives and Modification F-6W-9

Please refer to the technical information available on the application of silicone to resin modification.

7 Cosmetic Additives KF-56A

KF-56A is a clear, odorless methylphenyl silicone fluid with good compatibility with alcohol and other cosmetic ingredients. This product is stable against heat and ultraviolet light, and it has other superior properties such as water repellency, nonadhesiveness, and good elongation. It is used as an additive for a wide variety of cosmetic products.

Applications: Foundation, make-up, skin care products, hair care products, sunscreen, etc.

KF-995

KF-995 is a clear, volatile cyclic dimethyl sillicone fluid. It leaves no residue after volatilization, so it provides a smooth texture. It also has excellent water repellency,

Applications		DM-FLUID of dimethyl silicone fluids			F-5W-0 and KF-54 methylphenyl silicone fluids	F-9W-9 methyl-hydrogen silicone fluid	Modified silicone fluids*1	Benefits
		L	M	H				
Vehicles	Torque converter oil			●				Low variation in viscosity due to temperature change, shear resistance, high compressibility, high/low temperature resistance, shininess, water repellency, etc.
	Brake fluid		●					
	Traction fluid		●				●	
	Car wax	●	●		●	●	●	
	Polish	●	●		●	●	●	
Machinery	Damper oil			●				Mold releasability, defoaming, high/low temperature resistance, low variation in viscosity due to temperature change, etc.
	Cutting oil	●	●		●		●	
	Lubricating oil		●	●	●		●	
	Die casting mold release agent		●				●	
	Shell mold release agent		●				●	
	Diffusion pump oil				●			
	Transformer oil		●					
	Heat transfer oil (high/low temperature)		●		●			
Textiles, paper, and pulp	Fibert oiliness agents		●		●	●	●	Lubricity, water repellency, defoaming, etc.
	Texturing and softening		●		●	●	●	
	Hydrophylic softening		●				●	
	Water repellency and waterproofing		●		●	●	●	
	Antistatic treatment						●	
	Antibacterial treatment						●	

*1 Please refer to our catalogue on modified silicone fluids.

good elongation, and other superior properties.
Applications: Antiperspirants, hair care products, etc. (For more information, please refer to our cosmetic silicone catalogue.)

8 High-Vacuum Oil Diffusion Pump Applications

HIVAC F-4
HIVAC F-5

These two products are methylphenyl silicone fluids with superior resistance to oxidation, heat, and chemicals. Unlike petroleum and fatty acid ester pump oils, these products do not crack when subjected to heat or intake gas. They also do not emit oxidation gas or produce acid, tar, pitch, or other substances when the vacuum is broken during the heating process. They therefore enable prolonged, stable operation of vacuum pumpls.

With HIVAC F-4, a vacuum of up to 10^{-7} to 10^{-8} Torr can be reached. This vacuum can be extended to 10^{-10} Torr through the use of liquid nitrogen traps.

With HIVAC F-5, a vacuum of up to 10^{-9} to 10^{-10} Torr can be reached. This vacuum can be extended to a super high vacuum of up to 10^{-12} Torr through the use of liquid nitrogen traps.

For more information, please refer to our technical materials.


Improved fluidity of powders


Lubricants for instruments

Applications		DM-FLUID of dimethyl silicone fluids			F-5W-0 and KF-54 methylphenyl silicone fluids	F-9W-9 methyl-hydrogen silicone fluid	Modified silicone fluids*1	Benefits
		L	M	H				
Textiles, paper, and pulp	Defoaming during scouring and dyeing		●					Lubricity, water repellency, defoaming, etc.
	Defoaming during black liquor, bleaching, and papermaking processes		●					
	Defoaming during waste water treatment		●					
	Release paper						●	
	Processing paper						●	
	Water repellency for short glassfiber matting						●	
	Waterproofing spray						●	
Foodstuffs, health care, and leisure	Defoaming during manufacture of miso, soy sauce, and tofu		●					Defoaming, lubricity, physiological inertness, etc.
	Mold release agent for breadmaking, cookie baking, etc.		●					
	Mold release agent during molding of food containers		●					
	Defoaming during fermentation processes		●					
	Hydraulic fluid for food processing		●	●				

*1 Please refer to our catalogue on modified silicone fluids.

GENERAL PROPERTIES

Grade	Appearance	Kinetic viscosity 25°C, mm^2/s*	Specific gravity 25°C	Volatile matter content 150°C/ 24 hours (%)	V.T.C**	Refractive index 25°C	Pour point °C
DM-FLUID-0.65cs	Clear transparent liquid	0.65	0.760	BP100°C	0.31	1.375	- 75 max.
DM-FLUID-1cs	Clear transparent liquid	1.0	0.818	BP153°C	0.37	1.382	- 100 max.
DM-FLUID-1.5cs	Clear transparent liquid	1.5	0.852	BP194°C	0.46	1.387	- 90 max.
DM-FLUID-2cs	Clear transparent liquid	2.0	0.873	BP229°C	0.48	1.391	- 120 max.
DM-FLUID-5cs	Clear transparent liquid	5.0	0.915	40 max. (105°C/3h)	0.54	1.396	- 110 max.
DM-FLUID-A-6cs	Clear transparent liquid	6.0	0.925	5.0 max. (105°C/3h)	0.54	1.397	- 100 max.
DM-FLUID-10cs	Clear transparent liquid	10	0.935	40 max.	0.55	1.399	- 100 max.
DM-FLUID-20cs	Clear transparent liquid	20	0.950	4.0 max.	0.57	1.400	- 60 max.
DM-FLUID-30cs	Clear transparent liquid	30	0.955	1.5 max.	0.58	1.401	- 55 max.
DM-FLUID-50cs	Clear transparent liquid	50	0.960	0.5 max.	0.59	1.402	- 50 max.
DM-FLUID-100cs	Clear transparent liquid	100	0.965	0.5 max.	0.59	1.403	- 50 max.
DM-FLUID-200cs	Clear transparent liquid	200	0.970	0.5 max.	0.60	1.403	- 50 max.
DM-FLUID-300cs	Clear transparent liquid	300	0.970	0.5 max.	0.60	1.403	- 50 max.
DM-FLUID-350cs	Clear transparent liquid	350	0.970	0.5 max.	0.60	1.403	- 50 max.
DM-FLUID-500cs	Clear transparent liquid	500	0.970	0.5 max.	0.60	1.403	- 50 max.
DM-FLUID-1,000cs	Clear transparent liquid	1,000	0.970	0.5 max.	0.60	1.403	- 50 max.
DM-FLUID-3,000cs	Clear transparent liquid	3,000	0.970	0.5 max.	0.60	1.403	- 50 max.
DM-FLUID-5,000cs	Clear transparent liquid	5,000	0.975	0.5 max.	0.60	1.403	- 50 max.
DM-FLUID-6,000cs	Clear transparent liquid	6,000	0.975	0.5 max.	0.61	1.403	- 50 max.
DM-FLUID-10,000cs	Clear transparent liquid	10,000	0.975	0.5 max.	0.61	1.403	- 50 max.
DM-FLUID-12,500cs	Clear transparent liquid	12,500	0.975	0.5 max.	0.61	1.403	- 50 max.
DM-FLUID-30,000cs	Clear transparent liquid	30,000	0.976	0.5 max.	0.61	1.403	- 50 max.
DM-FLUID-50,000cs	Clear transparent liquid	50,000	0.976	0.5 max.	0.61	1.403	- 50 max.
DM-FLUID-60,000cs	Clear transparent liquid	60,000	0.976	0.5 max.	0.61	1.403	- 50 max.
DM-FLUID-100,000cs	Clear transparent liquid	100,000	0.977	1.5 max.	0.61	1.403	- 50 max.
DM-FLUID-300,000cs	Clear transparent liquid	300,000	0.977	1.5 max.	0.61	1.403	- 50 max.
DM-FLUID-500,000cs	Clear transparent liquid	500,000	0.978	1.5 max.	0.61	1.403	- 50 max.
DM-FLUID-1,000,000cs	Clear transparent liquid	1,000,000	0.978	1.5 max.	0.61	1.403	- 50 max.
F-6W-9	Clear transparent liquid	20	0.950	25		1.400	- 62 max.
F-9W-9	Clear transparent liquid	20	1.000	5 max.****		1.396	- 73 max.
F-5W-0-100cs	Clear transparent liquid	100	0.995	0.5 max.	0.65	1.427	- 65 max.
F-5W-0-300cs	Clear transparent liquid	300	0.998	0.5 max.	0.65	1.427	- 65 max.
F-5W-0-1,000cs	Clear transparent liquid	1,000	1.000	0.5 max.	0.65	1.427	- 65 max.
F-5W-0-3,000cs	Clear transparent liquid	3,000	1.000	0.5 max.	0.65	1.427	- 65 max.
KF-54	Clear transparent liquid	400	1.070	0.5 max.	0.82	1.505	- 30 max.
KF-965-100cs	Dark brown liquid	100	0.965	0.5 max.	0.59	1.403	- 50 max.
KF-965-1,000cs	Dark brown liquid	1,000	0.975	0.5 max.	0.60	1,403	- 50 max.
KF-965-10,000cs	Dark brown liquid	10,000	0.975	0.5 max.	0.60	1,403	- 50 max.
KF-968	Light yellow liquid	100	0.965	0.5 max.	0.59	1.403	- 50 max.
KF-56A	Clear transparent liquid	15	0.995	15****	0.71	1.498	- 55 max.
KF-995	Clear transparent liquid	4.0	0.956	BP210°C		1.396	- 40(-40)*****
HIVAC F-4	Clear transparent liquid	37	1.065	BP210°C/0.67kPa	0.78	1.555	- 35(-31) max.*****
HIVAC F-5	Clear transparent liquid	160	1.097	BP240°C/0.80kPa	0.88	1.575	- 15 max.

* $1mm^2/s$ (SI units) = 1cSt (conventional units)

** V.T.C = Abbreviation of "viscosity temperature coefficient," an index of the change in viscosity due to the temperature. The V.T.C is calculated as follows:

$$V.T.C = 1 - \frac{\text{Kinematic viscosity at 98.9°C}}{\text{Kinematic viscosity at 37.8°C}}$$

The lower the V.T.C, the smaller the change in viscosity.

Flash point °C	Specific heat 25°C (cal/g · °C)	Thermal conductivity 25°C W/m · K	Surface tension 25°C mN/m	Coefficient of expansion 25 – 150°C (cc/cc/°C)	Volume resistivity*** TΩ · m	Dielectric breakdown strength***: 2.5 mm/kV	Dielectric constant*** 50 Hz	Dielectric loss tangent*** 50 Hz	UN Hazardous Classification
-1	0.47	0.10	15.9	0.00135	1min.	35.0min.	2.17	0.0001max.	UN 1993
37	0.47	0.10	16.9	0.00129	1min.	35.0min.	2.28	0.0001max.	UN 1993
64	0.47	0.10	17.7	0.00127	1min.	35.0min.	2.38	0.0001max.	NON
88	0.43	0.11	18.3	0.00124	1min.	35.0min.	2.42	0.0001max.	NON
102	0.43	0.12	19.7	0.00109	1min.	35.0min.	2.60	0.0001max.	NON
174	0.43	0.12	19.8	0.00109					NON
160min.	0.40	0.14	20.1	0.00106	1min.	50.0min.	2.65	0.0001max.	NON
260min.	0.38	0.15	20.6	0.00104	1min.	50.0min.	2.70	0.0001max.	NON
280min.	0.38	0.15	20.7	0.00099	1min.	50.0min.	2.71	0.0001max.	NON
310min.	0.35	0.15	20.8	0.00096	1min.	50.0min.	2.72	0.0001max.	NON
315min.	0.35	0.16	20.9	0.00095	1min.	50.0min.	2.74	0.0001max.	NON
315min.	0.35	0.16	21.1	0.00095	1min.	50.0min.	2.74	0.0001max.	NON
315min.	0.35	0.16	21.1	0.00095	1min.	50.0min.	2.75	0.0001max.	NON
315min.	0.35	0.16	21.1	0.00095	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.1	0.00095	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.2	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094	1min.	50.0min.	2.76	0.0001max.	NON
315min.	0.35	0.16	21.3	0.00094					NON
315min.	0.35	0.16	21.3	0.00094					NON
315min.	0.35	0.16	21.3	0.00094					NON
80			19.7	0.00094					NON
100min.			20.0	0.00107					NON
315min.	0.35	0.15	21.8	0.00096	1min.	50.0min.	2.80	0.0003max.	NON
315min.	0.35	0.15	22.2	0.00096	1min.	50.0min.	2.80	0.0003max.	NON
315min.	0.35	0.15	22.6	0.00096	1min.	50.0min.	2.81	0.0003max.	NON
315min.	0.35	0.15	22.7	0.00096	1min.	50.0min.	2.82	0.0003max.	NON
300min.	0.35	0.13	25.2	0.00073	0.1min.	50.0min.	2.88	0.0005max.	NON
315min.	0.35	0.16	20.9	0.00095					NON
315min.	0.35	0.16	21.2	0.00094					NON
315min.	0.35	0.16	21.3	0.00094					NON
315min.	0.35	0.16	20.8	0.00095					NON
100min.			24.4						NON
77			17.8						NON
210min.	0.33		33.9	0.00077	0.1min.	50.0min.	2.81	0.0005max.	NON
240min.	0.31		34.3	0.00063	0.1min.	50.0min.	2.85	0.0005max.	NON

(Not Specified Values)

*** The electrical characteristics are for oils with a water content of 50 ppm or less. **** 105°C/3 hours ***** Melting point°C

Notes
1. The hyphenated number after the product name indicates the viscosity.
2. Please inquire about the data for the blank spaces.

PACKAGING

●=Round can ■=Rectangular can

Package / Content / Products	1-liter can	18-liter can				Others
	1kg*	13kg	14kg	16kg	18kg	
DM-FLUID-0.65cs	■	■				
DM-FLUID-1~5cs	■		■			
DM-FLUID-A-6cs	■			■		
DM-FLUID-10~3,000cs	■			■	●	
DM-FLUID-5,000cs	●				●	
DM-FLUID-6,000~60,000cs	●				●	
DM-FLUID-100,000~1,000,000cs	●			●		
F-6W-9	■			■		
F-9W-9	■				■	
F-5W-0-100~3,000cs	■				■	
KF-54	■				■	
KF-965-100~10,000cs	■			■		
KF-968	■			■		
KF-56A	■				■	
KF-995	■			■		
HIVAC F-4	Cylindrical can				■	500cc・1,000cc / Cylindrical can
HIVAC F-5	Cylindrical can				■	500cc・1,000cc / Cylindrical can

* 1kg containers are shipped in sets of 10.

HANDLING PRECAUTIONS

Storage and Handling

1. The products listed in this catalogue are for industrial use. For use in medicines, food, or cosmetics and for other products for which safety is important, please evaluate the acceptability of these products with regard to the applicable standards.

2. Silicone fluid may be denatured by heat, light, acid, or alkali. Keep these products in tightly sealed containers and store in a dark, cool location.

3. Silicone fluid usually contains 100 to 200 ppm dissolved water. Control humidity carefully, especially when using the fluid as electrical insulation oil. For details, refer to the technical materials for silicone fluid DM-FLUID.

4. Although silicone fluid is chemically inert, plasticizers may be extracted from some synthetic rubbers or plastic compounds when they are exposed to silicone fluid. This may result in a reduction in volume and weight.

Safety and Hygiene

1. Although silicone fluid is not an irritant by natur, it is difficult to remove when it adheres to the skin. Wear rubber gloves and safety glasses to avoid contact with skin and mucosa. If it contacts the skin, wipe off with a washcloth and rinse thoroughly with soap and running water.

2. If silicone fluid enters the eye, wash it away immediately with large volumes of water for at least 15 minutes and ask for medical attention if necessary.

3. Use extensive ventilatin when handling volatile silicone fluid and do not inhale the vapor.

4. Silicone fluid normally decomposes thermally when used above 150°C in a normal atmosphere. Irritant gas may be emitted upon decomposition. Ventilate extensively when handling silicone fluid in such an environment.

5. Keep out of reach of children.

6. Please read the Safety Data Sheet (SDS) before use. SDS can be obtained from our Sales Department.

For further information about silicone fluid, please contact us to request additional technical information.

Shin-Etsu Chemical Co., Ltd.

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- The data and information presented in this catalog may not be relied upon to represent standard values. Shin-Etsu reserves the right to change such data and information, in whole or in part, in this catalog, including product performance standards and specifications without notice.
- Users are solely responsible for making preliminary tests to determine the suitability of products for their intended use. Statements concerning possible or suggested uses made herein may not be relied upon, or be construed, as a guaranty of no patent infringement.
- For detailed information regarding safety, please refer to the Safety Data Sheet (SDS).
- The silicone products described herein have been designed, manufactured and developed solely for general industrial use only; such silicone products are not designed for, intended for use as, or suitable for, medical, surgical or other particular purposes. Users have the sole responsibility and obligation to determine the suitability of the silicone products described herein for any application, to make preliminary tests, and to confirm the safety of such products for their use.
- Users must never use the silicone products described herein for the purpose of implantation into the human body and/or injection into humans.
- Users are solely responsible for exporting or importing the silicone products described herein, and complying with all applicable laws, regulations, and rules relating to the use of such products. Shin-Etsu recommends checking each pertinent country's laws, regulations, and rules in advance, when exporting or importing, and before using, the products.
- Please contact Shin-Etsu before reproducing any part of this catalog.

The Development and Manufacture of Shin-Etsu Silicones are based on the following registered international quality and environmental management standards.

Gunma Complex	ISO 9001 (JCQA-0004)	ISO 14001 (JCQA-E-0002)
Naoetsu Plant	ISO 9001 (JCQA-0018)	ISO 14001 (JCQA-E-0064)
Takefu Plant	ISO 9001 (JQA-0479)	ISO 14001 (JQA-EM0298)

https://www.shinetsusilicone-global.com/

This is an edited version of the product data released on Oct. 2021.