



# STO-50 Silicone Transformer Oil

100% Polydimethylsiloxane...contains < 50ppm water content...High Dielectric Strength & High Flash Point



STO-50 is a 100% PDMS silicone oil formulated for use in liquid filled transformers.

STO-50 Silicone Transformer Oil is a 100% linear Polydimethylsiloxane fluid (CAS# 63148-62-9) with a viscosity of 50cSt (centistoke) @ 25°C. STO-50 is formulated specifically for use as a dielectric fluid and dielectric coolant in electrical transformers. Unlike conventional polydimethylsiloxane fluids, STO-50 is formulated to contain < 50ppm water content to ensure the highest degree of dielectric strength and stability.

STO-50 Silicone Transformer Oil is characterized by its high dielectric strength, wide service temperature range, high flash point, low vapor pressure, low viscosity change at extremely high and low temperatures, and inertness to virtually all substrates \*. It contains no additives (such as thermal stabilizers). Ultimately, STO-50 will prolong the service life of the transformer and reduce maintenance.

STO-50 is an environmentally safe replacement for PCB containing askarels as the dielectric coolant for liquid-filled transformers. Its high thermal stability makes it a good choice for transformers that are located indoors or next to buildings where a thermally stable fluid is more critical.

### Features and Benefits

- High dielectric strength fluid
- Excellent dielectric coolant
- High flash point > 300°C...minimal flammability and high temp stability
- Low Viscosity change, low volatility,
- High thermal oxidation resistance
- Self-extinguishing
- Chemically inert
- Low toxicity and bioaccumulation
- VOC Exempt
- Compatible with most existing transformer insulation systems
- Environmentally superior alternative to PCB's as transformer fluid
- Longer service life than conventional transformer oils

### IEC & ASTM Specifications:

STO-50 Silicone Transformer Oil meets both **International Electrotechnical Commission IEC 836** "Specifications for silicone liquid for electrical purposes" (Silicone Fluid Type T-1) and **ASTM D 4652** "Silicone Fluids for Electrical Insulation" specifications for repair or top-off of existing liquid-filled units. These standards cover both the physical and electrical properties of fluid suitable for dielectric applications.

STO-50 has a fire point exceeding the requirements of these documents and is within the IEC 1100 class with lowest heat of combustion. Silicone Transformer Oil presents a much lower fire hazard than other transformer fluids. It is difficult to ignite, but if ignited, it will produce less heat and smoke. It will virtually extinguish itself when external heat source is removed.

### Typical Properties:

Parameter	Unit	Value
<b>Physical properties:</b>		
Appearance		Crystal clear fluid
Density @ 25C	kg/dm3	0.96
Viscosity @ 25C	mm2 sec	50 (cSt)
Water content	ppm	50
Refractive Index		1.404
<b>Electrical Properties:</b>		
Dielectric Breakdown voltage	KV	50
Permittivity @ 25C, 50Hz		2.7
Dissipation factor @ 25C, 50Hz		0.0001
Volume resistivity @ 25C	ohm.cm	1.0 x 10 <sup>14</sup>
<b>Thermal properties</b>		
Flash point (open cup)		>300°C/572°F
Fire point (open cup)		>370°C/698°F
Specific heat	KJ/kg.K	1.51
Specific heat	cal/gm °C	3.7 x 10 <sup>-4</sup>
Thermal conductivity	W (m.K)	0.151
Oxygen index	TDLOI	21.4
Coefficient of Expansion	cc/cc/°C	10.55 x 10 <sup>-4</sup>

### Applications:

Clearco STO-50 may be considered for use in all types of transformer applications, where safety, toxicity, and environmental hazards are of primary concern. Applications include power distribution transformers installed indoors or in close proximity to buildings, railroad and electrostatic precipitator transformers, pulse transformer, TV fly-back transformers, capacitors and many other high-reliability TV and radar circuit components. STO-50 fluid may also be considered for use in systems where heat transfer properties are as necessary as good dielectric behavior.

### Packaging

5-gallon pail (18.9 liters).....18kg / 40 lbs net wt.  
 55-gallon drum (208 liters).....200kg / 440 lbs net wt.  
 F.O.B. Phila, PA USA

### For More Info, Contact: Clearco Products Co., Inc.

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**Requirements of Silicone Type T-1in IEC 836**

Property	Test method *	Permissible value	Typical value
<b>Physical</b>			
Color	8	Max 35	
Appearance	8	Clear	Clear, no suspended matter
Specific Gravity	9	0.995 to 0.970	0.96
Viscosity @ 25°C	10		50cSt
Flashpoint (close cup)	11	Min 240°C	260°C
Fire Point (open cup)	12	Min 330°C	370°C
Refractive Index	13	1.404 ±0.002	1.404
Pour Point, °C	15	Max -50°C	-55°C
<b>Chemical</b>			
Water content, ppm	16	Max 50	<50ppm
Neutralization value (mg KOH/g)	17	Max 0.02	0.008
<b>Electrical</b>			
Breakdown voltage (kV)	19	Min 40	50
Dissipation factor (tg) @ 90°C, 50Hz	20	Max 0.001	0.0005
Permittivity @ 90°C	20	2.55+0.05	
d.c. rsistivity @ 90°C (g ohm.m)	20	Min 100	1,000

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