Technical Data Sheet

# XIAMETER™ PMX-561 Transformer Liquid

Polydimethylsiloxane

## Features & Benefits

- Meets the requirements of both IEC 836 and ASTM D 4652-92
- Essentially non-toxic
- Environmentally safe
- Non-halogenated
- Compatible with a wide range of solid electrical insulating materials
- Contains no additives
- Classified as non-hazardous
- High thermal stability and oxidation resistance
- Higher fire point and lower heat release rate than other types of class K insulating liquids
- Good electrical properties and operating capabilities over a wide temperature range
- Non-sludging

## Applications

- Cooling and insulating liquid for transformers and other electrical equipment.

## Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

| Property | Unit | Result |
|---|---|---|
| **Table 1: Tested to ASTM 4652-92** | | |
| Appearance | | Crystal clear liquid |
| Density at 25°C (77°F) | $kg/dm^3$ | 0.96 |
| Viscosity at 25°C (77°F) | $mm^2/s$ | 50 |
| Water content | ppm | 30 |
| Specific heat | kJ/kg.K | 1.51 |
| Thermal conductivity | W/(m.K) | 0.151 |
| Refractive index at 25°C (77°F) | | 1.404 |
| Breakdown voltage[1] | kV | 50 |
| Permittivity at 25°C (77°F) – 50 Hz | | 2.7 |

1. Breakdown voltage measured as in IEC 156:1995 section 3.4.2.



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## Typical Properties (Cont.)

| Property | Unit | Result |
|---|---|---|
| Dissipation factor at 25°C (77°F) – 50 Hz | | 0.0001 |
| Volume resistivity at 25°C (77°F) | ohm.cm | $1.0 \times 10^{14}$ |
| Flash point open cup | °C | > 300 |
| | °F | > 572 |
| Fire point – open cup | °C | 370 |
| | °F | 698 |

## Description

XIAMETER™ PMX-561 Transformer Liquid is a polydimethyl silicone liquid that meets the requirements of:

- International Electrotechnical Commission (IEC) 836 “specifications for silicone liquid for electrical purposes” (Silicone Type T-1).
- ASTM D 4652-92 “silicone fluids for electrical insulation”.
- IEC 1100 – “Classification of insulating liquids according to fire point and net calorific value” (Class K3).

XIAMETER™ PMX-561 Transformer Liquid has a fire point exceeding the requirements of these documents and is within the IEC 1100 class with lowest net calorific value (heat of combustion).

With excellent electrical insulation properties over a wide temperature range, combined with high thermal stability, XIAMETER™ PMX-561 Transformer Liquid is suitable for transformers and other electrical equipment designed to operate at high temperatures or at very low temperatures.

## Handling Precautions

XIAMETER™ PMX-561 Transformer Liquid is handled in the same manner, and with the same type of equipment, as other insulating liquids. Wherever possible, equipment used for handling XIAMETER™ PMX-561 Transformer Liquid should be reserved for that purposed only. Thorough cleaning of equipment is essential if changing from one insulating liquid to another.

Care must be exercised when selecting pumping equipment, and other items in which sliding movement is involved. Although perfectly satisfactory equipment is available for use with polydimethylsiloxanes, this liquid does not adequately lubricate certain pump designs. The use of improperly designed pumps may result in premature failure and metal particle contamination of the liquid.

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

**Table 1:** Test Requirements of Silicone Type T-1 in IEC 836.

| Property | Test Method[1] | Permissible Values | Typical values for XIAMETER™ PMX-561 Transformer Liquid |
|---|---|---|---|
| **Physical** | | | |
| Color | 8 | Max 35 | |
| Appearance | 8 | Clear, free from suspended matter and sediment | |
| Density at 20°C (68°F) (kg/dm$^3$) | 9 | 0.995 to 0.970 | |
| Kinematic viscosity at 40°C (104°F) (mm$^2$/s) | 10 | 40 ± 4 | |
| Flash point (°C/°F) (closed cup) | 11 | Min 240/464 | 260/500 |
| Fire point (°C/°F) (open cup) | 12 | Min 330/626 | 370/698 |
| Refractive index at 20°C (68°F) | 13 | 1.404 ± 0.002 | |
| Pour point (°C/°F) | 15 | Max -50/-58 | |
| **Chemical** | | | |
| Water content (mg/kg) | 16 | Max 50 | 30 |
| Neutralization value (mg KOH/g) | 17 | Max 0.02 | 0.008 |
| **Electrical** | | | |
| Breakdown voltage (kV) | 19 | Min 40[2] | 50 |
| Dielectric dissipation factor (tg) at 90°C (194°F) and 50 Hz | 20 | Max 0.001[2] | 0.0005 |
| Permittivity at 90°C (194°F) | 20 | 2.55 ± 0.05[3] | |
| D.c. resistivity at 90°C (194°F) (G ohm.m) | 20 | Min 100 | 1000 |

1. Test methods are described in IEC 836.
2. For untreated liquid, as received.
3. Only needed as a specification value when used for capacitors.

NOTE: XIAMETER™ PMX-561 Transformer Liquid complies with all of the requirements of IEC 836 Silicone Type T-1. The above typical values EXCEED the minimum requirements of IEC 836.

## Recycling or Disposal

Reprocessing procedures for silicone transformer fluid are described in the International Electrotechnical Commission Guide IEC 944 (also available as BS 7713).

Fuel blending is another form of recycling where the “spent” fluid is mixed with compatible solvents or other fuels and used as a feedstock in industrial furnaces such as cement kilns. The silicone fluid will be thermally converted to energy and to a silica residue with may be incorporated into the end product.

Incineration is a viable alternative for direct disposal. Landfilling is not recommended.

## Usable Life and Storage

This product should be stored in airtight containers to protect it from moisture and contamination.

When stored at or below 60°C (140°F) in the original unopened containers, this product has a usable life of 36 months from the date of production.

## Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

## Health and Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, dow.com or consult your local Dow representative.

## Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

## Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

## Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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