

## SILICONE TRANSFORMER FLUID

**XL-7335** is a 100% Silicone transformer fluid designed for use as a replacement for PCB (askeral) filled electric transformers, or as an OEM fill on new equipment.

Small fires involving PCB transformers can result in long-term shutdown of facilities, loss of business, extensive clean-up costs, and the possibility of extensive lawsuits. A carefully selected replacement transformer fluid can make sound business sense in many ways through improved safety of the units, and higher operating efficiencies.

There exists a vast array of transformers on the market today such as:

- Air Cooled
- Dry Type
- Cast Resin
- Vapour Cooled
- Mineral Oil
- High Molecular Weight (HMW) Hydrocarbon
- Chlorinated Hydrocarbon
- Silicone Liquid

Liquid filled transformers are preferred over dry-type and vapour-cooled systems in medium to large type units because of the following advantages:

- Unlike solids, liquids cool as well as insulate
- More compact than dry-type or cast resin
- High efficiency at reasonable cost
- Liquids do not crack
- Can be operated in harsh surroundings because they are sealed

In addition, **XL-7335** Silicone Transformer Fluid adds the following to the list of advantages:

- Same dielectric strength and temperature stability as PCB's
- Same performance as PCB's without environmental hazards attached
- Non toxic (cosmetic grade & food additive) base oil
- May be used in food processing plants, and near waterways
- Highly compatible with most other transformer fluids and construction materials
- Polydimethylsiloxane base is non-solvent and chemically inert
- Will not sludge or break down
- Longer transformer life, with reduced maintenance
- **REDUCED FIRE HAZARD**(see below)

**XL-7335** is hard to ignite, gives off less heat and smoke when it does burn, and virtually extinguishes itself when the external source of heat is removed. Tests have also shown that the combustion by products are significantly lower than that of other transformer coolants.

Because heat generated by a fire contributes to its spread and hampers fire fighting efforts, the amount of heat released by a material as it burns is an important factor in assessing the potential fire hazard. **XL-7335** proved in tests performed that it produced the lowest heat release rates of the liquids tested.



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The constitution of **XL-7335** is a pure liquid without any stabilizers, pour point suppressants or other additives found in comparable mineral oils. The inherent high chemical stability, and 'water-white' clarity of **XL-7335** permits simple visual checks for foreign materials in the field.

**XL-7335** intrinsically provides the same high dielectric properties as hydrocarbon fluids with the added dimension of exceptional thermal, electrical and chemical stability. This results in a product that will NOT break down and form acids that will attack and corrode the insulation and solid components.

The main source of heat transfer in liquid filled transformers are by convective forces, though conductive and radiative forces also help remove the heat from the transformer core. The convective effect occurs when fluid heated by the hot windings and core rises, and the heavier cool fluid sinks downward. This circulation of fluid carries heat to the transformer case and cools the windings without additional equipment. **XL-7335** is comparable to askerals in heat transfer ability, and its density change with respect to heat is far greater than hydrocarbons thus resulting in a highly efficient 'thermal syphon' and greater cooling ability.

| <b>TYPICAL FLUID PROPERTIES</b>                                      |   |
|--|---|
| <b>Product Code: XL-7335</b>   |   |
| <b>DIELECTRIC</b>  |   |
| Dielectric Strength (KV @ 25°C) (ASTM D-877)                         | 40  |
| Dielectric Constant (@ 25°C) (ASTM D-924)                            | 2.7   |
| Volume Resistivity (ohm cm 25°C) (ASTM D-1169)                       | 1 x 10 <sup>15</sup>  |
| Dissipation Factor (@ 25°C) (ASTM D-924)                             | 0.00002   |
| (@ 100°C) (ASTM D-924)   | 0.00004   |
| <b>THERMAL</b>   |   |
| Flash Point (°C) (ASTM D-92)   | 300   |
| Fire Point (°C) (ASTM D-92)  | 343   |
| Pour Point (°C) (ASTM D-97)  | -55   |
| Thermal Conductivity (Cal/[Sec cm <sup>2</sup> °C]/cm) (ASTM D-2717) | 0.00036   |
| Specific Heat (Cal/gm/°C) (ASTM D-2766)                              | 0.365   |
| Coefficient of Expansion (OC/0°C/°C) (ASTM D-1903)                   | 0.00104   |
| Rate of Heat Release - Convective (kW/m <sup>2</sup> )               | 62  |
| - Radiative (kW/m <sup>2</sup> )                                     | 30  |
| <b>CHEMICAL</b>  |   |
| Chemical Name  | Polydimethyl-siloxane   |
| Chemical Structure   | [(CH <sub>2</sub> ) <sub>2</sub> SiO] <sub>y</sub> (CH <sub>3</sub> ) <sub>2</sub>          |
| <b>PHYSICAL</b>  |   |
| Specific Gravity (g/ml @ 25°C) (ASTM D-1810)                         | 0.960   |
| Interfacial Tension (dyne/cm @°C)                                    | 20.8  |
| Viscosity (cSt @ 25°C) (ASTM D-88)                                   | 50  |
| (cSt @ 50°C) (ASTM D-88)   | 32  |
| Smoke Release Rate (cfm/ft <sup>2</sup> L) (ASTM E-906 [OSU])        | 67  |
| Weight Loss (% [burn time, min]) - Smoldering                        | 1 [40]  |
| - Flaming  | 16 [13]   |
| Gases evolved during combustion                                      | SiO <sub>2</sub> , H <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> |

