

# TMC FC-3283 Reclaim

## Fully-fluorinated Heat Transfer Liquid

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TMC FC-3283 reclaim is a clear, colorless, thermally stable, fully-fluorinated reclaim liquid that is ideal for use in many single phase heat transfer applications in the semiconductor manufacturing industry. Its liquid range (-50°C to 128°C) makes it ideal for a variety of applications such as etchers, ion implanters, testers and others.

Because TMC FC-3283 reclaim is primarily a single compound, its composition will not shift or fractionate with time. This keeps fluid loss to a minimum and insures that transport properties will not change with time.

TMC FC-3283 reclaim liquid is compatible with most metals, plastics and elastomers. It is non-irritating to the skin, minimally irritating to the eyes upon contact, and is practically non-toxic orally. A Safety Data Sheet is available upon request.

### Heat Transfer Properties

The following formulas can be used to calculate the specific heat, thermal conductivity, density and vapor pressure of reclaim TMC FC-3283 at various temperatures.

$$\text{Specific Heat (J kg}^{-1} \text{ }^{\circ}\text{C}^{-1}) = 1014 + 1.554 (T, \text{ }^{\circ}\text{C})$$

$$\text{Thermal Conductivity (W m}^{-1} \text{ }^{\circ}\text{C}^{-1}) = 0.065 - 0.000056 (T, \text{ }^{\circ}\text{C})$$

$$\text{Density (kg/m}^3) = 1878 - 2.455 (T, \text{ }^{\circ}\text{C})$$

$$\text{Log}_{10}(\text{Vapor Pressure (pascals)}) = 10.237 - (2110/(T, \text{ K}))$$



## TMC FC-3283 Reclaim Specifications

Appearance	Clear, colorless liquid
Boiling Point	128° C
Molecular Weight	521
Pour Point	-50° C
Vapor Pressure	1.44 x 10 <sup>3</sup> pascals
Liquid Density	1820 Kg/m <sup>3</sup>
Kinematic Viscosity	0.75 centistokes
Absolute Viscosity	1.4 centipoise
Latent Heat of Vaporization (at boiling point)	78 J/g
Liquid Specific Heat	1100J kg <sup>-1</sup> ° C <sup>-1</sup>
Liquid Thermal Conductivity	0.066 W m <sup>-1</sup> ° C <sup>-1</sup>
Coefficient of Expansion	0.0014 ° C <sup>-1</sup>
Water Solubility	7 ppmw
Solubility in Water	<5 ppmw
Dielectric Strength	43 kV, 0.1" gap
Dielectric Constant	1.89
Electrical Resistivity	5 x 10 <sup>15</sup> ohm cm

Before using this product, please read the current product Safety Data Sheet. Follow all applicable precautions and directions. TMC FC-3283 reclaim liquid is non-flammable, and is highly resistant to thermal breakdown and hydrolysis in storage and during use.

TMC-3283 reclaim has zero ozone depletion potential. The material is exempt from the U.S. EPA and most State definitions of a volatile organic compound (VOC), and does not contribute to ground-level smog formation. TMC FC-3283 reclaim liquid, a perfluorocarbon (PFC), has a high global warming potential and a long atmospheric lifetime. As such, it should be carefully managed so as to minimize emissions.

TMC Industries recommends that users of TMC FC-3283 reclaim liquid further limit emissions by employing good conservation practices, and by implementing recovery and recycling using TMC Industries' professional reclamation services.

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