

FR3™ Dielectric Fluid

Natural, earth-friendly, ester-based fluid from renewable vegetable based oil



■ HAEFELY HIPOTRONICS is proud to be a part of the Hubbell Sustainability Initiative (HSI). HSI represents an enterprise-wide commitment to develop sustainable products and business practices.

HSI is good for the environment and good for your business. Environmental responsibility is an important topic for the world today and is particularly relevant within our industry. HAEFELY HIPOTRONICS has begun implementing sustainable design strategies throughout our product development stages and manufacturing processes.

HAEFELY HIPOTRONICS now integrates Envirotemp® FR3™ – a natural and earth-friendly fluid from renewable vegetable based oil – in the products listed in this document. HAEFELY HIPOTRONICS is committed to continuous improvement with respect to this sustainability initiative for years to come.



SOURCE: Envirotemp® FR3™ Fluid

BENEFITS

- ☑ Increased **dielectric strength**
- ☑ Makes accidents or spills **far less costly to businesses**
- ☑ Does not contain silicones, halogens, petroleum
- ☑ **Extended insulation lifetime**
- ☑ Part of the **Federal BioPreferred® Program**
- ☑ Received Environmental Technology Verification (ETV) from the **U.S. Environmental Protection Agency**

With its environmental safety features and high-quality performance characteristics, the new FR3™ fluid delivers substantial benefits to customers.

PRODUCTS USING FR3™ OIL

- ☑ **800PL Series: DC Hipots**
 - 815PL – 15kV DC Hipot
 - 880PL – 80kV DC Hipot
 - 8120-5PL – 120kV Two Piece DC Hipot
 - 8170-5PL – 120kV Two Piece DC Hipot
- ☑ **HVT Series: Portable AC Hipot Testers**
 - 30HVT – 30kV AC Hipot Tester
 - 60HVT – 60kV AC Hipot Tester
 - 100HVT – 100kV AC Hipot Tester
 - 120HVT – 120kV AC Hipot Tester
- ☑ **CF30** – 30kV Primary Cable Fault Locator
- ☑ **CF70** – 70kV Primary Cable Fault Locator
- ☑ **OC90D** – Digital Liquid Dielectric Testing Equipment
- ☑ **HD125** – Bench Top Hipot Tester (~0-25kV DC/10kV AC)
- ☑ **HD140** – Bench Top Hipot Tester (~0-40kV DC/15.5kV AC)

FR3 TECHNICAL INFORMATION

Envirotemp and FR3™ are trademarks of [Cargill Incorporated](#). The information below was extracted from the following [Material Safety Data Sheet](#). **Disclaimer:** The values represented here are subject to change at any time and customers should search online for the most up-to-date information.

A. IDENTIFICATION

Envirotemp FR3 fluid is a dielectric fluid intended for use as an insulation and cooling medium in electrical apparatus such as electrical distribution and power transformers.

B. COMPOSITION/INFORMATION OF INGREDIENTS

Envirotemp FR3 fluid is a proprietary formulation using food-grade vegetable oils combined with performance-enhancing additives. All components are listed in the EINECS inventory.

<u>Component</u>	<u>Proportion (wt%)</u>
Vegetable oil	> 98.5
Antioxidant additive	< 1.0
Cold flow additive	< 1.0
Colorant	< 1.0

C. HAZARDS IDENTIFICATION

Envirotemp FR3 fluid is a preparation not classified as dangerous according to Directive 1999/45/EC. Not expected to cause a severe emergency hazard.

D. HANDLING AND STORAGE

Precautions to take in handling and storage: Avoid extremes of temperature in storage. Store Envirotemp FR3 fluid in labeled, tightly closed containers in cool, dry, isolated and well-ventilated areas, away from sources of ignition or heat. To maintain fluid for intended use as an electrical insulating fluid, eliminate exposure to oxygen and moisture. Intermediate bulk storage container (tote): Prolonged exposure to ultraviolet radiation (sunlight) may affect color.

E. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values:

TWA (mg/m³)

	OSHA¹ PEL	ACGIH² TLV
Vegetable oil mists	-	10
Vegetable oil mists: total dust	15	-
Vegetable oil mists: respirable fraction	5	-

Hazardous Materials Identification System (HMIS):	Health 0	Flammability 1	Physical Hazard 0
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F. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: clear, light-green liquid
Odor: slight vegetable oil odor
Closed cup flash point: 310 – 320°C
Autoignition temperature: 401 – 404°C
Boiling point: >360°C
Relative density (H₂O = 1): 0.92
Vapor pressure (mm Hg): < 0.01 @ 20°C
Pour point: -18 to -24°C

Vapor density (air = 1): n/a
Solubility in water: negligible; < 0.1%
Viscosity: 33 – 35 mm²/s at 40°C
Evaporation rate (butyl acetate = 1): nil
Volatile organic compounds: < 0.001 g/L
Miscibility: mixes with other dielectric fluids except silicon.

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