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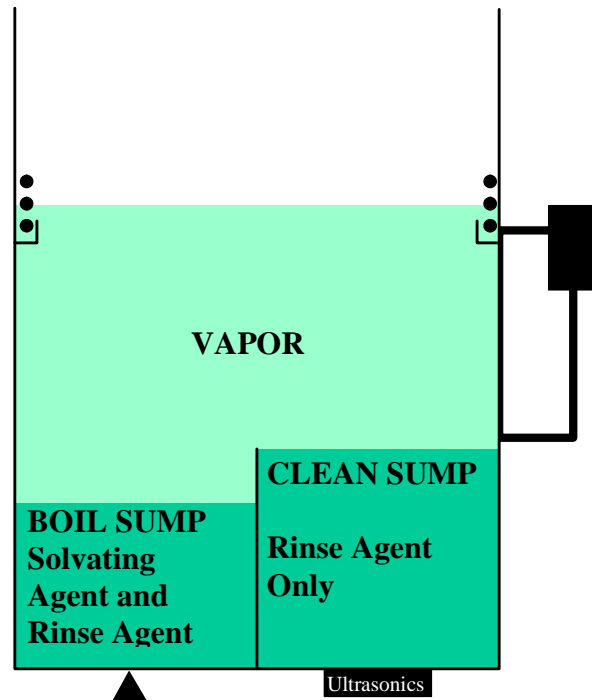
# LENIUM<sup>®\*</sup> FRA

## Electronic Cleaning Solvent

**Description**      LENIUM FRA is a binary azeotrope of fluorocarbons specially formulated to be used a rinsing agent in a vapor degreasing co-solvent process. It can also be used as a flush solvent for particle counting analysis as well as a carrier fluid for fluoro-lubricants.

**Process**            LENIUM FRA is designed for use in a vapor degreasing process. This product can be used in existing vapor degreasing equipment (batch or in line), but emission control retrofits may be useful in reducing vapor losses. If existing equipment is utilized, it is necessary to adjust temperature control settings.

Petroferm has developed a comprehensive user's manual that covers all aspects of operating a LENIUM FRA vapor degreasing process. Topics discussed in the manual include process parameters, equipment start-up and operational procedures, solvent maintenance, and health, safety, and disposal information. If converting from another solvent to a LENIUM product, please consult the operator manual and your Petroferm representative.




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\* LENIUM is a registered trademark of Petroferm Inc.

**Typical Properties** The physical and environmental properties of LENIUM FRA are compared to other halogenated solvents in Table 1.

**Table 1.**

	<b>LENIUM FRA</b>	<b>Trichloro-ethylene</b>	<b>HCFC-141b</b>	<b>HCFC-225</b>	<b>Methylene Chloride</b>	<b>1,1,1-TCA</b>
Flash Point (TCC)	None	None	None	None	None	None
Boiling Point	108 (42C)	189°F (87°C)	90°F (32°C)	129°F (54°C)	104°F (40°C)	165°F (74°C)
Specific Gravity @ 25°C	1.28	1.46	1.24	1.55	1.33	1.32
Viscosity @ 25°C	0.34 cps	0.54 cps	0.43 cps	0.59 cps	0.43 cps	0.79 cps
Surface Tension (dynes/cm)	14.8	26.4	19.3	16.2	28.2	25.6
Vapor Pressure @ 20°C	398 mm Hg	57.8 mm Hg	593 mm Hg	283 mm Hg	349 mm Hg	100 mm Hg
Evaporation Rate (TCA = 1)	-	0.57	>1	>1	1.64	1
Specific Heat @ 25°C	0.30	0.22	ó	0.25	0.28	0.25
Heat of Vaporization	41.4 cal/g	57.2 cal/g	52.3 cal/g	33 cal/g	78.7 cal/g	57.5 cal/g
Solubility in Water	-	110 ppm	180 ppm	330 ppm	140 ppm	70 ppm
Solubility of Water	720 ppm	300 ppm	420 ppm	300 ppm	6 ppm	500 ppm
Flammability Limits (vol %)	-	8 - 10.5	7.6 - 17.7	None	14 - 22	7 - 13
Kauri Butanol (KB) Value	-	129	56	31	136	124
GWP	890-1300	0	620	620	10	110
ACGIH TLV	500 ppm	50 ppm	500 ppm	50 ppm	25 ppm	350 ppm

**Compatibility**

The following metals are generally compatible with LENIUM FRA:

Steel, iron, stainless steel, copper, brass, bronze, aluminum, zinc and die cast alloys.

LENIUM FRA was also tested for compatibility with plastics and elastomers. Coupons were immersed in LENIUM FRA at ambient temperature for 15 minutes.

**Table 2. Effects of LENIUM FRA on Plastics and Elastomers**

<b>Plastic</b>	<b>Compatible</b>	<b>Incompatible</b>
ABS	X	
PVC	X	
POLYESTER, PET, PBT	X	
POLYPROPYLENE	X	
Teflon® (PTFE, ETFE)	X	
<b>Elastomers</b>		
ETHYLENE PROPYLENE	X	
HYPALON®	X	
NITRILE		TEST
POLYACRYLATE		X
POLYCHLOROPRENE	X	
POLYISOPRENE POLYBUTADIENE	X	
SILICONE		TEST
STYRENE BUTADIENE	X	
Viton®		X

Hypalon and Viton are registered trademarks of DuPont Dow Elastomers. Teflon is a registered trademark of DuPont.

**Environmental and Regulatory**

**Table 3.**

Ozone Depletion Potential (ODP)	Zero
Global Warming Potential (GWP)	890-1300
Volatile Organic Compound (VOC)	Exempt
Significant New Alternatives Program (SNAP)	Yes
Hazardous Air Pollutants (HAP)	No
National Emission Standards for Hazardous Air Pollutants (NESHAP)	Not regulated
Superfund Amendments and Reauthorization Act (SARA)	Not regulated
Resource Conservation and Recovery Act (RCRA)	Not regulated
Toxic Substance Control Act (TSCA)	SNUR* 40 CFR 721.5645
Canadian Environmental Protection Act (CEPA)	SNAC**

\*One component of LENIUM FRA is subject to a TSCA Section 5, Significant New Use Rule (SNUR; 40 CFR 721.5645). The uses approved by the SNUR are: precision and general cleaning, carrier fluid, displacement drying, printed circuit board cleaning, particulate removal and film cleaning, process medium, heat transfer fluid (dielectric and non-dielectric), and test fluid. Processors and users of this substance must also comply with the applicable general SNUR requirements set forth in 40 CFR 721 subpart A, including export notification requirements if applicable (40 CFR 721.20), and the applicable record keeping requirements set forth at 40 CFR 721.125. Refer to the MSDS for more detail.

\*\*Another component of LENIUM FRA is listed on the Canada Domestic Substance List (DSL) with a restriction that it can only be used as a foam-blowing agent, cleaning agent, diluent or solvent. Notification is required for any activity involving, in a calendar year, more than the threshold value for other uses whether imported or manufactured as such would constitute a Significant New Activity (SNAC) under subsection 81(3) of the Canadian Environmental Protection Act. Refer to the MSDS for more detail.

**Safety and Toxicity**

Please see Material Safety Data Sheet for detailed information.

**Disposal**

Petroferm recommends contacting your current or local environmental service company for disposal of this product. The most common and economical method of disposal is incineration of used material in compliance with all applicable government regulations. Used LENIUM FRA can also be delivered to a solvent reclaimer.

**Packaging**

LENIUM FRA is available in 5-gallon pails (45 lb/21 kg) and 55-gallon drums (500 lb/ 227 kg). Samples are available in one-quart and one-gallon containers.

**Storage**

LENIUM FRA should be stored in the original container, preferably in a cool, ventilated, fire-resistant building.

**Shelf Life**

The shelf life for this product is indefinite when it is stored in its original, sealed container at room temperature. However, the product should be inspected after the designated date on the product label (twenty-four months from the date of manufacture) prior to customer use.

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