

Frank's Funky Formula

Vapor-Degreasing Solvent

Technical Data Sheet

Introducing FFF!

Frank's Funky Formula is a blend of non-flammable hydrofluoroethers and trans-1,2-dichloro-ethylene designed to maximize solvency.

Frank's Funky Formula is a drop-in replacement for trichloroethylene (TCE), n-propyl bromide (nPB), and Chemours Vertrel™ SDG as well as a substitute for cleaners such as Asahi AK-225 (blend of HCFC-225 ca/cb) and HCFC-141b. By replacing these environmentally harmful chemicals with Frank's Funky Formula, there is no concern for staying within the environmental restrictions of these chemicals.

As an economically feasible option for vapor-degreasing solvents, Frank's Funky Formula is a desirable choice with its exceptional performance and minimal environmental impact.

Benefits of Frank's Funky Formula

Frank's Funky Formula is a vapor-degreasing solvent with excellent performance, is safe for workers to handle, and is environmentally friendly with properties including:

- No ozone depletion
- Drop-in replacement
- Low global warming potential
- Low toxicity
- High allowable exposure limit
- Chemically stable
- Superior cleaning performance due to high wetting index

Technology and Performance

The blending technology used to create Frank's Funky Formula utilizes the chemical solvency of the fluid as well as physical properties like high density, low surface tension, and low viscosity for greatest performance. To clean metals in the shortest amount of time, the solvent must flow extremely close to the surface of the metal to remove contaminants. We engineered Frank's Funky Formula by specifically blending the material to have a high wetting index. Field data provides a strong correlation between high wetting index and overall cleaning performance. (See figure below).

Industry Conformity Testing

Frank's Funky Formula has been subjected to a variety of industry testing including:

Boeing D6-17487 Revision P	Solvent Cleaners; General Cleaning
ARP 1755 B	Effect of Cleaning Agent on Aircraft Engine Materials
Douglas Aircraft Company	Type 1: Materials and Procedures for General Exterior Cleaning of Painted and Unpainted Surfaces (General Purpose Cleaner)

Physical Properties

Property	FFF	Asahi AK-225	Chemours Vertrel® SDG	Honeywell Solstice®	TCE	nPB
Boiling Point °C [°F]	42 [108]	54 [129]	43 [109]	19 [66]	87[189]	71[160]
Density at 25°C (77°F) kg/liter [lb/gal]	1.29 [10.8]	1.29 [10.8]	1.28 [10.7]	1.27 [10.6]	1.46 [12.15]	1.35 [11.26]
Surface Tension at 25°C (77°F) dyne/cm	19.1	16.2	21.2	12.7	32.3	25.9
Viscosity at 25°C (77°F), cPs	0.45	0.59	0.59	0.53	0.54	0.49
Vapor Pressure at 25°C (77°F) kPa	50.9	38.5	51.7	152	9.9	20.3
Heat of Vaporization @bp cal/g	65.3	35	67.3	45.6	56	58.8
Global Warming Potential	<30	370	148	1	n/a	n/a
Ozone Depleting Chemical	No	Yes	No	No	No	No
Volatile Organic Compounds (VOC) g/l	1,035	0	1,150	0	1,270	1,350
Allowable Exposure Limit (AEL) ppm	355	100	200	800	10	<10
Worker Exposure Ceiling (ppm)	No	No	400	No	30	10
KB Value	95	31	95	25	120	125

Worker Safety

Frank's Funky Formula has low toxicity demonstrated from acute toxicity studies. The Acceptable Exposure Limit (AEL) is 335 ppm based on individual components in the solvent and was calculated in accordance with ACGIH formulas for TLVs for mixtures. The AEL is an airborne inhalation exposure limit that determines time-weighted concentration levels that a worker may be exposed to repeatedly without adverse effects. Refer to the SDS for information regarding detailed exposure limits and toxicity-related data.

Frank's Funky Formula is worker friendly since its individual components do not have any chronic or acute toxicity associated with them. Review the Material Properties table to view comparative data on other available solvent options.

By NFPA and DOT definitions, Frank's Funky Formula exhibits no closed cup or open cup flash point and is not classified as a flammable liquid. However, since it is volatile, vapors may become flammable in air. Vapor flammability units and flash point data are in the Flammability Table.

Storage Info

Frank's Funky Formula is a stable solvent thermally and chemically. Important properties for storage include:

- Non-reactive
- Low affinity for water
- Air exposure will not cause oxidation
- UV exposure will not cause degradation

Per typical industrial storage practices, the solvent should be kept away from food sources and extreme temperatures. Freezing temperatures will cause drum compression and hot temperatures will cause drum ballooning. The product remains usable in any of these conditions.

Recycling!

By adding commercially available modular recycling units, Frank's Funky Formula can be reclaimed and reused through a simple process. With its phenomenal chemical stability, recycling can recover the solvent with a typical yield range of 80 to 95% resulting in sizable savings. Contact technical services for more information!

Material Compatibility

FluoSolv® CX is compatible with a range of materials including all metals, ceramics, and other non-conducting materials. Only a few elastomer materials are non-compatible such as Viton and Kalrez that cause swelling. Before using FluoSolv® CX, additional testing is recommended for all materials.

Testing is recommended prior to use for all compatible materials.

	Compatible	Additional Testing Required
Metals	Aluminum, Copper, Stainless Steel, Titanium, Brass, Tungsten	N/A
Elastomers	Neoprene, Butyl Rubber	Viton, Kalrez
Plastics	Nylon, Epoxy, Phenolic, HDPE, PTFE, PVC	ABS, Acrylic,

Frank's Funky Formula Specifications

A typical FluoSolv® CX composition is:

Hydrofluoroethers	<30 wt%
Trans-dichloroethylene	>70 wt%
Water	<100 ppm
Non-volatile Residue	<100 ppm (drums) <200 ppm (pails)
Appearance	Clear, odorless

Flammability

	Test Method	Frank's Funky Formula
Closed Cup Flash Point	ASTM D93	None
Douglas Aircraft Company	ASTM D1310	None
Vapor Flammability in Air	ASTM E681	
Lower Explosivity		9.7 vol%
Upper Explosivity		12.8 vol%