

# Versatill® HD Designed Fluid

## Description

Versatill® Designed Fluids are based on fluorinated (HFE) and chlorinated (t-DCE) carbons and cover a wide spectrum of applications: from elastomer and plastic cleaning, to cleaning -defluxing of electronic components and assemblies; precision-cleaning of any metal parts, to heavy-duty degreasing of metals, in cold-immersion or through vapor-degreasing. Versatill® Fluids are non-flammable, environmentally sound, user-friendly and economical, making them ideal cost-effective and efficient replacements for ANY non-flammable brominated, chlorinated or fluorinated solvent.

Versatill® HD is an aggressive cleaner with azeotropic properties, aimed at degreasing and cleaning metal and ceramic surface, and may be utilized in existing vapor degreasing equipment after minimal adjustments. It is an excellent replacement for many solvents, including CFCs, PFCs, HFEs, HCFCs (HCFC-141b, HCFC-225) and aqueous cleaners, in terms of performance and cost.

## Features

- Ideal for immersion cleaning and with existing vapor degreaser processes
- Outstanding performance; highest solvency in its class and low surface tension
- Designed for cleaning heavy greases, oils, waxes, silicones and non-polar contaminants with high soils loading capacity
- Stable composition; additive and maintenance-free use in vapor degreaser
- Non-flammable and low in odor and toxicity for an excellent safety profile
- Environmentally Sound – GWP < 23 and ZERO Ozone Depletion Potential
- Replacement for nPB, TCE, ozone-depleting HCFC and other inefficient, harmful HFC
- Faster cycle times, fast drying, lower energy use

## Typical Physical Properties

The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications are available by request.

Properties	Versatill® HD	Novoc™ 73DE	Opteon™ SE79	nPB	TCE	HCFC- 141b	HCFC- 225
Boiling Point (°C/°F)	48 (118)	48 (118)	47 (117)	71 (160)	87(188)	32 (90)	54 (129)
Liquid Density (g/mL)	1.29	1.28	1.29	1.35	1.44	1.24	1.55
Surface Tension (dynes/cm)	20	19.9	21	26	32	32	16
Kauri-Butanol Value	112	83	103	125	129	129	31
Vapor Pressure mmHg @ 20°C (68°F)	352	263	335	112	N/A	518	216
Viscosity (cP)	0.41	0.38	0.42	0.49	0.54	0.54	0.59
Heat of Vaporization (cal/g @ boiling point)	59.5	54.2	66.9	58.8	56.4	56.4	34.6

Data compiled from publicly available sources. Not for specification purposes.

## Applications

- Cleaner-Degreaser of oil, grease, wax, silicone and non-polar contaminants
- Immersion and cold cleaning
- Vapor-degreasing after minimal adjustments
- Defluxing printed circuit boards
- Precision cleaning
- Metal cleaning
- Carbon removal
- Silicone stripping
- Drying agent

## Environmental Properties and Safety Profile

Properties	Versatill® HD	Novec™ 73DE	Opteon™ SE79	nPB	TCE	HCFC-141b	HCFC-225ca/cb
Ozone Depletion Potential (ODP)	0	0	0	0.026	0	0.1	0.03
Global Warming Potential (GWP)	23	47	15	<1	<1	782	127/525
Flash Point (TCC)	None	None	None	None	None	None	None
Flammability Limits (v%)	7-15	6-14.5	7.2-15.2	4-7.8	8.3-12.5	7.6-17.7	N/A
Exposure Guideline (ppmv)	200	200	200	0.1	10	500	50

Data compiled from publicly available sources. Not for specification purposes.

## Material Compatibility

Testing of Versatill® HD Designed Fluid concluded compatibility of a wide range of metals, plastics and elastomers.

Metal <sup>+</sup>		Plastics <sup>++</sup>		Elastomers <sup>++</sup>	
Compatible	Incompatible	Compatible	Incompatible	Compatible	Incompatible
Aluminum		Acetal	ABS	PTFE	Silicone
Brass		Epoxy	Acrylic	Perfluoroelastomers	Fluorosilicone
Carbon Steel		Nylon	Polycarbonate	Parfluor™	Buna N
Copper		PEEK	Styrene	Viton™ (perfluor)	Viton™ Non-fluor
Inconel		Polyester	PolySulfone	PTFE with EPDM	EPDM
Magnesium		Polyethylene			Butyl rubber
Monel		Polypropylene		PTFE with Neoprene	Neoprene
Stainless Steel		PTFE			
Titanium					

<sup>+</sup>Metals tested in accordance with Mil-T-81533A, the metal corrosion test

<sup>++</sup>Plastics and elastomers were tested for changes in weight, dimensions and appearance after immersion in boiling temperatures for minutes followed by an hour drying.

## Conformity

Versatill® HD Designed Fluid conforms to the following specifications:

- **AMS 1562B** Aircraft exterior surfaces (except for ASTM F484 Acrylic Stress Cracking)
- **ARP 1755B** Aircraft engine cleaning
- **ASTM-F-945** Stress Corrosion of titanium alloys (aircraft engine)
- **Boeing D6-17487P** Exterior and general cleaner

## Regulations

With its favorable health and environmental properties, t-DCE is subject to less stringent and fewer regulations than other chlorinated solvents.

- Versatill® HD is not reportable under SARA 313
- Versatill® HD is not regulated as a hazardous waste under RCRA
- Versatill® HD is not regulated as a hazardous air pollutant under NESHAP

## Packaging & Storage

Versatill® HD is available in 250 Kg drums (551 lbs) and 23 Kg pails (50 lbs).

This product should be stored in original containers, in a cool, dry and ventilated place. Do not expose to temperatures higher than 120°F

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