

# DuPont™ Vertrel® Sion™ Cleaning Fluid

## PRODUCT INFORMATION

### Introduction

DuPont™ Vertrel® Sion™ is an azeotropic mixture of a fluorocarbon and trans-1,2-dichloroethylene (t-DCE). It has the strongest solvency strength of any fluid in its class, and is designed to replace trichloroethylene (TCE), n-propyl bromide (nPB), and other strong solvency fluids where maximum cleaning power is needed. It is also an ideal substitute for HCFC-225, HCFC-141b, HFEs, PFCs, CFCs, HFC-365 blends, and aqueous cleaners.

### Features and Benefits

- Best solvency power in its class (Kb Value = 100) for superior cleaning performance.
- Fast drying and optimum boiling point (117 °F/47 °C). Cleaned parts are immediately ready for use and can be handled.
- High soil loading factor. Boosts process productivity by increasing the time between equipment clean out.
- Azeotrope: Stable composition throughout use.
- No stabilizer maintenance required. Easy to maintain and use.
- In general, existing vapor degreasing equipment can be used with minor or no modifications required. See DuPont™ Retrofit Guidelines for details.
- No surfactants: No extra washing is needed for residue free cleaning
- Recyclable and reusable: Reduces cost of ownership and environmental footprint
- Non flammable
- Low odor
- Low toxicity
- Excellent environmental profile: Low GWP, no ODP.

### Typical Applications

- Oil, and grease removal
- Precision cleaning
- Defluxing
- Silicone removal
- Vapor degreasing
- Cold cleaning

### Physical Properties

Table I.

Property	Units	DuPont™ Vertrel® Sion™
Boiling Point	°C	47
	°F	117
Liquid Density	g/cm <sup>3</sup>	1.28
	Lb/gal	10.7
Saturated Vapor Density at 25 °C (77 °F)	Kg/m <sup>3</sup>	1.80
	Lbs/ft <sup>3</sup>	0.11
Surface Tension	Dyn/cm	~21
Vapor Pressure at 25 °C (77 °F)	kPa	44.1
	psia	6.4
Viscosity at 25 °C (77 °F)	cP	0.42
Liquid Thermal Conductivity	mW/m-K	127
Heat Capacity at 25 °C (77 °F)	kJ/kg K	1.092
	BTU/lb F	0.26
Heat of Vaporization at Boiling Point	kJ/kg	250
KB Value		100



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## Performance Evaluations

Vertrel® Sion™ was evaluated for performance using typical coupon cleaning tests according to ASTM D122/123. Below are examples of the results from performance evaluations. Contact DuPont™ to initiate a cleaning trial in one of our regional cleaning laboratories, or obtain a sample for on-site testing.

**Table II. Performance evaluations of DuPont™ Vertrel® Sion™ cleaning agent**

	Contamination Level (mg/cm <sup>2</sup> )	% Contamination Removed (avg of three trials)
Mineral Oil	2.00	100%
Hydraulic Fluid (MIL-PRF-83282)	3.29	100%
Grease (MIL-PRF-81322)	16.27	100%

## Solubility

Vertrel® Sion™ has the highest cleaning power of any cleaning fluid in its class as measured by the KB value (KB = 100). The KB value is determined by ASTM D1133 and is a well known measure of solvency strength. In general, the higher the KB value, the greater the cleaning power.

The solubility of Vertrel® Sion™ for various contaminants are shown in Table III.

**Table III. Solubility of Various Contaminants in Vertrel® Sion™**

Contaminant	Solubility
Mineral Oil	Miscible
Hydraulic Fluid (MIL-PRF-83282)	Miscible
Grease (MIL-PRF-81322)	Miscible
Silicone (DC-704)	Miscible
Skydrol®	Miscible

## Materials Compatibility

Vertrel® Sion™ was found to be compatible with most metals, plastics and elastomers. Consult DuPont for your specific plastic and elastomer compatibility.

## Safety, Toxicity and Environmental

Vertrel® Sion™ exhibits no closed or open cup flash point and is not classified as a flammable liquid by NFPA or DOT. The product is volatile, and if allowed to evaporate and mix with air, the vapor may become flammable in the concentrations shown below. Flash point data and vapor flammability limits in air are shown in the table below.

**Table IV. Safety, Toxicity, and Environmental Properties**

Property	Units	
Flash Point, CC, ASTM D56	C	None
Flash Point, OC, ASTM D1310	C	None
Vapor Flammability Limits	%Vol	7-14
Ozone Depletion Potential	–	0
Global Warming Potential	–	<1
Occupational Exposure Limit	ppm	201

## Storage and Handling

Vertrel® Sion™ is thermally stable and does not oxidize or degrade during storage. Store in a clean, dry area. Protect from freezing temperatures. Do not allow stored container to exceed 52 °C (126 °F). Shelf life in unopened packages properly stored is 2 years.

Package sizes for Vertrel® Sion™ are 20 kg (metal pail) and 227 kg (steel drum).

Viton® gloves are recommended when handling Vertrel® Sion™.



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