

Vertrel™ SDG Select

Specialty Fluid

Precision Cleaning and Degreasing

Technical Information

Introduction

Vertrel™ SDG Select is an engineered mixture of nonflammable hydrofluorocarbons (HFCs) and trans-1,2-dichloroethylene (t-DCE).

Vertrel™ SDG Select is designed to replace trichloroethylene (TCE) and n-propyl bromide (nPB) and perform in applications where maximum cleaning power is needed. It can also be used as a substitute for other cleaners, such as HCFC-225 and its blends, HCFC-141b, HFEs, PFCs, CFCs, and aqueous cleaners, where safety and environmental concerns and/or floor space and cleanliness are at a premium.

Vertrel™ SDG Select has excellent solvency power for a wide range of soils, including oils, greases, waxes, and hydraulic fluids. The high solvency power, low surface tension, and non-flammability properties of Vertrel™ SDG Select make it an ideal ultrasonic vapor degreasing solvent.

Features and Benefits

Vertrel™ SDG Select does a good job balancing performance with favorable environmental and worker safety properties.

- Excellent solvency power (Kb value = 95): Superior cleaning performance
- Good solvency for silicone fluids
- Fast drying: Increases productivity
- Low surface tension: Able to penetrate and clean tight areas
- Compatible with most plastics, elastomers, and metals
- Can be used with ultrasonics

- Nonflammable
- Low toxicity
- Zero ozone depletion potential (ODP)
- Low global warming potential (GWP)
- Existing equipment can be used with minor or no modification
- No surfactants needed: Residue-free cleaning is promoted.

Typical Applications

Vertrel™ SDG Select is ideal for a wide range of cleaning applications, including:

- Oil, grease, and wax removal
- Silicone carrier fluid
- Silicone grease removal
- Precision cleaning

Specification Conformity Tests

Vertrel™ SDG Select has been tested in a variety of industry tests, including:

- Boeing BAC5408 Vapor Degreasing
- 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)



Environmental

Vertrel™ SDG Select has zero ozone depletion potential (ODP) and low global warming potential (GWP). See **Table 1** for various environmental properties of Vertrel™ SDG Select. Vertrel™ SDG Select is accepted by the U.S. Environmental Protection Agency (EPA) under the Significant New Alternatives Policy (SNAP) program as a substitute for ozone-depleting substances (solvent category). It is not SNAP-approved for aerosol packages.

Table 2. Physical Properties

| Property | Vertrel™ SDG Select | HCFC-225 ca/cb | TCE | nPB | CFC-113 | HCFC-141b |
|--|---------------------|----------------|---------------|---------------|---------------|-----------------|
| Boiling Point, °C (°F) | 43 (109) | 54 (129) | 87 (189) | 71 (160) | 48 (118) | 32 (90) |
| Freezing Point, °C (°F) | <-50 (<-58) | -131 (-204) | -86 (-123) | <-76 (<-105) | -35 (-31) | -103.5 (-154.3) |
| Liquid Density, kg/L (lb/gal) | 1.29 (10.8) | 1.55 (12.9) | 1.46 (12.15) | 1.35 (11.26) | 1.56 (13.06) | 1.23 (10.26) |
| Surface Tension at 25 °C (77 °F), N/m (dyn/cm) | 0.0212 (21.2) | 0.0162 (16.2) | 0.0323 (32.3) | 0.0259 (25.9) | 0.1073 (17.3) | 0.0193 (19.3) |
| Viscosity at 25 °C (77 °F), cP | 0.59 | 0.59 | 0.54 | 0.49 | 0.47 | 0.43 |
| Vapor Pressure at 25 °C (77 °F) | | | | | | |
| kPa | 51.7 | 38.5 | 9.9 | 20.3 | 44.5 | 76.9 |
| atm | 0.51 | 0.38 | 0.099 | 0.20 | 0.44 | 0.75 |
| psia | 7.5 | 5.6 | 1.4 | 2.9 | 6.46 | 11.15 |
| Heat of Vaporization at Boiling Point, kJ/kg (cal/g) | 283 (67.1) | 146 (35) | 237.9 (56) | 248.0 (58.8) | 148 (35) | 225 (53.2) |
| Heat Capacity at 20 °C (77 °F), kJ/kg·°C (Btu/lb·°F) | 1.12 (0.27) | 1.2 (0.29) | 0.87 (0.21) | - | 0.87 (0.21) | 1.41 (0.34) |
| Kb Value | 95 | 31 | 129 | 125 | 37 | 56 |

Safety/Flammability/Storage

Data from acute toxicity studies has demonstrated that Vertrel™ SDG Select has low toxicity. It has a calculated Acceptable Exposure Limit (AEL) of 193 ppm, based on its individual components. AEL is an airborne inhalation exposure limit established by Chemours that specifies time-weighted average (TWA) concentrations to which nearly all workers may be repeatedly exposed without adverse effects. The calculated AEL is in accordance with ACGIH formulas for TLVs for mixtures. Vertrel™ SDG Select is a slight skin and eye irritant and has low acute inhalation toxicity.

Please refer to the Safety Data Sheet (SDS) for information on detailed exposure limits and toxicity-related data.

Vertrel™ SDG Select exhibits no closed cup 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. Flash point data and vapor flammability limits in air are shown in **Table 3**.

Table 1. Environmental Properties

| Property | Vertrel™ SDG Select |
|--|---------------------|
| Ozone Depletion Potential (ODP) | 0 |
| Global Warming Potential (GWP/100 yr ITH)* | 148 |
| Volatile Organic Compounds (VOC, g/L) | 1,150 |

*IPCC Second Assessment Report (1995)

All components are listed in the TSCA inventory. Refer to the SDS for regulatory information.

Addition of alcohols, such as methanol, ethanol, or isopropanol, to Vertrel™ SDG Select will increase the flammability of Vertrel™ SDG Select. Therefore, it is recommended that alcohol should not be mixed with Vertrel™ SDG Select.

Table 3. Flammable Properties

| Property | Test Method | Vertrel™ SDG Select |
|---|-------------|---------------------------------|
| Closed Cup Flash Point | ASTM D93 | None |
| Open Cup Flash Point | ASTM D1310 | None |
| Vapor Flammability in Air Lower Explosivity Limit Upper Explosivity Limit | ASTM E681 | 7 vol% in air 14 vol% in air |

Vertrel™ SDG Select is thermally stable and does not oxidize or degrade during storage. Store in a clean, dry area. Protect from freezing temperatures. If solvent is stored below -10 °C (14 °F), mix prior to use. Do not allow stored product to exceed 52 °C (125 °F) to prevent leakage or potential rupture of container from pressure and expansion.

Disposal and Recovery of Spent Solvent

Please read SDS and discuss disposal options with a knowledgeable Chemours or distributor representative prior to disposal or recovery. The presence of high concentrations of certain soils (such as petroleum-based lubricating oils) may affect the flammability characteristics of the material during disposal and/or recovery operations. Users should test for flammability in their particular application and test the spent Vertrel™ SDG Select to ensure proper classification for waste disposal.

Material Compatibility

Vertrel™ SDG Select is compatible with metals. Plastics that may show signs of softening, swelling, or other changes include acrylics, ABS, and polycarbonate. Elastomers, if affected, will generally revert to within a few percent of original size after air-drying. Prior to use, testing of plastics and elastomers should be performed under conditions expected during normal operation (e.g., time in contact with Vertrel™ SDG Select, temperature, etc.). For more information on material compatibility, contact Chemours or a Vertrel™ distributor.

Contact with highly basic materials, pH 10 and above, is not recommended.

Product Description, Packaging, and Availability

Table 4. Vertrel™ SDG Select Composition (Typical)

| Property | Vertrel™ SDG Select |
|---------------------------------|----------------------------|
| Hydrofluorocarbon Mixture, wt% | 17–20 |
| Trans-1,2-dichloroethylene, wt% | 80–83 |
| Water, ppm | <200 |
| Nonvolatile Residue, ppm | <10 (drums) <50 (pails) |
| Appearance | Clear, colorless |

Vertrel™ SDG Select is available commercially in 55-gal (208-L) drums with a net weight of 500 lb (227 kg) and in 5-gal (19-L) pails with a net weight of 45 lb (20 kg).

For more information on Vertrel™, please visit vertrel.com or call (800) 235-7882.

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