MicroCare®

Technical Information

MicroCare® HDS Heavy Duty Degreasing Solvent

For Precision Metal Cleaning

Introduction

The MicroCare® HDS Heavy Duty Degreasing Solvent is a near-azeotropic solvent consisting of HFC-43-10 (2,3-dihydrodecafluoropentane), HFC-365mfc (pentafluorobutane) and trans-1,2-dichloroethylene. It has "zero" ozone depletion potential and a low global warming potential, making it an ideal replacement for HCFC-141b, HCFC-225 and perfluorocarbons (PFCs) in many applications.

This Technical Information Sheet summarizes product properties, application and use, safety, health, environmental and regulatory information. Users should also consult the Material Safety Data Sheet (MSDS) for additional information.

Applications

This formula is ideally suited for use in both vapor degreasing equipment and in "cold cleaning" applications such as cleaning of hydraulic lines, and related equipment. It has enhanced solvency for hydrocarbon soils, making it particularly effective in many precision cleaning applications. It also can be used as a carrier fluid for silicone and other materials of lubrication and mold release applications.

Vapor degreasing should be used for optimum cleaning effectiveness and economy. Modern vapor containment technology is recommended for batch and in-line equipment. These systems have higher freeboard and a secondary set of low temperature (-29˚C /-20˚F) condenser coils to reduce vapor losses. For more information about cleaning equipment, contact MicroCare.

The MicroCare HDS Heavy Duty Degreasing Solvent has a broad range of cleaning capabilities. The typical soils readily removed from parts in a normal vapor degreasing cycle include:

Cutting Oils	Gear Oils
Heavy Greases	Hydraulic Oils
Stamping Oils	Vacuum Oils
Wax	Mineral Oils

Environmental

The ingredients of this formula are listed as "Acceptable" by the U.S. Environmental Protection Agency (EPA) under the Significant New Alternatives Policy (SNAP) program as a substitute for ozone depleting substances. It has an Ozone Depletion Potential (ODP) of zero. It is an effective alternative to hydrofluorocarbons (HCFCs), n-Propyl Bromide (nPB), and perfluorocarbons (PFCs) in many mission critical, drying, carrier fluid and similar high-value specialty uses where reliability is essential.

All of the ingredients of HDS Heavy Duty Degreasing Solvent are listed in the USA TSCA, and EU ELINICS. None of the ingredients in this formula are classified as Hazardous Air Pollutants (HAP) and thus not subject to NESHAP regulation. It is also not included in SARA Title III Section 313 list of toxic chemicals, and is not subject to SARA Title III (EPCRA) reporting requirements.

Physical and Chemical Properties

Table 1

Physical and Chemical Properties

Boiling Point, °C / °F	37° / 99°
Molecular Weight	125
Surface Tension, dyn/cm	19
K_b Value	48 (est)
Liquid Density, g/cc (lb/gal)	1.32 (11.0)
Carrier Evaporation Rate (Ether = 1)	>1
Vapor Pressure, mm Hg (psia)	497 (9.6)
Freezing Point, °C / °F	-30˚ / -22˚
Heat of Vaporization at Boiling Point, cal/g°C	48
Heat Capacity, BTU/lb°F	0.4
Viscosity, cPs	0.57
Flash Point, °C / °F Closed Cup (ASTM D 93)	None
Vapor Flammability in Air, vol %	
Lower Limit	06.5
Upper Limit	10.0

Plastic and Elastomer Compatibility

MicroCare HDS is compatible with the polymeric materials commonly encountered in precision parts. However, acrylic, ABS, and polycarbonate parts, especially if under stress, may show slight cracking or crazing and should be tested for compatibility. EPDM, butyl rubber, Buna-S and neoprene are recommended materials.

Table 2

Plastic Compatibility (15 Min. Immersion)

COMPATIBLE	
Polyethylene	Acetal
Polyvinylchloride	Epoxy
Polyester, PET, PBT	Liquid Crystal Polymer
Polyimide, PI, PEI, PAI	Phenolic
Polyetherketone, PEK	PTFE, ETFE
Polyaryletherketone, PEEK	Chlorinated PVC
Polyarylsulfone, PAS	Ionomer
Polypropylene	ABS
Polyphenylene Sulfide, PPS	Polysulfone, PSO
INCOMPATIBLE	
Polystyrene	Acrylic
Polyphenylene Oxide, PPO	Cellulosic

Metals and Other Compatibility

The MicroCare HDS solvent is compatible with aluminum, copper, iron, with and without oil present. Contact with highly basic process materials, pH 10 or greater, is not recommended.

Safety/Exposure Limits

Data from acute toxicity studies has demonstrated that the MicroCare HDS solvent has low toxicity. It is a slight skin and eye irritant and has low inhalation toxicity. The listing below details the applicable exposure limits for the component materials for the MicroCare HDS Heavy Duty Degreasing Solvent.

The AEL and TLV limits are Time Weighted Average (TWA) concentrations for a normal 8 or 12 hour workday and a 40 hour work week to which nearly all workers my be repeatedly exposed, day after day, without adverse effect. Please read and understand the Material safety Data Sheet (MSDS) for this product for additional details.

Table 3
Worker Safety and Exposure Limits

Ingredient	Limit, PPM	Type
HFC-43-10 (2,3-dihydro-decafluoropentane)	200 400	8 & 12 hour TWA AEL(a) Ceiling(b)
HFC-365mfc (pentafluorobutane)	200	AEL(a) 8 hour TWA
Trans-1,2-dichloroethylene	200	8 hour TWA TLV(c)

NOTES:

(a) An AEL (Acceptable Exposure Limit) is an airborne inhalation exposure limit established by DuPont that specifies time weighted average concentrations to which nearly all workers may be repeatedly exposed without adverse effects.

(b) A ceiling limit is the concentration that should not be exceeded during any part of the working day. The ceiling for individual components applies to the blend product as well.

(c) A TLV (Threshold Limit Value) is an airborne inhalation exposure limit established by the American Conference of Government and Industrial Hygienists (ACGIH) that specifies time weighted average concentrations to which nearly all workers may be repeatedly exposed without adverse effects.

Safety/Flammability

The MicroCare HDS Heavy Duty Degreasing Solvent exhibits no flash point per Tag Closed Cup (TCC, ASTM-D 56) and Pensky-Martins Closed Cup (ASTM-D 93). It is not classified as a flammable liquid by NFPA or DOT. This product does have flammable limits in air with a LEL = 4.3 and a UEL of 13.5 (% by volume).

Recovery

This product has azeotropic properties that make it easily recoverable by off-line or in-line distillation equipment such as a vapor degreaser or a still. The presence of soil, however, may alter the characteristics of the material during recovery operations. Recovery should be closely monitored to ensure operating levels are maintained. Contact your MicroCare salesperson for assistance.

Storage/Handling

The MicroCare HDS Heavy Duty Degreasing Solvent is thermally stable and does not oxidize or degrade during storage. Store in a clean, dry area, out of direct sunlight and other sources of heat. 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.

Drum pumps are recommended to dispense this solvent from its container. Refer to the Material Safety Data Sheet for specific handling precautions and instructions. Contact MicroCare for additional assistance.

Specifications

Composition and specifications are detailed below:

Table 4
Composition and Specification

Ingredient	Content, % wt
HFC-43-10	25.0 +/- 1.0
HFC-365mfc	25.0 +/- 1.0
Trans-1,2-dichloroethylene	50.0 +/- 1.0
Nonvolatile Reside, by wt	100 ppm max
Moisture, by wt	200 ppm max

All ingredients are listed in the TSCA Inventory.

Ordering Information

# MCC-HDSD	500# (55 gallon) Drum
# MCC-HDSP	50# (5 gallon) Steel Pail
# MCC-HDSG	10# (1 gallon) Steel Pail
# MCC-HDSGG	10# (1 gallon) Glass Jug
# MCC-HDSL (sample only)	2# (1 liter) Metail Can

MicroCare®

Precision Cleaners

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