Tergo™ Performance Fluids

Chlorine-Free Cleaning Fluid

- Use in Existing Vapor Degreasers
- Fast, Effective, Safe
- Cleans Solder-Flux, Oil, Grease & Particulate

Tergo Chlorine-Free Cleaning Fluid is a non-flammable, non-chlorinated solvent for use in vapor degreasers. It has excellent materials compatibility and is designed to work at normal vapor degreasing temperatures. This Technical Information Sheet summarizes product properties, applications, safety, health, environmental and regulatory information. Users should also consult the Safety Data Sheet (SDS) for additional information.

Introduction

Tergo Chlorine-Free Cleaning Fluid is a non-halogenated, non-chlorinated blend with a high flash point, very high boiling point and a low vapor pressure. It acts as a solvating agent in a co-solvent process that employs two different solvents; one commonly referred to as a solvating agent and the other a rinsing agent. The solvating agent cleans all types of solder fluxes, oil, grease, wax, and particulate used in the electronic industry. The rinsing agent is a volatile nonflammable fluid that has a low boiling point, high vapor pressure and no flash point. Almost any existing two-sump vapor degreaser (Boil / Rinse Sumps) can be used for this cleaning process.

In a vapor degreaser, the solvating and rinsing agents are mixed together in a ratio that can range from 40/60 to 70/30 percent by volume. The solvating agent concentrates in the Boil Sump to lift and dissolve soils from part surfaces while the rinsing agent concentrates in the Rinse Sump to quickly rinse the solvating agent and soils from the part. This simple process allows for maximum cleaning flexibility and broad compatibility with plastics and elastomers. This process also eliminates the dependence on chlorinated solvents, which are traditionally used to enhance the cleaning properties of milder fluorinated solvents.

Application

Tergo Chlorine-Free Cleaning Fluid is engineered for use in most modern vapor degreasers to provide optimum cleaning effectiveness and economy for both batch
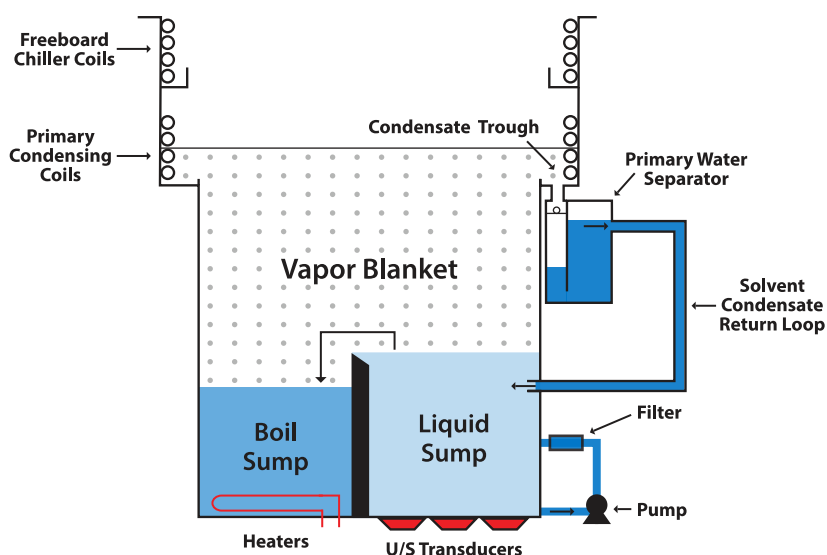
and in-line cleaning processes. The ideal vapor degreaser will be equipped with high freeboard and a secondary set of low temperature condenser coils, called Freeboard Chiller Coils, to greatly reduce diffusional vapor losses.

Tergo Chlorine-Free Cleaning Fluid is ideal in removing the following soils:

Oil and Grease	Particulates	Buffing Compounds
Paints	Flux Removal	Ionic Contamination
Wax	Finger Prints	Anti-Rust Agents

Substrates:

Common Alloys	PWAs	Plastics
Optics	Ceramics	Acrylics

Targeted Soils

Tergo Chlorine-Free Cleaning Fluid is formulated to remove a wide variety of contaminants, ranging from heavy greases, wax, and most PCB solder fluxes to water soluble soils. It has been engineered to target both organic and inorganic soils, so it effectively cleans parts that may have multiple cleaning challenges. Combined with a fast-drying rinse agent, this formulation is excellent at quickly cleaning all types of contamination in an easy to use process.

High Heat or Low Heat

High Heat Cleaning

All vapor degreasers use heated solvent to clean contaminated parts. Regulations have eliminated or restricted many of the traditional, higher boiling vapor degreasing solvents (1,1,1 TCA, TCE, PCE, nPB, etc.), that had sufficient temperature to remove stubborn soils, such as wax, pitch, and heavy greases. The newer, safer fluids boil at, or below 130 °F, which may not introduce enough thermal energy to remove these stubborn temperature sensitive soils. If these fluids are enhanced with trans-1,2 dichloroethylene, they may be too aggressive on certain substrates. *Tergo* Chlorine-Free Cleaning Fluid allows the option of vapor degreaser cleaning at higher operating temperatures, which can help dissolve materials like wax and heavy hydrocarbons.

Cooler Temperature Limit

Likewise, the *Tergo* Chlorine-Free Cleaning Fluid can be set in a vapor degreaser to safeguard parts which need to be kept below certain temperatures.

Table 1: Boiling Temperatures
Ratio (Vol. %); *Tergo* Chlorine-Free Cleaning Fluid to Rinse Agent

Tergo Chlorine-Free Cleaning Fluid	Rinse Agent	Boiling point °F/°C
75%	25%	175 °F / 79 °C
50%	50%	165 °F / 73 °C
25%	75%	126 °F / 52 °C
10%	90%	120 °F / 48 °C
5%	95%	118 °F / 47 °C

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Table 2: Physical Properties

	Tergo Chlorine-Free Cleaning Fluid	Rinsing Agent - *Tergo* XE
Boiling Point, °F (°C)	>567 (297)	126 (52)
Vapor Pressure, mmHg (20 °C)	0.0025	250
Liquid Density, g/cc (lb/gal) (25 °C)	0.898	1.52 (12.7)
Surface Tension, dyn/cm	- - -	14.1
Freezing Point, °F (°C)	-112 (-80)	n/a
Heat of Vaporization (at boiling point), cal/g (Btu/lb)	- - -	35 (62)
Heat Capacity, cal/g°C (Btu/lb°F)	- - -	0.27
Viscosity, cPs	- - -	0.73

Flash Point
    Closed Cup[1]
    Open Cup[2]
	- - -
	- - -
		None
		None

Vapor Flammability in Air, vol%
    Lower Limit
    Upper Limit
	- - -
	- - -
		None
		None

[1] *Setaflash Closed Cup Tester (ASTM D 3278)*
[2] *Tag Open Cup Tester (ASTM D 1310)*

Co-solvent Process, Setup and Sequence

Adjust the vapor degreaser set points to the appropriate boil point of the *Tergo* Chlorine-Free Cleaning Fluid /Rinse Agent ratio. (See **Table 3**)

High Temperature Controller (HTC)	Desired Boiling Point + 10°F (+6°C)
Safety Vapor Control (SVC)	Desired Boiling Point - 10°F (-23°C)
Primary Refrigeration Coils	~40°F (2-5°C)
Freeboard Chiller Coils if Available	35°F to -30°F (2°C to -15°C)

The Boil Sump is filled with the desired ratio of solvating and rinsing agent.
The Rinse Sump is filled with rinsing agent only.

Table 3: Process Sequence

| Step 1	After a vapor blanket has been established, immerse the parts in the Boil Sump
Step 2	Remove parts from Boil Sump and allow the solvent mixture to drain off the parts and back into the Boil Sump
Step 3	Immerse parts in the Rinse Sump
Step 4	Remove parts from Rinse Sump and hold in the vapor until condensation ceases
Step 5	Remove clean and dry parts from the vapor degreaser

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, and is exempt from classification as a volatile organic compound (VOC) by the EPA. It is an effective alternative to hydrofluorocarbons (HCFCs), n-Propyl Bromide (nPB), and perfluorocarbons (PFCs) in mission critical, drying, carrier fluid and similar high-value specialty uses where reliability is essential.

All of the ingredients of *Tergo* Chlorine-Free Cleaning Fluid are USA TSCA listed. 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.

Safety and Flammability

Tergo Chlorine-Free Cleaning Fluid 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.

Packaging and Availability

Part Number	Package		Weight	Size
MCC-TCFCF01EUP (Boil)	Steel Pail	40 FE	45 Lb (20.41 kg)	5 Gal (18.93 L)
MCC-TCFCFRIEUP (Rinse)	Steel Pail	40 FE	55 Lb (24.95 kg)	5 Gal (18.93 L)
MCC-TCFCF01EUD (Boil)	Steel Drum	40 FE	500 Lb (226.8 kg)	55 Gal (208.2 L)
MCC-TCFCFRIEUD (Rinse)	Steel Drum	40 FE	550 Lb (249.48)	55 Gal (208.2 L)

Note: Products sold by weight, not volume.

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