

Tergo™ HPFR2

High Performance Flux Remover 2

- Cleans Solder Fluxes, Ionic Contaminants, Particulates
- Can be used in existing vapor degreasers
- Specifically formulated to remove a wide spectrum of no-clean, lead-free, and RMA flux residues
- Eliminates white residue
- Solvates and displaces stubborn organic and inorganic soils

Introduction

Tergo High Performance Flux Remover 2 (HPFR2) is a patent-pending formulation combining a low boiling, volatile cleaning fluid with a non-volatile cleaning additive.

It is designed specifically to remove stubborn white residues and difficult no-clean fluxes that are often left behind during standard printed circuit board cleaning procedures. This advanced cleaning fluid is also highly effective in cleaning aged or partially polymerized fluxes and pastes.

This product bulletin summarizes product properties, applications, use, safety, health, environmental, and regulatory information. Users should also consult the appropriate Safety Data Sheet (SDS) for additional details.

Physical properties of Tergo HPFR2 are shown in Table 1.



Tergo™ Performance Fluids

The MicroCare™ Signature Line of Precision Products

Cutting-edge cleaning fluids meticulously crafted for diverse industrial applications. Each Tergo™ product boasts a distinctive formula and unparalleled operational attributes, all united by a common mission: to deliver efficient and sustainable performance.



Table 1. Physical Properties (Rinse)

Property ¹	Value
Appearance	Colorless to light
Boiling Point, °C (°F)	42 (108)
Liquid Density, g/cc (lb/gal)	1.35 (11.3)
Vapor Pressure, mmHg (psia)	360.4 (52.3)
Surface Tension, dyn/cm	18
Kauri Butanol Value	38
Heat of Vaporization (at boiling point), cal/g (Btu/lb)	48.8 (86)
Flash Point, °C (°F) Closed Cup ²	None

¹ At 25°C (77°F), except where indicated.

² Setaflash Closed Cup Tester (ASTM D 3278)

Using Tergo™ High Performance Flux Remover 2

Equipment

Tergo HPFR2 is created to be used in a properly designed, operated and maintained vapor degreaser system with an available boiling sump and at least one rinse sump. In addition to the primary condenser coils the vapor degreaser should be equipped with a second set of low-temperature condenser coils, also referred to as freeboard cooling coils.

On start up, the vapor degreaser will be charged with *Tergo* HPFR2 (Rinsing agent). The *Tergo* HPFR2 Additive (a concentrated non-volatile additive) is added to the boil sump only. One 16 oz. bottle of additive should be added to the boil sump for every pail of *Tergo* HPFR2 that the boil sump is charged with. Use Table 2 below as an example:

Table 2. Amount of Additive to Add to the Boil Sump per Pail of Rinse Solvent

<i>Tergo</i> High Performance Flux Remover Rinse (MCC-THPFR2P)	<i>Tergo</i> High Performance Flux Remover Additive (MCC-THPFR2APT)
½ Pail	½ Bottle
1 Pail	1 Bottle
2 Pails	2 Bottles

Tergo HPFR2 (Rinse agent) contains only the volatile portion of the cleaning agent and acts as the vapor and rinse solution. As the cleaning process is utilized, the *Tergo* HPFR2 Additive (non-volatile cleaning agent) and soils are concentrated in the boil sump while the volatile portion circulates by distillation between the boil and rinse sumps. Distillation of the rinse fluid provides a constant stream of clean solvent for final rinsing.

Use *Tergo* HPFR2 Rinse Agent to replace solvent losses from the rinse sump. When replacing solvent in the boil sump, always add 1 bottle of additive for every pail of rinse solvent used.

Contact your local sales representative with any questions.

Cleaning

Parts need to be immersed in the boil sump of the vapor degreaser to dissolve flux residues, white residues, oils, mild oxidation and other undesirable contamination.

Rinsing

Parts are then transferred from the boil sump and thoroughly rinsed in the solvent rinse sump to achieve optimal cleaning results. The distilled solvent rinse removes all remaining residues, including particulate or contamination remaining on the part surface, and then evaporates quickly leaving a clean, dry, part.

Recovery

The volatile flux remover and rinse fluid component in *Tergo* HPFR2 is easily recoverable by off-line or in-line distillation equipment such as a vapor degreaser or still.

The non-volatile cleaning additive component of the *Tergo* HPFR2 does not volatilize, and will remain in the boil sump with the soils. Fresh *Tergo* HPFR2 Additive should be added to the boil sump when the vapor degreaser is refilled in order to maintain optimum cleaning capabilities.

Safety/Flammability

Tergo HPFR2 exhibits no closed cup flash point. This product 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 are shown in Table 1.

Plastic and Elastomer Compatibility

Most plastics commonly used on printed wiring board assemblies can be safely cleaned in *Tergo* HPFR2. Acrylic, ABS, and polycarbonate parts, particularly if under stress, may show slight stress cracking or crazing damage and should be tested. EPDM, butyl rubber, Buna-S, and neoprene are recommended for elastomeric parts.

Elastomer swelling and shrinking will, in most cases, revert to original size after air drying. Swell, shrinkage, and extractables are affected by the compounding agents, plasticizers, and curing used in the manufacture of plastics and elastomers. Therefore, prior in-use testing is particularly important.

Tables 3 and 4 summarize test results on short-term exposures of unstressed plastics and elastomers simulating a typical cleaning cycle.

Table 3. Plastic Compatibility
Immersion: 15 Minutes at Room Temperature

Compatible	
Polyethylene	Acetal
Polypropylene	Epoxy
Polyester, PET, PBT	Liquid Crystal Polymer
Polyimide, PI, PEI, PAI	Phenolic
Polyetherketone, PEK	PTFE, ETFE
Polyaryletherketone, PEEK	Polyvinylchloride
Polyarylsulfone, PAS	Ionomer
Polyphenylene Sulfide, PPS	Chlorinated PVC
Polysulfone, PSO	
Incompatible ¹	
Polystyrene	ABS
Cellulosic	Acrylic
Polyphenylene Oxide, PPO	Polycarbonate

Table 4. Elastomer Compatibility
Immersion: 15 Minutes at Room Temperature

Compatible	
Buna N, NBR, Nitrile	Buna S, SBR, GRS
Butyl Rubber, IIR	EPM, EPDM, Nordel® Polysulfide
Natural Rubber, Isoprene	Neoprene
Urethane	Viton® B
Silicone	
Incompatible ¹	
Chlorosulfonated PE	

¹ Material composition varies depending upon compounding agents, plasticizers, processing, etc. Specific materials should be tested for compatibility with solvent.

Metals and Other Compatibility

Tests confirm that after exposure for two weeks at 36°C (97°F) in sealed tubes, the volatile flux remover and rinse fluid component is compatible with aluminum, copper, and iron, with and without rosin flux present. Large amounts of water may affect cleaning performance. Therefore, users should minimize the introduction of water into the system, and that the water condensed and separated in the primary and secondary water separators is allowed to properly drain.

Seals and Gaskets recommended for use with *Tergo* HPFR2 are Teflon (PTFE), PTFE encapsulated Silicone or FEP (Fluorinated Ethylene Propylene).

Safety/Exposure Limits

All components of the *Tergo* HPFR2 are listed as accepted by the U.S. Environmental Protection Agency (EPA) under the Significant New Alternatives Policy (SNAP) program, as substitutes for ozone-depleting substances.

All components of *Tergo* HPFR2 are listed in the TSCA inventory. The non-volatile cleaning additive is inherently biodegradable, VOC free, non-flammable, and non-regulated.

Storage/Handling

Tergo HPFR2 is thermally stable and does not oxidize or degrade during storage. Store in a clean, dry area. Protect from freezing temperatures. If stored below -10°C (14°F), mix prior to use. Do not allow stored containers to exceed 52°C (125°F) to prevent leakage or potential rupture of container from pressure and expansion.

When stored properly, *Tergo* HPFR2 has an unlimited Shelf Life. *Tergo* HPFR2 Additive has a shelf life of 2 years.



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