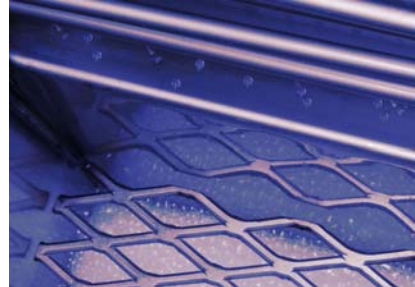




PRECISION V

VAPOR-DEGREASER FLUX REMOVER 1655



Introduction



Techspray has engineered solvent cleaners that offer exciting new options for precision cleaning. Precision-V cleaners are powerful, leave no residue, evaporate extremely fast, and are non-flammable with no flash-point. Electronics, optics, and metal parts are quickly and thoroughly cleaned, eliminating the need for further rinsing. Precision-V is non-ozone depleting, so ideal replacements for cleaners containing Freon, HFC-141b and AK225.

Flux Removers clean R, RA, RMA and SA type flux residues after high temperature reflow, wave and hand-soldering. Ideal for lead and lead-free processes.

Precision-V Vapor-Degreaser Flux Remover has azeotropic properties that allow it to maintain stable properties as it is cycled in a vapor-degreaser. It is not reactive nor corrosive to metals commonly found in the construction of vapor-degreasers.

Exposure to Precision-V solvents is less hazardous than many other solvents commonly used in vapor-degreasers: e.g. TCE (Trichloroethylene, CAS #79-01-6), nPB (n-Propyl Bromide, CAS #106-94-5), and Perc (Perchloroethylene, CAS #000127-18-4).

Precision-V solvents have a lower boiling point than most other vapor-degreaser solvents. This reduces heat-stress on components being cleaned and reduces energy consumption from the boil sump and chiller coils.

Features / Benefits

- Azeotropic Properties – Ideal for Vapor-Degreasers
- Much Safer Than nPB and TCE
- Non-Flammable
- Non-Ozone Depleting
- Residue-Free
- Rapid Evaporation
- Low Boiling Point – Lower Heat-Stress, Lower Energy

Applications

- Used in vapor-degreasers and as cold cleaner
- Removes flux residues electronic or electrical soldering
- Effective on both rosin and no-clean fluxes
- Effective for lead and lead-free soldering processes
- Removes light oils

Chemical Components

Component	CAS#
1,1,1,2,2,3,4,5,5,5-decafluoropentane (HFC-4310mee)	138495-42-8
1,2-transdichloroethylene	156-60-5
1,1,1,3,3-pentafluorobutane (HFC-365mfc)	406-58-6
Ethanol	64-17-5
Methanol	67-56-1
Nitromethane	75-52-5

Chemical Properties (MSDS available on request)

- EXPOSURE LIMIT: 278 ppm (weighted average)
- PHYSICAL STATE: Liquid
- ODOR: Faint ethereal odor
- APPEARANCE: Clear, Colorless liquid
- PERCENT VOLATILE: 100
- VAPOR PRESSURE: 129.34 mmHg@20C (VOC Composite Vapor Pressure)
- VAPOR DENSITY: > 1 (Air=1)
- BOILING POINT: 32.2°C (90°F)
- FLASHPOINT AND METHOD: None to boiling point --- Pensky Marten Closed Cup
- DENSITY: 1.3077 at 25°C
- VOC: 43% by weight (EPA)
- SURFACE TENSION: 17.2 dynes/cm

Exposure Limit Comparison

CLEANER	Toxicity (wt ave of TLV)
Precision-V Vapor-Degreaser Flux Remover	278 ppm
AK225 (1663)	270 ppm
AK225 ATE (1658)	243 ppm
AK225 T (1669)	281 ppm
AK225 ATMS (1664)	323 ppm
n-Propyl Bromide (nPB)	10 ppm
Trichloroethylene (TCE)	50 ppm
Perchloroethylene (Perc)	25 ppm
DuPont Vertrel SMT	200 ppm
3M Novec 72DA	200-300 ppm

Boiling Point Comparison

CLEANER	Boiling Point
Precision-V Vapor-Degreaser Flux Remover	90°F / 32°C
AK225 (1663)	129°F / 54°C
AK225 ATE (1658)	114°F / 45°C
AK225 T (1669)	129°F / 54°C
AK225 ATMS (1664)	114°F / 45°C
n-Propyl Bromide (nPB)	154°F / 68°C
Trichloroethylene (TCE)	188°F / 87°C
Perchloroethylene (Perc)	250°F / 121°C
DuPont Vertrel SMT	99°F / 37°C
3M Novec 72DA	113°F / 45°C

Comparative Test Data

CLEANER	FLUX TYPE			
	Control	Rosin	No-Clean	Water Soluable
Precision-V Vapor-Degreaser Flux Remover	1	1	1	3*
n-Propyl Bromide (nPB)	1	2	2	3*
AK225 T (1669)	1	1	1	3*
AK225 ATMS (1664)	1	1	1	3*
DuPont Vertrel SMT	1	1	1	3*
3M Novec 72DA	1	1	1	3*

Cleaning performance based on Surface Insulation Resistance (SIR) testing in accordance with IPC-TM-650 Method 2.6.3.7.

Testing performed by Trace Laboratories, September 2008.

Fifty-Six (56) customer prepared IPC-B-24 test boards were coated with one of the following:

Nothing (control), rosin flux R-100 (Multicore), no-clean flux (Techspray), and water soluble flux (Kester 2235).

Samples were cleaned in a vapor-degreaser.

Performance Key:	Final SIR reading
1 Excellent cleaning ability	Greater than or equal to 1×10^{11} ohms insulation resistance
2 Acceptable cleaning ability	Less than 1×10^{11} ohms insulation resistance
3 Poor cleaning ability	Less than 1×10^9 ohms insulation resistance
* Dentrific growth noted	

Compatibility

Plastics

Material	Compatibility
ABS	Not Compatible
Nylon	Excellent
Lexan	Not Compatible
HDPE	Excellent
LDPE	Excellent
C. E. Phenolic	Excellent

Material	Compatibility
PMMA	Not Compatible
POM	Excellent
PP	Excellent
PS	Not Compatible
PTFE	Excellent
PVC	Not Compatible

Elastomers

5 minute immersion at room temperature.

Material	Compatibility
Silicone	Slight Swelling (2)
Santoprene	Excellent (1)
Hypalon	Excellent (1)
Epichlorohydrin	Slight Swelling (2)
Viton	Slight Swelling (2)
EPDM	Excellent (1)
Neoprene	Excellent (1)
Butyl rubber	Excellent (1)

Material	Compatibility
Polyurethane	Slight Swelling (3)
Nat. gum rubber	Slight Swelling (2)
Buna-N	Slight Swelling (2)
Oil Resist Vinyl	Excellent (1)
Buna-S	Slight Swelling (2)
Sorbothane	Excellent (1)
Kelrez 6375	Excellent (1)
Kelrez 7075	Excellent (1)

1 = Swelling under 5%

2 = Swelling under 10%, recovery to under 5%

3 = Swelling under 12%, recovery to under 5%

Metals

Short-Term Exposure – 120 hrs in Vapor-Degreaser

Material	Compatibility
Brass Foil	Excellent
Copper Foil	Excellent
Galvanized Steel	Excellent
Nickel 200	Excellent
Aluminum 2024	Excellent

1 = Black oxide noted

Material	Compatibility
Aluminum 6061	Excellent
Stainless Steel 316	Excellent
Stainless Steel 304	Excellent
Mild Carbon Steel	Slight Reaction (1)

Long-Term Exposure – 62 days, sealed at room temperature

Material	Compatibility
Brass Foil	Slight Reaction (1)
Copper Foil	Slight Reaction (2)
Galvanized Steel	Excellent
Nickel 200	Excellent
Aluminum 2024	Slight Reaction (3)

1 = Slight metal loss (0.28%), tarnish in vapor phase

2 = Tarnish in vapor phase

3= Tarnish at interface point between liquid and vapor phase

4= Black oxide in vapor phase noted

Material	Compatibility
Aluminum 6061	Excellent
Stainless Steel 316	Excellent
Stainless Steel 304	Excellent
Mild Carbon Steel	Slight Reaction (4)

Reclamation Process

The reclamation (ie. boil down) process utilizes the vapor-degreaser as a still to distill solvent from the dirty boil sump and allows you to reclaim and reuse this solvent.

When it is determined that the Boil Sump needs to be cleaned out, you should do the following things to boil down the solvent:

1. If you have a 2 sump vapor-degreaser, drain the rinse sump into a clean container for reuse. If you have a one-sump vapor-degreaser, drain the spray reservoir using the spray wand. This material should be collected in a clean container, so it can be reused.
2. Allow the solvent to continue to boil, and the vapors to condense, until such time as one of two things happens:
 - a. the High Temperature Control (HTC) trips and turns off the heat to the heating elements
or
 - b. the Liquid Level Control trips because the level in the Boil Sump is too low.
3. Drain the remaining solvent/soil mixture into a container that is labeled as Hazardous Waste. This material can be used in future “boil downs” to reclaim more of the solvent in the mixture.
4. Use the retained solvent (from step 1) to refill the vapor-degreaser and add whatever volume of solvent is necessary to completely fill the machine.

This process can be repeated as often as necessary, depending on the amount of usage of the vapor-degreaser and the amount of soil that is introduced into the vapor-degreaser.

When you “boil down”, always put the solvent/soil mixture into the vapor-degreaser to reclaim additional amount of the solvent from this mixture.

Environmental Policy

Techspray® is committed to developing products to ensure a safer and cleaner environment. We will continue to meet and sustain the regulations of all federal, state and local government agencies.

Packaging and Availability

Precision-V Vapor-Degreaser Flux Remover available in the following sizes:

1655-G	1 gal (3.8L) in glass bottle
1655-5G	50 lbs in 5 gal (18.9L) metal drum
1655-54G	580 lbs in 54 gal (204L) metal drum

Resources

Techspray® products are supported by a global sales, technical and customer services resources.

For additional technical information on this product or other Techspray® products in the United States, call the technical sales department at 800-858-4043, email tsales@techspray.com or visit our web site at: www.techspray.com.

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