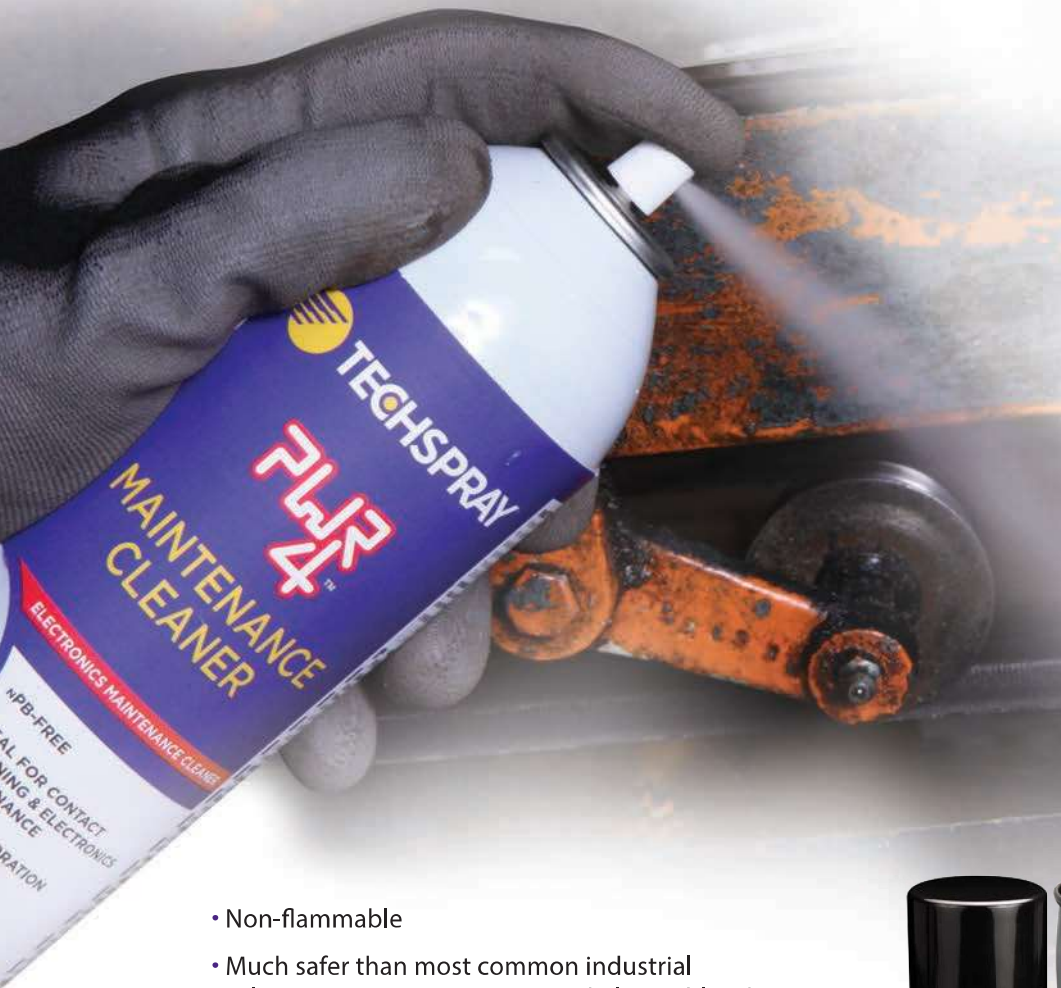




# TECHSPRAY®

## Precision Cleaner Guide



**POWERFUL  
NON-FLAMMABLE  
CLEANING SOLVENTS**

- Non-flammable
- Much safer than most common industrial solvents — TCE, nPB, Perc & Methylene Chloride
- Powerful cleaner — Ideal for degreasing and contact cleaning
- Available in aerosol or bulk for vapor-degreasing, ultra-sonic and bucket cleaning
- Rapid evaporation

**The performance you need at  
the price you want!**



### Precision, Safety, Performance . . . Advanced Chemistries to Improve Your Products & Processes.

Techspray® offers cutting-edge technologies to improve your processes. Several formulas are available for applications ranging from electronics cleaning to heavy-duty industrial cleaning.



#### POWERFUL, NON-FLAMMABLE & COST EFFECTIVE CLEANER

- Ideal replacement for n-propyl bromide (nPB) and other toxic industrial solvents
- Available in aerosol or bulk for vapor-degreasing, ultra-sonic and bucket cleaning
- PWR-4™ Maintenance Cleaner for heavy-duty degreasing and contact cleaning, PWR-4™ Flux Remover for PCB cleaning



#### NON-FLAMMABLE & POWERFUL CLEANER

- Top-selling solvent that's effective on the broadest array of soils
- Available in aerosol or bulk for ultra-sonic and bucket cleaning



#### NON-FLAMMABLE, POWERFUL & HIGH PRECISION CLEANER

- Replacement for AK225, which was banned because of environmental issues
- Ideal for aviation, aerospace, medical and military applications
- Available in aerosol or bulk for vapor-degreasing, ultra-sonic and bucket cleaning



#### ECONOMICAL & POWERFUL CLEANER, BUT FLAMMABLE

- Effective cleaner, yet safe on sensitive plastics
- Available in aerosol or bulk for ultra-sonic and bucket cleaning



#### HIGH PERFORMANCE ECO-FRIENDLY CLEANERS

- Water-based flux removers with zero GWP and low VOC
- Engineered for batch and inline equipment



### SAFER REPLACEMENTS FOR TOXIC INDUSTRIAL SOLVENTS

n-Propyl Bromide (nPB), Trichloroethylene (TCE), and Perchloroethylene (Perc) are three examples of harmful chemicals that are commonly used in aerosol cleaners in industrial applications. These chemicals are commonly used as cleaning solvents because they are non-flammable, have high solvency, and are relatively inexpensive.

Because of safety concerns, these solvents are under close scrutiny by OSHA, EPA, and local agencies. For example, The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a 10 ppm time-weighted average threshold limit of nPB, but has proposed a lower 0.1 ppm (ACGIH 2013). That's because nPB is a suspected human carcinogen, and has shown to negative impact neurological and reproductive functioning.

Techspray offers effective replacements for these toxic solvents. PWR-4® High Performance Solvents provides all the cleaning power of nPB and other industrial solvents, but without the health risks.

For more information, read "Toxic Chemicals Used for Industrial Cleaning" white paper at [www.techspray.com/l-1-tslibrary.aspx](http://www.techspray.com/l-1-tslibrary.aspx)







“ I want to switch to something safer, but need help...I've heard that nPB, TCE and some of these other cleaners are not good for us, but everything else is such a price jump! Why can't I find a strong, safe cleaner at a price we can afford? ”

# INTRODUCING PWR-4™

## POWERFUL, NON-FLAMMABLE & COST EFFECTIVE CLEANER

PWR-4™ solvent cleaners are ideal where a safer, non-flammable, and cost effective aerosol cleaner is required. This innovative cleaner is much safer than the four most common industrial solvents: TCE, nPB, Perc and Methylene Chloride and quickly blasts off oils, greases, fluxes, silicones, dirt and grime.

- Non-flammable
- Much safer than most common industrial solvents — TCE, nPB, Perc & Methylene Chloride
- Powerful cleaner — Ideal for degreasing and contact cleaning
- Available in aerosol or bulk for vapor-degreasing, ultra-sonic and bucket cleaning
- Rapid evaporation

The performance you need at the price you want!



### PWR-4 Maintenance Cleaner

Blasts away oil and contaminants off of contacts, printed circuit boards, barcode instruments, switch boxes, gear boxes, and electronic motor controllers. Grease and oil flow right off, reducing the time and materials needed to scrub off stubborn soils.

- 3400-20S** 20 oz. (567g) aerosol
- 3400-G** 1 gal. (3.8L) metal pail
- 3400-5G** 5 gal. (18.9L) metal pail
- 3400-54G** 54 gal. (204L) metal drum



### PWR-4 Flux Remover

Cleans away flux residues and other contaminants in vapor cleaning and ultrasonic application. Easily removes residues from high temperature lead free soldering operations, no-clean fluxes and all handling soils.

- 3401-G** 1 gal. (3.8L) metal pail
- 3401-5G** 5 gal. (18.9L) metal pail
- 3401-54G** 54 gal. (204L) metal drum





### NON-FLAMMABLE & POWERFUL CLEANER

G3 solvent cleaners are formulated to maximize cleaning performance, eliminating wasted time and materials from scrubbing and brushing. G3 does not contain nPB, TCE, Perc, and other highly toxic chemicals, so provides both safety and performance.



### Blue Shower Maintenance Cleaner

Clean oil and contaminants off of metal parts, printed circuit boards, barcode instruments, switch boxes, gear relays, and electronic motor controllers.

- Non-flammable
- Powerful cleaner
- Non-ozone depleting
- Dielectric strength – 27.3 kv

**1630-16S** 16 oz. (454g) aerosol



### Industrial Maintenance Cleaner

Blast away heavy oils and greases off of metal parts, gear boxes, and engines.

- All-in-one degreaser & contact cleaner
- Rapid evaporation
- Low toxicity compared to TCE, nPB & Perc
- Dielectric strength – 30.5 kv

**1635-20S** 20 oz. (567g) aerosol



### Bulk Cleaner

Engineered to remove oils, fluxes and other contamination using a manual bucket-cleaning process or ultrasonic equipment.

- Non-flammable
- Powerful cleaner
- Effective as maintenance cleaner and flux remover
- Non-ozone depleting
- Dielectric strength – 27.3 kv

**1638-G** 1 gal. (3.8L) glass bottle  
**1638-5G** 5 gal (19L) metal drum  
**1638-54G** 54 gal. (205L) metal drum



### Flux Remover

Remove flux residues and other contaminants left by manufacture, rework, or repair of printed circuit boards.

- Non-flammable
- Powerful cleaner
- Proven effective for lead-free processes
- Non-ozone depleting

**1631-5S** 5 oz. (142g) aerosol w/brush attachment  
**1631-16S** 16 oz. (454g) aerosol  
**1631-16SB** 16 oz. (454g) aerosol w/brush attachment



### No-Clean Flux Remover

Remove no-clean flux and white residues left by manufacture, rework, or repair of printed circuit boards.

- Non-flammable
- Ideal for no-clean fluxes
- Proven effective for lead-free processes
- Non-ozone depleting

**1634-12S** 12 oz. (340g) aerosol



### Contact Cleaner

Clean oxidation, oil, and other contaminants from contacts, metal switches, relays, edge connectors, buss bars, and circuit breakers.

- Non-flammable
- Powerful cleaner
- Dielectric strength – 36.2 kv

**1632-16S** 16 oz. (454g) aerosol





## PRECISION V

### NON-FLAMMABLE, POWERFUL & HIGH PRECISION CLEANER

Precision-V provides the performance and safety of G3, but with better plastic sensitivity and lower VOC. Precision-V Plastic-Safe formula is ideal for the most delicate plastics, like acrylics and polycarbonates.

### PRECISION V

#### Flux Remover & Maintenance Cleaner

Clean off flux residues, oil, and other contamination from electronics and other sensitive surfaces.

- Non-flammable
- Low VOC
- Safe on most plastics
- High precision – residue-free
- Non-ozone depleting

- 1651-16S** 16 oz. (454g) aerosol  
**1651-P** 1 pt. (0.47L) glass bottle  
**1651-G** 1 gal. (3.8L) glass bottle  
**1651-5G** 5 gal. (19L) metal drum  
**1651-54G** 54 gal. (205L) metal drum



### PRECISION V

#### No-Clean Flux Remover

Remove no-clean flux and white residues left by manufacture, rework, or repair of printed circuit boards.

- Effective on R, RMA, no-clean and OA (aqueous) fluxes
- Non-flammable
- Non-ozone depleting
- Rapid evaporation with no residue
- Safe on most plastics

- 1649-12S** 12 oz. (340g) aerosol



### PRECISION V

#### Plastic-Safe Universal Cleaner

Engineered for use on sensitive plastic electronic components, packaging and casements.

- Non-flammable
- Low VOC
- Safe on sensitive plastics
- High precision – residue-free
- Dielectric strength – 23 kv

Specifications: NESHAP 63.741-753

- 1652-10S** 10 oz. (284g) aerosol  
**1652-P** 1 pt. (0.47L) glass bottle



## VAPOR-DEGREASER SOLVENTS

Techspray® offers a wider variety of vapor-degreaser formulas engineered to meet challenging requirements from cleanliness specifications, difficult-to-clean soils, solvent-sensitive materials, and restrictive regulations. All Techspray solvents have azeotropic properties that allow them to remain stable as they are cycled in a vapor-degreaser. They are not reactive or corrosive to metals commonly found in the construction of vapor-degreasers.

PWR-R™ solvents are designed to replace nPB, TCE and Perc, matching and surpassing cleaning performance without the safety concerns. Precision-V™ vapor-degreaser solvents are ideal replacements for AK-225 based cleaners, which were phased out in 2015 due to ozone depletion restrictions.

Part #	Product Name	Base Solvents	kB value	Boiling Point (°F/°C)	VOC (g/l)	GWP	Degreasing	Defluxing
3400	PWR-4 Maint Clnr	Proprietary HFE	100	118/48	1201	ND	●	
3401	PWR-4 Flux Remvr	Proprietary HFE	100	118/48	1201	ND		●
1653	VC-1100	DuPont Vertrel® XF	95	109/43	1150	148	●	
1654	VC-1200	DuPont Vertrel® XF	56	94/34	552	684	●	
1655	VC-1500	DuPont Vertrel® XF	62	90/32	562	663		●
1656	VC-1600	DuPont Vertrel® XF	100	106/41	1063	264		●
1686	ME-1500	3M Novec 7100/7200	58	104/40	889	43	●	●

ND=Not Defined



### ECONOMICAL & POWERFUL CLEANER

E-LINE™ solvent cleaners are some of the most effective on the market, with great performance, low toxicity, plastic safe, and no ozone depletion. For companies accustomed to working with flammable materials, like fluxes, alcohols and lubes, E-LINE offers an economical alternative to chlorinated solvents.



#### Blue Shower Maintenance Cleaner

Clean oil and contaminants off of metal parts, printed circuit boards, barcode instruments, switch boxes, gear boxes, and engines.

- Powerful cleaner
- Ideal for sensitive plastics
- Low toxicity
- Flammable

**1620-10S** 10 oz. (284g) aerosol




#### Flux Remover

Remove flux residues and other contaminants left by manufacture, rework, or repair of printed circuit boards.

- Proven effective for lead-free processes
- Ideal for sensitive plastics
- Low toxicity
- Flammable

Specifications: GM H1013; USDA Accepted; Ford Fox #142431, USDA: Approved K-2 rated aerosol and bulk.

**1621-10S** 10 oz. (284g) aerosol  
**1621-10SB** 10 oz. (284g) aerosol w/brush attachment



1621-10S

1621-10SB



#### Contact Cleaner

Clean oxidation, oil, and other contaminants from contacts, metal switches, relays, edge connectors, buss bars, and circuit breakers.

- Powerful cleaner
- Ideal for sensitive plastics
- Low toxicity
- Fast evaporation
- Flammable

**1622-10S** 10 oz. (284g) aerosol  
**1622-13S** 13 oz. (369g) aerosol



1622-10S

1622-13S



#### IPA Electronics Cleaner

Ideal for deflusing, stencil cleaning and fiber optic connector cleaning.

- 99.8% pure IPA
- Compliant with SCAQMD rule 1171
- Plastic safe
- Low toxicity
- Non-ozone depleting
- Flammable

Specifications for 99.8% IPA: Fed spec TT-1-735A (amend 3, notice 2) grades A&B, ASTM D770-05

**1610-12S** 12 oz. (340g) aerosol




#### Bulk Cleaner

Engineered to remove oils, fluxes and other contamination using a manual bucket-cleaning process or ultrasonic equipment.

- Effective as Maintenance Cleaner and Flux Remover
- Ideal for sensitive plastics
- For cold cleaning and ultrasonic (unheated only)
- Flammable

**1621-G** 1 gal. (3.8L) glass bottle  
**1621-5G** 5 gal (18.9L) metal drum  
**1621-54G** 54 gal. (204L) metal drum



1621-G

1621-5G



## HIGH PERFORMANCE ECO-FRIENDLY CLEANERS

### Eco-dFluxer

*Water-based Inline & Batch Flux Removers*

Eco-dFluxer cleaners are water-based, environmentally friendly and designed to work in both inline and batch cleaning equipment. They are optimal combinations of solvents and saponifiers that lower surface tension for penetration under low stand-offs, and powerful cleaning action to remove all flux residues.

Effective on a wide variety of solders and fluxes: lead, lead-free, aqueous, RMA, no-clean, and new halide-free fluxes. High compatibility with common PCB metals and plastics. Eco-dFluxer cleaners are highly filterable with long bath life.

High performance cleaning gives you brilliant solder joints and allows you to increase dilution, increase line speeds, reduce waste water, decrease cost per board, and most importantly... eliminate field failures due to ionic contamination!

- High performance cleaning
- Non-flammable
- No VOC, zero GWP
- Also used for pallet cleaning in batch systems

### Eco-dFluxer SMT100

Powerful defluxer, allowing you to optimize your cleaning process. Reduce concentration and increase line speed to maximize your profit. Effective on no-clean, R, RMA and OA fluxes.

- 1550-G** 1 gal. (3.8L) plastic container
- 1550-5G** 5 gal. (19L) plastic container
- 1550-54G** 54 gal. (205L) plastic drum

### Eco-dFluxer SMT200

Superior metals compatibility, preventing oxidation and leaving shiny solder joints. Eco-friendly formula reduces shipping and disposal costs. Effective with reduced concentration even on the toughest no-clean, R, RMA, OA and new halide-free fluxes.

- 1520-G** 1 gal. (3.8L) plastic container
- 1520-5G** 5 gal. (19L) plastic container
- 1520-54G** 54 gal. (205L) plastic drum



### Eco-dFluxer SMT300

Powerful defluxer but safe on sensitive metals, preventing oxidation and leaving shiny solder joints. Safe, eco-friendly formula. Effective on no-clean, R, RMA, OA fluxes and new halide-free fluxes.

- 1530-G** 1 gal. (3.8L) plastic container
- 1530-5G** 5 gal. (19L) plastic container
- 1530-54G** 54 gal. (205L) plastic drum

### Defoamer DF1

*Defoaming Agent for Inline & Batch Cleaners*

Reduce foaming as cleaner becomes loaded to extend bath life. Add directly to sump at 1 to 4 fl oz. (30-120ml) per 100 gallons (379L). Dilute in spray bottle to 15% with DI water to eliminate foaming issue on the spot.

- Effective at all processing temperatures
- Extends bath life
- Silicone & particulate free
- Non-flammable

- 1555-P** 1 pt. (0.47L) plastic container



## MAINTENANCE CLEANERS

Maintenance cleaners clean oil and contaminants off of metal parts, printed circuit boards, barcode instruments, switch boxes, gear boxes, and engines.

	1610 E-LINE IPA	1620 E-LINE Maintenance Cleaner	1621 E-LINE Bulk Solvent	1622 E-LINE Contact Cleaner	1630 G3 Maintenance Cleaner	1632 G3 Contact Cleaner	1635 G3 Industrial Cleaner	1638 G3 Bulk Solvent	1651 Precision-V	1652 Precision-V Plastic-Safe	1653 Precision-V VC1100	1654 Precision-V Parts Cleaner	1656 Precision-V VC1600	3400 PWR-4 Maintenance Cleaner
PROPERTIES														
Non-flammable	●				●	●		●	●	●	●	●	●	●
Evaporation rate (1=slow, 5=fast)	3	4	4	4	5	5	4	5	5	5	5	5	5	5
VOC% (EPA) - Aerosol	75	75	-	75	64	64	69	-	37	13	-	-	-	75
VOC% (EPA) - Bulk	100	-	100	-	-	-	-	61	49	18	74	41	67	95
VOC% (CARB) - Aerosol	75	75	-	75	75	75	69	-	75	75	-	-	-	75
VOC% (CARB) - Bulk	100	-	100	-	-	-	-	61	100	100	100	100	100	83
APPLICATIONS														
Benchtop cleaning	●	●	●	●	●		●	●	●	●	●	●	●	●
Ultrasonic	*		*					●	●	●	●	●	●	●
Vapor-degreasing										●	●	●	●	●

NOTE: Test for substrate compatibility as a part of your qualification process.

## FLUX REMOVERS

Flux removers remove flux residues and other contaminants left by manufacture, rework, or repair of printed circuit boards. Techspray flux removers have been proven very effective at removing fluxes baked on at leadfree temperatures.

	1520 Eco-dFluxer-SMT200	1530 Eco-dFluxer-SMT300	1550 Eco-dFluxer-SMT100	1610 E-LINE IPA	1621 E-LINE Flux Remover	1631 G3 Flux Remover	1634 G3 No-Clean Flux Remover	1638 G3 Bulk Solvent	1649 Precision-V No-Clean Flux Remover	1651 Precision-V	1652 Precision-V Plastic-Safe	1653 Precision-V VC1100	1655 Precision-V Flux Remover	1686 Precision-V VC1600	3401 PWR-4 Flux Remover
PROPERTIES															
Non-flammable	●	●	●		●	●	●	●	●	●	●	●	●	●	●
Evaporation rate (1=slow, 5=fast)	1	1	1	3	4	5	5	5	5	5	5	5	5	5	5
VOC% (EPA) - Aerosol	-	-	-	75	75	64	64	-	64	37	13	-	-	-	-
VOC% (EPA) - Bulk	22	52	45	100	-	-	-	61	-	49	18	74	41	67	95
VOC% (CARB) - Aerosol	-	-	-	75	75	75	75	-	75	75	75	-	-	-	-
VOC% (CARB) - Bulk	52	22	45	100	-	-	-	61	-	100	100	100	100	100	83
APPLICATIONS															
Benchtop cleaning				●	●	●	●	●	●	●	●	●	●	●	●
Ultrasonic	+	+	+	*	*			●	●	●		●	●	●	●
Vapor-degreasing										●		●	●	●	●
Inline defluxing system	●	●	●												
Batch defluxing system	●	●	●												

NOTE: Test for substrate compatibility as a part of your qualification process.

\* Non-heated ultrasonic only

+ Rinse required

