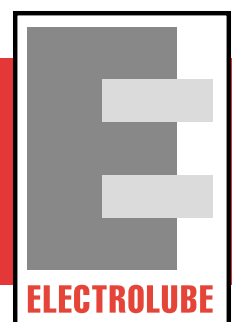




ELECTROLUBE®
OUR PRODUCTS,
YOUR WORLD

PRODUCT CATALOGUE

www.electrolube.com



ELECTROLUBE®

Electrolube's wide range of high performance chemicals are used extensively by the international electronics and manufacturing industries.

Demand for production materials in convenient packaging has led to the development of a wide range of versatile delivery systems and pack types that are filled at our manufacturing sites in the UK and Far East. These include aerosols, pump sprays, syringes, tubes, pens, sachets and small tins. The majority of Electrolube products are also available in bulk packaging for manufacturing. The world-renowned Electrolube quality can be found throughout its environmentally friendly product portfolio.

All the products in this catalogue have both technical and material safety data sheets available from your local Electrolube office or agent. Many also have NATO stock numbers.

CONTENTS

| | |
|---------------------------------------|---------|
| <i>The Company</i> | Page 1 |
| <i>Cleaning</i> | Page 2 |
| <i>Conformal Coatings</i> | Page 7 |
| <i>Resins</i> | Page 10 |
| <i>Thermal Management</i> | Page 15 |
| <i>Contact Lubricants</i> | Page 17 |
| <i>Maintenance & Service Aids</i> | Page 21 |
| <i>Industrial Products</i> | Page 24 |
| <i>Accessories</i> | Page 26 |
| <i>Mechanical Lubricants</i> | Page 27 |
| <i>Surface Mount</i> | Page 28 |
| <i>Prototyping</i> | Page 28 |
| <i>Further Company Information</i> | Page 29 |
| <i>Size Charts</i> | Page 30 |
| <i>Index</i> | Page 33 |

The Company

Mission Statement

“To exceed our customers’ expectations with new products and the highest levels of customer service.”

- World-wide distribution
- Multi-language packaging
- ISO 9001:2000 certified
- Comprehensive product range

Electrolube, a division of H. K. Wentworth Limited, is a leading manufacturer of electro-chemicals for electronics and industrial manufacturing. Additionally, Electrolube has an unsurpassed reputation for the manufacture and supply of specialist lubricants to the automotive, industrial and domestic switch manufacturing sector.

Research & Development, quality control and environmental concerns are fundamental to the Electrolube philosophy of providing the highest level of customer service.



Electrolube products are specified and widely used for the manufacture and maintenance of electrical and electronic components and assemblies in the following market segments:



Manufacturing and warehouse facilities in Derbyshire, UK

- Automotive
- Military
- Aerospace
- Transport
- Marine
- Telecommunications
- Medical
- Consumer electronics
- Industrial electronics
- Traction
- Utilities
- Education
- Service, repair and maintenance

All Electrolube packaging is multi-lingual, and its international network of field service professionals and specialist distributors are connected directly to the UK Technical Service Department, meaning that professional assistance and advice are always available. The continued global expansion of Electrolube and its innovative range of environmentally friendly products proves that the total capability and dedication to customer care combine to create a winning formula.



Cleaning

- Flux removal
- Metal degreasing
- Flammable & non-flammable
- Bulk & aerosol
- Water & solvent based

Experience has shown that the cleaning of PCBs, stencils and electronic assemblies is vital to ensure long term performance. Electrolube has developed a comprehensive range of cleaning products which provide high reliability at minimum unit cost.

The range includes products that will remove fluxes, solder paste, grease and other general contaminants to recognised international cleanliness standards. Products are also available for degreasing precision metal parts and a huge variety of cleaning applications.

Electrolube can provide flammable and non-flammable solvent cleaners and water based cleaners.

The Safewash Range

Electrolube Safewash range is the most effective family of aqueous cleaning products available. It is currently in use by major manufacturers in a wide variety of cleaning machines. It provides superior cleaning performance to military and commercial standards at minimal cost - both financial and environmental.

The Safewash Range is effective in all equipment types including batch ultrasonics, in-line spray, dishwasher and also by hand. Products are available for use with sensitive metals such as aluminium, copper and alloys, whilst compatibility with plastics and rubbers is assured.

The benefits of Safewash include excellent cleaning performance at room temperature, low odour, very low toxicity, and it continues to clean effectively over long time periods.

Eventually, as Safewash continues to absorb flux, its efficiency begins to decline. The exact time when replacement is required is dependent upon the type and amount of flux used, the surface area cleaned and the cleanliness level required. Methods to determine the status of the Safewash include electrical conductivity and pH measurement.



Solvents

Solvents as defined here are fast evaporating, organic materials. For ease of discussion they may be split into flammable and non-flammable solvents.

Flammable solvents are characterised by relatively low toxicity, good materials compatibility together with a wide range of evaporation rates and flashpoints.

Non-flammable solvents fall into two groups, traditional chlorinated solvents are characterised by relatively high levels of toxicity, poor materials compatibility but are fast drying. The new non-flammable fluorinated solvent blends exhibit excellent solvency, fast drying and relatively low toxicity with good materials compatibility.

The use of solvent based cleaners may be necessary when the PCB or assembly contains unsealed components or water sensitive devices.

Both solvent types generally require specialist equipment for their use in high volume manufacturing to protect against toxicity or problems associated with their flashpoint. This specialist equipment is expensive and running costs are high in comparison with aqueous systems. However, hydrocarbon solvents are particularly effective for small scale production and bench rework as they clean effectively, and remove a wide range of soils. They dry extremely quickly, are easy to use and leave no residues.

Electrolube has developed a range of hydrocarbon solvents to meet the requirements of many applications. In general, the faster the evaporation rate, the lower the flashpoint; i.e. the higher the flammability risk.

Cleaning

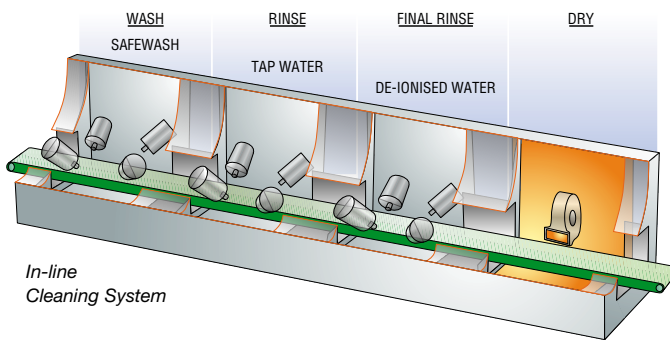
Volatile Organic Compound (VOC)

The definition of a Volatile Organic Compound by the EU Solvent Emissions Directive is “any organic compound having at 20°C a vapour pressure of 0.01kPa or more, or having a corresponding volatility under the particular conditions of use.”

The emissions of solvents are being limited, but why?

Emissions need to be controlled because many solvents undergo chemical reactions in the atmosphere, which cause a number of indirect effects, in particular the formation of ozone. Elevated concentrations of ozone in air can impair human health and can damage some building materials, forests, vegetation and crops. The European Solvent Emissions Directive (1999/13/EC) of 11 March 1999 aims for a 57% reduction on the 1999 figures for solvent emissions by the specified solvent-using industries by 2007.

As environmental concerns increase and the pace quickens towards the transition to solvent-free and low-VOC materials, practical solutions need to be found. Electrolube, as a responsible manufacturer, is continually investing in R&D so that our product range evolves to meet and exceed our customer's expectations through this period of change.



In-line Cleaning System

Benefits of Cleaning

The effective cleaning of PCBs and metal parts increases the reliability of the assemblies and allows coating and encapsulating operations to be carried out with full confidence.

The primary benefit of cleaning is that all contamination is removed from the assembly ensuring high reliability and long life. Shiny solder joints and contaminant free products enhance the manufacturer's reputation.

Typical Application

Cleaning has been used for many years within the electronics industry to remove potentially corrosive flux and other residues from PCBs.

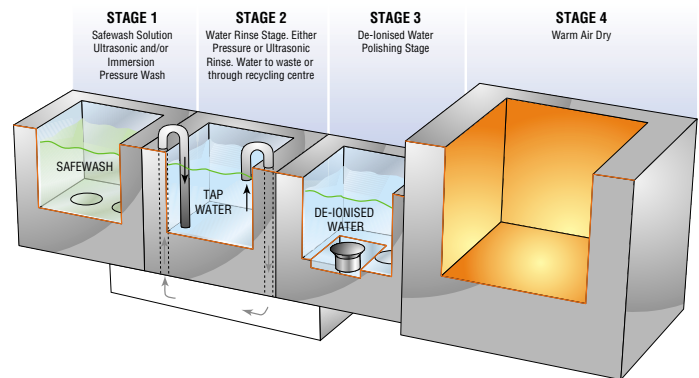
Today, even though 'no-clean' fluxes have been introduced, many electronics manufacturers still clean their PCBs. Screens and stencils always need cleaning to ensure accurate solder and adhesive printing.

Applications are extremely varied, but the following list does give some indication of the main areas of use:

- Automotive
- Aerospace
- Domestic appliances
- Medical
- Military
- Industrial control systems

The common feature of these applications is the requirement for high reliability. Manufacturers are under constant pressure to provide exceptional reliability at low cost.

The Electrolube cleaners in small packs include products for hand cleaning PCBs, screens and stencils, glass, contacts, ink removal and general degreasing. Drying cloths are also available as well as impregnated wipes in sachets and tubs.



Ultrasonic Cleaning System

Cleaning

Aqueous Cleaning

| | SWA | SWAC* | SWAJ | SWAS | SWAP | SWAF* | SWAX | SWMN | SWMP |
|--------------|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Equipment | Ultrasonic | Yes | Yes | Yes | Best | Yes | Yes | Yes | Yes |
| | Pressure/ Dishwasher/ In-Line | No | Yes | No | No | Yes | Yes | No | No |
| | Spray under Immersion | Yes | Yes | Yes | Yes | Best | No | Yes | Yes |
| | Screen and Stencil Cleaner | No | Yes | No | No | Yes | Yes | Best | No |
| Soil Removal | Heavy Grease (& organics) | Yes | Yes | Yes | Best | Yes | Yes | Yes | Yes |
| | No clean fluxes | No | Best | Yes | Best | Yes | Yes | No | No |
| | Flux/Ionics | Yes | Yes | Yes | Best | Yes | Yes | Yes | Yes |
| | Uncured Paste | Yes | Yes | Yes | Yes | Yes | Yes | Best | Yes |
| | Uncured adhesive | No | Non | No | No | No | No | Best | No |
| Other | Sensitive Metals | No | Test | Yes | Yes | Yes | No | Yes | No |
| | Rinseability | Good | Good | Good | Best | Good | Good | Good | Good |
| | Low Foam | No | Yes | No | No | Yes | Yes | Yes | No |

All the above products are water based and must not be stored at temperatures below 5°C.

Disposal: All products should be disposed of in accordance with local regulations.

*Concentrates require dilution.

Solvent Cleaning

| | IPA Isopropyl Alcohol | ECSP ECS Plus | ULS Ultrasolve | FLU Fluxclene | ULC Ultraclean | MDS Metal Degreasing Solvent | SSS Screen & Stencil Solvent | SSW Screen & Stencil Wipes | DGC* Degreaser | FRC* Flux Remover | CCC* Contact Cleaner | |
|---------------------------|---------------------------------|------------------|-------------------|------------------|-------------------|---------------------------------------|---------------------------------------|-------------------------------------|-------------------|-------------------------|----------------------------|------|
| Typical Properties | Density (g/ml) | 0.8 | 0.8 | 0.8 | 0.8 | 1.32 | 1.025 | 0.851 | 1.33 | 1.33 | 1.37 | |
| | Flashpoint (°C IP-34) | 12 | -48 | 0 | 0 | >60* | None | >60* | >60* | None | None | |
| | Boiling Point (°C IP-123) | 82 | 36 | >80 | >80 | >173 | 40 | >100 | >100 | 36 | 36 | 45 |
| | Vapour Pressure (kPa) D2889 | 4.4 | 53.3 | 11.5 | 11.5 | 0.5 | 47.5 | 1.45 | 1.5 | 66.2 | 66.2 | 34.7 |
| | Evaporation rate (ether = 1) | 6 | 1.5 | 16 | 16 | 66 | 6 | >50 | 33 | >1 | >1 | 1.1 |
| | TLV (ppm) | 400 | 500 | 300 | 300 | 300 | 100 | 300 | 300 | 242 | 242 | 242 |
| | Soil Removal | Heavy Grease | Yes | Yes | Yes | Yes | Yes | Best | Yes | Yes | Best | Yes |
| Ionic | | Yes | Yes | Best | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes |
| Flux | | Yes | Yes | Yes | Best | Yes | Yes | Yes | Yes | Yes | Best | Yes |
| Plastics Compatibility | ABS | Yes | Yes | Test | Test | Test | No | No | No | Test | Test | Test |
| | Polymethacrylate (acrylic) | Yes | Test | Test | Test | Test | No | Test | Test | Test | Test | Test |
| | Polycarbonate | Yes | Yes | No | No | Yes | No | No | Test | Test | Test | Test |
| | Polystyrene | Yes | Yes | Test | No | Test | No | No | No | Test | Test | Test |

NOTES:

Evaporation Rate : The higher the number the slower the rate of evaporation.

Many solvents do not affect plastics on short contact times (spray and wipe) but may be unsuitable for prolonged immersion.

* Classed as non flammable.



CCC

Contact Cleaner

- Non-flammable
- Non-conductive with high materials compatibility
- Instant drying with almost no aroma
- Leaves no residue
- Supplied with brush and extension tube



DGC

Degreaser

- Non-flammable, degreaser and electronics cleaner
- Super fast evaporating
- No rinsing required
- Versatile, non-corrosive and safe for use on all types of electrical circuit
- Plastics-safe
- Supplied with brush and extension tube



ECSP

Electronic Cleaning Solvent Plus

- Fast evaporating cleaning solvent
- Removes grease, dirt and most fluxes
- Completely residue-free
- Highly flammable - not to be used on live equipment



ECW

Engineers Cleaning Wipes

- High quality cloth with exceptional wet and dry tear strength
- Economical and re-usable
- Extremely absorbent
- Packed in a re-sealable gripper bag which protects against contamination



EWI

IPA Electrowipes

- Impregnated lint-free pads
- Conveniently packed in dual sachets
- Ideal for cleaning all types of connectors and cables, especially fibre optic cables



FLU

Fluxclene

- Fast drying solvent cleaner for efficient removal of flux residues after soldering
- Leaves a perfectly clean, dry surface
- Harmless to most plastics, rubbers and elastomers
- Aerosol versions available with or without a brush applicator



FRC

Flux Remover

- Non-flammable flux remover
- Effective on 'no-clean' fluxes and many water based fluxes and pastes
- Quick drying and residue free
- Plastics-safe
- Supplied with brush and extension tube



GLC

Glass Cleaner

- Silicone-free allowing use on PCB production guards
- Excellent cleaning of grease, oil and light organic contaminants
- Non-smear and non-toxic
- Wipe clean with a lint-free cloth (such as ECW025)



IPA

Electronic Cleaning Solvent

- High quality, electronics grade IPA
- Suitable for all electronic and PCB cleaning
- Cleans thoroughly to a perfectly dry and residue free surface
- Effective and economic in use



PRS

Printasolve

- Removes ink (solvent or oil based) from most surfaces
- Highly effective and economic to use
- Re-textures rubber rollers
- Strong solvent which should be tested for plastics compatibility before use



SSS

Screen & Stencil Solvent

- Non-flammable solvent for cleaning of screens and stencils
- Excellent solder paste and adhesive removal
- Non-foaming and biodegradable
- Use with ECW025



SSW

Screen & Stencil Wipes

- Superb cleaning power that removes pastes and adhesives
- Leaves screens and stencils clean and dries with no staining
- Large size (20x28cm)
- Convenient 100 wipe tub dispenser
- Low odour



SWA/SRI

Safewash & Saferinse

- SWAJ in an aerosol formulation for bench cleaning of PCBs
- Removes fluxes from PCBs. May also be used to clean grease and general dirt
- Fast, effective foaming action
- Use Saferinse (SRI) after cleaning to give final polish
- Biodegradable and 100% ozone friendly



ULC

Ultraclens

- Highly penetrating cleaning solvent for removing heavy deposits
- Excellent cold cleaner for electronics and engineering
- Offers low flammability and low odour



ULS

Ultrasolve

- Fast drying solvent for quick and efficient cleaning of electrical equipment
- Excellent removal of grease, oil, flux residues and acrylic conformal coatings
- Leaves clean, dry surface
- Compatible with most plastics



VID

Magnetic Head Cleaner

- For use on all magnetic tape heads
- Quick drying, leaving no residue
- Good plastics compatibility

Conformal Coatings

- UL and MIL approval
- Solvent removable and solvent resistant coatings
- Acrylic, silicone, polyurethane and solvent free
- UV trace aid inspection
- Thinners and masking products

Conformal coatings are specially formulated lacquers designed to protect PCBs and related equipment from their environment. This improves and extends their working life and ensures security and reliability of performance. These coatings 'conform' to the contours of the board and its components creating a thin (25 - 50µm) layer which is both lightweight and flexible. They protect circuitry from hazards such as chemicals (e.g. fuels, coolants etc.), vibration, moisture, salt spray, humidity and high temperature. This can prevent corrosion, mould growth and current leakage which may otherwise result in board failure with an un-coated PCB.



Electrolube is among the world's foremost experts in the formulation and application of conformal coatings designed to meet international approvals (including European and American military specifications). The range of products currently available comprises acrylics, silicones, polyurethanes and water based coatings. Electrolube can offer products with UL, MIL and DEF STAN approval and most utilise a UV trace to aid inspection.

Electrolube also offers a full range of ancillary products to complement the use of our conformal coatings that include thinners and strippers, peelable coating mask and thixotropic materials for the effective coating of lead ends.



Benefits of Conformal Coatings

These coatings improve the reliability of PCBs, enhance security and ensure life-long performance by forming a protective layer which insulates and protects circuitry against the effects of environmental attack from chemicals, moisture and other contaminants.

Conformal coatings allow higher power and closer track spacing as they prevent current leakage. This, in turn, enables designers to meet the demand for miniaturisation.

Both transparent and pigmented coatings improve the appearance of PCBs - the latter ensures a high degree of security by camouflaging the components and layout.

Typical Application

Initially conformal coatings were only used in 'high tech' applications. As consumers become more concerned with quality and reliability, and electronic assemblies become more widely used in everyday life, conformal coatings offer manufacturers the ability to improve the quality of their products whilst eliminating costly warranty failures.

Typical areas of use include domestic and commercial electronics, automotive, aerospace, marine, medical and industrial.



Conformal Coatings

Selection Criteria

With such a wide range of conformal coatings, all offering differing features and benefits, it is important that the correct coating and method of application is chosen. The main questions to be addressed are:-

- Working environment
- Electrical requirement
- Board layout
- Method of application
- Rework and repair

Working Environment

Controlling or predicting the exact operating conditions is difficult to achieve without expensive, sophisticated test chambers, so the solution is to protect the circuit completely from the hazards it may face.

The physical demands on equipment range from sudden decompression, as an aircraft climbs through the atmosphere, to the constant vibration of an office printer; so flexibility and the ability to expand and contract are important features in a conformal coating. Checks should be made to ensure these characteristics are maintained when sudden pressure and temperature changes take place, and that the material will retain these properties throughout the lifetime of the equipment.

Electrical Requirements

A conformal coating should exhibit high dielectric strength and breakdown voltage. The minimum required dielectric strength of the coating can be determined from the inter-track separation and the potential difference between adjacent tracks.

Board Layout

The design of the board should include consideration of the placement of components that must not be coated. These components include connectors, IC sockets, adjustable potentiometers and test points. If the design allows, these components should be placed on the edge of the PCB to enable the board to be coated with the minimum of masking. If this is not possible, Electrolube provides a fast curing peelable coating mask to protect the relevant components. Component legs should be cropped to minimum length to ensure a coherent film is formed.

Rework and Repair

If the assembly requires repair, consideration must be given to the ease of removal of the coating. Most coatings may be safely soldered through and some can be easily removed in a standard solvent.

Electrolube can also supply powerful solvents and strippers to remove the most stubborn, aged coatings.

| Typical Properties | SCC3 DCA/DCB/DCR Silicone Conformal Coating (SCC3) | HPA High Performance Acrylic | APL Acrylic Protective Lacquer | SRC Silicone Removable Coating | CPL Clear Protective Lacquer | TFCF Fluorocoat | PUC Polyurethane Coating | WBC Aquacoat |
|---|--|---------------------------------------|---|---|---------------------------------------|--------------------|--------------------------------|------------------|
| Viscosity (Bulk) (cPs @ 20°C, Brookfield) BS 3900 Part A7 | 200 | 300 | 300 | 170 | 25 | 2 | 240 | 220 |
| Flashpoint (°C) (Bulk) BS 3900 Part A6 | 27 | <0 | <0 | 27 | 12 | 7 | 38 | None |
| Solids (%) (Bulk) BS 3900 Part B18 | 37 | 35 | 35 | 50 | 37 | 2 | 50 | 35 |
| Dielectric Strength (kV/mm, MIL 202 (301)) | 90 | 45 | 45 | 90 | 45 | 90 | 60 | 50 |
| Insulation Resistance (Ω, DEF STAN 59/47 Pt4) | 10 ¹⁵ | 10 ¹⁵ | 10 ¹⁵ | 10 ¹⁵ | 10 ¹² | 10 ¹⁵ | 10 ¹⁵ | 10 ¹¹ |
| Temp. Range (°C) | -70 → +200 | -55 → +130 | -55 → +125 | -50 → +125 | -50 → +100 | -50 → +125 | -55 → +130 | -50 → +170 |
| Touch Dry Time (20°C, minutes) | 50-55 | 10-15 | 10-15 | 15-20 | 15-20 | 5 | 40-45 | 30-40 |
| Cure Time for Max. Props. (Hours @ 20°C) | 2@20°C & 2@90°C* | 24 | 24 | 24 | 24 | 24 | 24 | 8 |
| Solvent Resistance | Excellent | Good | Good | Good | Poor | Poor | Good | Excellent |
| Humidity Resistance | Excellent | Excellent | Excellent | Excellent | Good | Good | Excellent | Excellent |
| Mould Resistance | Excellent | Excellent | Excellent | Excellent | Good | Good | Excellent | Excellent |
| Thinners | DCT | UAT | UAT | DCT | CPT | N/A | PTH | DI Water |
| UV Trace | Yes (DCA) | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Colours Available | Clear/Black/Red DCA/DCB/DCR | Clear | Clear | Clear | Clear | Clear | Clear | Clear |
| Approvals | UL746CQMJU2 (DCA) DEF STAN | MIL-I-46058C | - | - | - | - | - | - |

*SCC3 may require additional thermal curing for some military applications. Please see Technical Data Sheet for more information.



APL

Acrylic Protective Lacquer

- Offers excellent adhesion to all substrates
- Good temperature range and dielectric properties
- May be soldered through, allowing easy repair
- UV trace for inspection
- May be removed with solvents such as Ultrasolve (ULS)



CPL

Clear Protective Lacquer

- General purpose coating for PCBs giving high quality glossy finish
- Ideal for protecting ferrous metals from corrosion
- Good resistance to humidity
- Resolderability through the lacquer



DCA/DCR/DCRT

SCC3 Conformal Coating

- High specification flexible modified silicone resin conformal coating
- Transparent version (DCA) is UL approved
- Red version (DCR) available for camouflage
- Red version high build (DCRT) available for extreme conditions
- Excellent chemical and solvent resistance
- May be soldered through for rework



HPA

HPA Conformal Coating

- High performance flexible acrylic coating
- Approved to US MIL-1-46058C and, meets requirements of IPC-CC-830B
- UV trace for inspection
- Excellent dielectric properties and with a wide temperature range
- Resistant to mould growth
- May be removed with solvents such as Ultrasolve (ULS)



PCM

Peelable Coating Mask

- Flexible latex for masking components
- Completely hand-peelable, leaving no residue
- Solvent resistant and does not contaminate conformal coatings
- Dries at room temperature
- High film strength, does not break easily



PUC

Polyurethane Coating

- Good mechanical strength
- Excellent adhesion under all climatic conditions
- Fluoresces under UV light to aid inspection
- Wide temperature range -55°C to +130°C
- Excellent resistance to a wide range of chemicals
- Resistant to mould growth



SRC

Silicone Removable Coating

- Solvent removable, silicone conformal coating
- Good adhesion and humid ageing properties
- May be soldered through safely
- Wide operating temperature range
- Excellent surface resistivity
- DAT2V approved



TFCF

Fluorocoat Surface Modifier

- Thin film coating offering excellent moisture resistance
- Assemblies can be coated without masking
- Applies a very thin film which breaks when connectors, etc are inserted
- Contains UV trace for easy inspection

Resins

- UL approved
- Potting/encapsulating
- Cable jointing
- Sealing and protection
- Bespoke and ex-stock

Electrolube continues to be at the forefront of resin technology, offering a wide range of high performance polyurethane and epoxy resins for circuit and component protection and also designing new resins to solve customer problems. Resin systems are designed to protect and insulate electrical and electronic components from the threats of harsh and challenging environments - moisture, vibration, thermal or physical shock and general contamination.

Resins can form a complete barrier against environmental hazards and totally insulate assemblies, thus making them more suitable than conformal coatings for operation under extreme conditions.



Polyurethane resins are ideal for bend restriction applications

Benefits of Resin Systems

Resins are an excellent way of forming tough polymeric materials in difficult locations and where heat curing is impractical, such as on site cable jointing and insulation, outdoor cable duct sealing, road sensor installation and for many electrical and electronic potting and encapsulation applications.

Most Electrolube resins consist of two liquids, resin and hardener that when mixed together in the correct ratio, react to form solids. By careful formulation the properties of the cured resin can be tailored to meet individual customer requirements. These include hardness, flexibility, dielectric strength, heat transfer properties, temperature range etc. Electrolube can alter the properties of the constituent parts and how they behave whilst curing. Other properties can also be changed such as viscosity and colour.

Resin systems range from hard, tough materials, through rubbers, to soft, self healing removable gels.

Typical Application

Resins are used to provide security and protection in many different applications including:

- Automotive (ABS, sensors)
- Electronic & electrical (transformers, thyristors, PCBs)
- Cable jointing (fibre optics, oil platform terminations)
- Casting & moulding (decorative badges, tool making)



The Wolf Safety Lamp Company use Electrolube Resin products in portable lighting, for use in potentially explosive atmospheres

Resins

Specific Information

Resin Types

The two most commonly used resin types in the electronics industry are epoxy and polyurethane. Electrolube designs and manufactures a wide range of both of these systems.

Epoxy

Epoxyes generally have a higher temperature rating than polyurethanes, exhibit lower shrinkage on cure, are harder and stronger and are easier to make flame retardant. They exhibit better adhesion, superior resistance to humidity during and after cure and high chemical resistance.

Polyurethane

Polyurethanes are generally softer, more flexible and truly elastomeric in comparison with epoxyes and therefore cause less stress to the components they protect. Curing far more quickly at low temperatures, they exhibit much higher abrasion resistance and have a lower operating temperature (down to -60°C).

Packaging

Electrolube resin systems are designed to be simple and cost effective and are suitable for all production methods and volumes.

Resin Packs - small scale production/prototyping/field application. These contain resin and hardener, matched to the correct ratio. The resin and hardener are contained in a single pouch, separated by a removable clip. The clip is removed and the liquids must be thoroughly mixed within the sealed bag. When mixing is complete the corner of the pack is cut off and the mixed system dispensed. Resin packs are available in varying sizes.

Resin Kits - medium to high volume with or without automated equipment. The resin and hardener are supplied in two tins matched to the correct ratio. Sufficient space is left in the resin tin to allow the addition of the hardener for subsequent mixing. This avoids the user having to weigh materials to the correct ratio.

Bulk Resin - high volume with automated equipment. Resin and hardener are supplied in separate containers. The two materials must be mixed together in the correct ratio, preferably utilising a proportional mix and dispense machine. If equipment is not available the quantities of each component must be weighed accurately.

Conclusion

Electrolube can supply standard resins for many applications. If standard resins do not meet the need of the customer, then Electrolube will work with the customer to produce a product tailored to the exact parameters required. Once approved for use, the resin can be packed to suit the customer's production environment.



Mixing and dispensing is easy using the Electrolube resin twinpack system

Resins

Epoxy

| Typical Properties | ER2001 | ER2074 | ER2188 | ER2183 | ER2195 |
|---|------------------|----------------------|-------------------------------|------------------|--------------------|
| Base material | Epoxy | Epoxy | Epoxy | Epoxy | Epoxy |
| Thermal Conductivity (W/mK) | 0.55 | 1.26 | 0.45 | 1.1 | 0.45 |
| Cured Density (g/ml) | 1.74 | 2.25 | 1.69 | 2.19 | 1.68 |
| Mixed System Viscosity (cPs Brookfield) | 9000 | 16700 | 9000 | 5000 | 9000 |
| Temperature Range (°C) | -40→+130 | -40→+130 | -40→+120 | -40→+130 | -40→+130 |
| Max Temperature Rating (Short Term, °C) | 150 | 150 | 140 | 150 | 150 |
| Dielectric Strength (kV/mm) | 10 | 10 | 10 | 10 | 10 |
| Volume Resistivity (ohm-cm) | 10 ¹⁵ | 10 ¹⁵ | 10 ¹⁴ | 10 ¹⁵ | 10 ¹⁵ |
| Usable Life (Minutes @ 25°C) | 150 | 90 | 60 | 120 | 240 |
| Gel Time (Minutes @ 25°C) | 300 | 300 | 150 | 420 | 600 |
| Cure Time (Hours @ 25°C) | 24 | 24 | 24 | 24 | 36 |
| Cure Time (Hours @ 60°C) | 4 | 4 | 2 | 4 | 4 |
| Cure Time (Minutes @ 100°C) | 30 | 60 | 20 | 60 | 60 |
| Shore Hardness | D85 | D80 | D85 | D80 | D80 |
| Colour | Black | White | Black | Black | Black |
| Special Property | General | Thermal Conductivity | DDM Free (ER2002 replacement) | Low Viscosity | Adhesion Toughness |
| Flame Retardancy | Yes UL94V-0 | Yes | Yes UL94V-0 | Yes | Yes UL94V-0 |

Polyurethane

| Typical Properties | UR5041 | UR5044 | UR5048 | UR5528 | UR5547 | UR5604 | UR5097 | UR5608 | UR5618 |
|---|------------------|--------------------|------------------|-------------------------------|--------------------|---------------------------------|---|------------------|------------------|
| Base material | Polyurethane | Polyurethane | Polyurethane | Polyurethane | Polyurethane | Polyurethane | Polyurethane | Polyurethane | Polyurethane |
| Thermal Conductivity (W/mK) | - | 0.25 | - | 0.245 | 0.35 | 0.45 | 0.65 | 0.45 | 0.45 |
| Cured Density (g/ml) | 1.18 | 1.50 | 0.95 | 1.07 | 1.60 | 1.54 | 1.49 | 1.59 | 1.59 |
| Mixed System Viscosity (cPs Brookfield) | 2500 | 3400 | 980 | 2000 | 4000 | 2000 | 6000 | 2000 | 2000 |
| Temperature Range (°C) | -60→+125 | -60→+120 | -60→+100 | -50→+125 | -50→+110 | -40→+110 | -40→+110 | -40→+100 | -40→+100 |
| Max Temperature Rating (Short Term, °C) | 130 | 130 | 100 | 130 | 120 | 130 | 130 | 120 | 120 |
| Dielectric Strength (kV/mm) | 20 | 17.7 | 18 | 25 | 14 | 18 | 18 | 18 | 18 |
| Volume Resistivity (ohm-cm) | 10 ¹⁵ | 10 ¹⁰ | 10 ¹⁴ | 10 ¹⁴ | 10 ¹⁴ | 10 ¹⁴ | 10 ¹⁴ | 10 ¹⁴ | 10 ¹⁴ |
| Usable Life (Minutes @ Room Temp) | 20 | 30 | 20 | 20 | 20 | 40 | 20 | 30 | 12 |
| Gel Time (Minutes @ Room Temp) | 60 | 65 | 40 | 35 | 50 | 90 | 80 | 60 | 20 |
| Cure Time (Hours @ Room Temp) | 36 | 24 | 48 | 72 | 24 | 24 | 36 | 24 | 24 |
| Cure Time (Hours @ 60°C) | 4 | 3 | 4 | 5 | 3 | 3 | 4 | 3 | 3 |
| Cure Time (Minutes @ 100°C) | - | - | - | - | - | - | - | - | - |
| Shore Hardness | A85 | A40 | A12 | D57 | A80-A90 | A75 | A85 | D50 | D50 |
| Colour | Black | Blue | Clear | Black | Black | Black | Black | Black | Black |
| Special Property | Water Resistance | Soft, re-enterable | Soft, Low Stress | Hard, Tough and high adhesion | Excellent adhesion | Flexible, tough & high adhesion | Flame retardant & high Thermal Conductivity | Tough, Rigid | Fast UR5608 |
| Flame Retardancy | No | Yes UL94V-0 | No | No | Yes | Yes UL94V-0 | Yes UL94V-0 | Yes UL94V-0 | Yes UL94V-0 |

ER2001

(Black)

- Medium viscosity
- General purpose
- Flame retardant
- Excellent insulation properties
- Certified to UL94V-0
- For potting PCBs, coils, transformers and mould casting

ER2074

(White)

- Thermally conductive
- Flame retardant
- No abrasive fillers
- For potting PCBs, power supplies, DC-DC converters and temperature sensors

ER2136

(Blue)

- One part hot cure system
- Allows thick films to be applied
- Ideal for use as a dipping resin for hybrid circuits and discrete components
- Low ionisable chlorine level

ER2183

(Black)

- Enhanced machine mixing and dispensing
- Low viscosity alternative to ER2074
- For use with ABS sensors, pressure barrier sensors, temperature sensors, and power supplies

ER2188

(Black)

- DDM free
- Flame retardant
- General purpose potting resin
- Certified to UL94V-0
- For potting and encapsulating applications where flame retardancy is required
- Very glossy finish

ER2195

(Black)

- Tough, flame retardant potting resin
- DDM free
- Excellent thermal shock resistance
- Certified to UL94V-0
- For transformers, large castings, rotor arm sealing, pyrotechnical cables, diesel sensors and other automotive applications

OP9003

Resin Remover

- Non-flammable
- Designed to swell and soften cured epoxy, polyurethane and other resins and enable their removal from most substrates

OP9004

Machine Cleaner

- Non-flammable
- Slow evaporation rate allowing surfaces to be polished clean
- Designed to swell and soften cured epoxy, polyurethane and other resins and enable their removal from most substrates
- Cleans machines, tools and jigs
- Doesn't corrode metal components

Electrolube also offers an extensive range of bespoke resin systems.

UR5041

(Black)

- A ultra-high performance system based on polybutadiene urethane technology
- High toughness and tear resistance, good adhesion to most substrates
- These properties retained at temperatures down to -60°C

UR5044

(Blue opaque)

- Flame retardant
- Digoutable polybutadiene based urethane
- Low hardness to avoid stressing on delicate units
- Certified to UL94V-0
- For prototype circuitry, silicone replacement, and control units

UR5048

(Clear)

- Digoutable gel
- Transparent - Clear to allow fast fault findings
- Hydrophobic, thermal and mechanical shock resistant
- For the encapsulation of delicate components

UR5097

(Black)

- Medium hard, flame retardant, high performance resin with exceptional water resistance
- Especially suited to potting of electrical and electronic devices operating in harsh environments such as marine, automotive and tropical
- Certified to UL94V-0
- For marine terminations, bend restrictors, cable joints, converters, temperature sensors, lighting equipment in hazardous environments

UR5528

(Black)

- A hard and tough resilient casting resin
- Excellent adhesion qualities to substrates such as PVC, ceramics etc
- Low viscosity enabling a bubble free product to be obtained
- Castings made with this resin have excellent resistance to acids, alkalis and other aqueous materials

UR5547

(Black or White)

- A semi rigid, flame retardant casting resin for use in potting or cable jointing applications
- Water and impact resistance and excellent adhesion to a wide variety of substrates
- White version is UR5581

UR5604

(Black)

- High performance potting resin with excellent adhesion properties
- Medium hardness
- Certified to UL94V-0

UR5608

(Black or White)

- Semi-rigid flame retardant polyurethane with exceptional toughness, adhesion and chemical resistance
- Certified to UL94V-0
- Fast and medium speed of cure versions available
- For cable blacking and jointing, casting, coil impregnation, PCB encapsulation, transformers, alarms and battery terminations
- White version is UR5623

Electrolube also offers an extensive range of bespoke resin systems.

Thermal Management

- Non-silicone pastes
- Silicone pastes
- Epoxy resins
- High thermally conductive RTV
- 0.9 to 3.0W/m.K



Electrolube manufactures a comprehensive range of products with high thermal conductivity. These include pastes (greases), adhesives, RTVs and encapsulants. They are used to dissipate heat in electronic and related equipment to ensure effective operation.

Benefits of Thermally Conductive Products

Most components have a maximum effective operating temperature and failure to maintain the temperature below this can lead to two main problems:

- Increased failure rates
- Variation of electrical properties

Heat generated within components is usually removed by the use of metals, which may be formed to give high surface areas (heatsinks) or be part of the assembly's outer body. The hot component is usually mechanically attached to the metal. The limitation of this is that there will always be an air gap between the surfaces. Air is an extremely poor conductor of heat, so this air gap greatly reduces the rate of heat dissipation. The application of a flexible thermally conductive material completely fills the gap, excluding air. Electrolube products have excellent heat transfer properties ensuring that heat flows from the component into the metal heatsink at the fastest rate possible.

Typical Application

The range of applications where the use of a thermally conductive materials is necessary has greatly increased as electronic circuits have become more complex and powerful. These advances have resulted in greater heat generation. This heat must be drawn away from the components quickly and efficiently to ensure long term reliability and operating efficiency.

In solar panel systems it is vital that the heat is transferred with minimal loss. Electrolube's ultra-high thermally conductive pastes (over 2.8W/mK) are ideal for this application.

Thermal management in high power industrial applications e.g. traction, is particularly important.

| Typical Properties | HTC Non-Silicone Heat Transfer Compound | HTS Silicone Heat Transfer Compound | HTCP Non-Silicone Heat Transfer Compound Plus | HTSP Silicone Heat Transfer Compound Plus | TBS 2 Part Thermal Bonding System | ER2074 2 Part Epoxy | TCR Thermally Conductive RTV |
|--|--|--|--|--|--|---------------------------|---------------------------------------|
| Base Material | Non-Silicone Oil | Silicone Oil | Non-Silicone Oil | Silicone Oil | Epoxy | Epoxy | Silicone RTV |
| Thermal Conductivity (W/mK) | 0.90 | 0.90 | 2.5 | 3.0 | 1.1 | 1.26 | 1.79 |
| Density (g/ml IP-59) | 2.04 | 2.1 | 3.0 | 3.0 | 2.8 | 2.09 | 2.3 |
| Temperature Range (°C) | -50 → +130 | -50 → +200 | -50 → +130 | -50 → +200 | -40 → +120 | -40 → +130 | -50 → +230 |
| Evaporation Weight Loss (96 hrs @ 100°C IP-183) | ≤1.00% | ≤0.80% | ≤1.00% | ≤0.80% | N/A | N/A | N/A |
| Dielectric Strength (kV/mm) | 42 | 18 | 42 | 18 | 11 | 10 | >8 |
| Electrical Insulation Resistance (Ω UL746C) | 10 ¹² | 10 ¹² | 10 ¹² | 10 ¹² | 10 ¹⁴ | 10 ¹⁵ | 10 ¹⁴ |
| Cure Time (Hours @ 20°C/ minutes @ 100°C) | N/A | N/A | N/A | N/A | 24/45 | 24/60 | 24* |

*Requires moisture to cure, elevated temperatures not recommended unless moisture is present.



HTC

Non-silicone Heat Transfer Compound

- Excellent non-creep characteristics
- Excellent thermal conductivity even at high temperatures: 0.9 W/m.K
- Wide operating temperature range: -50°C to +130°C
- Low evaporation weight loss
- Easy to handle
- Low toxicity



HTCA

Non-silicone Heat Transfer Compound Aerosol

- Excellent non-creep characteristics
- Excellent thermal conductivity even at high temperatures: 0.9 W/m.K
- Wide operating temperature range: -50°C to +130°C
- Low evaporation weight loss
- Easy to use and economic, particularly for larger applications



HTCP

Non-silicone Heat Transfer Compound Plus

- Excellent non-creep characteristics
- Excellent thermal conductivity even at high temperatures: 2.5 W/m.K
- Wide operating temperature range: -50°C to +130°C
- Low evaporation weight loss
- White colour enables treated parts to be easily identified



HTS

Silicone Heat Transfer Compound

- Excellent non-creep characteristics
- Wide operating temperature range -50°C to +200°C with low evaporation weight loss
- Excellent thermal conductivity even at high temperatures 0.9 W/m.K



HTSP

Silicone Heat Transfer Compound Plus

- Superior thermal conductivity even at high temperatures 3.0 W/m.K
- Excellent non-creep characteristics
- Wide operating temperature range -50°C to +200°C with low evaporation weight loss



TCR/TCRGUN

Thermally Conductive RTV

- Silicone RTV with high thermal conductivity (2 W/m.K)
- Operates from -50°C to +230°C
- Cures in 24 hours at room temperature
- For ease of use, a trigger gun applicator is available



TBS

Thermal Bonding System

- Two part epoxy bonding system with thermal conductivity of 1.1 W/m.K
- Eliminates need for mechanical fixing by providing a permanent bond

Contact Lubrication

- Extends switch life
- Improves signal quality
- Reduces operating temperature
- Controls switch 'feel'
- Prevents contamination
- Silicone free

Contact lubricants increase the reliability and lifetime of all current carrying metal interfaces. These include switches, connectors and busbars.

Electrolube have been the leading supplier of contact lubricants since their invention by the founder Henry Kingsbury in the 1950s.

A wide range of products are available covering all common applications, whilst a programme of continual development provides speciality products for ever-changing customer needs.

Manufactured as tenacious greases and oils, products are available for consistent operation at extremes of temperature and with sensitive plastics that are normally attacked by traditional lubricants.

The use of a suitable contact lubricant will solve the problems of wear, poor signal quality, inconsistent operation and allow the use of less expensive materials. The choice of lubricant can also allow the 'feel' characteristics of the switch to be optimised.

Typical Application

The range of applications is vast and can include everything from PC edge connectors to switches in washing machines, kettles, hair dryers and electric blankets. Contact lubricants will bring significant benefits to any application where switches and contacts are fundamental to successful, long term operations.

The use of contact lubricants is widely spread in the automotive industry, where they are employed to ensure reliability, safety, efficiency and to control the 'feel' of switches.

These lubricants are also used in electric motors and for electroplating. They are available for low current applications as well as traditional switch currents.



Benefits of Contact Lubrication

Contact lubricants are specially formulated greases and oils that reduce friction and enhance the electrical performance of current carrying metal interfaces in switches and connectors. Electrolube products are electrically insulative in thick films, preventing tracking. In ultra thin films, i.e. between closed metal contacts, they allow consistent current flow, owing to the 'Quantum Tunnelling Effect'. They also exhibit a neutral pH, thereby avoiding surface corrosion.

Tests have shown that contact lubrication can extend the lifetime of switches by more than 300%, producing excellent performance under all circumstances and preventing the need for expensive maintenance. Contact lubricants also help to improve the reputation of manufacturers by reducing or preventing warranty claims and the associated commercial costs of product recalls.

The effectiveness of even perfectly designed switches can be improved by contact lubricants and, when considered at design stage, significant production cost savings can be achieved by the use of less expensive materials (both plastics and contact metals).



Contact Lubrication

How Contact Lubricants Work

Contact technology is constantly developing with new alloys, plastics and customer demands. However, it is still impossible to solve the main cause of switch malfunction i.e. the inability to produce a perfectly smooth metal contact surface. This leads to the following problems:

Heat Generation

Microscopic examination reveal 'peaks and troughs' on the surface and when the contacts come together, only the peaks are actually touching. The true current carrying surface area is therefore far smaller than it would appear.

As the current is carried by a fraction of the designed surface area, the heat generated is concentrated at the peaks. This, in turn, causes the formation of high resistance oxide layers. As the resistance increases, more power is converted into heat, leading to further oxidation.

This spiralling effect creates 'hot spots' reducing the efficiency of the switch and can cause complete failure as the two surfaces weld together.

Application of an Electrolube contact lubricant solves this problem. The lubricant film dramatically increases the effective surface area as, in thin films, the lubricants allow the passage of electricity. The switch now has the surface area that the designers planned. 'Hot spots' are eliminated and the contact resistance remains low and stable.

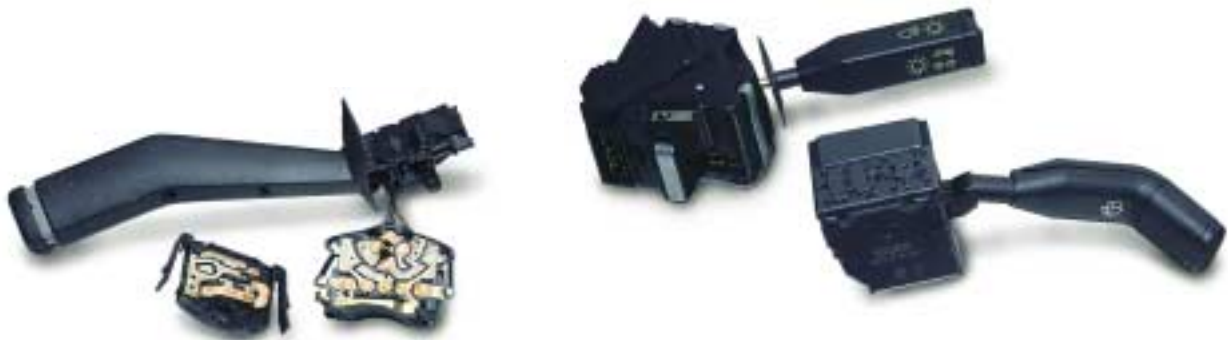
Arcing

As un-lubricated contacts open and close, arcing (mini-lightning strikes) can often occur. Arcing is destructive as it generates heat, causing oxide formation, and, as the amount of energy is high, corrosive by-products can be formed. These cause corrosion of the surface and can destroy plated contacts.

Ionisation of the air and the associated rise in temperature causes metal transfer between the contacts, resulting in the formation of new 'peaks and troughs' - a common problem found in high power contacts.

The problem of arcing is compounded in 'make & break' switches where every time the circuit is opened, the contacts may bounce several times before finally mating. This exacerbates the problems and subjects the circuit to repeated surges of current giving a poor signal-to-noise ratio.

This problem is not found in lubricated switches, as the lubricant fills the air gap between the contacts, preventing arcing, related temperature rises and corrosive chemical formation. As air is excluded from the metal surfaces, airborne contamination cannot form insulative barriers on the metals. Contact lubricants provide a cushion between the contacts to damp the effects of bouncing.



RENAULT



Electrolube contact lubricants are highly regarded throughout the automotive industry. Here are just some of the manufacturers that use our products.

Contact Lubrication

Mechanical Wear

The problems described previously are compounded by the action of the two surfaces rubbing against each other. This occurs in all metal interfaces, whether static or moving. Why static contacts (connectors) suffer from mechanical wear may not be immediately obvious. However, this phenomenon is explained by the fact that connectors and closed contacts are exposed to small amplitude movements caused by vibration, temperature changes etc. These small movements are known as 'fretage'.

As the surfaces fret, friction causes metal particles to be removed from the peaks breaking through plated surfaces. This exposes surface and underlying metal to effects of oxidation and wear. Additionally the detached metal particles can cause intermittent signal transmission and ultimately switch failure.

A lubricated switch is subject to far less mechanical wear as the lubricant facilitates smooth movement. Friction is therefore greatly reduced, as is wear, extending switch lifetime.

Feel Characteristics

The way a switch 'feels' when operated has become an indicator of quality particularly within the automotive industry. Contact lubricants, in addition to their technical benefits can also determine the 'feel' of a switch, whether it be strong and decisive for the dashboard of a commercial vehicle, or smooth and quiet for a luxury car.

Silicone Contamination

Silicone contamination poses particular problems which can also be overcome by contact lubricants. Silicones can be found in mechanical lubricants, sealants, polishes and mould release agents.

As silicones can "creep" great distances, these products should not be used in switch assembly areas. When silicone is present between moving or vibrating contacts, they react under arcing conditions to form silicon carbide. These crystals abrade the contact surface and cause electrical breakdown.

If a contact lubricant is used on the switch prior to the introduction of silicone these problems are avoided.

Conclusion

Electrolube range of contact lubricants has been developed to improve the efficiency and life-span of switches and connectors.

However, it is important to discuss options with Electrolube at the design stage to ensure that the correct product is selected and properly applied. Among the areas to be considered are voltage, current, operating temperature range, contact metals, number of cycles and associated plastics.

| Typical Properties | SGA | SGB | CG52B | CG53A | CG60 | CG70 | CG71 | EGF | EPC | Plastics Lubricant | LCG |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------------|---------------|
| | 2G | 2GX | | | | | | | | SPG | |
| Colour | Light Brown | Light Brown | Beige | Cream | Cream | Cream | Cream | White | Red | Light Brown | Cream |
| Pour Point (base oil, °C IP-15) | -46 | -37 | -45 | -37 | -54 | -57 | -56 | -25 | -46 | -57 | -52 |
| % Evaporation Weight Loss between 24 and 150hrs (IP-183 100°C) | 0.9 | 0.93 | 0.84 | 0.21 | 0.3 | 0.3 | 0.3 | <0.1 | 0.9 | 0.2 | 0.3 |
| Fliessdruck (mbar, -40°C, DIN 51805) | 650 | 720 | 400 | 350 | 300 | 300 | 300 | 1100 | N/A | 450 | 300 |
| Drop Point (°C IP-31) | >250 | >250 | >230 | 200 | 200 | 200 | 200 | >250 | >250 | >250 | 200 |
| Penetration (Worked, Cone, 20°C IP-50) | 320 | 320 | 320 | 320 | 330 | 320 | 310 | 270 | 320 | 320 | 320 |
| Temperature Range (°C) | -40 → +125 | -35 → +130 | -45 → +130 | -35 → +130 | -45 → +130 | -55 → +130 | -50 → +130 | -25 → +300 | -50 → +250 | -50 → +130 | -45 → +130 |
| Mechanical Lubrication | Good | Good | Good | Excellent | Excellent | Excellent | Excellent | Good | Good | Excellent | Excellent |
| Electrical Performance | Excellent | Good | Good | Excellent | Excellent | Excellent | Excellent | Good | Good | Fair | Excellent |
| Oil Version Available | SOA | SOB/EML | N/A | SOB/EML | N/A | N/A | N/A | EOF | N/A | N/A | N/A |
| Plastics Compatibility Polycarbonate * | Poor | OK | OK | OK | Excellent | Excellent | OK | Excellent | N/A | Excellent | Excellent |
| Plastics Compatibility ABS * | Poor | OK | OK | OK | Excellent | Excellent | OK | Excellent | N/A | Excellent | Excellent |

*Compatibility may differ from quoted results - **Testing should always take place prior to production.**

12.5 & 25Kg drums are straight sided and therefore suitable for automatic dispensing.

12.5Kg: 254mm inside diameter x 330mm height 25Kg: 305mm inside diameter x 406mm height.



CCS

Contact Cleaning Strips

- Easy to use
- Impregnated, mildly abrasive card
- Cleans, refurbishes and lubricates metal contacts
- High quality contact lubricant



CG53A

Contact Grease

- Contact grease with excellent electrical properties
- Ideal for automotive switches
- Very good plastics compatibility
- Luer lock syringe dispenser
- Good high and low temperature performance: -35°C to +130°C



EML

Contact Cleaner Lubricant

- Cleans and lubricates switches and connectors
- Removes dirt and protects from further contamination
- Reduces contact resistance
- Improves conductivity
- Commonly known as switch cleaner



SGB

2GX Contact Treatment Grease

- High quality, non-melting contact grease
- Lubricates switches and electrical contacts
- Reduces contact wear and arcing
- Excellent plastics compatibility
- Applicable for high and low voltage



SOB

2X Contact Treatment Oil

- Contact oil for switch and contact applications
- Non-flammable and silicone free
- Good mechanical properties
- Reduces arcing and hence contact wear



SWC

Switch Cleaner Lubricant

- Non-flammable
- Provides protection against arcing and corrosion
- Can be used on live equipment
- Safe to use on most plastics
- Contains high quality contact treatment oil
- Supplied with brush and extension tube



ULL

Ultralube

- Tenacious long lasting and non staining lubricant
- Suitable for use on printer mechanisms, etc.
- Can be used as an edge connector lubricant, particularly for gold contacts
- Can be used as a silicone inhibit for relays, etc.

Maintenance & Service Aids

- Syringes, pump sprays, tubes, aerosols, wipes, pens
- Airduster and freezer
- Cleaners and coatings
- Greases and oils
- Thermal grease and resins
- Maintenance, test, repair and small scale production
- Paints and galvanising sprays

Electrolube manufactures a wide range of products for use in manufacturing, whether by OEMs or subcontractors, in convenient packaging. Developed over many years to complement the original products, these are ideal for use in maintenance and servicing. They include aerosols, pump sprays, syringes, tubes, pens, sachets and small tins.



As part of this range Electrolube has Airduster and Freezer aerosols offering a simple and cost-effective solution to common problems found in the electronics industry.

Airdusters remove dust and dirt from, for example, the heads of disc drives, inaccessible assemblies, photographic equipment and will blast off water and other solvents after cleaning.

Freezer rapidly cools components to well below -50°C . This enables the extremely fast identification of faulty components. The alternative method of testing each component for integrity is extremely labour intensive. Electrolube Minimal Charging Freezer has been specially formulated to ensure that it induces the minimum level of charge possible, making it safe to be used on static sensitive components.

The maintenance range includes products for hard surface cleaning, together with cyanoacrylate adhesives, tamper evident seals, contact cleaner lubricants and many other products vital to the field service engineer. Whether he is repairing a photocopier or a PCB, Electrolube can provide a total solution for the mobile engineer.



Industrial Maintenance

Electrolube Industrial Maintenance Range includes a selection of high quality paints, galvanising sprays, mechanical lubricants, special plastic grease, silicone oils and graffiti removers. It offers problem solving products for mobile mechanics and service engineers.



AFC

Anti-static Foam Cleaner

- Protects against static build-up
- Biodegradable
- Safe on all plastics
- Non-flammable
- Apply and wipe with Engineers Cleaning Wipes (ECW025)



ASA

Anti-static Spray

- Powerful non-foaming cleaner which also prevents static build-up
- Long term effect
- Non-flammable
- Suitable for use on screens and bench tops
- Also suitable for use on fabrics



BLV/R

Bloc'lube

- Tamper evident seal for potentiometers etc
- Green or red
- Supplied with integral brush



CTC

Carterclene

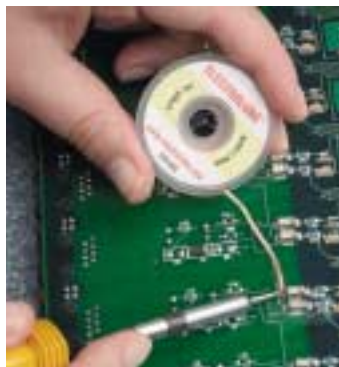
- Heavy duty anti-static foaming cleaner that removes ingrained dirt and grime
- Gives long lasting anti-static properties on glass, plastic and other synthetic materials
- Shake well before use, apply and wipe with ECW025



CYL

Cyanolube

- Fast curing cyanoacrylate adhesive which dries in 1-5 seconds
- Tear strength 25-30N/mm
- Bonds most common substrates
- Adheres well to most plastics without leaving a white 'bloom'



DB1003/2003

Desolder Braid

- Fast, effective wicking when removing components
- Utilises no-clean flux
- Economic 3m length
- Available in two widths - 1.25mm and 2.00mm



EAD/EADI

Airduster

- Inert, pure compressed gas for dust removal
- Available in standard and invertible versions
- Ideal for removing particulates from inaccessible areas on delicate equipment
- Non-flammable



EADP

Airduster Plus

- Ultra high power airduster
- High pressure blast for removing stubborn particulates
- Inert, pure compressed gas
- Non-flammable
- Use in short, sharp bursts to avoid can frosting



EML

Contact Cleaner Lubricant

- Cleans and lubricates switches and connectors
- Removes dirt and protects from further contamination
- Reduces contact resistance
- Improves conductivity
- Commonly known as switch cleaner



FRE

Freezer

- Standard freezer for non-sensitive, electronic fault finding
- Can aid mechanical shrink fitting
- Non-flammable, cools down to -55°C
- Prevents damage to components during soldering



GDP

High Powered Airduster

- High powered airduster with powerful initial blast and minimal drop off
- Non-flammable, pure compressed gas
- Use to remove dust and dirt from delicate and inaccessible areas
- Use in short, sharp bursts to avoid can frosting



LRM

Label Remover

- Paper label remover
- Suitable for EPROMS, also useful around the office
- Aerosol with brush enables mechanical scrubbing action to aid removal
- Handy pen version available
- Harmless to most plastics



MCF

Minimal Charging Freezer

- Unique additive minimises static build up whilst still allowing frost formation
- Fast fault finding in electronics
- Suitable for static sensitive devices
- Protection from overheating
- Cools to -55°C



NSC

Nickel Screening Compound

- Efficient EMI/RFI screening coating with excellent attenuation levels
- Enhanced adhesion to wide variety of substrates
- Provides even coating with superior scratch resistance
- Fast drying at room temperature
- Prevents static build-up



SCP

Silver Conductive Paint

- Highly conductive silver loaded paint
- Ideal for track repair and pinpoint shielding
- Fast drying
- Excellent adhesion to most substrates



RRR

Rubber Roller Restorer

- Restores texture to rubber rollers in office equipment
- Prolongs the lifetime of rubber rollers, preventing costly replacement
- Supplied in pump spray
- Leaves no residue
- Dissolves ink, oil, grease and will remove general office dirt



ACL

Adhesive Chain Lubricant

- Highly tenacious
- Excellent resistance to water and high temperatures
- Good mechanical stability
- Good penetration at low temperatures



AGC

Copper Anti-seize Fluid

- Provides anti-seize and anti-corrosion protection
- Ideal for use on threaded components
- High copper content provides effective lubrication
- Highly water resistant
- Effective at high temperatures



DAS

Silicone Mould Release

- Colourless silicone lubricant
- Water repellent surface treatment
- Ideal for all mould release applications
- Very good thermal stability
- Reduces surface friction



DDF

Leak Detector

- Allows immediate detection of air and gas leaks from all types of pipework and vessels
- Non-flammable and safe to use
- Water-based
- Contains anti-corrosion agents to ensure that substrates are not affected



DGT

Penetrating Fluid

- Penetrates and lubricates mechanical parts
- Produces a highly water resistant film, providing long term corrosion protection
- Loosens seized assemblies and prevents friction noise
- Ideal for breakdown and maintenance services



DTP

Paint Stripper

- Extremely powerful paint and varnish remover
- Can be used for removing graffiti
- Suitable for removing varnishes on wood
- May be removed simply by brushing
- Not to be used on plastics



HDC

Cutting Fluid

- Industrial grade metal cutting oil
- Powerful lubricant suitable for ferrous metals, stainless and heat resistant steels
- Allows high speed punching
- Extends tool life



MPU

Polyurethane Foam

- One-part ready to use self-expanding PU foam
- Cures quickly to form a tough, waterproof layer
- Excellent for filling and sealing spaces around cables, window frames, pipe ducts, etc.
- Provides good thermal and acoustic insulation



PBS

Antispatter Spray

- Prevents adhesion of weld spatters
- Suitable for protecting nozzles, weld units and tools
- Non-flammable and silicone free
- Very fast drying



PGB/PGM

Galvanising Spray

- Cold galvanisation paint for metal surfaces
- Protects against oxidation and corrosion
- Very fast drying with excellent adhesion properties
- May be used as a primer for fixing lacquers
- Available in gloss and matt finishes



PNM/PAM

High Temperature Paints

- Heat resistant paints suitable for objects exposed to temperatures of up to 650°C
- Excellent coverage and flow characteristics
- Rapid drying to a very tough finish
- Good adhesion and anti-corrosion properties
- Available in aluminium grey or matt black



PWB/PVB/PBB/ PJB/PRB/PNB

High Gloss Paints

- Quick drying, high quality, universal spray paints with excellent coverage and hardness
- Suitable for use in manufacturing, repair, workshop and home
- Colours

| | | | |
|--------|-----|-----|------|
| White | PWB | RAL | 9010 |
| Blue | PBB | RAL | 5010 |
| Yellow | PJB | RAL | 1021 |
| Black | PNB | RAL | 9005 |
| Red | PRB | RAL | 3000 |
| Green | PVB | RAL | 6002 |



GRG

Graffiti Remover Gel

- High viscosity gelled product – clings to vertical surfaces
- Low odour, low volatility – longer contact time
- Removes graffiti from porous and non-porous surfaces e.g. wood, brick, vinyl
- Harmless to most plastics and metals
- Effective and economical in use



GRS

Graffiti Remover for Sensitive Surfaces

- Removes graffiti from porous and semi-porous surfaces, e.g. vinyl and laminates
- Pleasant light odour
- Contains non-chlorinated solvents
- Compatible with most plastics and metals



APB

Air Powered Bottle

- Achieves 'aerosol' results without the use of propellant
- 300ml HDPE bottle holds a maximum 200ml of fluid
- Compatible for use with IPA and aqueous solutions



DEI

Demineralised Water

- Provides a final polish to circuit boards and assemblies that have been cleaned and rinsed in tap water
- Ideal for use with Safewash
- Suitable for use in trigger spray bottle (TSB000) or air powered bottle (APB000)



SGL

Silica Gel

- Non-indicating silica gel sachets used to protect assemblies from moisture attack
- Inert to most non-aqueous chemicals
- Available in 10g, 50g and 100g sachets



TSB

Trigger Spray Bottle

- Re-usable bottle for spraying various solutions
- Volumetric graduation marks on the side of bottle
- Holds up to 600ml
- Controlled usage with adjustable spray

See page 30 for available sizes



For more information on Electrolube products or services go to our web-site at www.electrolube.com

▼ **Health & Safety and Technical Data available to download**

▼ **Extensive product information**

▼ **Full product portfolio**

▼ **Distributor details**

▼ **Frequently asked questions**

▼ **Links to other H K Wentworth sites**

H K Wentworth Ltd
HKW Direct
AF International

and much more...

Search!



CMO

Clear Mechanical Oil

- Clear lubricant with excellent mechanical properties
- Outstanding penetration characteristics
- Water resistant
- Contains Molybdenum Disulphide



DFL

Dry Film Lubricant

- High purity PTFE based lubricant
- Operating temperature range of -200°C to +280°C
- Water repellent with a low co-efficient of friction
- May be used where silicones or mineral oils are unsuitable
- Can be used as a cold mould release



EPE

Permagard

- De-watering and penetrating fluid
- Excellent lubricating properties
- Loosens seized metal parts
- Protects against rust and corrosion



HTG

High Temperature Grease

- High quality mechanical grease for lubrication and protection
- Wide temperature range of -20°C to +200°C (does not harden at high temperature)
- Fortified with anti-wear and anti-oxidant additives
- Water resistant



MPG

Multi-purpose Grease

- General purpose grease in a tube for use in mechanical and electrical applications
- Wide temperature range of -20°C to +200°C
- Safe on most thermoplastics
- Good lubricating and thermal properties



OSL

Silicone Oil

- High quality, multi-purpose mechanical lubricant
- Silicone spray with excellent water repellency
- Long term lubrication for line printers, keyboards, platens, bearings, etc
- May also be used as a mould release agent



SCO

Silicone Grease Compound

- High quality, multi-purpose electrical insulating compound
- Excellent water and moisture repellency
- Chemically inert, odourless and non-toxic
- Excellent resistance to tracking and corona discharge



SPG

Special Plastics Grease

- Excellent plastics compatibility
- Offers outstanding low temperature performance
- Efficient mechanical lubricant for plastic/plastic or plastic/metal friction
- Ideal to reduce wear in timers, plastic cogs and gears etc.



SMA

Surface Mount Adhesive

- One part UV resistant system with high green strength and dot profile
- Excellent mechanical strength
- Resistant to cleaning solvents
- Long term stability after cure cycle
- Syringe can be used by hand or dispensing equipment



SMSP

Surface Mount Solder Paste

- Long tack time, dispensing grade silver solder paste
- Excellent wetting characteristics
- Good reflow characteristics, with no solder balling
- No post-cleaning necessary



SMF

Surface Mount Rework Flux

- Quick drying, mildly activated (RMA type) no-clean flux
- For use with hot air, hot gas or conventional soldering techniques
- Excellent solder ability
- Zero halide content so no cleaning is required
- Very high reliability



SMFL

Surface Mount Rework Flux

- Quick drying, no clean flux
- Can be used with hot air, hot gas or conventional soldering techniques
- Non tacky and no corrosive residue
- Very high reliability

Prototyping



CPL

Clear Protective Lacquer

- General purpose coating for PCBs giving high quality glossy finish
- Ideal for protecting ferrous metals from corrosion
- Good resistance to humidity
- Resolderability through the lacquer



FCC

Ferric Chloride

- 250g pack makes 500ml of Ferric Chloride hexahydrate
- Used for etching copper clad boards to produce PCBs, signs, pictures etc.



PRP

Positive Photoresist

- Fast drying positive photoresist in an aerosol
- Used for reproduction of circuits, images, PCBs, signs and diagrams
- Fine resolution down to 0.1mm, develops using UV or sunlight
- Ideal for prototyping



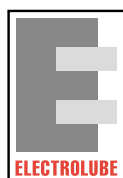
PDN

Photoresist Developer

- Safe aqueous alkaline developer to be used in conjunction with PRP and other positive photo resists



The H K Wentworth Group



Electrolube - Europe's leading manufacturer of electro-chemicals for the electronics, automotive and manufacturing industries.

AF International - The market leading brand of advanced cleaning products for computers and communications equipment in the modern working environment.

EuroChem - Provides innovative high-tech chemical solutions for niche applications in the fields of cleaning, agriculture, the railways, soil contamination and erosion, as well as waterproofing technologies for many diverse materials.

In 1956 Henry Kingsbury formed Kingsbury Components which manufactured volume controls. With vast experience and knowledge in the electronics field, he found himself developing new ideas to make the manufacturing process more successful. This breakthrough came with a specially formulated oil which had the ability to lubricate electrical contacts and moving parts. This oil not only solved many till then, intractable problems it also extended the life of the contacts.

From this was born a range of contact lubricants, which then grew consistently and steadily into the diverse product portfolio available from Electrolube today.

H K Wentworth Ltd is still a private company owned by the Kingsbury family and run by a small group of Executive Directors with active participation from the family.

Our comprehensive range of products are manufactured in a fully ISO 9001:2000 certified site which is in excess of 4831m² in the UK and another 4645m² in the Far East.

Research and Development is key to our business. The experience and knowledge within our R & D divisions enables H K Wentworth to create a constant supply of new innovative products for industry as well as providing an essential service to our customers by solving unique problems as and when they arise.

Maintenance & Service Aids

| | Each | Pen Pack | 2ml Syringe | 3g Bottle | 5g | 10g | 15ml | 20g | 26g | 35ml | 50g | 50ml | 100g | 150ml | 200ml | 200ml (brush) | 250ml | 400ml | 500ml | 600ml | 900g | 1 Litre | 1kg | 5 Litre | 10kg | 12.5kg | 20kg | 30 Litre | 52kg | 200 Litre | |
|------|------|----------|-------------|-----------|----|-----|------|-----|-----|------|-----|------|------|-------|-------|---------------|-------|-------|-------|-------|------|---------|-----|---------|------|--------|------|----------|------|-----------|--|
| ACL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AFC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AGC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| APB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BLR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BLV | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CMO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CTCP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CYL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DAS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DB1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DB2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DDF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DFL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DGT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DTP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EAD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EADI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EADP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EML | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EMPL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EPE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FRE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FSL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GDP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HDC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HTG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LRM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MBP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MCF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MPG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MPU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NSC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OSL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PBB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PBS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PGB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PGM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PGO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PJB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PNB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PNM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PRB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PVB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PWB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RRR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SGL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TPC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TPG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TSB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Cleaning

| | 20 Strips | Pen Pack | Pack of 25 | Pack of 100 | 20ml | 35ml | 50ml | 55ml | 200ml | 200ml (brush) | 400ml | 400ml (brush) | 500ml | 1 Litre | 1kg | 5 Litre | 5kg | 12.5kg | 20kg | 25 Litre | 25kg | 200 Litre | |
|------|-----------|----------|------------|-------------|------|------|------|------|-------|---------------|-------|---------------|-------|---------|-----|---------|-----|--------|------|----------|------|-----------|---|
| CCC | | | | | | | | | • | • | | | | | | | | | | | | | |
| CCL | | | | | | | | | • | | | | | | | | | | | | | | |
| DGC | | | | | | | | | • | • | | | | | | | | | | | | | |
| ECSP | | | | | | | | | • | • | • | | | | | | • | | | | | | |
| ECW | | | • | | | | | | | | | | | | | | | | | | | | |
| EWI | | | | • | | | | | | | | | | | | | | | | | | | |
| FLU | | | | | | | | | • | | • | • | | • | | • | | | | | • | | |
| FRC | | | | | | | | | | • | | | | | | | | | | | | | |
| GLC | | | | | | | | | | | | | | | | | | | | | | | |
| IPA | | • | | | | | | | • | | • | | | | | | • | | | | | | |
| MDS | | | | | | | | | | | | | | | • | | | | | | | | |
| PRS | | | | | | | | | | | | | | | • | | | | | | | | |
| SRI | | | | | | | | | | | • | • | | | | | | | | | | | |
| SSC | | | | | | | | | | | • | • | | | | | | | | | | | |
| SSS | | | | | | | | | | | | | | | | | | | | | | | |
| SSW | | | | • | | | | | | | | | | | | | | | | | | | |
| SWA | | | | | | | | | | | | | | | | | | | | | | | |
| SWAC | | | | | | | | | | | • | | | | | | • | | | | • | | • |
| SWAF | | | | | | | | | | | | | | | | | | | | | • | | • |
| SWAJ | | | | | | | | | | | | | | | | | • | | | | • | | • |
| SWAP | | | | | | | | | | | | | | | | | • | | | | • | | • |
| SWAS | | | | | | | | | | | | | | | | | • | | | | • | | • |
| SWAX | | | | | | | | | | | | | | | | | • | | | | • | | • |
| SWMN | | | | | | | | | | | | | | | | | • | | | | • | | • |
| SWMP | | | | | | | | | | | | | | | | | • | | | | • | | • |
| ULC | | | | | | | | | | | • | • | | | | | • | | | | • | | • |
| ULS | | • | | | | | | | • | | • | • | | • | | • | | | | | • | | • |
| VID | | | | | | | | | | | • | | | | | | | | | | | | |

Contact Lubricants

| | 20 Strips | Pen Pack | Pack of 25 | Pack of 100 | 20ml | 35ml | 50ml | 55ml | 200ml | 200ml (brush) | 400ml | 400ml (brush) | 500ml | 1 Litre | 1kg | 5 Litre | 5kg | 12.5kg | 20kg | 25 Litre | 25kg | 200 Litre | |
|------|-----------|----------|------------|-------------|------|------|------|------|-------|---------------|-------|---------------|-------|---------|-----|---------|-----|--------|------|----------|------|-----------|---|
| CCS | • | | | | | | | | | | | | | | | | | | | | | | |
| CG52 | | | | | | | • | | | | | | | | • | | | • | | | | | • |
| CG53 | | | | | | | • | | | | | | | | • | | | • | | | | | • |
| CMO | | | | | | | | | • | | | | | | • | | | • | • | | | | • |
| DFL | | | | | | | | | • | | | | | | • | | | | | | | | |
| EGF | | | | | | | | | | | | | | | • | | | | | | | | |
| MPG | | | | | | | • | | | | | | | | • | | | | | | | | |
| SGA | | | | | | | | | | | | | | | • | | | | | | | | |
| SGB | | | | | • | • | | | • | | | | | | • | | • | • | | | • | | |
| SOA | | | | | | | | • | | | | | | | • | | • | • | • | | | | |
| SOB | | | | | | | | | • | | | | | | • | | • | • | • | | | | • |
| SPGA | | | | | | | | | | | | | | | • | | | | • | | | | |
| SWC | | | | | | | | | • | | | | | | • | | | | | | | | |
| ULL | | | | | | | | | • | | | | | | • | | | | | | | | |

Product Size Charts

| Each | Pen Pack | 2ml Syringe | 10ml | 15ml | 20ml | 30ml | 35ml | 50ml | 75ml | 200ml | 250ml | 250g | 400ml | 500ml | 700g | 1 Litre | 1kg | 5 Litre | 25kg | 30kg |
|------|----------|-------------|------|------|------|------|------|------|------|-------|-------|------|-------|-------|------|---------|-----|---------|------|------|
|------|----------|-------------|------|------|------|------|------|------|------|-------|-------|------|-------|-------|------|---------|-----|---------|------|------|

Conformal Coatings

| | | | | | | | | | | | | | | | | | | | | | |
|------|--|--|--|---|--|--|--|--|--|---|---|--|---|---|--|--|---|---|---|---|--|
| APL | | | | • | | | | | | • | | | • | • | | | | | | | |
| CPL | | | | | | | | | | • | | | | | | | | | • | • | |
| DCA | | | | | | | | | | • | | | | | | | | | • | • | |
| DCE | | | | | | | | | | | | | | | | | • | • | | | |
| DCR | | | | | | | | | | • | | | | | | | • | • | | | |
| DCRT | | | | | | | | | | | | | | | | | • | • | | | |
| DCT | | | | | | | | | | | | | | | | | • | • | | | |
| DRG | | | | | | | | | | | | | | | | | • | • | | | |
| HPA | | | | | | | | | | • | | | | | | | • | • | | | |
| NSC | | | | | | | | | | | | | • | | | | | | • | • | |
| PCM | | | | | | | | | | | • | | | | | | | | • | • | |
| PTH | | | | | | | | | | | | | | | | | | | • | • | |
| PUC | | | | | | | | | | | | | | | | | | | • | • | |
| SRC | | | | • | | | | | | | | | • | | | | | | • | • | |
| TFCF | | | | | | | | | | | • | | | • | | | | | • | • | |
| UAT | | | | | | | | | | | | | | | | | | | • | • | |
| WBC | | | | | | | | | | | | | | | | | | | • | • | |

Heat Dissipation

| | | | | | | | | | | | | | | | | | | | | | |
|--------|---|--|---|---|--|---|---|---|---|---|--|--|--|--|--|---|---|---|---|---|--|
| HTC | | | • | • | | • | | | | | | | | | | • | | • | | | |
| HTCA | | | | | | | | | | • | | | | | | | | | | | |
| HTCP | | | | | | • | | | | | | | | | | • | | • | | | |
| HTS | | | • | • | | | • | | | | | | | | | | • | • | | | |
| HTSP | | | | | | | | • | | | | | | | | | • | • | | | |
| TBS | | | | | | • | | | | | | | | | | | | | • | • | |
| TCR | | | | | | | | | • | | | | | | | | | | | | |
| TCRGUN | • | | | | | | | | | | | | | | | | | | | | |

Surface Mount

| | | | | | | | | | | | | | | | | | | | | | |
|------|--|---|--|---|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|
| SMA | | | | • | | | | | | | | | | | | | | | | | |
| SMF | | • | | | | | | | | | | | | | | | | | | | |
| SMFL | | | | | | | | | | • | | | | | | | | | | | |
| SMSP | | | | • | | | | | | | | | | | | | | | | | |

Prototyping

| | | | | | | | | | | | | | | | | | | | | | |
|-----|--|--|--|--|--|--|--|--|--|---|---|---|--|--|--|--|--|--|--|--|---|
| FCC | | | | | | | | | | | | • | | | | | | | | | • |
| PDN | | | | | | | | | | | • | | | | | | | | | | |
| PRP | | | | | | | | | | • | | | | | | | | | | | |

| Code | Product | Page | Code | Product | Page | Code | Product | Page |
|--------|---|-------|--------|--|------|--------|--------------------------------------|------|
| ACL | Adhesive Chain Lubricant | 24 | EWI | IPA Electrowipes | 5 | PNM | High Temperature Matt Black Paint | 25 |
| AFC | Anti-static Foam Cleaner | 22 | FCC | Ferric Chloride | 28 | PRB | High Gloss Paint (Red) | 25 |
| AGC | Copper Anti-Seize Fluid | 24 | FLU | Fluxclene | 5 | PRP | Positive Photoresist | 28 |
| APB | Air Powered Bottle | 26 | FRC | Flux Remover | 5 | PRS | Printasolve | 6 |
| APL | Acrylic Protective Lacquer | 9 | FRE | Freezer Spray | 23 | PUC | Polyurethane Coating | 9 |
| ASA | Anti-static Spray | 22 | GDP | High Powered Airduster | 23 | PVB | High Gloss Paint (Green) | 25 |
| BLR | Bloc'lube | 22 | GLC | Glass Cleaner | 5 | PWB | High Gloss Paint (White) | 25 |
| BLV | Bloc'lube | 22 | GRG | Graffiti Remover Gel | 25 | RRR | Rubber Roller Restorer | 23 |
| CCC | Contact Cleaner | 5 | GRS | Graffiti Remover for Sensitive Surfaces | 25 | SCO | Silicone Grease Compound | 27 |
| CCS | Contact Cleaning Strips | 20 | HDC | Cutting Fluid | 24 | SCP | Silver Conductive Paint | 23 |
| CG53A | Contact Grease | 20 | HPA | Conformal Coating | 9 | SGB | 2GX Contact Treatment Grease | 20 |
| CMO | Clear Mechanical Oil | 27 | HTC | Non-silicone Heat Transfer Compound | 16 | SGL | Silica Gel | 26 |
| CPL | Clear Protective Lacquer | 9+28 | HTCA | Non-silicone Heat Transfer Compound Aerosol | 16 | SMA | Surface Mount Adhesive | 28 |
| CTC | Carterclene | 22 | HTCP | Non-silicone Heat Transfer Compound Plus | 16 | SMF | Surface Mount Rework Flux | 28 |
| CYL | Cyanolube | 22 | HTG | High Temperature Grease | 27 | SMFL | Surface Mount Rework Flux | 28 |
| DAS | Silicone Mould Release | 24 | HTS | Silicone Heat Transfer Compound | 16 | SMSP | Surface Mount Solder Paste | 28 |
| DB1003 | Desolder Braid | 22 | HTSP | Silicone Heat Transfer Compound Plus | 16 | SOB | 2X Contact Treatment Oil | 20 |
| DB2003 | Desolder Braid | 22 | IPA | Electronic Cleaning Solvent | 6 | SPG | Special Plastics Grease | 27 |
| DCA | SCC3 Conformal Coating (Transparent) | 9 | LRM | Label Remover | 23 | SRC | Silicone Removable Coating | 9 |
| DCR | SCC3 Conformal Coating (Red) | 9 | MCF | Minimal Charging Freezer | 23 | SRI | Saferinse | 6 |
| DCRT | High Build DCR | 9 | MPG | Multi-purpose Grease | 27 | SSS | Screen and Stencil Solvent | 6 |
| DDF | Leak Detector | 24 | MPU | Polyurethane Foam | 25 | SSW | Screen and Stencil Wipes | 6 |
| DEI | Demineralsised Water | 26 | NSC | Nickel Screening Compound | 23 | SWA | Safewash | 6 |
| DFL | Dry Film Lubricant | 27 | OP9003 | Resin Remover | 13 | SWC | Switch Cleaner Lubricant | 20 |
| DGC | Degreaser | 5 | OP9004 | Machine Cleaner | 13 | TBS | Thermal Bonding System | 16 |
| DGT | Penetrating Fluid | 24 | OSL | Silicone Oil | 27 | TCR | Thermally Conductive RTV | 16 |
| DTP | Paint Stripper | 24 | PAM | High Temperature Aluminium Grey Paint | 25 | TCRGUN | Trigger Gun Applicator | 16 |
| EAD | Airduster | 22 | PBB | High Gloss Paint (Blue) | 25 | TFCF | Fluorocoat Surface Modifier | 9 |
| EADI | Airduster | 22 | PBS | Antispatter Spray | 25 | TSB | Trigger Spray Bottle | 26 |
| EADP | Airduster Plus | 22 | PCM | Peelable Coating Mask | 9 | ULC | Ultraclens | 6 |
| ECSP | Electronic Cleaning Solvent Plus | 5 | PDN | Photoresist Developer | 28 | ULL | Ultralube | 20 |
| ECW | Engineers Cleaning Wipes | 5 | PGB | Galvanising Spray | 25 | ULS | Ultrastolve | 6 |
| EML | Contact Cleaner Lubricant | 20+23 | PGM | Galvanising Spray | 25 | UR5041 | Polyurethane Resin | 14 |
| EPE | Permagard | 27 | PJB | High Gloss Paint (Yellow) | 25 | UR5044 | Polyurethane Resin | 14 |
| ER2001 | Epoxy Resin | 13 | PNB | High Gloss paint (Black) | 25 | UR5048 | Polyurethane Resin | 14 |
| ER2074 | Epoxy Resin | 13 | | | | UR5097 | Polyurethane Resin | 14 |
| ER2136 | Epoxy Resin | 13 | | | | UR5528 | Polyurethane Resin | 14 |
| ER2183 | Epoxy Resin | 13 | | | | UR5547 | Polyurethane Resin | 14 |
| ER2188 | Epoxy Resin | 13 | | | | UR5604 | Polyurethane Resin | 14 |
| ER2195 | Epoxy Resin | 13 | | | | UR5608 | Polyurethane Resin | 14 |
| | | | | | | VID | Magnetic Head Cleaner | 6 |



Electrolube
International Headquarters:
Kingsbury Park
Midland Road
Swadlincote
Derbyshire DE11 0AN
United Kingdom
Tel: +44 (0) 1283 222111
Fax: +44 (0) 1283 550177
E-mail: info@hkw.co.uk



Electrolube France
Le Pavé Neuf
53, rue de L'Université
93191 Noisy Le Grand Cedex
France
Tel: +33 (0)1 4815 4363
Fax: +33 (0)1 4304 7525
E-mail: electrolube@hk-wentworth.fr



Electrolube Australia
Unit 3/98 Old Pittwater Road
PO Box 339
Brookvale
NSW 2100
Australia
Tel: +61 (0) 2 9938 1566
Fax: +61 (0) 2 9938 1467
E-mail: techsupport@hkwentworth.com.au



Electrolube New Zealand
29 Keeling Road
Henderson
Auckland
New Zealand
Tel: +64 (0) 9 836 6588
Fax: +64 (0) 9 836 9169
E-mail: wentworth@extra.co.nz



Electrolube Germany
Friedrich-Ebert-Str.6
50996 Köln
Germany
Tel: +49 (0) 221 935535-0
Fax: +49 (0) 221 935535-19
E-mail: el@hkwd.de



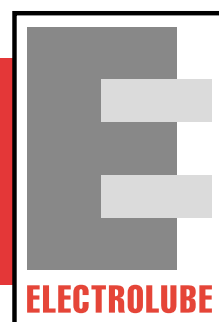
Electrolube China
B-1301
Building 16
Area 1
Fangchengyuan
Fangzhuang
Fengtai District
Beijing
China 100078
Tel: +86 (10) 87676468
Fax: +86 (10) 67636194
E-mail: infochina@hkw.co.uk



Electrolube Brazil
Rua Guaricanga, 135 – Lapa
CEP 05075-30
São Paulo
Brazil
Tel: +55 (11) 3836-2344
Fax: +55 (11) 3832-6285
E-mail: hkw@sti.com.br

www.electrolube.com

Distributor:



ELPROCAT/0