



Number 39

D.W. ELECTROCHEMICALS LTD.

97 Newkirk Road North, Unit 3
Richmond Hill, Ontario L4C 3G4
CANADA Phone: (905) 508-7500
Fax: (905) 508-7502

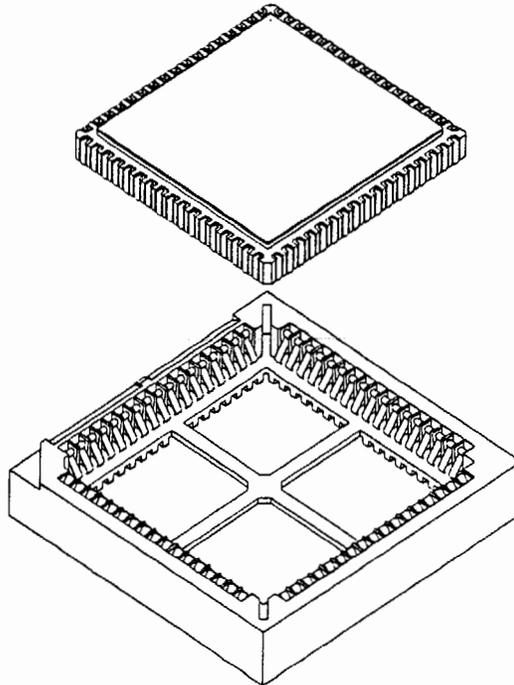
APPLICATION NOTE

Use of Stabilant 22A™ on PLCC Packages & Sockets

- *What is Stabilant 22?*

Stabilant 22 is an *initially non-conductive* block polymer which when used in a thin film between metal contacts becomes *conductive* under the effect of an electrical field. This occurs at an electric field gradient such that the material will remain *non-conductive* between adjacent contacts in a multiple pin environment. In addition **Stabilant 22** exhibits surfactant action as well as lubrication ability providing a single-component *resident* solution to virtually all contact problems. *When applied to electromechanical contacts, Stabilant 22 can provide the connection reliability of a soldered joint without bonding the contact surfaces.*

- *How can Stabilant 22A improve the performance of PLCC's?*



Stabilant 22A provides a quick and effective way of increasing the reliability of PLCC devices through improvement of the device connections.

The application is simple. Using the dropper insert on the 15 mL or 50 mL bottle of **Stabilant 22A**, apply a small amount to the connections on the edges of the device and/or on the contacts in the socket before insertion of the device.

A soft camel's hair brush can also be used to spread the material at some saving in the amount that has to be applied. As **Stabilant 22A** is just the **Stabilant 22** concentrate thinned 4:1 with isopropanol, the diluant will evaporate leaving a thin film of the concentrate resident on the contacts. Note that from 0.25 to

0.5 Mil film-thickness of the concentrate is all that is required. The concentrate itself has a very low vapour pressure and a life expectancy of over 12 years in service. During application the usual precautions should be taken against static discharge.

- *Is Stabilant 22 just another contact cleaner?*

No, **Stabilant 22** is a *resident* potentially *electrically-active* material which through a synergistic combination of effects enhances conductivity within a contact without causing leakage between adjacent contacts. Thus large quantities of the material do not have to be "hosed" on as is the case with cleaners.

- *Is Stabilant 22 cost effective?*

As **Stabilant 22** can be quickly applied to all contacts and connectors in a system, the often difficult diagnostic determination as to which one of many contacts are erratic, can often be eliminated. This can significantly reduce service time in the field and in many cases eliminates the need to return boards for shop service or re-manufacturing. As any service manager knows, the diagnosis of electronic problems, especially where intermittent failures are concerned, is often much more difficult than the actual part replacement; as well as requiring service personnel of exceptional caliber. In many cases the use of **Stabilants** can thus increase the efficiency of existing staff as well as allowing many connector-related problems to be handled at a much lower cost.

- *How does Stabilant 22 work?*

Contact failure is rarely caused by a single factor. Thus, treatments that solve only one problem don't necessarily offer a reliable long term solution. For example, cleaners do not prevent the re-entry of contaminants or the reformation of contaminant films; nor do they offer any lubrication. They must be used each time a connector gets dirty. Lubricants in themselves are rarely cleaners. Corrosion inhibitors are neither cleaners nor lubricants and are often specific to one type of metal or plating. Unsaturated oils used as contact treatments can cross-link under the influence of elastomer or thermoset plastic curing agents and accelerants.

While resident in the connector, **Stabilant 22** performs several concurrent functions. Its very presence in the contact gap will prevent the entry of outside contaminants. It has sufficient surfactant action to lift surface contaminants and hold them in suspension. In cases where corrosion products are present **Stabilant 22** will penetrate them and prevent rectification effects. Due to its high dielectric constant it will act to form a capacitive layer which is in parallel with whatever residual resistance exists in the contact increasing the passage of AC signals. Given sufficient DC bias within the gaps of the contact the thin film of **Stabilant** will "switch", conducting by quantum tunneling and thus limit the resistance of the contact to a serviceable level.

- *Is it environmentally acceptable?*

Yes. **Stabilant 22** itself is non-toxic and only the isopropanol-diluant in **Stabilant 22A** represents a flammability and a very minor health hazard.

Even Stabilant 22A has only about 1/200th the solvent impact as conventional contact cleaning solvents over a three year time span. As **Stabilant 22** contains no solvent it has absolutely minimal environmental impact and is, therefore, becoming the treatment of choice for many service organizations!

- *Can Stabilant be used by untrained personnel?*

Thousands of applications of the consumer version of **Stabilant 22** have been made over a period of several years now without any reported problems.

- *What is the best way to apply Stabilant to a contact?*

The 15ml container has a "dropper" type cap that allows **Stabilant 22A** to be applied directly to such components as socketed IC's, switches, connectors, etc. Some end users prefer to use industrial syrettes to apply the material. Camel's hair brushes can be used to brush it on card-edge connectors or they could be dipped into the dilute material. Most metering-type liquid dispensing systems can be used as well.

- *Does the action of Stabilant deteriorate with age?*

No. **Stabilants** have been used in military applications for almost ten years and are also being employed in Avionics, Flight-instrumentation, Computers, Automotive, Process controls, Bio-medical electronics, and tele-communications to name but a few of the fields where they have been used to meet major reliability requirements. There, they have proven themselves as an efficient, long-term solution to both eliminating and preventing connection problems.

In some field trial applications lasting over twelve years **Stabilant 22** has shown no sign of reduced effectiveness. With a high molecular weight and a very low vapor pressure, little is lost by evaporation. Unlike some other contact protection oils, **Stabilant 22** will not cross-link when exposed to free-machining materials such as high-sulphur brass, or when used on contacts where agents used to promote cross-linking of thermosets or elastomers are present in the environment or in the actual connector components. Unlike non-saturated oils, **Stabilant 22** does not "varnish".

NATO Supply Code 38948 - 15 mL of S22A has NATO Stock # 5999-21-900-6937.
- 15 mL of S22 has NATO Stock # 5999-21-909-9981

The **Stabilants** are patented in Canada - 1987; US Patent number 4696832. World-wide patents applied for. Because the patents cover contacts treated with the material, a Point-of-sale License is granted with each sale of the material.

MATERIAL SAFETY DATA SHEETS ARE AVAILABLE ON REQUEST

NOTICE

This data has been supplied for information purposes only. While to our knowledge it is accurate, users should determine the suitability of the material for their application by running their own tests. Neither D.W. Electrochemicals Ltd., their distributors, or their dealers assume any responsibility or liability for damages to equipment and/or consequent damages, howsoever caused, based on the use of this information.

Stabilant, Stabilant 22, and product type variations thereof are Trade Marks of D.W. Electrochemicals Ltd.
© Copyright 1992 - D.W. Electrochemicals Ltd. Printed in Canada