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**Number 37**

## **APPLICATION NOTE**

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### **Use of Stabilants to Replace Environmentally Unsafe Solvents**

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#### **What are the Stabilants?**

The Stabilants (Stabilant 22 concentrate or alcohol diluted versions 22A and 22E) are used on contacts to provide a resident, long-life, contact enhancement treatment which does not involve the use of any CFCs. or any other ozone-depleting solvents.

While non-conductive in bulk, a film of Stabilant 22 between contact surfaces can be considered a "Z-axis conductor"; enhanced conductivity is by quantum tunneling in the microscopic gaps between electro-mechanical contacts. The portion of the liquid film around the contact interface remains nonconductive and protects the connection from external moisture and dust.

This results in the reliability of a soldered joint without formation of a physical bond.

Because Stabilant 22 is environmentally safe, and serves as a one-application, resident treatment, a small amount can replace many times the volume of cleaning solvents with a consequent major improvement in the environmental burden of manufacturing and service.

Stabilant 22 itself, being non-volatile, is not an ODC (Ozone Depleting Chemical) , nor are any ODCs (such as CFCs, and to a lesser degree, HCFCs) used in the manufacture of Stabilant products. We do not supply Stabilants diluted by or propelled using any CFCs or HCFC's - they are not available in pressurized spray cans.

Having a very low vapor pressure and a resistance to cross-linking effects caused by the presence of curing agents or accelerants in both elastomers and thermoset plastics used in electronics, Stabilant-treated contacts will generally last longer than the design life of the electronic equipment on which they are used.

#### **How safe are Stabilant 22/22A/22E?**

The concentrate, Stabilant 22, has extremely low toxicity. The isopropanol-diluted form, Stabilant 22A and the ethanol-diluted form, 22E have, very low toxicity - mostly due to the choice of alcohol.

In the quantities used in electronics manufacture and/or servicing within a room having normal ventilation it is extremely doubtful that even a minor-irritant concentration of the isopropanol could be reached unless very large quantities of the material were spilled. As Stabilant 22A is usually applied from a 15 or 50 ml dropper bottle, the amount of isopropyl alcohol available for vaporization is so small as to be a non-hazard.

### **What other desirable attributes do the Stabilants possess?**

Stabilant 22 has excellent lubricating properties making it ideal for use in such applications as switches, potentiometers, slip rings, and tunable microwave cavities.

When applied, a Stabilant film retains an ability to lift both corrosion by-products as well as contaminant materials off the metal contact surfaces. Thus, low level electronic connectors are made much less susceptible to thin-film rectification effects and use of Stabilant 22 can significantly cut RF demodulation in poorly shielded contacts.

Because of its broad temperature tolerance (from -70° C to +220° C) Stabilant 22 has found wide application in electronic equipment used in severe temperature environments.

### **What has been Stabilants' history of use?**

The Stabilants were developed in 1977 and went several years of experimental use before being adopted by the Canadian Armed Forces in 1983 after which they were issued with a NATO reference. They were also introduced into the consumer (non-military) market in 1983 and were initially employed in consumer/audio electronics. After several successful years in the consumer field, Stabilant products were introduced in biomedical electronics and commercial computing applications, and are now employed in electronic equipment ranging from air traffic control applications to agricultural machinery.

### **Is the cost of Stabilants justified in actual use?**

Yes. Customers have told us that a small amount of Stabilant has saved expenses of thousands of dollars. Because a single application often suffices, the result is a long-term limit on the degradation of electronic contacts that is far more reliable and much less expensive than the practice of repeated disconnection and cleaning. And because a Stabilant film will not short-circuit between adjacent contacts, the product can be used without a follow-up cleaning of the connector's insulation, provided no great excess is used. Unlike the solvents in some competing products, Stabilant 22 does not affect plastics used in electronics.

Stabilants are very simple to use, allowing the bulk of connector-related problems to be cured in the field. This has allowed customers to significantly reduce the service time and the inventory of replacement modules and wiring harness units needed to keep systems functioning.

Finally, in numerous instances, Stabilant treatment has enabled the restoration of electronic equipment/systems, which were considered unserviceable, to many additional years of useful life.

NATO CAGE/Supplier Code 38948

15ml Stabilant 22 (Concentrate), NATO Part # 5999-21-909-9981

15ml Stabilant 22A (Isopropanol Diluted), NATO Part # 5999-21-900-6937

15ml Stabilant 22E (Ethanol Diluted), NATO Part # 5999-21-909-9984

The Stabilants are patented. Because the patents cover contacts treated with the material a Point-of-Sale license is granted with each sale of the 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.

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