STABILANT 22

D.W. ELECTROCHEMICALS LTD.
70 Gibson Drive, Unit 12
Markham, Ontario
L3R 4C2 CANADA
Phone: (905) 508-7500
Email: dwel@stabilant.com

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APPLICATION NOTE

Environmental Considerations for the use of Stabilant 22

Introducing Stabilant 22

Stabilant 22 is an initially non-conductive block polymer that when used in a thin film within contacts switches to a conductive state under the effect of the electrical field. The field gradient at which this occurs is set such that the material will remain non-conductive between adjacent contacts in a multiple pin connector environment.

Thus, Stabilant 22 provides the connection reliability of a soldered joint without bonding the contacting surfaces together!

Contacts are generally the weakest link in any piece of electrical/electronic equipment whether it be in low current devices found in computers or higher current circuits found in automotive and aviation applications, to name only a few. The use of Stabilant 22 or its isopropanol diluted form, Stabilant 22A, will make contacts up 100 times more reliable, eliminating costly service callbacks and ensuring customer satisfaction. Here we discuss the environmental benefits of Stabilant 22/22A.

Prospective and existing restrictions on contact cleaning solvents

The individual service manager is not generally aware of the large amounts of cleaning solvents that are used in the electronics industry. Setting aside those that are used in closed systems (where release of solvents to the atmosphere is minimized or virtually eliminated), hundreds of thousands of gallons of cleaning solvents are used each year in the electronics industry. The environmental impact of these is considerable, as a substantial portion of them evaporate into the air.

Not only do solvents present a potential health hazard in the workplace, but many also contribute to photochemical smog. While few solvents have the potential impact of the chlorofluorocarbons, they are nevertheless of considerable concern to environmental authorities and concerted efforts are underway to limit their use. A measure of things to come is the California legislation restricting (among other concerns) the amounts of solvents permitted in paints, cleaners, and many other goods. Strict regulations exist governing processes which can release solvents into the atmosphere, such as compressed air based paint spraying.

North American and European manufacturers and service organizations face the challenge of coping with the numerous and differing standards as to which cleaning solvents are acceptable and their permissible levels of usage. This makes the use of "central stores" purchasing with its attendant economies quite hard to manage. Indeed, what may be legal in one area may well be illegal in another area of the same country or state. Here we answer some questions about how Stabilant products can help.

What is meant by a device's solvent burden per year?

Solvent burden/year is the average amount of cleaning solvent used per year to keep a piece of electronic equipment operating over its useful life.

How did the use of Stabilant 22A change the annual solvent burden?

In an early test case - the trial use of a solvent to clean contacts in an older computer - we found that it took about 20 mL of an isopropanol and perchloroethylene based product to clean a 100 contact card edge connector. Even though some was left on the wiper used, it too evaporated. The equipment became erratic in operation four months later, and the contacts had to be recleaned. In the preceding year, the same approximate usage pattern had been repeated – enough data to conclude that the annual solvent usage for that set of contacts was about 60 mL. The next time the equipment malfunctioned, we used 2mL of Stabilant 22A which released 1.6 mL of isopropanol to the atmosphere. No further service was needed for three and a half years, (the equipment was sold in working order). Here, the solvent burden of that connector amounts to 0.46 mL/year – a reduction in solvent burden of 130:1.

Had the concentrate (Stabilant 22) been used there would have been *no solvent burden* as the vapor pressure of that material is very low. Purely evaporative losses are not an issue, so it has a Volatile Organic Compounds listing of zero. VOC ratings for Stabilant 22A and 22E are listed in their Safety Data Sheets.

Do Stabilant products contain any Ozone Depleting Chemicals?

No. Stabilants do not contain any CFCs, HCFC's or trichloroethylene, nor are such chemicals used in their manufacture.

Do any import/export bans apply to Stabilant products?

Aside from solvent concerns, neither Stabilant products themselves nor any of their labels or packaging contain lead, cadmium or hexavalent chromium compounds. In addition, many other substances of concern have been addressed by regulations worldwide. As detailed in our Safety Data Sheets – Stabilant 22/22A/22E contain none of these. Shipping of the alcohol diluted products (22A / 22E) is subject to safety regulations, but no restrictions apply to Stabilant 22 concentrate orders.

Other regulatory factors in the use of Stabilant products:

Stabilant 22 is not subject to the TSCA (Toxic Substance Control Act) nor are they reportable under SARA Title III.

Are there concerns with disposal of Stabilant 22 or Stabilant-treated equipment?

Regarding disposal or accidental spillage, we note that Stabilant 22 is not a chelating agent and thus will not cause heavy metals to become concentrated in effluents. And while testing has not revealed evidence of toxicity to marine or littoral life, we recommend, subject to local ordinances, that surplus Stabilant or contaminated materials be destroyed by incineration.

Halogen content: 0 ppm (ug/g)

Sulfur content: 0 ppm (ug/g)

For United States end-users:

Stabilant 22 is not a hazardous waste when discarded as defined in 40CFR261.337.

Stabilant 22 is not a halogenated solvent when spent as defined in 40CFR261.317.

The total Organic Carbon Content (TOC) of Stabilant 22 is 28%.

Conclusions:

As the useful life of the Stabilant 22 is generally in excess of five years, the reduction in solvent burden when using the isopropanol diluted Stabilant 22A could be as much as 200:1, by volume alone, for the connector in a piece of electronic equipment.

We note that the Mean Time Between Failures rating of electronic equipment may exceed the time between connector failures in corrosive or challenging environments. Stabilant treatment of all contacts in a system can prevent early failure and cuts down on the use of volatile solvents, as described above.

While even a 50:1 reduction in solvent burden is worthwhile, *the total elimination of solvent burden* by the use of the concentrate, Stabilant 22 is even more significant.

The fact that Stabilant 22 is not a chelating agent is a matter of concern to industries that produce heavy metal waste products, and to the nuclear power industry.

As Stabilant 22 contains no solvents and has an exceptionally low vapor pressure it is technically not subject to the various rules and regulations governing coatings such as paints and varnishes, and in California's Southwest, the amounts of isopropanol (as a solvent) involved in the use of Stabilant 22A are so small on a daily basis that there is generally no problem in obtaining a letter of exception from the appropriate agencies. As Stabilant 22A is not packaged in quantities sufficient to be affected by the various acts it does not require special labeling in California.

NATO CAGE/Supplier Code 38948

5mL Stabilant 22 (Concentrate), NATO Stock Number 5999-20-002-1112

15mL Stabilant 22 (Concentrate), NATO Stock Number 5999-21-909-9981

15mL Stabilant 22A (Isopropanol Diluted), NATO Stock Number 5999-21-900-6937

15mL Stabilant 22E (Ethanol Diluted), NATO Stock Number 5999-21-909-9984

Stabilant products 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.