STABILANT 22

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APPLICATION NOTE

Contact Problems from Solder Flux and other Resinous Deposits

Introducing Stabilant 22

Stabilant 22 is an initially nonconductive 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 nonconductive 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 provides the connection reliability of a soldered joint without bonding the contact surfaces together.

This Application Note describes the problems caused by excess solder flux and similar residues, along with service methods that include Stabilant treatment to restore contacts and prolong their useful lifetime.

Problems caused by solder flux residues

Solder fluxes generally include a resinous component (e.g., rosin) and additives that prepare the metal surfaces by removing oxides and promoting wetting with the melted solder. The "activator" in many flux types is the most likely additive to cause trouble as a residue. Many older types are strongly acidic and some contained chlorides or bromides. Newer types avoid the halides and use organic acids, normally in proprietary formulations.

The removal of solder flux from printed circuit boards can be done by washing with an organic solvent or a water based cleaner. Water based cleaning systems have gained prominence due to regulations and environmental considerations. The process begins with dissolution of the flux, often with the aid of surfactants. Any remaining particles are dispersed in the solvent and flushing with more solvent completes the routine.

Older equipment may have circuit boards that were manufactured without a conformal coating. Unlike the situation with modern PCB's, these can allow flux deposits between electrical conductor areas – contacts of switches and connectors as well as circuit traces. Manual work on soldered components also requires care in minimizing excess flux. We recommend application of Stabilant 22 to contacts once the boards are clean.

Most finished PCB's will have some minute gaps between parts, or between the component and the circuit board. These can form traps for some of the flux bearing cleaning agent, resulting in small residues of flux being left in place when the solvent evaporates. If one of the more corrosive types of residue is left behind, it can migrate onto electrical contact surfaces when conditions allow. This is one the few cases in which reapplication of Stabilant 22 may become necessary to restore reliable operation of board mounted switches and connectors.

Can Stabilant 22 solve these problems?

Yes. Once it is recognized that a contaminant migration condition exists there are three alternatives that can be used.

The first is to use Stabilant 22A, as it contains isopropyl alcohol, with a slight excess to flush the contamination from the contact area. This is limited; it is wasteful in cases where flushing is not efficient, for example when there are resinous deposits which are very slow to dissolve in alcohol.

The second alternative is to apply Stabilant 22A, then repeat some hours or days after the initial treatment. The first treatment with Stabilant will soften and lift or disperse contaminants - some of which would typically be removed by aggressive solvents or cleaners. The additional Stabilant 22A treatment will normally carry this softened residue away, resulting in reliable operation of the contacts as well as protection from further contaminant based problems.

The third alternative begins with a thorough precleaning of the connector with an aggressive solvent to remove all traces of the flux or resinous contaminant. The use of Stabilant 22 will then provide long term protection against contaminants as well as the other conditions which cause connector malfunction.

Connector failures originating in flux/resin contamination are, fortunately, rather uncommon in newer equipment. Detailed record keeping can help to identify these anomalies; once a consistent pattern of failure is found involving this type of contamination, a plan con be formulated for cleaning and contact treatment using Stabilant products.

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

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