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APPLICATION NOTE

Contact Problems from Solder-flux and other Resinous Deposits

- *What problems can be caused by solder-flux residue?*

The removal of solder-flux from printed circuit boards is essentially one of washing the board with either a organic-solvent or water based cleaning solution. With the increasing limitations on organic-solvent-systems that are imposed by environmental considerations, the water-based-systems are starting to dominate flux-removal processes. Whichever process is used, it is generally involves a dissolving/dilution/flushing process where the flux is dissolved and dispersed within the flushing-solvent through the action of one or more surface-active agents.

But so long as electrical components and connectors are made of more than one part, there will be minute gaps between these constituent parts, or even between the component and the circuit-board itself. These gaps often form traps for some of the flux-bearing cleaning agent resulting in small residuals of flux being left in place when the solvent/water evaporates.

It is not too uncommon to find connectors and/or switches where these minute flux residues are either are waiting to migrate (the moment a vehicle for their movement is introduced) or have migrated onto the contact surfaces. The problem caused by this condition can be identified where the initial treatment does not solve the problem, and the treatment must be repeated in order to get the contact to operate reliably.

The mechanism should be obvious. If the treatment involves the minimization of the amount of solvent, it may simply soften and mobilize some of the residual flux, re-depositing it on the surface of the contact where it will cause a problem once more.

Thus some contact faults can be cured by a thorough cleaning using an aggressive solvent or solvent/surfactant involving the massive dilution of any flux residues. But this process may require solvents that are environmentally unacceptable.

Much the same mechanism can exist with airborne contaminants such as wood resins, or even the tar and nicotine from cigarette smoke. The condition can be aggravated by the placement of the connectors in the path of the airflow used to cool the electronic equipment. In addition, certain types of closed-back-end push-button switches have developed a bad reputation based on their "inhalation" of contaminants because of the pumping-action that occurs when they are released.

- *Can the use of Stabilants solve these problems?*

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

The first involves use of substantially more of the **Stabilant** than would normally be required in order to flush the contamination from the contact area. Besides being wasteful in those cases where the flushing action is not needed, there are some resinous deposits which are very slow to dissolve.

The second alternative requires a repetition of the **Stabilant** treatment some hours or days later. The initial treatment with **Stabilants** will soften and lift contaminants which would not be removed except by the use of aggressive solvents or cleaners. The additional **Stabilant** treatment will normally carry this softened residue away, resulting in reliable operation of the contacts as well as protection from further occurrence or airborne-contaminant-based problems.

The third alternative requires a thorough pre-cleaning of the connector with an aggressive solvent which will remove all traces of the flux or resinous contaminant. The use of **Stabilants** will then provide long-term protection against contaminants as well as the other conditions which cause connector malfunction.

These connector-failure-modes are, fortunately, rather uncommon. Proper record-keeping can be of great benefit in identification of these anomalies. Once a consistent pattern of failure is found involving this type of contamination, it's usually simple to select of one of the alternatives as a dedicated treatment.

NATO Supplier Code 38948 - 15 mL S22a size has NATO Part # 5999-21-900-6937

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

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