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Number 48

APPLICATION NOTE

Use of Stabilant 22 for Digital Camera Contacts

What is Stabilant 22?

Stabilant 22 is a liquid block polymer which is non-conductive in bulk, but 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.

Stabilant 22 provides the connection reliability of a soldered joint without bonding the contact surfaces.

How is Stabilant 22 used in digital cameras that use interchangeable lenses?

Generally, an automatically controlled zoom lens has electrical connections between the lens assembly and the camera body. The use of Stabilant 22 on those contacts results in consistent reliability in exposures and focussing especially where automatic settings are employed. We provide one example here for the Nikon D70™ camera (right) and the Sigma™ interchangeable zoom lens (Figure 1, below). Note the electrical contacts on the lens barrel.





Figure 1 - Sigma Zoom Lens for the Nikon D70 Camera

The best way to apply Stabilant 22 is to brush a small amount on the electrical contacts on the lens assembly. It should not be applied to the mating contacts on the camera's body as this would easily accumulate dust or grit. We recommend the use of a Microbrush™, which is provided in our Service Kits, or the equivalent - avoid the use of cotton swabs as they may not be lint free.

Where else can Stabilant 22 be used?

Stabilant 22 can be used in all types of connectors, for DC and at frequencies up to several gigahertz, on faders or potentiometers, or in switches for non-inductive loads. The number of applications is limitless.

Is Stabilant 22 just another contact cleaner?

No, in contrast with contact cleaners, Stabilant 22 is a resident contact enhancer. Its synergistic properties of corrosion prevention and lubricating quality provide a complete contact treatment solution. The convenient isopropanol-diluted product, Stabilant 22A, additionally offers penetrating and cleaning qualities, but in much smaller quantities than conventional cleaners.

Is Stabilant 22 cost effective?

Yes. Stabilant 22 can be quickly applied to all contacts and connectors in a system, in many cases avoiding the often difficult diagnostic determination as to which of many contacts are erratic. This can significantly reduce service time in the field and in many cases eliminates the need to return boards for shop service or remanufacturing. 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, likely requiring service personnel of exceptional calibre. In many cases the use of Stabilant 22 can thus increase the efficiency of existing staff - many connector harness related problems to be handled at a much lower cost.

Most photographers, professional or hobbyist, will have an assortment of other electronic and computer equipment - further opportunities to experience the improved reliability Stabilant 22 offers for connectors on all of these devices.

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 repeated entry of contaminants. Lubricants (which can protect against contact fretting and other mechanical wear) in themselves are rarely cleaners. Corrosion inhibitors are often specific to one type of metal or plating. Some contact treatments contain unsaturated oils, which can cross-link under the influence of catalytic agents from elastomers or thermoset plastics in electronic gear.

Stabilant 22 remains on contacts to perform all of these functions. Its 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. It has a lubricating quality that reduces mechanical wear on contacts - a concern commonly found with temperature extremes or vibration.

In what forms is Stabilant available?

Stabilant 22 products are available in several forms - as a concentrate (Stabilant 22), an isopropyl alcohol-diluted form (Stabilant 22A), and an ethyl alcohol diluted form (Stabilant 22E). The concentrate is available in 5mL, 15mL, 50mL, 100mL, 250mL, 500mL and 1L sizes. Stabilant 22A is available in sizes no larger than 500mL due to shipping restrictions. The most popular Stabilant 22A product is the 15mL Service Kit, which includes micro-brush applicators and instructions, all in a capped tube for convenient storage or tool kit use.

Another form of packaging is available as Stabilant 22S. This includes a quantity of the concentrate, occupying one-fifth the volume of an otherwise empty container. This allows the end-user to add his own diluent, thus avoiding the added costs and regulatory issues of shipping the alcohol. Also, the end user can use either alcohol or an alternate diluent such as one of the Freon-based solvents.

In addition, a 0.5 ml vial of Stabilant 22A is available for manufacturers to include with plug-in circuit boards.

Custom labelling has been provided for many manufacturers who wish to assign their own stock control number, or to distributors who wish to market the product with their own logo included. This requires purchase in of the product in suitable quantities.

What is the difference in use of Stabilant 22 vs. 22A?

Stabilant 22 (the concentrate) is most useful where the connections are out in the open, such as card-edge connectors, on switches, or where the lubricating properties of the material are useful - as an aid to installing IC's in sockets. Where the connections are not too easy to get at or where the user wishes to apply the material to something such as a socketed IC (without removing the IC from its socket), it is easier to use the alcohol diluted form (Stabilant 22A or 22E). The alcohol diluent serves ONLY to carry the concentrate into the connector.

How much should be used?

Normally, a final film thickness of from 0.5 to 2 mils of the concentrate is all that is necessary. In other words, you want just enough to fill up the interstices between the contact's faces. When using Stabilant 22A or 22E, use enough so that once the alcohol evaporates the desired 0.5 to 2 mil film of Stabilant 22 remains.

In applications to moving contact surfaces, such as slip rings or potentiometers, film thickness should be minimized to the point where "hydroplaning" is avoided.

How can I be sure that Stabilant works?

The best way to find out just how well it works is to try it out. That's why we have samples available. Almost every service shop or manufacturer has equipment available where the switches or connectors have become erratic over the years. Use Stabilant 22/22A/22E on them and satisfy yourself. In order to get the most visible results, don't try to evaluate Stabilant 22's performance on brand new connectors. Instead, use it on connectors that are corroded, dirty or just plain unreliable.

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

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