

Stabilant 22 Contact Enhancer Application Notes

App. Note 12 - Broadcast Equipment

What is Stabilant 22?

Stabilant 22 is an *initially non-conductive* block polymer that under the effect of a electrical field and/or when used in a very narrow gap between metal contact becomes *conductive*. The electric field gradient at which this occurs is set so that the material will remain *non-conductive* between adjacent contacts in a multiple pin environment.

Thus, when applied to electromechanical contacts, **Stabilant 22** provides the connection reliability of a soldered joint without bonding the contact surfaces together.

While **Stabilant 22** exhibits surfactant action it is not sold as a contact cleaner. Equally, it exhibits quite good lubricating properties but is not sold as a contact lubricant. Its m^otier is in its *active properties* when used in a connection and the other properties are a bonus.

What are its uses in broadcast equipment?

Stabilant 22 can be used wherever electrical contacts are used, whether this is connectors, or in switches. In broadcast applications the number of places where **Stabilant 22** or **22A** can be employed are almost too numerous to list. When a entire audio mixer is treated (including socketed ICs and card-edge connectors) it not unusual to find that the distortion and signal-to-noise figures are improved substantially as well as increasing the reliability of the mixer.

Many consoles employ ITT-Schadow switches; these can be serviced very quickly using **Stabilant 22A**, by first flushing them out with isopropyl alcohol and then injecting the switch with **Stabilant 22A**.

TV switches often suffer from erratic switching as well as noise, **Stabilant 22** or **22A** will cure these problems.

Microphonics in connectors can be especially troublesome in portable equipment, **Stabilant 22 or 22A** will stop this.

In critical Audio work involving long signal runs, **Stabilant 22** on the XLR connector will not only cut noise, but will, in many cases, improve the sound by stopping high-order harmonic distortion caused by thin film rectification effects.

In audio patch bays, **Stabilant 22** is recommended for ring, tip, and sleeve plugs and jacks. Unlike some of the other protective oils which will cross-link (varnish) under the effects of the free sulfur in the brass, **Stabilant 22** is chemically stable and therefore, need not be periodically cleaned off and replaced.

In video patch bays, **Stabilant 22** will cut losses and eliminate noise.

In recording equipment, the connections to the playback heads can be a source of distortion and noise. **Stabilant 22A** can be applied to the connectors to eliminate these problems.

We have even been told that some stations are applying **Stabilant 22** to the finger -stock contacts used on transmitting tubes in order to reduce parasitics.

RF interference is a constant problem. With the passage of time, connectors often build up thin films that act as crude rectifiers. This source of RF interference can be eliminated by using **Stabilant 22**.

Why should we use Stabilant over less expensive alternatives?

We grant that the material itself is expensive. However it is unique in having a very long useful life. Unlike other so-called contact treatments, **Stabilant 22** will not cross-link (becoming varnish-like) under the action of sulfur based curing agents in elastomers, cutting oil residues, or the sulfur-bearing free-machining metal alloys used in some contacts. In most types of service work, the cost of the time involved in removing and replacing an amplifier will be much greater than the cost of the **Stabilant** used to treat the connectors. Here, what is important is that not only will proper connector treatment cure existing contact problems, it will prevent others from occurring, thus eliminating the necessity of repeating the treatment at a later date! Video switchers which had to be serviced every two to three weeks are now running for months at a time without service!

In other words, why should you have the expense of doing a job more than once?

In what forms is Stabilant available?

Stabilant 22 is packaged in 15mL, 50mL, 100mL, 250mL, 500mL and 1 Liter containers. **Stabilant 22** is available in several forms. It is packaged as a concentrate called **Stabilant 22**. It is available as an isopropyl alcohol-diluted form called **Stabilant 22A**, and an ethyl alcohol diluted form named **Stabilant 22E**. Because of the 4:1 dilution, a given size container of **Stabilant 22A** or **Stabilant 22E**, will cost about one-fifth the amount of a container of **Stabilant 22** for it has only one-fifth the amount of the concentrate in it. Another packaging is available for industrial-bulk users. **Stabilant 22S** packages the concentrate such that it occupies one-fifth the volume of an otherwise empty container. This allows the end-user to add his own diluant and saves the added costs of shipping isopropyl alcohol, as well as allowing the end-user to use an alternate diluant such as one of the other solvents used in electronics.

What is the difference in use of the Stabilants?

The concentrate, **Stabilant 22** is most useful where the connections are out in the open such as exposed RF connectors. 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 diluant serves *only* to carry the concentrate into the connector.

Is it available in a spray can?

No, not at present. During the initial stages of our market research we did provide spray cans of the material, but the users found that in most cases it did not speed the application of the material enough to justify the cost of the material that was wasted. In addition the spray application generally left a film of excess material that had to be cleaned up if only for appearances sake.

A further consideration is the fact that although chlorofluorocarbon propellants are no longer generally used in spray cans, a highly inflammable mixture of Butane and Propane has often been substituted. Remember, very little **Stabilant 22** is necessary to treat a contact, so why waste it?

Is Stabilant just another contact cleaner?

No, it is important to remember that **Stabilant 22** is an *electrically active* material which enhances conductivity within a contact without causing leakage between adjacent contacts. Thus large quantities of the material do not have to be "hosed" on as is the case with cleaners.

Just how much should be used?

Normally, a final film thickness of from 0.5 to 1 mils of the concentrate is all that necessary. In other words you want just enough to fill up the interstices between the contact's faces. Where you're using **Stabilant 22A**, you'll have to use enough so that once the isopropyl alcohol evaporates the desired 0.5 to 1 mil film of **Stabilant 22** remains.

What is the 15mL service kit?

This was made up at the request of several manufacturers and electronics equipment service organizations who wanted a standard kit of reasonable dimensions that they could purchase and stock in quantity, issuing it to their field service personnel required. The service kit consists of a 15mL container of **Stabilant 22A** and some soft-tip applicators, all in a small capped tube. The applicators are reusable.

Why would anyone want to buy quantities of the concentrate?

Many manufacturers and larger cable companies prefer to make large volume purchases, diluting the material and issuing it, as required, for specific field service requirements.

Many end users have found that the material cuts their service costs so much that it is more economical to purchase **Stabilant 22** in the larger container sizes rather than run any risk of being without the material. The number of different applications tends to increase as users discover the large number of problems that can be solved by the material.

How can I be sure that the material works?

Quite apart from the fact that **Stabilant 22** has passed a number of stringent field tests before being issued a NATO supply code number, we could cite the fact that **Stabilant 22** is used by many hospitals on their biomedical electronics to improve reliability of the equipment where lives are in the balance, we could cite the use of **Stabilant 22** by many broadcasting networks to achieve the last measure of reliability in critical network switching applications, we could cite its use in navigational aids, or we could cite the years of use in the audio field where even consumers found the material easy to use and its results impressive; but we still feel that 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 22A** on them for a quick turnaround test, or use the material in field service and satisfy yourself.

What are some pieces of equipment on which Stabilant has been used?

- McCurdy Consoles - SS 8824e, SS 8400, SS 8448, SS 8700, SS 8600
- Ampex - ATR 100
- ITC Cart Machines - Deltas
- Broadcast Electronics - BE 250
- McMartin - B801
- and many, many others.

Can I use Stabilant 22 in other equipment?

It can be used in test equipment, cameras, just about everywhere there's a low voltage signal or control connection. For example, the effect of **Stabilant 22** in Computers is to reduce the number of times the system locks-up or crashes, sometimes it even eliminates non-software crashes completely.

When used on socketed IC's, photo-couplers/isolators, rotary, push button, or slide switches, or even on BNC connectors, the net effect is usually to make the proper operation of the equipment less erratic, and in the case of IEEE-488 buss- controlled equipment, to cut down on the potential for system lock-ups.

Is the material hazardous?

Stabilant 22 has caused no skin reactions in tests. In the undiluted form it is nonflammable although if its temperature is raised above 200' C the decomposition products will burn. If orally ingested in small quantities it will cause bowel looseness while ingestion of quantities in the order of 200 mL of the concentrate could lead to general systemic collapse! **Stabilant 22** has an LD50 of about 5 grams per kilogram body weight. In the US, neither is subject to the TSCA (Toxic Substance Control Act) nor are they reportable under SARA Title 111.

What is the best way to apply it to a contact?

The 15mL and 50mL containers have a "dropper" type cap that allows Stabilant 22A to be applied directly to such components as socketed IC's, switches, connectors, etc. Some end users prefer to buy larger quantities and use industrial syrettes to apply the material onto connections. Camel's hair or sable brushes can be used to brush it on card-edge connectors. Cards can also have their edge connectors dipped into the dilute material.

Does the action of Stabilant 22/22A/22E deteriorate with age?

Stabilants have been in some applications for over fifteen years now without showing any sign of reduced effectiveness. The material has a high molecular weight and a very low vapor pressure, thus it is not prone to evaporation.

The **Stabilants** do not affect elastomers save for some slight swelling on some materials. The diluants employed (isopropyl alcohol) is much more likely to cause problems, although it is gone as soon as it evaporates. Nor are plastics general affected. We don't recommend the use of **Stabilants** on deposited- carbon-film resistive-paint-film type potentiometers.

Once again let us emphasize the point that unlike some other contact treatments containing oils, **Stabilant 22** will not cross-link when exposed to certain material such as high sulfur brass, when used on connectors having accelerant and curing agents in their elastomer or thermoset plastic parts, or when used on contacts where cross-link promoting agents are present in the environment. This phenomena of "varnishing" does not occur .with **Stabilant 22**

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Stabilants are a product of Dayton Wright research & development and are made in Canada

NSCM/Cage Code - NATO Supply Code 38948

15 mL of S22A has NATO Part # 5999-21-900-6937

The Stabilants are patented in Canada - 1987; US Patent number 4696832. World-wide patents pending. 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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NOTICE: This Application Note is based on customer-supplied information, and D.W. Electrochemicals is publishing it for information purposes only. In the event of a conflict between the instructions supplied by the manufacturer of the equipment on which the Stabilant material was used, and the service procedure employed by our customer, we recommend that the manufacturer be contacted to make sure that warranties will not be voided by the procedures.

While to our knowledge the information is accurate, prospective users of the material should determine the suitability of the Stabilant materials 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 any consequent damages, howsoever caused, based on the use of this information.

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