

Stabilant 22 Contact Enhancer Application Notes

App. Note 24 - Car Stereo Systems

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 contacts 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 surface 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 mÃ©tier is in its *active properties* when used in a connection and the other properties are a bonus.

What are its benefits in a Stereo System?

In general, **Stabilant 22** can be used wherever electrical contacts are used, whether this is in connectors, or in switches. In home stereo system applications the number of places where **Stabilant 22** or **22A** can be employed are almost too numerous to list. When an entire stereo system is treated (including socketed ICs and card-edge connectors) the distortion and signal-to-noise figures are substantially improved.

Where and how do I apply Stabilant 22?

HIGH CURRENT SUPPLY LEADS: With increasing power levels in amplifiers, the current supplied to those amplifiers is getting so high that contamination-caused heating of connectors and fuse blocks can become a major problem. With each successive heat cycle, the parts involved expand and may actually stretch some metal parts lowering the contact pressure and thus increasing the heating problem. This can cause erratic operation of the power amplifier and increased transient distortion an eventually could lead to burn-out of the connection. The use of **Stabilant 22** or **Stabilant 22A** on these connections (such as alternator, fuse block etc.) will not only lead to lower distortion but can prevent these burn-outs. The **Stabilants** can be use on high-current contacts up-to and including battery connectors. In industrial service, **Stabilants** are used in systems carrying currents as high as 30,000 amps.

PREAMPLIFIER SWITCH TREATMENT: Audiophiles also overlook the fact that preamplifiers use switches that handle signals and that these switches are also potential source of distortion and noise. Rotary switches are usually the easiest treat although it may be necessary to use a toothpick to transfer a drop of **Stabilant 22a** from the dropper bottle to the switch contacts. Slide switches may be treated by placing a drop in one end of the switch and cycling the switch.

Push button type switches, especially the ITT-Schadow type, may contain a lubricant that must be removed before **Stabilant 22A** is used. We have found that if the switch is flushed out with isopropanol (isopropyl alcohol) or one of the proprietary contact cleaners it does not have to be disassembled. Several drops of **Stabilant 22A** should be run into the switch body through the slot on the upper side (ITT Schadow type).

We do **not** recommend the use of **Stabilant 22A** on volume or balance controls unless they are of the wirewound or stepped-metal-contact type, as some inexpensive controls, simply use a resistive paint for the element. In some of these cases, **Stabilant 22A** will damage this resistance element through softening of the paint. When in doubt, try it a similar control!

All of the input and output jacks can be treated with Stabilant 22A.

DO NOT TREAT ANY POWER-INTERRUPTING SWITCHES THAT SPARK ON OPENING!

CASSETTE DECKS: **Stabilant 22A** may be used on cassette decks. If spring contacts are used on the playback and recording heads these should be treated in the same way as the connections on a phono cartridge. Anywhere there are card-edge connections, **Stabilant 22A** can be used. And it should also be used on any microphone connectors.

In critical Audio work involving long signal runs, Stabilant 22 on the XLR connectors 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.

CD PLAYERS: Treat the output connectors with **Stabilant 22A**.

INTERCONNECT CABLES: The RCA-type connectors on the interconnect cables should be treated, making sure that both the inner pin (signal) and outer shell (ground) of each connector are treated. On DIN-type connectors be sure that all the pins are treated.

POWER AMPLIFIERS: In transistor power amplifiers the output-transistor pins can be treated as well as the electromechanical contacts to the filter capacitors, any tab-type connectors, as well as any card-edge connectors. It is suggested that you have this done by a qualified service-technician.

LOUDSPEAKER CONNECTORS: The loudspeaker connections should be treated with **Stabilant 22A** but we suggest that you make sure that you have treated all the low-level signal contacts first as otherwise there will be less beneficial

effect when **Stabilant 22A** is used only on speaker cables. The tab-type slide-on connectors used are quite vulnerable to both vibration and corrosion, especially in the winter months when both moisture and salt can penetrate the speaker installation areas within the car's doors. Many problems attributed to damaged speakers are actually due to the speaker connections and can be prevented with the **Stabilants**-

GENERAL ANTENNA USE:**Stabilant 22A** can be used on the antenna connection to reduce signal loss in those connections. In addition, when used on the grounding connections in antenna installations it will often cut ignition noise pick-up.

RADIO FREQUENCY INTERFERENCE: RF interference in stereo systems can be 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 often 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 once in place. Unlike other so-called contact treatments **Stabilant 22A** 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 a module, plug-in component, or IC 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 other contact problems from occurring, thus eliminating the necessity of repeating the treatment at a later date.

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

In what forms is Stabilant available?

For automobile stereo system use by the consumer, we would suggest the use of the 15 mL service kit size of **Stabilant 22A** (isopropyl alcohol diluted form). This is also the most convenient size for use by system installers. However **Stabilant 22A** is also available in sizes up to 500mL where installers wish to bulk treat component assemblies.

What is the difference in the 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?

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 ease the application of the material, wasted many times the amount that actually got on the contact areas, and generally left a film of excess material that had to be cleaned up for appearances sake.

Another consideration is that although chlorofluorocarbon propellants are longer generally used in spray cans, a highly inflammable mixture of Butane and Propane has usually 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 is necessary. In other words you want just enough to fill up the interstices between the contact's faces. Where you're using **Stabilant 22A** or **22E**, you'll have to use enough so that once the alcohol evaporates the desired 0.5 to 1 mil film of **Stabilant 22** remains.

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 22/22A/22E** 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 consumers have 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!

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 bus- 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 heated above 200' C its decomposition products will burn. If orally ingested in small amounts it will cause bowel looseness. If it gets into the eyes it should be flushed out with running water. **Stabilant 22** has an LD50 of about 5 grams per kilogram body weight and is therefor considered as non-toxic.

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

Stabilants have been in some field trial 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.

Once again let us emphasize the point that unlike some other contact treatment containing oils, **Stabilant 22** will not cross-link when exposed to certain material such as high sulfur brass, rubber insulation or other elastomers, thermosetting plastics 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**.

Revision 2

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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