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**Number 005**

# APPLICATION NOTE

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## Automotive Applications of Stabilant 22

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### Introducing Stabilant 22

Stabilant 22 is an initially non-conductive 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. A convenient isopropyl alcohol diluted product, Stabilant 22A is a popular alternative to the concentrate.

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

In this Application Note, we address the use of Stabilant 22 in the automotive service field. A few common questions are answered about the product - for a more complete list, please also see Application Note #001.

### Automotive Applications

Electrical and electronic systems for automobiles, trucks and other transportation share a set of environmental and operational concerns. Contacts are generally the weakest link in any piece of electrical/electronic equipment whether it be an electronic ignition module, an automotive computer, power door locks, or even headlights. The use of Stabilant 22 provides a long lasting benefit, making contacts more reliable, thus eliminating unnecessary service call-backs, and ensuring customer satisfaction.

Here are some examples of automotive systems in which Stabilant treatment improves reliability:

#### Electronic Ignition Systems

Often a "sensor malfunction" error message on a diagnostic computer occurs because of a faulty connection to the sensor – potentially a recurring problem. Both power connectors and the individual sensor connections can be treated with Stabilant 22 or 22A after removing any grease with isopropyl alcohol.

## **Instrument Clusters**

Malfunctioning lights or instruments on/in an instrument cluster are often caused by poor contacts, and this can be cured by the use of the Stabilants. Uncoupling of the Tab™ type connectors, especially in older cars, sometimes breaks wire strands near the crimped connection. You can use Stabilant 22A to penetrate the connector without having to uncouple it by applying a couple of drops to the coupled connector. It will 'wick' into the contacts by itself.

## **Fuses**

While the new blade type fuses are more reliable than the older 3AG/AGC types, the use of Stabilant 22/22A will reduce the possibility of fuse contact heating which can cause a fuse to blow below its rated current on a circuit that is operating normally.

## **Dome Lights and Courtesy Lights**

It is good practice to use Stabilant 22/22A when replacing dome and courtesy lights. Ignition switch lights are often quite difficult to get to, and the time involved in changing a light in an older car often makes it a job where the cost of the work is not appreciated by the customer.

On older equipment, poor grounding of the light fixture (due to rusting of the attachment point) can often result in dim lights. Stabilant 22A applied to the mount can often restore the circuit to peak performance. Quartz halogen bulbs have the usual handling precautions – avoid getting any Stabilant residue on the bulb itself.

## **Heater & Air conditioning Controls**

Thermostats and electric motor switches can be treated with Stabilant 22 with this precaution: It is applicable for those not used directly with an inductive load. A good rule of thumb is, if there's enough inductive kick to make the switch spark, don't use it on that switch, as Stabilant 22 would break down under the heat of the spark. However, it is beneficial to use Stabilant in the wiring harness connectors in these circuits.

## **Power Windows and Electric Rear-view Mirrors**

Tab connectors inside the auto or truck doors are susceptible to contamination from some of the oil/wax rust-preventative sprays. Usually, a drop of Stabilant 22A per contact is all that's needed to restore reliability. Another problem is that some cars rely on the hinge/door latch to provide a ground return for these circuits (which explains the anomaly of power windows that only work perfectly when the doors are open at some detent position). Failure of any frame type connection due to rust or grease may necessitate installation of a proper ground wire to restore proper function. Stabilant treatment of all proper connections will ensure continued reliable operation.

## **Headlights, Signal Lights, Taillights and Parking Lights**

Although the current through the contacts is usually high enough to burn off the contamination on contacts in these circuits, there is often a voltage drop that causes the connectors to overheat. Salt and moisture contamination combine with the temperature cycling to hasten the corrosion process. Use Stabilant 22 to stop this and increase the lighting level by the elimination of these undesirable voltage drops.

Finally, treat the connectors on the headlight relays - just don't use it on the relay contacts if there's any sign of sparking when they open.

## **Solenoid Door & Trunk Locks**

The same concerns apply (as with power windows) to solenoid-operated lock mechanisms in the environment of doors and trunks.

## **Horn Circuits**

These are as prone to recurring problems as other system. Use Stabilant 22 to prevent having to repair the same failure a second time.

## **Door Activated Switches**

Everyone has run across automobiles with dome-lights that don't turn on as intended when the doors are opened. Stabilant 22 on the switch connectors (or exposed contacts in older units) will usually cure these problems.

## **Radios, Audio Players & Speakers**

When stereo speakers start to go out of balance or noise becomes a nuisance, often it's not the fault of the radio or power amplifier, but the interconnects or speaker leads. Stabilant treatment of all sound system connectors is useful in auto and truck systems, as it has been for many years in the home audio industry, to ensure reliability and reduce distortion.

## **Sensor Connectors**

Sensors for electronic control systems (O<sub>2</sub>, temperature, etc.) appear to malfunction, a common reason for repair calls that causes dealers problems. Replacement of the sensor appears to cure the problem, but the customer returns with the same issue hours, days, or even weeks later. Connector issues often cause this; replacing the sensor 'cures' the problem because the process of replacement simply 'wiped' its connector contacts. Stabilant 22A provides an improvement in the connector contact and will usually eliminate this problem at a much lower cost, in time and parts, than replacement of a sensor. A drop on each connector contact is normally all that is required.

## **Battery Terminals and Starter Lugs & Terminals**

In one of the proven high current applications, Stabilant 22 is preferred by many automotive electricians to "seat" the main battery connections, rather than just a petroleum jelly or electrical grease. Much better contact reliability results when this treatment is applied to the cleaned terminals, followed by application of grease over the coupled connections. This reduces the potential for typical corrosion from battery acid (liquid or fumes).

## **Voltage Regulators and Alternators/Generators**

Again, Stabilant 22 is very useful on these devices' connectors. Often alternators with bolt on voltage regulators suffer from close proximity to the exhaust manifold. Any excess heating creates localized contact problems leading to erratic regulation or premature failure of the voltage regulator. Stabilant 22/22A applied to the lug type and Tab™ connectors can result in better regulation and will help prevent battery damage due to insufficient current or voltage from the charging circuits.

## **Electric and Hybrid Vehicles**

Stabilant 22 has been used with great success in recent years to ensure the reliable operation of systems in hybrids and plug-in electric vehicles. From power connectors to computers, these vehicles increasingly rely on complex electrical/electronic systems. The proliferation of new connector types has created new applications for Stabilant 22.

## **Diagnostic Equipment**

One of the first uses for Stabilant 22 was in the maintenance of electronic test equipment where it has been employed since 1983 in military, civilian, not to mention avionics and biomedical electronics settings. Automotive and other transportation services require advanced computer interfaced test equipment, employing a large assortment of connectors that can benefit from Stabilant 22 treatment.

## **In what forms is Stabilant available?**

Stabilant 22 is provided as a concentrate (simply 'Stabilant 22'), or as in alcohol diluted versions: Stabilant 22A (with isopropanol) or Stabilant 22E (diluted with ethanol). Containers available include 5mL, 15mL, 50mL, 100mL, 250mL, 500mL and 1 Litre. The Stabilant 22A 15mL Service Kit, including the 15mL bottle, microbrush applicators and instructions, is our most popular product.

An additional packaging form, Stabilant 22S, is available for industrial/bulk users. Here the concentrate occupies one-fifth the volume of an otherwise empty container, allowing the end-user to add his own diluent. This saves the added costs of shipping the alcohol, as well as allowing the end user to use an alternate diluent such as one of the other solvents used in electronics.

## **Where are Stabilant products available?**

D.W. Electrochemicals Ltd. manufactures Stabilant products in Canada and sells through a network of distributors around the world. A list is available on our website or by contacting us (address, phone and email above).

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**

<b>NOTICE</b>
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