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Number 40

## APPLICATION NOTE

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### Solving Sensor Problems Using Stabilant Products

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#### Introducing Stabilant 22

Stabilant 22 is an initially non-conductive block polymer that when used in a thin film within contacts switches to a conductive state under the effect of the electrical field. The field gradient at which this occurs is set such that the material will remain non-conductive between adjacent contacts in a multiple pin connector environment.

*Thus, Stabilant 22 provides the connection reliability of a soldered joint without bonding the contacting surfaces together.*

Contacts are generally the weakest link in any piece of electrical/electronic equipment whether it be in low current devices found in computers or higher current circuits found in automotive and aviation applications, to name only a few. The use of Stabilant 22 or its isopropanol diluted form, Stabilant 22A, will make contacts from 10 to 100 times more reliable, eliminating costly service call-backs and ensuring customer satisfaction.

#### Background

Sensors have been with us ever since the days when Watt invented the flyball governor for steam engine speed regulation. While we are seeing an increase in optical encoded outputs suitable for optical-fibre cable use, most sensors we encounter today use electrical signals to transmit their output back to the controlling device. With the increase in microprocessor-controlled signal processing the signal levels in the wiring harnesses have generally dropped to TTL/MOS levels, that is, voltages under 5 volts and with correspondingly low currents.

Unfortunately for the reliability of equipment whose operation is controlled by sensors, reliability in connectors used at these voltage and power levels has lagged behind the demands placed upon them. The consequences are, for example, that it is estimated that 10% of all automobiles stalled on the roadside are suffering from an electrical connector failure of some sort.

The same conditions exist in many other areas, be it untimely landing-gear retractions caused by "squat switch" failure to unnecessary rejections of IC's during the final acceptance tests caused by improperly functioning test fixture connectors.

Where "sensor failures" occur, the loss of time and loss of product can be expensive. The cost of replacing perfectly good sensors because of the malfunction of a connector (whose cost is generally only a fraction of the cost of the sensor itself) can really hit a service group in the pocketbook. Normally, reimbursement of the service group for labor and parts costs are dependant upon testing by the manufacturer to verify that the assembly is actually at fault. The problem is that a simple disconnect and reconnect cycle will usually clear up the connector problem (for a short time anyway) and thus the faulty connector may perform flawlessly under the manufacturer's testing conditions. Not only is the customer annoyed by the original down time, but the service group is out of pocket. Another problem is the potential for loss of good relations between the dealer and customer, and between the manufacturer and dealer.

Often the long term duty cycle of the equipment can increase the problem. For example, in the agricultural implement field, the situation can be aggravated by the fact that the equipment is usually laid up for the larger part of the year and then is called upon to function perfectly during several weeks of intensive use.

It is not unusual for farmers to run their combines on a multiple-shift basis to bring in the crop as soon as the grain ripens. Any serious downtime can increase the potential for a major financial loss to the farmer, who may also be concerned with adverse weather conditions.

### **Can Sensor Connector Problems be Reduced?**

Yes, Stabilant 22 has proven to be very effective in improving the reliability of connectors in general and are developing a reputation for ease and speed of use under field conditions. Many OEM's are pre-treating sensor connectors during manufacture; many are providing Stabilant products to their service technicians either as Standard Store items or recommending them for field procurement.

Stabilant products are presently used in applications ranging from avionics through process control, including such critical fields as biomedical electronics, air traffic control, police & emergency communications and the like.

### **How are Stabilants Products Applied?**

The application of Stabilant products is exceptionally easy. Just use a drop of two of Stabilant 22A (the product version diluted with isopropyl alcohol) on one of the sensor connectors and any other signal-path connector in the wiring harness. and reconnect the system. The concentrate, Stabilant 22 can be used where the alcohol diluent is undesirable.

NATO CAGE/Supplier Code 38948

5mL Stabilant 22 (Concentrate), NATO Stock Number 5999-20-002-1112

15mL Stabilant 22 (Concentrate), NATO Stock Number 5999-21-909-9981

15mL Stabilant 22A (Isopropanol Diluted), NATO Stock Number 5999-21-900-6937

15mL Stabilant 22E (Ethanol Diluted), NATO Stock Number 5999-21-909-9984

Stabilant products 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**

**NOTICE**

This data has been supplied for information purposes only. While to our knowledge it is accurate, users should determine the suitability of the material 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 consequent damages, howsoever caused, based on the use of this information.

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