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Number 007

APPLICATION NOTE

Stabilant 22 for Trucks and Farm Machinery

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. The isopropanol-diluted product, Stabilant 22A is used in many applications.

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 special environments and equipment common to trucks and farm machinery. (Many systems, common to the general automotive field, are described in Application Note #005). After this, a few questions are answered about the product - for a more complete list, please see Application Note #001.

Stabilant 22 applications for trucks, farm machinery, other vehicles

Vehicles and machinery employ an increasing number of electrical and electronic devices, and not only with the newest electric vehicles.

Electrical connectors can be the weakest link in such systems in all vehicles. Many apparent component failures can be traced to prior failure of connectors within the system. These are notoriously unpredictable, often intermittent. Many service people find it difficult to isolate such problems and have to resort (under the pressure of cost and time) to replacement of a component or module which itself may not be at fault.

The cost of service, along with uncertainty as to whether the problem has been cured, impacts customer satisfaction. For example, where a farmer is absolutely reliant upon a piece of equipment, such as his use of a combine during a harvest period, the failure of a connector can be unnecessarily expensive.

Manufacturers are aware of these problems and spend a significant amount of time in the selection and testing of connectors. However, the extreme environmental conditions and problems of field contamination together with the number and diversity of connector types and the need for cost effectiveness have made perfect reliability almost impossible to achieve.

Even in the most expensive equipment used for biomedical electronics, where component cost is no object, connector reliability is still considerably less than the reliability of the other electronic components. An effective contact treatment is a significant and economical benefit for vehicles and machinery that operate in harsh environments or remote locations.

The use of a material such as Stabilant 22 or 22A, which provide a tenfold to one hundred-fold connector reliability increase can make an even greater difference in the reliability of a system employing hundreds of contacts.

Systems in which Stabilant 22 is used:

As with auto service, trucks and other vehicles benefit from Stabilant treatment of connectors. Electronic ignition systems, instrument clusters, fuses, headlights, dome lights, indicators, heater and A/C controls, power windows & mirrors, solenoid operated locks and trunks, door-activated switches, horn circuits, radio/CD/speaker systems, alternators & voltage regulators, GPS connections and other modern instrumentation are all notable areas.

Stabilant 22 also has a place in the diagnostic equipment used in servicing automobiles, trucks and other vehicles and machinery. The special service environments and work loads in heavier vehicles only serve to emphasize the benefits of reliable connectors.

Trucks may also feature systems that are uncommon in the automotive sphere. But these share the same range of connector types and reliability issues.

For example, semi tractors may include auxiliary power units (APU), Optimized Idle systems, built-in power inverters and a greater variety of lighting types, in addition to connections between the cab and trailer.

We will address more specific details in time; as of this writing (in 2023) there is ongoing rapid change in the electrical/electronic technology used in heavy vehicles, including the development of both large scale electric trucking and hydrogen fuel cell power for long haul vehicles.

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

Stabilant 22A can be applied to any type of connector, even hard to reach places like switches. The alcohol in this is only a carrier solvent and leaves a film of the concentrate on the contacts. This can save time and effort on assembled connectors.

On open easily accessible contacts a small amount of Stabilant 22 concentrate can be applied with a microbrush (supplied in our Service Kits). This can allow better monitoring of the amount being used.

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.

How much should be used?

Normally, a film thickness of about 1 to 2 mils of the concentrate is enough to promote low resistance contact and seal out contaminants (a mil here being 1/1000 inch or .0254 mm) - just enough to fill up the minute gaps within the contacts. Where Stabilant 22A is used, allow for the evaporation of the isopropanol, which forms 75% of the volume.

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

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