STABILANT 22

**D.W. ELECTROCHEMICALS LTD.**
70 Gibson Drive, Unit 12
Markham, Ontario
L3R 4C2 CANADA
Phone: (905) 508-7500
Email: dwel@stabilant.com

**Number 38**

# APPLICATION NOTE

## Design Goals in the Development of Stabilant 22

### Background

D.W. Electrochemicals Ltd., the manufacturer of Stabilant 22, is the latest venture originated by William M.D. Wright ("Mike"), who created the Stabilant products.

In 1976, Wright Electroacoustics (later, the Dayton-Wright Group) was manufacturing innovative audio equipment, including speaker systems, amplifiers and pre-amps.

At that time, major problems were encountered with switches which were being used at very low signal levels. Although mechanically efficient, they demonstrated excessive RF demodulation effects, thin-film distortion anomalies and intermittent microphonics. All attempts to rectify these problems by cleaning or the application of protective materials available at that time (such as oils), had only a short-term remedial effect.

In working with audio voltages as low as 80 microvolts, into impedances of from 40 ohms to 47 KΩ, unsatisfactory results were also seen in the connectors used in the systems. In the high-end equipment being designed at Dayton-Wright, connectors and switches became the "weak link" in the system.

Beginning with audio quality concerns and, being aware of the continuing evolution of low-power (CMOS) logic and the demands that low voltages and currents would place on connector systems, Mike decided in 1977 to develop a coating treatment which could be applied to electromechanical contacts in order to make them more reliable.

## Goals

Mike set forth several goals for the material: (not in order of importance)

1) The material had to be easy to apply.
2) It should have a long life, both on the shelf and in actual use. (>> 5 years).
3) It should be very stable, especially in its resistance to "varnishing" due to cross-linking caused by the presence of sulfur or its compounds on or in the vicinity of the contacts, the presence of other curing agents either in elastomers or plastics used in the connector or switch construction, or airborne contaminants that are cross-linking-initiating compounds.
4) It should be capable of providing a limit to the degradation of the connector, keeping it sufficiently close to the normal "new condition" that it would be within the connector's specified operational envelope.
5) It should have a switching-gradient of between 10,000 and 15,000 volts/inch, such that on insulating parts of a system, its "unswitched" condition (insulating in bulk) would allow negligible leakage between adjacent contacts, yet it should have a low effective volume resistance when in the "switched" condition.
6) It should have good lubricating properties.
7) It should have the ability to permeate and/or lift corrosion by-products from the active surface of connections and keep such material in suspension for very long periods of time and so prevent RF rectification and thin-film distortion effects.
8) It should be non-toxic.
9) It should not require dilution with any CFC or other environmentally sensitive solvent such as tri-chloro-ethylene in order to provide a surfactant action. If it had to be thinned in order to apply the desired film thickness, any diluents needed should be as non-toxic as possible.
10) It should not cause any adverse effects on any plastic used in the electronics industry.
11) It should be compatible with the majority of the elastomers used in the electronics industry.
12) Ideally, the vapor pressure should be low enough so that it could be used in satellite applications without having to be concerned with out-gassing.
13) It should have an operating temperature range of -70°C to at least +170°C.

## Summary

The research and development for this contact treatment material resulted in the present-day product, Stabilant 22. In the years from 1977 to 1982 this material was developed to meet the stated goals and to confirm the design parameters. Extensive field testing was done and the material was released to the Canadian Armed Forces in 1983 for field trials as well as being introduced to the consumer electronics market at that time.

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**

**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.