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How to Protect Data Center and Telecom Hardware from Creep Corrosion
Guidelines to Minimize Leading Factors in Creep Corrosion and Increase Electronics Performance Reliability

DORAVILLE, GA – Since the introduction of “lead-free” legislations, such as the European Union (EU) directive “on the Restriction of the use of certain Hazardous Substances” (RoHS), facilities housing electronics are increasingly experiencing non-compliance of electronic warranty specifications, as well as downtime caused by corrosion-related ghost signals, circuit board failure and complete failure of electronic components. Organizations such as the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the International Electronics Manufacturing Initiative (iNEMI) have generated guidelines for limits of gaseous contamination in data centers and telecommunication rooms, recommending a Class G1 environment, as described by the International Society of Automation (ISA) Standard 71.04-1985, *Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants*.

iNEMI stated in a recently published position paper that “the most effective way to protect electronic hardware from creep corrosion is to ensure that environmental conditions are within the modified severity level G1 of ANSI/ISA-71.04-1985,” which is attainable by reactivity monitoring and gas phase filtration. To ensure a G1 environment and reduce the risks of creep corrosion, iNEMI recommends maintaining the atmospheric environments at a copper reactivity rate of less than 300 Å/month and a silver reactivity rate of less than 200 Å/month. The research paper also corroborates temperatures and humidity recommendations from ASHRAE’s Technical Committee TC 9.9 *2011 Gaseous and Particulate Contamination Guidelines for Data Centers*; temperatures in electronic housing facilities should be kept within 64° to 81° F, relative humidity at less than 60% and dew point within the range 42° to 59° F.

Purafil has been monitoring corrosive gases for 25 years; since the first Purafil Corrosion Classification Coupon (CCC), the company has offered several monitoring tools based on the

ISA Standard 71.04-1985. Purafil's CCCs are a cost-effective tool to passively monitor corrosive gases in variety of applications including data centers, telecom facilities, refineries, pulp and paper mills, microelectronics, cleanrooms and museums. Since the first coupon analysis, Purafil's laboratory scientists have analyzed thousands of field-exposed coupons each year, providing comprehensive atmospheric reports in 10 languages.

While the CCCs measure the level of gaseous contaminants that form over a 30 day period, the OnGuard® 3000 provides real-time monitoring of corrosive gases such as sulfur dioxide (SO₂), hydrogen sulfide (H₂S), nitrogen oxides (NO_x), and other acidic gases found in modern urban environments and near industrial facilities, thus enabling customers to prevent corrosion before severe damage occurs. Purafil's OnGuard line of air monitors were invented in the mid-1990s using quartz crystal technology and won the prestigious R&D 100 Award, which was also given to other famous inventions such as the first microwave oven and the first copy machine.

The reports obtained from each Purafil monitoring tool detail the types of contaminants in the environment and the severity of corrosion in the room, making it easier to minimize the risks of creep corrosion. When confronted with a contaminated environment, Purafil offers extensive solutions to remove the corrosive gases from the atmosphere. In fact, depending upon the specific situation, either permanganate impregnated media or extruded carbon composite filters such as the PuraGRID® can be used to remove problematic corrosive gases.

For over 40 years, Purafil's gas-phase media has protected environments from corrosive, toxic, irritant and odorous gases. Purafil, Inc. is the world leader in innovating, designing, engineering, and manufacturing gas-phase air filtration systems, atmospheric and reactivity corrosion monitors, and UL classified granular media. Purafil maintains nearly 40,000 global installations in industrial, commercial, municipal, cleanroom, high purity, data centers and telecom facilities, power generation, and preservation facilities.

Purafil's ongoing commitment to quality, customer satisfaction and safety are exemplified by an obligation to the research and development of new clean air technologies, and by earning the latest ISO 9001:2008 certification, along with numerous industry awards.

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