

## THE IMPORTANCE OF REGULARLY SCHEDULED MEDIA REPLACEMENT

At Purafil® we design build-to-order systems with unique filtration solutions for any environment. Purafil is committed to providing clean air solutions and our expertise in engineering and manufacturing air filtration solutions allows us to provide best-in-class resolutions for our customers.

To ensure our products continue to provide maximum clean air solutions for our customers it is imperative that the media be replaced on a regular schedule. This document outlines need for media replacement, the risks, and implications of not replacing media in a timely manner, and the tools Purafil provides to monitor media life.

### Need for Media Replacement

Purafil media has a finite life which is a function of the available active ingredient and the concentration of target contaminants present in the airstream. High concentration of these contaminants can have detrimental effects on electronic equipment within a control room which could result in costly downtime. As a result, periodic, scheduled media replacement is imperative to ensure continued system performance and reliability.

Reliability problems develop when electronic equipment is exposed to environmental conditions exceeding the specified severity level as per ISA Standard 71.04-2013: Environmental Conditions for Process Measurement Control Systems: Airborne Contaminants. Details of the standard are listed below in Table 1. Note that both copper and silver reactivity monitoring is required, with the higher of the two being used to establish the severity level of the environment. When maintained properly with scheduled replacement of Purafil media, the environment will be maintained at a G1 severity level, ensuring that corrosion will not be a factor in causing the failure of electronic equipment.

TABLE 1: ANSI/ISA-71.04-2013 – CLASSIFICATION OF REACTIVE ENVIRONMENTS

Class	Severity Level	Angstroms (Å) per 30 days		Implication
		Copper Corrosion	Silver Corrosion	
G1	MILD	<300 Å	<200 Å	Corrosion is NOT a factor in electronic equipment reliability.
G2	MODERATE	300 Å – 999 Å	300 Å – 999 Å	Effect of corrosion is measurable and may be a factor in electronic equipment reliability.
G3	HARSH	1,000 Å – 1,999 Å	1,000 Å – 1,999 Å	High probability that corrosive attacks will occur. Should prompt further evaluation and result in environmental controls.
GX	SEVERE	> 2000 Å	> 2000 Å	Only specially designed and packaged equipment is expected to survive.

### Implications of Not Replacing Media in a Timely Manner

Purafil has observed numerous occurrences of early life failures due to corrosion of electronic equipment, resulting costly downtime for the operator. Depending on the application, the costs associated with this unplanned downtime could reach in the millions of dollars. Many electronic equipment manufacturers will also void the warranty if the environment is not maintained to a G1 level, further adding to the costs associated with the unplanned downtime.

A mismanaged environment, including temperature and humidity, will affect all electronic equipment, PC based servers, and controllers, systems, standalone electronics, and 3rd party equipment operating in industrial environments, including: oil & gas, hydrocarbon (H-C) processing, refining, pulp and paper plants, steel making processes, blast and electric furnaces and other processes that produce corrosive compounds that play havoc with electronic reliability.

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Figure 1 below contains examples of corrosion on electronic equipment resulting from a failure to maintain a G1 environment. In each instance the site experienced electronic equipment failure resulting in unplanned downtime in the operation.

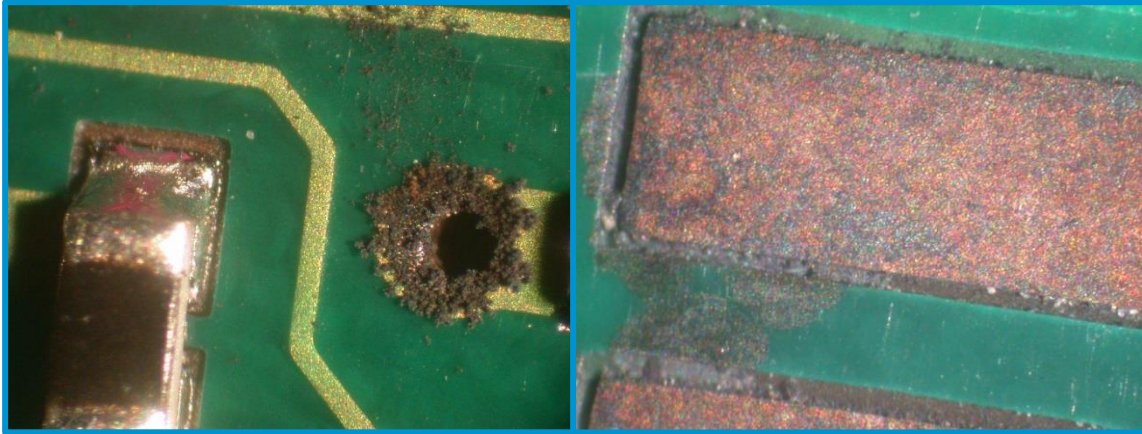


Figure 1: Corrosion resulting from sulfur compounds reaction with copper traces and connectors forming copper sulfide.

### **Purafil Tools for Evaluating Media Life and Corrosive Environments**

Purafil is committed to providing clean air solutions. We have a portfolio of technical services and instrumentation to allow for verification that Purafil's air filtration system is performing optimally.

#### Media Life Analysis (MLA)

As a complimentary service, Purafil's laboratory analyzes samples of media from your air scrubber to determine the remaining life. A date for replacement can then be scheduled to ensure the protected space is not exposed to gas breakthrough or media is replaced prematurely. By analyzing samples of media from the air filtration system, Purafil can project the life cycle of system media and make suggestions to improve system performance. Your MLA Report is made available through your local Purafil representative via Purafil's online portal.

#### Coupon Analysis

Purafil provides Corrosion Classification Coupons to determine whether your environment is safe for electronics. As part of Purafil's assessment service, our laboratory analyzes coupons and issues a comprehensive report detailing the environment's ISA Classification, the classes of gases present and concentration levels, and humidity effects.

#### OnGuard Smart

The OnGuard Smart measures the overall reactivity level of air contaminants, temperature, humidity, and room pressure in a controlled environment. The OnGuard Smart measures and logs in real time and provides access to this data via multiple communication methods, including Wi-Fi. In addition, the system can be programmed to send email alerts when a parameter reaches a critical threshold. Installation takes only minutes and data is accessible anytime, anywhere.

  
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