

PRODUCT BULLETIN

4 THE ONGUARD® 2000 ATMOSPHERIC CORROSION MONITOR




THE PURAFIL ONGUARD 2000 ATMOSPHERIC CORROSION MONITOR continuously measures the real-time effects of corrosion, as well as temperature, relative humidity and differential room pressure. Using these measurements, the OnGuard Monitor projects the environment's ISA severity level and help to increase the reliability of electronic instruments.



YOUR FIRST LINE OF DEFENSE AGAINST CORROSION

Corrosion can wreak havoc on your business by damaging sensitive electronic equipment. In many cases, even slight changes in atmospheric

conditions can adversely impact equipment performance. More severe corrosion can result in prolonged downtime, costly production delays, manufacturing defects and lost business. Left unchecked, corrosion can cause permanent damage to valuable equipment.

While the battle against corrosion plagues manufacturing facilities, few places are more vulnerable to atmospheric damage than museums and archives. In these settings, irreplaceable art and documents are continuously exposed to potential damage from airborne particles and gaseous contaminants, as well as changes in temperature

and humidity. Regardless of the source - vehicular traffic, neighboring industries, food service, restoration labs or cleaning services - the effects are the same: paint cracks, metals tarnish, paper yellows and deterioration is accelerated.

HOW THE ONGUARD WORKS

The R & D 100 award winning OnGuard system identifies hazardous environmental conditions that are destructive to electronic equipment and sensitive artifacts on a realtime basis. Environmental corrosion problems are detected immediately, allowing the user to take action before problems develop. OnGuard increases the reliability of electronic instrumentation, and reduces the deterioration of artifacts.

Introduced in 1993, OnGuard was the first real-time corrosion monitoring instrument developed for commercial and industrial applications. The OnGuard series remains the undisputed leader even today, with patented technology that offers continuous monitoring and reporting of contaminant levels in control rooms, rack rooms, motor control centers and other sensitive environments. OnGuard's design is compact and simple to use. All measurements can be easily viewed on the graphic liquid crystal display (LCD), and the parameters can be easily configured using the menu-based keypad, or the same features can be accessed through OnGuard's Remote Control software.

Corrosion on electronic components and contacts, and on precious and semiprecious metal artifacts is characterized by the buildup of various chemical reaction products (tarnish) which form when corrosive gases come in contact with the base metal. The sources of these gases are often the results of processes being operated at an industrial site, chemicals in use, or by general atmospheric contamination. They may also come from an adjacent facility; therefore, consideration should be given to corrosion causing contaminants outside of the facility.

Typical corrosive gases include hydrogen sulfide (H₂S), chlorine (Cl₂), oxides of sulfur and nitrogen (SO₂, SO₃, NO, NO₂, etc.), ozone (O₃), ammonia (NH₃), and hydrogen fluoride (HF). Therefore, corrosion films can be composed of reaction products such as copper sulfide (Cu₂S), copper oxide (Cu₂O), silver sulfide

(Ag₂S), and silver chloride (AgCl). These reaction products cause an associated weight gain on the metal surface which can be directly correlated to the thickness of the corrosion film.

A less sensitive corrosion monitoring method requires the use of metallic "coupons" which are placed in control rooms or other test areas and examined over periods of 30 to 90 days. They are then sent to a lab for analysis, after which a report is generated and sent back to the user. Unfortunately, generation of the reports can often take several additional weeks. Ultimately, this process informs the user that a corrosion problem did, indeed, exist...several months ago!

Most computer manufacturers cite the Instrument Society of America (ISA) standards for acceptable levels of airborne contaminants. OnGuard's measurements correlate directly to these standards. Every 15 minutes the OnGuard updates the corrosion build-up over the previous 24-hour period and projects the corresponding 30-day ISA severity level. OnGuard can detect and record minute changes in controlled environments: if the presence of harmful corrosion increases by a few angstroms, OnGuard can immediately notify you. And, the OnGuard can be easily adjusted to the appropriate levels for a particular industry or application. Moreover, OnGuard calculates both cumulative and incremental corrosion on a continuous basis. This level of information enables the user to more accurately predict when failures might occur and then take the necessary corrective action.



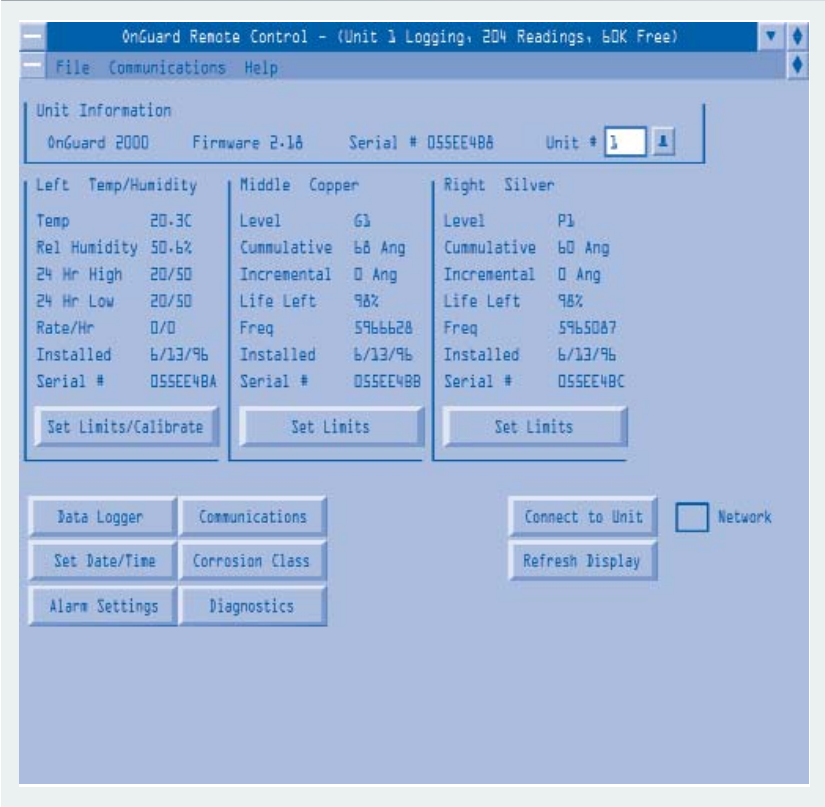
OnGuard offers the most complete reactivity detection available. In addition to monitoring copper and silver corrosion (both cumulative & incremental), OnGuard also monitors and delivers comprehensive data on temperature, relative humidity and differential room pressure.

Alarm indicators warn of threatening corrosive conditions while OnGuard's powerful memory can log up to one full year of comprehensive data. This means that OnGuard is suitable for standalone applications, but can also be easily networked to relay information from single or multiple units to a central location. This information can be easily uploaded to a personal computer (PC) for viewing, graphing or archiving using the exclusive windows based OnGuard Remote Control software. For a Distributed Control System (DCS), the same data can be monitored using existing DCS software. OnGuard offers the flexibility: from monitoring an individual control room to establishing a complete plant-wide system.

ONGUARD CORRELATION TO ISA STANDARD 571.04-1985 FOR LEVELS OF CORROSION EFFECTS ON EQUIPMENT

ISA STANDARD 571.04-1985	ONGUARD CORRELATION	EFFECTS
Class G1: <300 Å/30 days	Class G1: <10Å/24 hours	Mild: Corrosion is not a factor
Class G2: <1000 Å/30 days	Class G2: <33 Å/24 hours	Moderate: Corrosion is measurable
Class G3: <2000 Å/30 days	Class G3: <66 Å/24 hours	Harsh: High probability that corrosive attacks will occur
Class GX: >2000 Å/30 days	Class GX: <67 Å/24 hours	Severe: Electronic/electrical equipment not expected to survive

MAIN MENU ON THE WINDOWS BASED ONGUARD REMOVE CONTROL SOFTWARE PROGRAM



ASK THE EXPERTS:

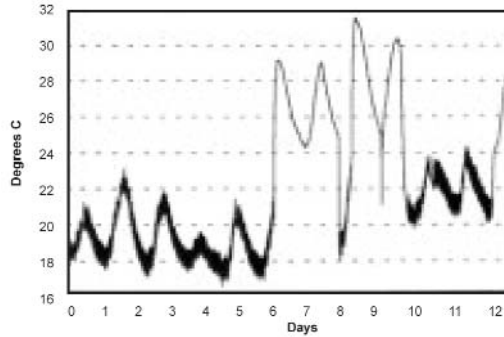
Detecting corrosion is just the first step; maintaining a corrosion-free environment is the real goal. That's why manufacturers worldwide have been turning to Purafil, the world's most experienced designer of air purification systems, for over 30 years. Successful corrosion prevention programs require skilled analysis of needs, installation of the right air filtration system, technical support and timely service. Purafil's technical staff and worldwide rep organization are available to assist you with all your needs.

Whichever Purafil system you use, you'll receive the security and comfort that only comes from dealing with the industry leader. Each system is supported by analytical services from Purafil's state-of-the-art laboratories and a team of trained professionals dedicated to providing you with the world's finest environmental monitoring equipment.

FEATURES	ONGUARD 2000	ONGUARD 2000-INS	ONGUARD 2000-RSM
Monitors:			
Copper Corrosion	Yes	Yes	Yes
Silver Corrosion	Yes	Yes	Yes
Temperature	Yes	Yes	Yes
Relative Humidity	Yes	Yes	Yes
Room Pressure	Optional	Optional	Optional
Outputs values of:			
Copper Cumulative Corrosion	Yes	Yes	Yes
Copper Incremental Corrosion	Yes	Yes	Yes
Silver Cumulative Corrosion	Yes	Yes	Yes
Silver Incremental Corrosion	Yes	Yes	Yes
Temperature	Yes	Yes	Yes
Relative Humidity	Yes	Yes	Yes
Pressure (optional)	Yes	Yes	Yes
Interface to unit:			
LCD screen & keypad	Yes	No	via OG2000 or 2000-INS
Personal computer	Yes	Yes	via OG2000 or 2000-INS
Distributed control systems	Yes	Yes	Yes
Host-to-host capability	Yes	Yes	Yes
Field updatable firmware	Yes	Yes	Yes
Network capability	Yes	Yes	Yes
Digital communications capability:			
Digital RS232, RS485, RS422	Yes	Yes	via OG2000 or 2000-INS
Analog communications capability:	Optional	Optional	No
Reporting standards:			
Defaults to ISA standard	Yes	Yes	Yes
Reset to custom standards	with LCD/Keypad or PC	with PC and OnGuards	with PC and OnGuards
Data logging capability:			
2-hour readings	One Year	One Year	One Year
Upload data via software	Yes	Yes	Yes
View data on unit	Yes	No	No
Power requirements:			
18-36 VDC, powered locally or from other OnGuard unit	18-3 Yes	18-3 Yes	18-3 Yes
I/O digital communications to host OnGuard:	I/O d Yes	I/O d Yes	I/O d via host OnGuard
Alarm capability:			
LED alarm lights	Yes	Yes	No
Buzzer	Yes	Yes	Yes
Relayed contact closure	Optional	Optional	Optional
Types of alarms:			
Corrosion limits exceeded	Yes	Yes	Yes
Temperature limits exceeded	Yes	Yes	Yes
Rel. Humidity limits exceeded	Yes	Yes	Yes
Corrosion sensor failure	Yes	Yes	Yes
Rate of change RH exceeded	Yes	Yes	Yes

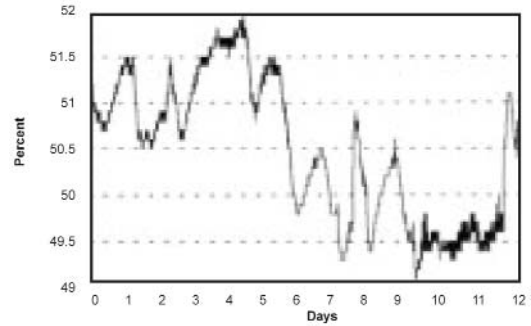
ENVIRONMENTAL DATA FROM AN ONGUARD ATMOSPHERIC CORROSION MONITOR'S DATA LOGGER

TEMPERATURE



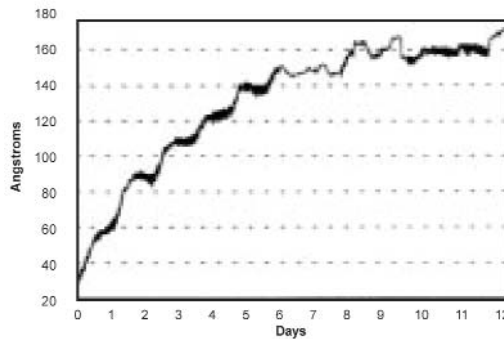
Shows the daily temperature variations with loss of temperature control days 6-10.

RELATIVE HUMIDITY



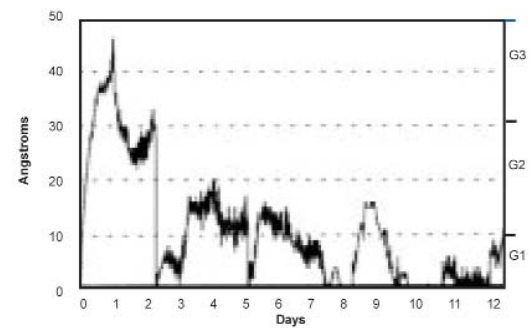
Shows the daily RH variation with a minor drop in RH days 10-11.

COPPER CUMULATIVE



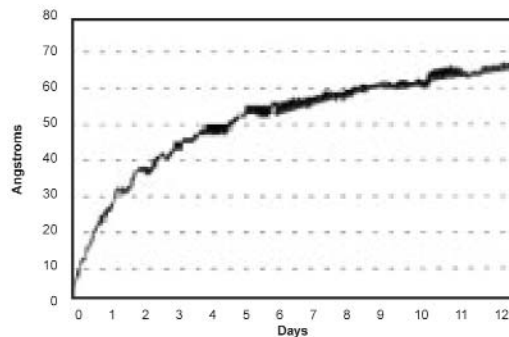
Shows rapid build-up of corrosion during the first 5 days with a decrease in the corrosion in the next 7 days.

COPPER INCREMENTAL



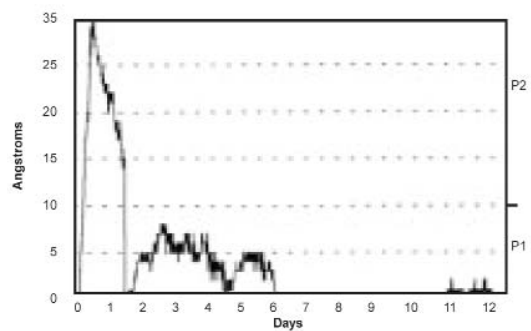
Shows G2 and G3 conditions in four events during the time period.

SILVER CUMULATIVE



Shows rapid build-up of corrosion during the first 5 days with a decrease in the corrosion in the next 7 days..

SILVER INCREMENTAL



Shows a P2 event in the first 2 days with minor events in the next 4 days and no corrosion in the balance of the period.