

MARKET SEGMENT BROCHURE: METALS & MINING

# MANAGING YOUR SMELTER: CORROSION CONTROL

GET CORROSION UNDER CONTROL AND MAINTAIN  
EQUIPMENT RELIABILITY, ALL WHILE INCREASING  
UPTIME.



**purafil**  
Filtration Group®

# IS CORROSION RUINING YOUR EQUIPMENT?



## ARE YOU PROTECTING YOUR EQUIPMENT & ELECTRONICS?

Your equipment is what allows you to be an effective mining operation; without it, you threaten the process and profitability of your business. By protecting critical equipment and the electronics that help run your operation, you can ensure increased productivity and uptime. So, how do you prevent equipment failure? Scrub the air of sulfur and other gaseous contaminants that are causing the electronics and machines to corrode.

Purafil's gas phase filtration systems capture and chemically absorb gaseous and harmful (not to mention odorous) contaminants, so you can rely on fully operational equipment and an effective control room with less downtime. As Purafil's systems clean the air, you'll come closer to G1 level environments—where corrosion is not a factor in equipment failure—which will give you the peace of mind that your equipment and electronics will require fewer repairs and less downtime.

***Purafil Solution: Deep Bed Scrubbers***

## CONFIRMING CORROSION

You have equipment rooms throughout your facility that house the motor controls, drives and sensors that allow you to stay up and running. But what happens when your equipment fails and production comes to a halt? Purafil's Corrosion Classification Coupons (CCCs) help diagnose the problem quickly so you can take corrective action and prevent downtime.

Our coupons include a silver and copper sensor to test the level of corrosion in your facility. After a short exposure time, we'll test the coupons and determine the severity level. A G1 environment is generally not corrosive to equipment and electronics, whereas a GX environment indicates that your equipment will likely fail due to the high levels of corrosion. Purafil gives you the necessary insights to identify and address corrosion problems.

***Purafil Solutions: Purafil Corrosion Classification Coupon (CCC), Purafil Side Access (PSA), PuraGRID Filters***

## MONITORING TO ENSURE MORE UPTIME

You've confirmed that corrosion is what's wreaking havoc on your equipment, and installed a gas filtration system to remedy the problem, but have you confirmed that it's working? A monitoring system allows you to maintain a clean environment, free from contaminants, but also indicates when it's time to replace your media.

Purafil's OnGuard Smart continuously measures the air quality (per ISA Standard 71.04-2013) in real time, so you're confident that you have a corrosion-free environment. It also helps estimate when to replace the media. You can send your media samples into the Purafil lab for testing and a recommended replacement date. Either way, you're ensuring equipment usability by controlling corrosion.

***Purafil Solution: OnGuard Smart, Purafil Side Access (PSA), PuraGRID Filters***

# REDUCING CORROSION WITH PURAFIL

## PURAFIL PUTS PRESSURE ON CORROSION IN COPPER MINES

The world's largest copper producer relies on Kairos Mining, a joint venture between Codelco and Honeywell, to improve its process and the performance of its concentrator plants. With such a key role to play, Kairos can't afford to slow down due to repeated computer failures in their control rooms caused by high levels of  $H_2S$  gas. Kairos Mining worked with Purafil and FiltraChile to implement a solution to address the  $H_2S$  gas, which helped with the computer failures and air quality.

Our Corrosion Classification Coupons (CCC) revealed that Kairos' control rooms were experiencing GX levels of corrosion from high levels of  $H_2S$ , which was causing the newly installed computers in the control rooms to fail. This corrosive gas was also a potential health hazard. To address both issues, Purafil pressurized the control room and reduced the contaminant gases in the air throughout the entire plant.

**We installed a side access unit (PSA) filled with Puracarb, which reduced corrosion levels from GX to acceptable levels, and improved the quality of the air such that Kairos hasn't experienced further electrical shorts in their computers.**

Purafil, Inc. is the leading manufacturer of dry-chemical media, scrubbers, and monitors in the oil and gas industries. Our products and solutions identify and remove harmful and unpleasant particles, gases, odors, bacteria, and viruses from the environment. The results are increased comfort levels, better equipment reliability, and confidence that environmental safety regulations are being met and exceeded.

# PURAFIL'S DRY-SCRUBBING MEDIA ADVANTAGE



## PURAFIL ENGINEERED MEDIA

By using Purafil air scrubbing media, you can greatly improve the reliability of production processes. You can also prevent expenditures for new systems and lost revenue due to repairs and other downtime-related expenses. Our patented media formulations are manufactured using special chemicals that react with corrosive gases and remove them from the air stream. Contaminant gases are chemically transformed into harmless solids that remain trapped inside the media. Known as chemisorption, this process converts damaging contaminants into harmless salts.

Purafil's media perform well at all temperatures and humidity levels, are non-flammable, UL certified, and remove a broad range of contaminants. Our media provides more than double the removal capacity of equivalent competitor products for key target gases. As a complimentary service, our laboratory technicians analyze samples from your system(s) and provide a report indicating the estimated media replacement date based on the specific conditions in your facility. Purafil's media is either bulk-filled within our engineered equipment, or packaged in our MediaPAK™ modules and PuraGRID® filters.

### Purafil offers the following granular media for your specific gas challenges:



#### PURAFIL® SP BLEND

Demonstrates a higher working capacity for broad-spectrum oxidation of contaminants, where multiple gas challenges are present such as an equipment room.

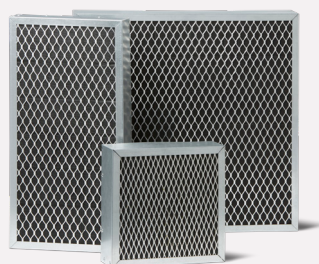


#### PURACARB®

Manufactured specifically for the removal of acid gases, including hydrogen sulfide and sulfur dioxide, the most common source of corrosion-related failure in industrial environments.

### PuraGRID™ Filter with GridBLOK™ Technology

The GridBLOK is a gas-phase air filtration medium in the form of an extruded carbon composite with a large number of small, parallel cells or channels. The GridBLOK is composed of essentially 100% adsorbent materials allowing the entire composite structure to function as a gas filter. Due to the large number of cells in each GridBLOK, the contact area between the adsorbent media and the airstream that travels inside the cells is very large. These cells are parallel so that the flow is not obstructed and the pressure drop is extremely low. The PuraGRID is available in multiple patented media formulations specific to your needs:



# PURAFIL CUSTOM EQUIPMENT

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## DEEP BED SCRUBBER (DBS)

Located outside the protected space to pressurize and provide ISA Class G1 air with up to four independent bulk-filled media beds for complex gas challenges to ensure a long residence time for system efficiency. Airflows of 500 - 8,000 CFM.



## POSITIVE PRESSURIZATION UNIT (PPU)

Modular system design works in tandem with standard air handling equipment to eliminate corrosive gases and provides continuous positive pressure within the space as it recirculates the air. Airflows of 500 - 4,000 CFM.



## CORROSIVE AIR UNIT (CA)

Self-contained modular air purification system that cleans and recirculates air inside the protected space. Airflows of 500 - 4,000 CFM.



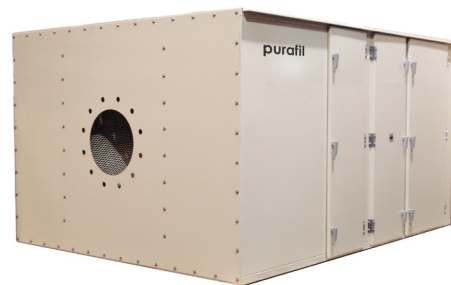
## Drum Scrubber (DS)

Targets removal of low-level gas emissions found at industrial sites. It is recommended for smaller air flow applications and is available in three sizes: Airflows of 100 cfm, 300 cfm, and 500 CFM.



## PURAFIL® SIDE ACCESS SYSTEM (PSA)

Modular system design features insulated double-walled construction and filters moderate levels of acid gases in less polluted areas of the plant. Can also be used as a filter in a recirculation circuit. Airflows of 250 - 50,000 CFM.



## COMPRESSOR INTAKE FILTER (CIF)

Modular system design removes contaminant gases from polluted airstreams entering the compressor while preventing corrosion damage to intercoolers, diffusers and casings. Airflows of 400-18,000 CFM.

# AIR QUALITY ASSESSMENT AND MONITORING

## AIR QUALITY ASSESSMENT

A controlled space, such as a control room or motor control center is designed in accordance with strict environmental criteria to protect sensitive electronics from damage caused by corrosive gases. These criteria were developed by the International Society of Automation (ISA). The ISA Standard 71.04-2013 titled “Environmental Equipment Conditions for Process Management and Control Systems: Airborne Contaminants,” has become the accepted guide for warranties of electronic equipment.

Purafil’s Air Quality Assessment Service provides specially prepared Corrosion Classification Coupons (CCCs) for critical operating environments. The rate of corrosion buildup, measured in angstroms, on the coupon is indicative of the environment’s severity level – G1, G2, G3, or GX. Purafil performs this service as a diagnostic tool to determine the types and levels of contaminants in various areas of your facility.

| ISA STANDARD 71.04-2013 |                                            |                                            |                                                                                    |
|-------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------|
| CLASS                   | COPPER REACTIVITY LEVEL<br>(IN ANGSTROMS)* | SILVER REACTIVITY LEVEL<br>(IN ANGSTROMS)* | AIR QUALITY CLASSIFICATIONS                                                        |
| G1                      | < 300                                      | < 200                                      | <b>MILD</b><br><i>Corrosion is not a factor</i>                                    |
| G2                      | < 1,000                                    | < 1,000                                    | <b>MODERATE</b><br><i>Corrosion is measurable</i>                                  |
| G3                      | < 2,000                                    | < 2,000                                    | <b>HARSH</b><br><i>High probability that corrosion attacks will occur</i>          |
| GX                      | > 2,000                                    | > 2,000                                    | <b>SEVERE</b><br><i>Electronic/electrical equipment is not expected to survive</i> |

\*Normalized to a 30-day exposure. 1 angstrom = one hundred-millionth of a centimeter, or  $10^{-10}$  meter.

## AIR QUALITY MONITORING

Purafil’s OnGuard® Smart (OGS) Monitor helps protect your equipment by measuring and transmitting the level of corrosion in your facility, allowing for action to be taken before problems develop. Purafil’s OGS can transmit real-time data to your SCADA system via a 4-20 mA output signal, and is accessible over ethernet or Wi-Fi. In addition, the Purafil OGS contains internal temperature, humidity, and room pressure sensors. In remote applications, it can be operated as a data logger using battery power. All measurements are directly related to ISA Standard 71.04-2013.



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