

MARKET SEGMENT BROCHURE: GALLERIES, LIBRARIES, ARCHIVES & MUSEUMS

SAFEGUARDING PRICELESS ART AND ARTIFACTS AROUND THE WORLD

ELIMINATE GASEOUS, MICROBIAL AND PARTICULATE
CONTAMINANTS FOUND IN THE AIR



purafil

Filtration Group®



PURAFIL SETS THE STANDARD FOR PRESERVATION ENVIRONMENTS



IS OUTSIDE AIR CAUSING A PROBLEM FOR YOUR FACILITY?

Controlling airborne pollutants is essential to maintaining adequate indoor air quality (IAQ) for preservation environments. Contaminants can come from many outside sources, including the incinerators, loading docks and waste disposal units usually located at the rear of the building within just a few feet of primary HVAC air intakes. Emissions from nearby industrial facilities, residential furnaces, and automotive exhaust can also result in damage to priceless pieces of artwork and archival material. Nitrogen dioxide (NO₂), Sulfur dioxide (SO₂), Ozone (O₃) and Volatile Organic Compounds (VOCs) from these sources are detrimental to calcium carbonate materials (marble, limestone, frescoes, alkaline, sandstones), cellulose (paper, cotton, linen, wood veneers), silk, and even metals like iron and steel. Outside air intake must be chemically filtered to eliminate these gases before they are brought inside.

Purafil Solutions: Front Access System (FAS) and Purafil Side Access System (PSA)

ARE YOU CONTROLLING THE INTERNAL SOURCES OF DETERIORATION?

Inside sources of pollution can include the actual collections (books, displays, etc.), food service areas, cleaning aerosols, effluents from guests, off-gassing from office furnishings, and printers. Contaminants including formaldehyde, ozone, chlorides, acetic acid, mold spores, viruses, and bacteria from these sources are detrimental to organically-based materials (paper, textiles, animal skins, plant materials, paints, and wood veneers) as well as metals. Recirculated air must be chemically filtered to control these internal sources, and absorbents should be placed inside displays to protect enclosed spaces.

Purafil Solutions: Corrosive Air Units (CA) Purafilters, PuraGRID, and Purafil Isolette Sorber

DO YOU KNOW THE AIR QUALITY LEVEL OF YOUR PRESERVATION ENVIRONMENT?

In partnership with the Dutch State Archives, Purafil created the standard for measuring air quality in preservation environments. The level of air purity needed is highly dependent on what items you are preserving (*see monitoring section for details*). Using a monitoring system can identify your current air quality level as well as alert you to any changes, allowing you to act before any damage can occur.

Purafil Solutions: Environmental Reactivity Coupons (ERCs) and OnGuard Smart (OGS)

PURAFIL PROVIDES THE SOLUTION

A detailed view of Michelangelo's famous fresco, 'The Creation of Adam', showing the reclining Adam and the reaching God. The background is a dark, semi-transparent overlay of the entire fresco.

PRESERVING THE MASTERPIECE IN THE SISTINE CHAPEL

Plans to upgrade the HVAC system in the Sistine chapel did not initially include gas phase air filtration. The specified filters would remove 95.3% of particulate contaminants but would not address the gaseous contamination that causes and accelerates the degradation of the frescoes that decorate the interior. To help preserve some of the world's most treasured artwork, Vatican engineers assembled a team including experts from Purafil and local representatives at E.T.T. S.r.l.. The Vatican needed a solution that was easy to service, would fit in the new air handling system, and would still meet the goal of controlling gaseous contamination in an environment that hosts more than 2 million annual visitors. Two passes of Purafil PuraGRID® filters (using Puracarb and IAQ GridBLOK™) were incorporated to ensure clean and long service life.

“Together, we developed an environmental control system that now works behind the scenes, protecting Michelangelo’s delicate work for future generations.” - Representative

Purafil, Inc. is the leading manufacturer of filtration media, scrubbers, and monitors to safeguard and preserve artifacts. 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, reduced corrosion, and confidence that your preservation environment will not cause the deterioration of artifacts, books, or artwork.

PURAFIL'S DRY-SCRUBBING MEDIA ADVANTAGE

PURAFIL ENGINEERED MEDIA

Purafil offers a broad selection of dry-chemical pellets called media, which are the core of our air purification solutions. Purafil manufactures a wide variety of media to remove specific pollutants from specific sources. Our patented media formulations are manufactured using special chemicals that react with damaging 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 detrimental contaminants into harmless salts.

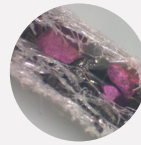
Purafil offers media with more than double the removal capacity of equivalent competitor products. In most cases, we recommend Purafil® SP Blend media because it removes the widest variety of odors and gases such as VOCs, hydrogen sulfide, sulfur dioxide, oxides of nitrogen, acetic acid and formaldehyde. This unique formulation is available in Purafil equipment or our patented Purafilter. Our IAQ formulation for the PuraGRID filter offers the same gas removal and can also be installed into existing air handling systems.



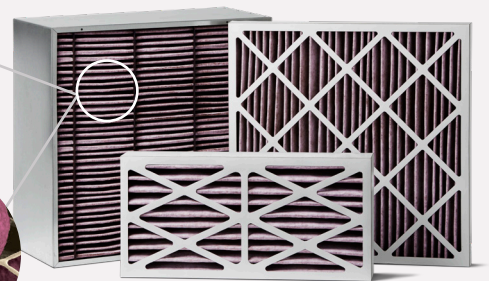
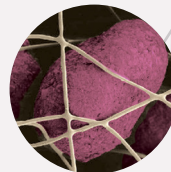
The Purafilter®

Combination chemical and particulate filter designed to replace existing particulate filters in retrofit or rework applications. The Purafilter contains Purafil SP Blend media and is useful in applications where space limitations exist. Purafil engineers are the first to successfully suspend sodium permanganate media in a bicomponent fiber matrix, which does not require the use of adhesives so the media is fully exposed for reaction with gaseous chemical contaminants and odors. Purafil's patented media formulation is evenly distributed throughout the filter structure to assure the highest filtration efficiency.

16X Magnified



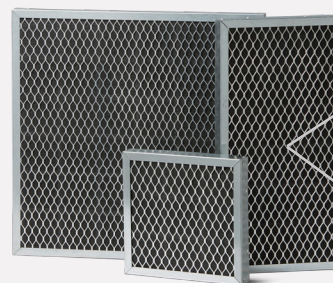
32X Magnified



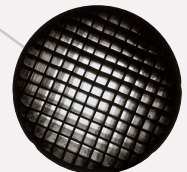
PuraGRID™ Filter with GridBLOK™ Technology

Made of extruded monolithic block consisting of 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 within the PuraGRID Filter. This filter features no bypass, low pressure drop and turbulent air flow with full utilization of the media. PuraGRID filters can be used inside Purafil's custom engineered equipment or installed into existing air handling systems. While Purafil manufactures multiple GridBLOK formulations, the IAQ GridBLOK is specifically designed to improve Indoor Air Quality. This new media formulation has twice the removal capacity for formaldehyde than any other chemically impregnated media.

GridBLOK Media



Magnified view of the GridBLOK structure



Purafil Isolette Sorber

The same patented Purafil media formulation available in our custom engineered equipment and filters, are also packaged in small Isolette Sorbers to protect valuables stored in display cases. Purafil offers two sizes to accommodate large or small display cases.

3.5" x 2.5" Isolette Sorber contains 10 grams of media

6.25" x 4.75" Isolette Sorber contains 80 grams of media



PURAFIL CUSTOM EQUIPMENT



FRONT ACCESS SYSTEM (FAS)

The Front Access System consists of box-shaped units called “frames” which may be stacked vertically or horizontally, giving the system flexibility in terms of size and shape. The modular frames are individually tracked for Purafil media modules. The FAS is specified in retrofit applications or custom air handling units.

Airflows up to 2,000 CFM per 24” x 24” frame



POSITIVE PRESSURIZATION UNIT (PPU)

The PPU is an all-in-one packaged air filtration machine for indoor use. Both particulate and chemical filtration are integrated into one unit, complete with a self-contained blower. It is used to filter gaseous pollutants while providing continuous positive pressure within the space.

Airflows of 500 - 4,000 CFM.



PURAFIL® SIDE ACCESS SYSTEM (PSA)

The PSA is designed for both particulate and gaseous contaminant control and works in conjunction with the facility’s air handling system. The PSA is a built-to-order system available in more than 20 sizes. A full range of pre-filter selections and particulate final filter selections are also available.

Airflows of 250 - 50,000 CFM.



CORROSIVE AIR UNIT (CA)

The CA is an all-in-one packaged air filtration machine for indoor use. Both particulate and chemical filtration are integrated into one unit that cleans and recirculates air inside the protected space.

Airflows of 500 - 4,000 CFM.

ENVIRONMENTAL ASSESSMENT AND MONITORING

ENVIRONMENTAL ASSESSMENT

Reactivity Monitoring is a widely accepted technique used to characterize the destructive potential of an environment. Because many of the contaminants targeted for control are corrosive in nature (i.e., sulfur dioxide), reactivity monitors have long been used to gauge the quality of ambient air and to indicate the effectiveness of pollution control strategies.

Purafil's Environmental Reactivity Coupons (ERCs) may be used to indicate the presence of sulfur dioxide, nitrogen dioxide, hydrogen sulfide and chlorine compounds, which can cause deterioration of metals, cellulose or calcium carbonate within museums, libraries and similar environments.

Purafil offers the OnGuard® Smart Corrosion Monitor (OGS), which provides real-time information on the amount of corrosion occurring and transmits this information to the building management system via a 4-20 mA output signal or over ethernet connection. The OGS features copper and silver Quartz Crystal Microbalance (QCM) sensors for the detection of contaminant concentrations as low as one part per billion. In addition, the Purafil OGS contains internal temperature, humidity, and room pressure sensors and can also be battery-operated for data logging functionality.



Environmental Classification

Environmental Reactivity Coupons and the OGS measure environmental reactivity in Angstroms, a unit of length equal to one ten-billionth of a meter. Purafil's understanding of the environmental challenges facing museums and archives has led to the following environmental classification system Purafil recommends the following levels of air quality for locations within your facility.

CLASS	COPPER REACTIVITY LEVEL (IN ANGSTROMS)*	SILVER REACTIVITY LEVEL (IN ANGSTROMS)*	AIR QUALITY CLASSIFICATIONS
S1/C1	<90 Å/30 days	<40 Å/30 days	Extremely Pure
S2/C2	<150 Å/30 days	<100 Å/30 days	Pure
S3/C3	<250 Å/30 days	<200 Å/30 days	Clean
S4/C4	<350 Å/30 days	<350 Å/30 days	Slightly Contaminated
S5/C5	>350 Å/30 days	>350 Å/30 days	Polluted

- **Class S1/C1:** Archives, Metal Collections, Rare Books
- **Class S2/C2:** Museums, Museum Storage, Libraries
- **Class S3/C3:** Historic Houses

- **Class S4/C4:** Short Term Acceptable
- **Class S5/C5:** Not Acceptable