CASE STUDY:
PORTLAND ART MUSEUM

ProMark media and filters save precious art by removing harmful contaminants in indoor air.

CHALLENGE

- *Chemicals in the air were slowly eroding museum artifacts.*
- *Existing filtration system was 70% efficient for particulates only.*
- *There was no existing gas filtration system and everyday gases ate away at the priceless artwork.*

SOLUTION

A three phase solution was devised and designed by Air Filter Sales and Services, Portland, OR, and ProMark Associates:

- **Phase One:** Upgraded the final filters to MERV 13 mini-pleats, removing 95% of particles one micrometer and larger.
- **Phase Two:** Filter bank #2 was utilized to hold PMA Retro filter modules filled with ProGuard Blend (a 50/50 blend of ProGuard 200 potassium permanganate on alumina and ProGuard 600 virgin carbon media).
- **Phase Three:** Primary filter bank and air returns were upgraded with 30% pleated filters.

TEST RESULTS

Before and after gas-phase testing showed:
(ppb = parts per billion)

- Ozone reduction from 10.8 ppb to 0.1 ppb
- Nitrogen dioxide reduction from 27 ppb to 0.2 ppb
- Sulfur dioxide reduction from 3.03 ppb to .015 ppb

Application was awarded the 2003 NAFA Clean Air Award Text Text

DESCRIPTION

Museums offer a particularly difficult filtration problem because chemicals in ordinary air are fatal to most art objects. *"Just as paper turns brown in newspapers, books and magazines, these same airborne chemicals, over time, eat away and corrode paints and finishes on art objects," said Micheal Havner, Facilities Engineer with the museum.*

Portland Art Museum retained the services of NAFA's member-company, Air Filter Sales and Services, Portland, OR, and their CAFS, Steve Royal: *"Testing showed that the existing filter system in the museum was about 70% efficient in removing particulates and there was no existing gas-phase filtration."*

Air Filter Sales and Services turned to ProMark Associates for help in finding a complete solution.

The existing final filters were retrofitted with MERV 13 mini-pleats. *"Special emphasis was placed on filters that have a longer in-service life, more dust holding capacity and would stop any particulate shedding of the carbon bank," said Royal.*

continued on page 2

PROMARK ASSOCIATES, INC.
Gas Filtration Experts

3856 Oakton St., Skoie, IL 60076-3454 USA
p 847.676.1894 **f** 847.676.1897 **toll free** 800.809.8300

www.promarkassociates.com

CASE STUDY continued:
PORTLAND ART MUSEUM

continued from page 1

DESCRIPTION

The second filter bank was utilized for gas phase filtration In order to minimize costs and utilize existing air handling equipment, a **PMA Retro** media module was chosen. The PMA Retro fit in where the 12" pleated filter had been. **ProGuard Blend** (a 50/50 blend of **ProGuard 200** media and **ProGuard 600** media) was chosen to cover the wide range of gases present. ProGuard 200 chemisorbent media is a round porous pellet uniquely designed with potassium permanganate ($KMnO_4$) uniformly distributed throughout for maximum availability for reaction with target contaminants.

The PG 200 is especially effective with the SO_2 and nitrogen dioxide gas that are corrosive and damage artifacts. ProGuard 600 carbon media contains a high percentage of small to medium diameter pores, which have the highest capacity to absorb low to medium molecular weight compounds such as VOCs and other hydrocarbon compounds.

The combination of these two media provided the museum full spectrum gas phase protection. As long as the museum replaces the particulate and gas phase filters as needed, the many wonderful pieces of art and artifacts will be preserved to thrill and educate future generations.

PMA Retro Media Filter Module

YOUR COMPLETE SOURCE FOR GAS PHASE FILTRATION

- *Media for all types of applications ($KMnO_4$ on alumina, plain carbon, impregnated carbon)*
- *Equipment design and supply*
- *Laboratory support, media testing, coupon analysis*
- *Monitoring instruments*
- *Technical support for application and design*

ADDITIONAL INFORMATION AND RELATED EQUIPMENT

- ***PMA Media Selection Chart -*** *lists specific gases that are controlled by ProGuard Blend as well as gases controlled by Proguard 200 and ProGuard 600 and other media in the ProGuard family, either alone or in a blend.*
- ***PMA 12 & 18 Media Modules -*** *refillable steel, standardized modules that hold the ProGuard media for use in housings.*
- ***PMD 12 & 18 Media Modules -*** *disposable modules that are filled at the factory with any of the ProGuard media.*
- ***PMA Trays -*** *refillable steel trays that hold media for installation in various housings.*
- ***Honeycomb Disposables -*** *directly replace refillables and can be filled with any of the ProGuard media.*
- ***Carbon Bonded Disposables -*** *activated carbon in a bonded block disposable filter, suitable for high purity applications; more carbon per panel than a comparable loose fill. Eliminates metal and labor to empty and fill metal trays.*

3344 Main St. Skokie, IL 60076-2451 USA **p** 847.676.1894 **f** 847.676.1897 **toll free** 800.809.8300
www.promarkassociates.com