

# CASE STUDY 4

## THE SISTINE CHAPEL



### PURAFIL PRESERVES ARTWORK 4 THE SISTINE CHAPEL



#### ABOUT THE SISTINE CHAPEL

Completed by Michelangelo in 1512, the frescoes have been exposed to centuries of damaging environmental conditions, including airborne pollutants resulting from more than two million visitors a year. During the past ten years, Vatican engineers have worked to restore the frescoes and prevent further deterioration.

#### THE PROBLEM

For nearly five centuries, Michelangelo's frescoes have been exposed to airborne pollutants from a multitude of indoor and outdoor sources, including:

- Burning candles
- Flaming coals for heat and light
- Nearby automobile traffic
- Industrial fumes
- Two million visitors annually

These pollutants, in addition to fluctuations in temperature and relative humidity, have resulted in layer upon layer of grime, dirt and glue. Vatican engineers realized that restoring this work was futile without a system to prevent further exposure to hazardous environmental conditions.

#### PURAFIL PROVIDES THE SOLUTION

A project team of environmental experts from Purafil and Carrier, incorporating personnel from the United States, England, France and Italy, worked closely with Vatican engineers and consultants over a two-year period to design, manufacture and install a new environmental control system.



VISITORS AT THE SISTINE CHAPEL



PURAFIL® SELECT MEDIA

The system treats the air within strict temperature and humidification parameters. The contaminated air stream passes through Purafil's dry scrubbing media, where gaseous contaminants are permanently removed. The air is then channeled up the chapel's outside wall and distributed to individual diffusers concealed in the base of each of the chapel's six south windows. The diffusers create two distinct airflows: (1) a very low velocity flow directed over the surface of the frescoes, and (2) a slightly higher velocity flow that "showers" visitors. The air is exhausted through the chapel's floor and recirculated through the HVAC unit and Purafil's gas-phase air filtration system. Because a separate building was constructed to house the complete system, admirers are never aware of the precise, environmental controls in place to protect Michelangelo's delicate work.

Purafil® Select Media is an activated alumina-based substrate impregnated with potassium permanganate. Alumina is a highly porous substrate and offers a greater surface area than other common substrates, such as zeolite or silica gel. Because the media offers a higher surface area, more of the active ingredient, potassium permanganate, is available for reaction with contaminants.

Purafil media removes gaseous contaminants through chemisorption, an irreversible chemical reaction process. The gases are absorbed by the media and oxidized to form noncorrosive solids which remain on the media pellet.

#### ABOUT PURAFIL

Purafil, Inc. specializes in the removal of odorous, toxic, and corrosive gases through gas-phase air purification. Call Purafil at (770) 662-8545 or (800) 222-6367 for assistance with your air quality concerns.