

# CASE STUDY 4

THE MINNESOTA HISTORICAL SOCIETY

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## PURAFIL PROVIDES REAL-TIME CORROSION DATA 4 THE MINNESOTA HISTORICAL SOCIETY



### ABOUT THE MINNESOTA HISTORICAL SOCIETY

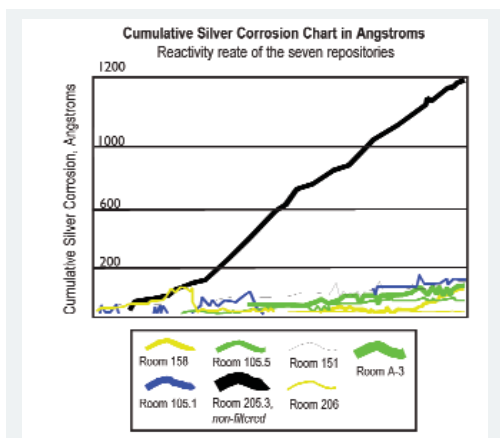
Established in 1849, The Minnesota Historical Society is dedicated to preserving and sharing the history of Minnesota. The society includes museum exhibits, libraries and archives, and 25 historic sites all committed to conserving Minnesota's extensive history.

### THE PROBLEM

Gaseous pollution is primarily caused by the burning of automobile fuels. If these pollutants are drawn indoor through an HVAC system or by natural filtration, museum artifacts can be permanently damaged.

The main components of automotive exhaust are sulfur dioxide, nitrogen dioxide and ozone. Sulfur dioxide combines with moisture to form sulfur acid, which oxidizes metals and deteriorates organic-based materials. Similarly, nitrogen dioxide dissolves in water to form nitric acid which oxidizes metals and attacks calcareous stone and murals. In the presence of ozone, organic-based materials, such as paints, textiles, animal skins and paints, will discolor and become brittle.

Minnesota Historical Society's head of conservation installed an OnGuard network in all seven of the museum's storage areas. To determine the effectiveness of gas-phase air filtration at preserving museum artifacts, the head of conservation ordered Purafil's filtration systems to be installed in six of the seven storage areas, with one repository to remain unfiltered (Room 205.3, see below). The OnGuard network continuously monitored the cumulative and incremental reactivity rates within both the filtered and non-filtered repositories.



### PURAFIL PROVIDES THE SOLUTION

The data from the archival storage areas revealed that with filtered air, the cumulative corrosion reactivity was virtually non-existent, while the storage area without a filtration system experienced significant reactivity. The Minnesota Historical Society conducted this experiment for six months. The data gathered revealed that without gas-phase air filtration, permanent damage to the museum's artifacts was imminent.

The information provided by the Minnesota Historical Society's OnGuard network is proof of the need for both gas-phase air filtration and continuous, real-time corrosion monitoring. Purafil continues to supply Purakol and Purafil Chemisorbant media, as well as replacement OnGuard sensors, to the Minnesota Historical Society.

The OnGuard monitor provides real-time measurements of the amount of reactivity forming on copper and silver surfaces by corrosive gases present in the local environment. It also measures the temperature and relative humidity of the environment, both of which can affect the reactivity rate of these metals.

The OnGuard is equipped with the standard sensor set (temperature/relative humidity, copper reactivity, silver reactivity) and can log measurements in internal memory at intervals determined by the user. These measurements can be easily viewed on the graphic Liquid Crystal Display (LCD), and the parameters can be easily configured using the menu-based keypad. As an added benefit, OnGuard's powerful memory can log up to one full year's worth of comprehensive data.

The OnGuard is suitable for stand-alone 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 or graphing using the exclusive windows-based OnGuard Remote Control software.