

Circul-Aire's Filtration Technology Protects the "Star- Spangled Banner"

The Smithsonian National Museum of American History has, for almost a century, had the responsibility of storing and protecting the United States of America's most treasured asset, the Star-Spangled Banner. The Flag was originally fabricated in 1814 by Mary Young Pickersgill, and until very recently, was suspended at the Smithsonian Museum in Washington, D.C.

Due to outdoor contamination, the 42 ft. long by 30 ft. high flag can no longer support its own weight. This degradation has been attributed to the excessively high levels of nitrogen dioxide, sulphur oxides and ground level ozone primarily generated by vehicular emissions.

Some archivists claim that the degradation experienced by most artifacts in the present day is due primarily to the



effects of post-modern society in the last 50 years. The result is that the fabric of the flag is being destroyed by unwanted acid gases entering into the museum via the building ventilation system. The Flag is presently being refurbished by museum curators and has been laid flat on display in a special room in the museum. Glass walls prevent any unwanted contaminants from entering into the protected space, without limiting public access.

This room is pressurized and filtered using Circul-Aire gas-phase filtration systems to eliminate all contaminants, both particulate and



gas, that could potentially enter this protected area. The Circul-Aire filtration system comprises of a customized blend of absorptive media and high-efficiency particulate-arresting air filters, custom designed to meet the museum's most stringent requirements. A 30% prefilter, 2 stages of MM-1355, and 95% final filter combine to provide the most comprehensive filtration strategy.

Since the museum's ventilation system provides complete control of temperature and humidity, it was essential that Circul-Aire design a filtration system that could easily be maintained while guaranteeing complete removal of all the malodorous and corrosive gases present in the outdoor air. The Tech-Chek™ Program (offered exclusively by Circul-Aire Labs) provides the Museum with a continuous assessment of the air quality surrounding the Flag. Circul-Aire Labs also sample the filtration media on a periodic basis to ensure that optimum performance of the system is maintained.

The two USAH-304 filtration systems provide up to 4000 CFM of purified pressurization air into the Flag's containment area. Reactivity Monitoring provided through coupon analysis (REMO) guarantees that there are no corrosive gases present above 300 Angstroms as per ISA Standard 71-04.

This **designer indoor air** approach to solving the most complex of air quality problems, is what Circul-Aire's team of chemists and engineers provide to industry as part of Dectron Internationale.

TECH-CHEK™ Service for Maintenance Monitoring

The maintenance of the USAH (Universal Side Access Housing) Air Purification Systems has also been simplified with the TECH-CHEK™ Service supplied by Circul-Aire. With this exclusive service, media samples are tested in order to verify consumption rates.

This lifetime service is monitored by a computerized program from Circul-Aire that indicates the appropriate schedule for media replacement.

This customized service, supplied at no additional charge, not only provides a precise maintenance schedule, but also ensures the highest performance of the USAH-304 Air Purification Systems installed at the Smithsonian National Museum.



USAH-304 Universal Side Access Housing System



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