Every year, approximately 6 million people visit the Sistine Chapel to view Michelangelo’s frescoes. Since their completion more than 500 years ago, the Sistine Chapel has welcomed an increasing number of visitors, bringing with them heat, humidity, dust and CO₂. Faced with substantial damage, the museum’s curators sounded the alarm, calling on Carrier to provide a solution to save this historic masterpiece. Carrier’s AdvanTE³C expert teams worked closely with the Vatican to design a system that both cools and preserves the Sistine Chapel. The result is a unique and innovative system that maintains optimal climate conditions within the chapel, preserving the past for the benefit of generations to come.
In 1993, Carrier designed and installed the Sistine Chapel’s first air-conditioning system to accommodate a maximum load of 700 simultaneous visitors. During its lifetime, the system worked exactly as designed, but was not powerful enough to cope with the growing number of visitors. The AdvanTE3C team used advanced computer simulations to calculate airflow and analyze the climate within the chapel. Key focus areas included the critical parameters of consistent relative humidity, low air velocity, temperature stability and carbon dioxide concentration.

By harnessing the power of today’s technology, international teams from United Technologies Corp. and Carrier developed a unique HVAC solution to ensure the preservation of this World Heritage treasure capable of maintaining optimal conditions for up to 2,000 simultaneous visitors inside the Sistine Chapel.

### Challenges and solutions

The project presented a number of specific challenges and the resulting solution succeeded in:

- **Efficiency** - twice as efficient than the previous system
- **Capacity** - three times greater capacity
- **“Invisibility”** - the system, including sensors, cabling, air handling units, pumps, chillers and diffusers, are nearly invisible to the public
- **Air quality** - air handling units are equipped with six filtration levels
- **Noise control** - the system is designed to deliver “church-quiet” levels operating at normal conditions
- **Innovation** - a new energy-saving process application is being used for the first time
- **Functional redundancy** provided by 2 identical subsystems.

### Perspectives

The partnership with the Vatican goes beyond the air-conditioning solution for the Sistine Chapel. With UTC Building & Industrial Systems’ unique breadth of technological capabilities, the company can act as consulting engineers to the Vatican for solutions in building management, including fire detection and suppression, video, security, heating, and ventilation.

Through the integration of these technologies, UTC Building & Industrial Systems expects to continue providing expertise in building solutions to the Vatican Museums for years to come.

Discover the story of this extraordinary project on www.youtube.com/UTCBISt