

Aviation Hangar Doors Coating Facilities

ASSA ABLOY
Entrance Systems

Experience a safer
and more open world



Environmental control for
sophisticated paint finishes

Ensure the quality of sophisticated paint finishes

Aerospace coatings have come a long way, from providing basic corrosion prevention to meeting the ever-increasing customer demand for high gloss mirror finishes and technically advanced military coatings.

As coatings become more complex, so do the requirements that must be met during application – if the resulting product is to perform as engineered. It is critical to control the environment in which the aircraft are prepared, coated and cured in order to achieve a high-quality finish.

Doors are key to controlling the environment

When researching and designing their paint booths, organizations soon realize the importance of the door system in controlling the environment. The door is typically the primary source of air infiltration into the controlled environment.

Most traditional metal doors leak like sieves. Gaps around the door perimeter and between metal siding are difficult to seal. These gaps are the source of the majority of airborne particulates entering the facility. The non-conditioned air entering the booth also decreases the efficiency of the air handling systems, making them work harder or requiring investments in more powerful systems.

However, paint shop managers have found they can significantly reduce the impact of these costly issues by installing a Megadoor system.

Megadoor meets the highest requirements

The Megadoor vertical lifting fabric door has the lowest level of air infiltration of any large door in the industry. The unique design utilizes a single, PVC-coated polyester fabric sheet that is attached to the exterior and interior of the door system. This eliminates any air infiltration through the door or at the door head.

The Megadoor fabric envelops the side guides, creating a unique, tight, double seal that does not require maintenance or replacement. The only maintainable seal on the entire door system is the heavy duty EPDM rubber bottom loop that seals the door to the floor. Together these features insure that air infiltration is low enough to make the Megadoor system an ideal fit for use by NASA in its satellite clean rooms.

Megadoor customers for paint hangers include:

- Airbus
- Bell
- Bombardier
- GAMECO
- Honda Jet
- IAC
- Maas Aviation
- Royal Air Force
- Satys
- Singapore Airlines Industries
- Spirit Aerosystems
- Textron Aviation
- US Air Force





“For each coating being applied, there are air temperature and humidity requirements that must be met in order to achieve an acceptable paint drying rate that yields a high quality appearance.

If conditions are too cold and/or dry, the solvents within the coating may evaporate too quickly, causing a blistering defect. Conversely, if conditions are too warm and/or wet, the solvents within the coating will evaporate much slower, leading to a low viscosity of the applied coating on the surface, which then causes it to sag.

Coating manufacturers therefore typically specify a single air temperature and humidity condition that must be maintained so that the rate of solvent evaporation within the coating is appropriate to prevent either of these types of defects”.

Automotive to Aerospace: Applying Automotive Paint Spray Booth Design Strategies to an Aircraft Paint Hangar. July 21st, 2010 Jim Pakkala, Engineering Manager, DURR Systems, Plymouth, MI.

Why you should use Megadoors on your paint hangars

- **Quality control** – the Megadoor system reduces the need for costly rework.
- **Energy savings** – the Megadoor system minimizes the costs to condition the paint booth.
- **Environmental benefits** – the Megadoor system helps reduce the amount of Hazardous Air Pollutants (HAPs) released into the atmosphere

Crossdraft booths

Crossdraft booths are the most common paint system in aerospace, accounting for approximately 75% of installations. Air is circulated horizontally from one wall, along the aircraft, from nose to tail, and extracted through the opposite wall.

One of the advantages of crossdraft booths is that they can also be used as wash, preparation or stripping bays. However, one of their disadvantages is the common problem of “dry spray”. This occurs when overspray from the front of the aircraft is carried by the air current, dries, and is deposited on the rear of the aircraft, creating rough surface defects.

Megadoor systems are often used as the exterior door on these booths. An ASSA ABLOY horizontal rolling filter door is installed a few feet interior of the Megadoor. A plenum is created between the two door systems and air is forced through the bottom rolling door filter medium and across the aircraft. The Megadoor system provides an excellent seal to the outside environment, ensuring maximum system efficiency. Further, the positive air pressure in the plenum forces the Megadoor fabric against the side guide seals, creating an extremely tight seal.



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Downdraft booths

Downdraft booths are used to create world-class finishes on business jets and other smaller aircraft. Air is circulated from ceiling vents, over the aircraft and recovered through floor grates.

Downdraft booths minimize dry spray issues, but may require higher airflow rates, which in turn requires higher capital investment and energy usage than those necessary with cross draft booths.

In this system, the Megadoor creates a barrier to the exterior environment. A translucent white fabric is typically specified for the interior of the Megadoor, helping to reflect light onto the aircraft. Paint overspray will not harm the door even after years of accumulation. However, some customers coat the interior surfaces of their booth walls and Megadoor with a film that prevents overspray adhesion, and is easy to remove every six months with light-pressure washing.



Paint hangars

The hangars where aircraft are painted often have varying levels of sophistication.

Some of these facilities are basic hangars with no special environmental control systems, while in others equipment has been installed to increase the quality of the coating process. These hangars are commonly used by third-party commercial aviation aircraft painters.

Here too, the installation of a Megadoor provides the best return on investment by minimizing the airborne particulates that could ruin a paint finish, and reducing the amount of energy required to climate-control the facility.

Retrofits

As paint managers look to keep lower the quality costs associated with expensive rework, they replace their traditional metal doors with a Megadoor.

The flexibility of the Megadoor system's construction allows us to easily retrofit them on hangars that had previously lacked a door system, as part of their conversion to a paint hangar.

Electrical systems

Electrical systems pose unique challenges in hazardous environments, including paint booths. Each project is unique and electrical codes and their interpretation may vary around the world. The hazardous area must be clearly defined and, in many countries, categorized according to Class, Group & Division.

The most cost-effective approach is to eliminate or minimize electrical components that must be mounted in the hazardous area. Typically, the main Megadoor control panel is mounted outside the paint booth, in a non-hazardous area where the operator can view the door through a window. If desired, an inherently safe remote push button station can be mounted in the booth to operate the door.

The other electrical components on a Megadoor, such as limit switch and motors, are located at the top of the door. These components are usually isolated from the hazardous area by being mounted above the booth ceiling.



Revolution in paint hangars

Satys Toulouse, France- A350 & A330 paint hangars

One of the best ways to reduce the initial investment and cost of ownership in a paint hangar is to reduce the volume of air that must be conditioned in the facility. The Satys hangars in Toulouse France dramatically reduces the volume of air inside the hangar by shaping the facility to the aircraft. While some previous paint

hangar designers lowered the interior ceiling and created a nose pocket to reduce interior volume; that Satys hangar also creates a tail pocket by using Megadoors. The unique vertical lifting design of the Megadoors allowed the engineers to create a hangar door that is shaped to the aircraft.



ASSA ABLOY Entrance Systems is a leading supplier of entrance automation solutions for efficient flow of goods and people. Building on the long-term success of the Besam and Megadoor brands, we offer our solutions under the ASSA ABLOY brand. Our products and services are dedicated to satisfying end-user needs for safe, secure, convenient and sustainable operations. ASSA ABLOY Entrance Systems is a division within ASSA ABLOY.

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