Vacuum Sanding Case Study
Boeing Long Beach C-17 Paint Hangar

The Boeing Company maintains a manufacturing facility at the Long Beach Airport in Long Beach, California. On the premises is a paint hangar in which aircraft coatings are applied and removed. The sanding operations performed in this hangar generate high concentrations of airborne dust. This dust contains hazardous materials, including hexavalent chromium, which is a component of the primers used on aircraft. In 2005, Boeing made a decision to take steps to reduce the levels of airborne dust to protect their employees and the environment. Boeing management approached Clayton Associates for a solution.

Clayton representatives surveyed the hangar, and held several meetings with Boeing management and employees. The first step was to understand and document the type of work being performed and the tools being used. The workers at this site perform sanding operations from four teleplatforms and from a set of aircraft stands which are maneuvered into place around the aircraft once it is in the hangar. The challenge was to provide a user friendly system that allows the workers to sand any location on the aircraft, and from any platform or stand, but that can also be detached quickly to enable the stands to be moved apart and out of the hangar. The stands are regularly stored outside of the hangar, so any equipment installed on the stands needs to withstand the elements.

The solution that Clayton presented incorporated all of the requirements expressed by both the workers and the management. Each teleplatform was fitted with a self contained vacuum sanding system capable of supporting 3 users simultaneously. The systems were all based upon the Clayton DM-304 vacuum system, which features a cyclone separator and three stage filtration. These systems were permanently mounted on the teleplatforms. The aircraft stands presented an unusual problem because of their mobility. The best solution for the workers would be to provide vacuum and air ports at multiple locations on each stand, so that the worker would only need to plug in a short work hose to a port near his work location. However, permanent plumbing was not an option, since the stands regularly move in and out of the hangar. The answer was a blend of central vacuum and mobile vacuum systems. Clayton installed rigid, fixed piping on each stand, and installed vacuum ports at locations around the stands, based upon worker input. The piping terminates in a cam and groove coupling, to which a vacuum can be connected.

When an aircraft enters the hangar, the mobile stands are pushed into position around the craft. Clayton mobile vacuums are rolled into place alongside the stands, and are joined to the piping system with a simple cam and groove coupling. When the vacuums are turned on, the piped systems provide vacuum to workers at any location. The workers simply bring a 20' to 40' lightweight work hose and a sander to their work location, and plug into an available port.

The systems were purchased and delivered in early 2007. From the time the equipment was delivered, all piping, equipment, and accessories were installed, tested, and fully operational in just under seven days. The result was truly dustless sanding, and the response from the workers and management was outstanding. For more information on this installation, contact Jim Clayton or Matthew Swan.

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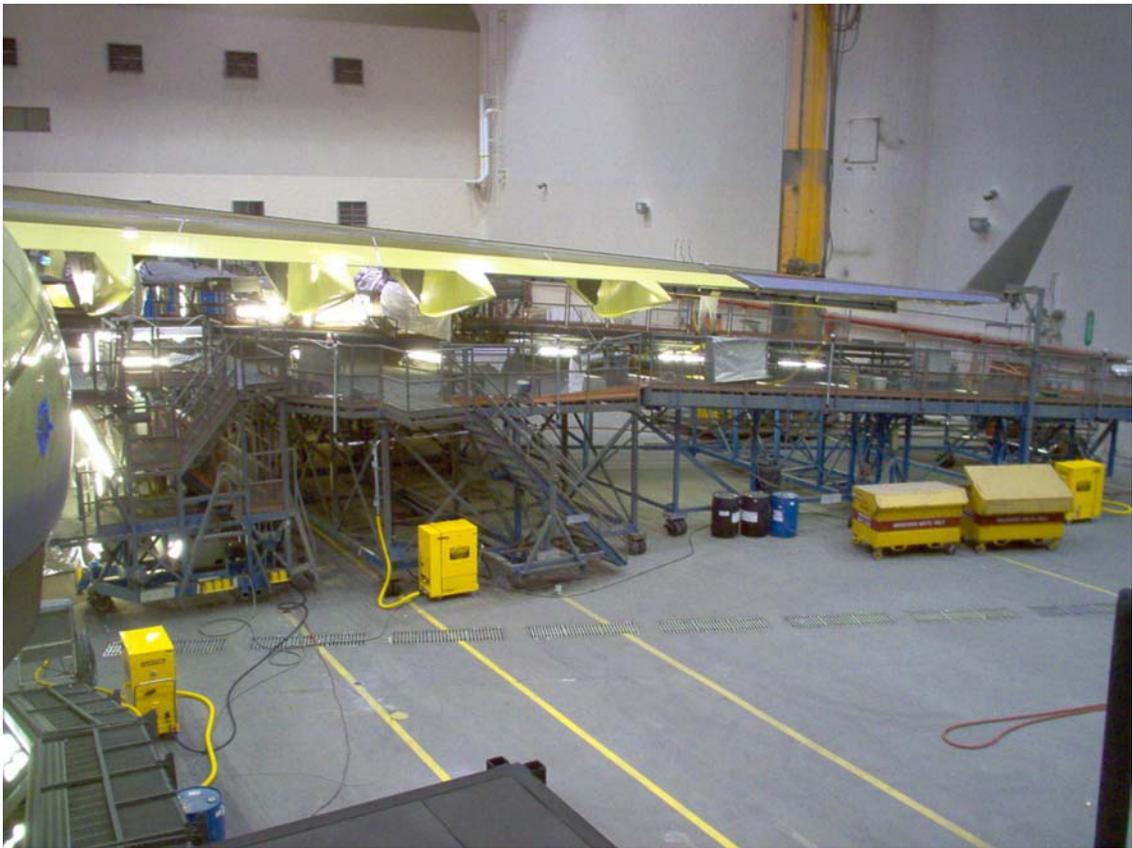
Two Clayton Vacuum Systems attached to wing stands, and one to the tail stand

Two Clayton DustMaster Cyclones Attached to Engine Stands

Clayton DustMaster Cyclones Attached to tail ramp

Technician on tail attached to vacuum line on tail ramp using hose support belt

Technician on tail ramp attached to vacuum line on tail ramp using hose support Belt

Clayton DustMaster Cyclone on teleplatform

Technician sanding engine.

Technician sanding wing from teleplatform.

Technician sanding tail from teleplatform.