

CLEANING AND DEGREASING COMPOSITE STRUCTURAL COMPONENTS

Cleaning with TRI in a total vacuum

In the aerospace industry there are many components which can only be cleaned and degreased using trichloroethylene. This makes it even more important that the best available technology is used.

— To many people, parts cleaning with trichloroethylene may sound rather outdated. However, there is still a whole range of applications which rely on this high-quality, but also high-risk solvent. This includes a number of components in the aerospace industry.

Customised cleaning system for structural components

One recent example of this type of application involves a well-known European manufacturer of structural aircraft com-

ponents made of metal and composites. In February 2010 the company began using a modern system supplied by Höckh in which parts are cleaned in a total vacuum. This replaced an old semi-open cleaning machine with very high levels of solvent consumption.

The new machine (a Multiclean-5-2-FC) has a cleaning chamber with a volume of around 25,000 litres and can accommodate parts holders which are 3500 x 1500 x 2000 mm (LxWxH) in size. The structural components are placed or

fixed onto or suspended from one of the two parts holders by employees in the loading area. The machine then loads the parts holder fully automatically into the cleaning chamber, providing that the safety door is closed, and seals the chamber so that it is vacuum-tight.

High safety standards for operators and the environment

The degreasing and drying process lasts for around 20 minutes and begins with a mandatory leak test of the cleaning



This machine is used to clean composite structural components for the aerospace industry in a total vacuum. It is enclosed on all sides with electric roller shutters for ease of maintenance.

Photo: Höckh

chamber. If the results of the test are satisfactory, the machine starts cleaning the parts using either a spray process or high-purity solvent vapour, which condenses on the cold surface of the components and removes the grease. The entire process takes place in a vacuum which provides the highest possible levels of safety for the operators and the environment.

The final stage of the automatic programme consists of vacuum drying. All the solvent vapour which is extracted is condensed out via a 4-phase condensation system or recovered from the process air using a double activated carbon unit. As a result, the machine produces very low levels of emissions. It has not yet consumed any solvent at all.

The challenge of drying

Despite the relatively good drying properties of trichloroethylene, the honeycomb structure of the components presented a real challenge for the machine manufacturer. The huge surface area and the relatively small size of the composite parts in some cases required the use of a combined hot air/vacuum dryer to produce perfect results.

The machine is encapsulated in a totally enclosed housing. In order to make maintenance easier, there are electric roller shutters on all sides and the machine can be accessed from above via a maintenance platform. The entire loading area with its two loading workplaces is secured using electric sectional doors and can be monitored by the employees at all times.

The control system with its easy-to-use graphical process display gives the operator an overview of the current operating status of the machine and indicates when maintenance is needed or when faults have occurred.



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