



HS Marston has optimised parts cleaning with DOWCLENETM Modified Alcohol solvent and COMPLEASETM Chemical Leasing

Better Cleaning Quality While Lowering Costs

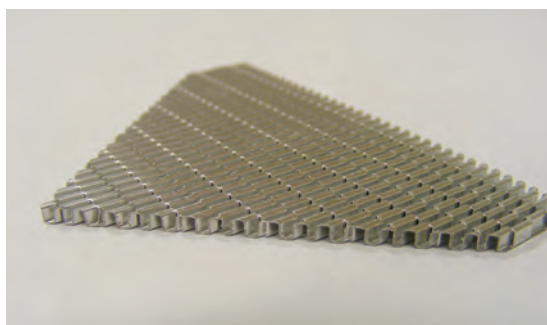
Intensive re-work, high costs as well as health, safety and environmental issues were reasons that the UK-based HS Marston Aerospace Limited, a UTC Aerospace Systems company, took an in-depth look at their cleaning process for heat exchanger components. The company has optimised parts cleaning through the use of modified alcohol solvent and COMPLEASETM, the chemical leasing model from SAFECHEM. UTC Aerospace Systems is a unit of United Technologies Corp. (NYSE: UTX).

UTC Aerospace Systems designs, manufactures and services integrated systems and components for the aerospace and defence industries. The company supports a global customer base with significant worldwide manufacturing and customer service facilities. United Technologies Corp., based in Hartford, Connecticut, provides high technology products and services to the building and aerospace industries.

Parts cleaning – a quality-critical step in manufacturing

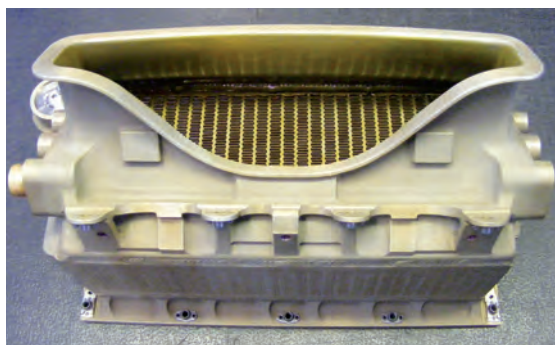
The core competence of the HS Marston site is the development and manufacture of a wide range of heat transfer and fluid management products and services for the commercial and military aerospace markets, motorsport and electronics industries. “Cleaning of heat exchanger components is a quality-critical process step. The complex geometries make it difficult to get these parts clean and dry which is necessary for the subsequent brazing. Here, even very tiny residues cause failures which can lead to leakage”, explains Andy Lees, Manufacturing and Logistics Manager at HS Marston.

With chlorinated solvents, which were used for many years in open top cleaning equipment, the company had achieved satisfactory results. More stringent requirements regarding health, safety and environment (HS&E) led to the decision to replace this cleaning process. The first considered option was a water based system. However, due to staining on parts surfaces and insufficient drying, aqueous cleaning systems could not be implemented. The company switched to another solvent, this time an nPB-based cleaning media. “As we had major problems to keep the solvent stable against built-up acidity, we changed to a hydrofluorocarbon (HFC). But even with this solvent we could not achieve the required cleaning quality reproducibly”, Andy Lees remembers. As a consequence, a high first pass rejection-rate and the need for intensive re-working affected the delivery time to customers on a continuous basis. Additionally, annual spend on solvent was extremely high.



For brazing the heat exchanger parts have to be clean and dry. Complex geometries make it difficult to achieve the required level of cleanliness.

Modified alcohol solvents – best individual solution
 In 2011 Andy Lees came across DOWCLENETM 1601 from SAFECEM Europe GmbH, a subsidiary of The Dow Chemical Company. It is a distillable solvent based on modified alcohols and has a wide range of approvals in the aerospace industry (e.g. Rolls Royce). Thanks to its lipophilic and hydrophilic properties, DOWCLENETM 1601 enables the removal of oils and greases as well as the elimination of polar contaminants like cooling emulsions or solids such as salt, particles and abrasives, in a reliable and reproducible manner. Extensive cleaning tests showed that this also applies for difficult to remove contamination from the heat exchanger components of HS Marston. The solvent is also characterised by low toxicity and good biodegradability. “Due to its specific properties the solvent enables us to meet our high demands on cleaning quality whilst ensuring that the corporate requirements concerning HS&E are achieved. For our application DOWCLENETM 1601 has proven to be the best cleaning solution and an ideal alternative to all halogenated solvents”, Andy Lees explains.



Heat Exchangers from HS Marston are used in the commercial and military aerospace markets, motorsport and electronics industries.

Convincing advantages provided by COMPLEASEM Chemical Leasing
 COMPLEASEM, the chemical leasing concept from SAFECEM has also proven as an ideal solution for HS Marston. The customised leasing package not only includes the supply of fresh solvent and take-back of used solvent, but also consultancy, support and various services on a continuous basis. Among these is the CHEMAWAREM Solvent Training for all employees involved in the cleaning process which is performed once a year. Staff members are trained on the safe handling of DOWCLENETM 1601 as well as on optimising the process by monitoring the solvent stability and quality with the MAXICHECKM DCL-1N Test Kit. “Using COMPLEASEM, we co-operate closely with SAFECEM regarding our cleaning process which is a great help to us in the development of our cleaning

expertise. It is very helpful having a partner who takes care together with us that our cleaning process is stable. And all that for a fixed monthly fee”, says Andy Lees.

Reliable process minimises the number of rejects
 DOWCLENETM 1601 is used at HS Marston in combination with a new, completely sealed machine from Pero AG, equipped with an integrated distillation unit. The machine works under full vacuum. This eliminates the need for the separate explosion protection usually required for the use of flammable solvents. Additionally, operation under vacuum offers process-related advantages such as better drying and lower stress on the solvent. Cleaning process and the continuous distillation are fully automated. Supply and take-back for an environmentally responsible disposal of the solvent take place in the SAFE-TAINERM System, developed by SAFECEM. This system for transport, storage and handling, consists of two different, specially designed double-walled containers for fresh and used solvents. In combination with the new cleaning machine the SAFE-TAINERM closed-loop transfer system represents the Best Available Technology (BAT) and enables a virtually emission-free cleaning process. This helps, as well as the continuous recycling of DOWCLENETM 1601, to significantly reduce consumption. “The investment has already paid off due to the reduced rejection-rate which is now around one per-cent. Additionally, cleaning costs could be significantly reduced and the HS&E goals have also been achieved. These advantages have triggered a huge interest on the cleaning solution within the group”, Andy Lees concludes.



The SAFE-TAINERM System, MAXICHECKM DCL-1N Test Kit and MAXIBOOSTM ST-1 Solvent Additive

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