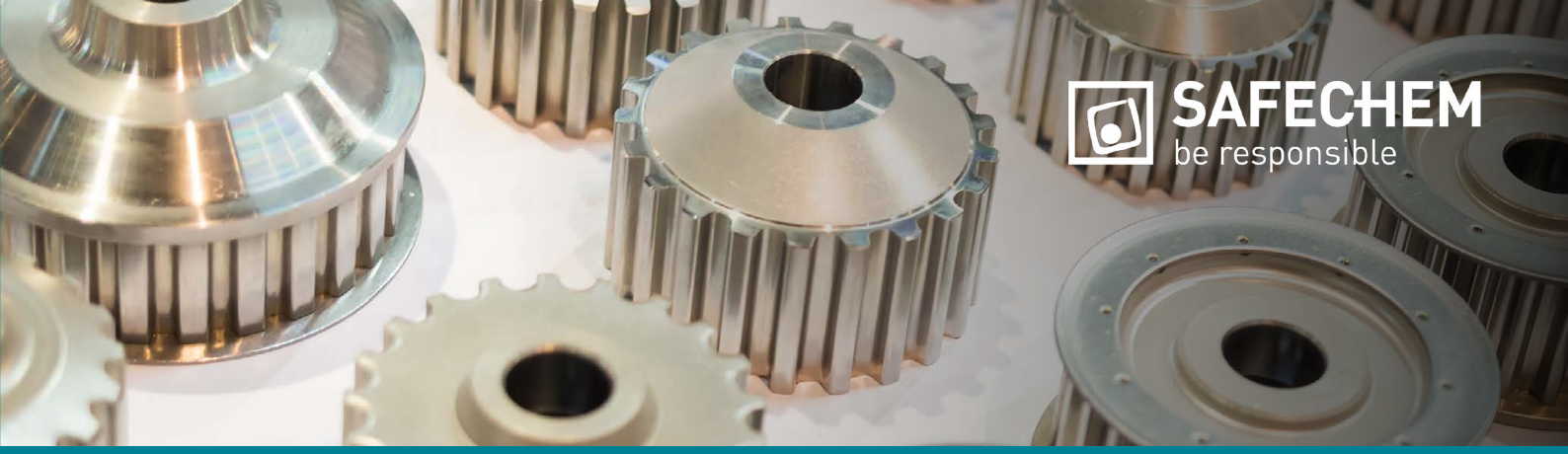

SAFECHEM
be responsible

DOWPER™* MC COMBINED WITH THE RIGHT MACHINE TECHNOLOGY BRINGS HIGH CLEANING PERFORMANCE

Tales of a heat treater and a parts cleaning contractor on sustaining solvent use for critical parts cleaning

Increasingly complex heat treat processes

Alloy Heat Treatment is the UK's first and only specialist in the heat treatment of aluminium alloys. Since the 70s, the subcontractor has been offering heat treatment of aluminium services to industrial manufacturers, in particular aerospace companies.

Over the past few decades, the hardening process has continued to evolve. Nowadays, the hardening services Alloy Heat provides are highly bespoke to its customer needs. The company also has a highly skilled rectification department whose job is to examine and rectify any distortions of parts after heat treatment. The increasing complexity and demands placed on heat treatment have necessitated higher cleanliness standards for parts as well.

"We cannot operate any of our heat treat processes for any aviation related operation without our degreaser. It's a very important kit for our operation," explained Frank Butler, HR Director. "Bad or insufficiently cleaned parts can seriously affect heat treat results. Once oil is baked onto parts, it's very hard to remove it."

aht *the solution in aluminium heat treatment*

COMPANY

- Alloy Heat Treatment – heat treat specialist of aluminium alloys

CHALLENGE

- To find the right combination of machine technology and solvent in order to achieve effective and reproducible cleaning results as good as trichloroethylene

SOLUTION

- New EVT GIGANT closed machine
- DOWPER™* MC (Perchloroethylene) delivered in the SAFE-TAINER™ System
- COMPLEASE™ Chemical Leasing

RESULTS

Within the ensuing 11 months since machine inception (compared to previous time period):

- Solvent consumption went from 3 tonnes to virtually zero
- Over 50% of operational savings
- No top-up of new solvent, or addition of stabilizer
- Repeatable and consistent cleaning results comparable to trichloroethylene

Operators at Midland Deburr & Finish controlling the parts cleaning process.

Existing cleaning machine not compatible with PERC

For a long time Alloy Heat Treatment had been using trichloroethylene (TRIC) in a semi-closed cleaning machine, and the results had always been satisfying. "TRIC is a very good solvent. It's still the benchmark to this day when it comes to degreasing," said Butler.

Due to EU legislation, the use of TRIC in parts cleaning would only be allowed under authorization after the sunset date 21 April 2016. As the existing cleaning machine at Alloy Heat did not satisfy the machine type required for the authorization, the company decided to replace TRIC with DOWPER™* MC, virgin-grade perchloroethylene (PERC) from SAFECHEM.

The cleaning result with DOWPER™* MC was great. However, its existing machine would often break down since it had not been built to operate with PERC. The frequent breakdown not only led to process disruptions but also a great loss of time and money. To Butler, it was evident that the old cleaning machine in combination with the solvent type was the cause of the problem because their business acquaintance, Chris Arrowsmith, owner of Midland Deburr & Finish Ltd, was telling a rather different story.

A different cleaning tale at Midland Deburr & Finish Ltd

Located just 3 miles away from Alloy Heat, Midland Deburr & Finish Ltd has been providing outsourcing services to companies in component degreasing, deburring, mechanical finishing and general surface improvement, since the late 90s.

The two businesses have known each other for a long time since Alloy Heat had commissioned work to Midland Deburr in the past.

Being one of the few part cleaning contractors in the UK, Arrowsmith is particularly aware of the increasing demands placed on parts cleanliness these days. "In the past, people were more ready to accept "dirty parts". Nowadays, quality requirements are increasing, particularly when parts are passed on from Tier 2 suppliers to Tier 1 companies for assembling. We are getting many more enquiries from companies with cleanliness specifications such as maximum particle size, or weight of particles per square meter," highlighted Arrowsmith.

Similar to Alloy Heat, Midland Deburr had also been using TRIC for its cleaning and degreasing operation previously. It has two EVT machines at its site, with the first machine being operational since 2007 (Model GIGANT with two baskets, each with a capacity of 1250 by 800 by 800 mm), and a second machine coming into service since 2013 (Model GIGANT/2S with a capacity of 1300 by 500 by 600 mm). With the second GIGANT machine, Midland Deburr had made an additional investment on an inline vacuum distillation unit which removes oil from the solvent ensuring pre vapour degrease wash is exceptionally effective and also helps cut down solvent losses in the waste stream even further.

In Oct 2020, when legislative authorization for TRIC in parts cleaning applications finally expired, Midland Deburr subsequently switched to DOWPER™* MC – and the transition has been nothing but smooth. Since its two existing EVT machines can operate with both TRIC and PERC, Midland Deburr has not experienced any machine issues.

According to Arrowsmith, parts cleaning quality with DOWPER™* MC is on par with TRIC. If anything, operating costs have even come down since TRIC was getting very expensive in its final years. At the same time, stabilizer consumption for DOWPER MC™* has remained very stable since 2020, with less than a litre required per month.

End-customers see solvent cleaning as preferred option

Having seen the positive experiences at Midland Deburr, Alloy Heat decided to invest in an EVT GIGANT to replace its old machine in 2021. During the 8 months it took for the construction and customization of the machine, Alloy Heat had outsourced its parts cleaning process to Midland Deburr.

Even though Alloy Heat had considered the potential of water-based cleaning, the idea was quickly dismissed. "Some of our customers insist on us using solvents for parts cleaning. Of course, having used TRIC for so long, we know very well how good solvents can clean. PERC is also known for its long solvent lifespan and high degreasing ability. Most importantly, many of our aerospace prime customers request the use of different cleaning agents. Since DOWPER™* MC is approved by all primes, it's a no-brainer," explained Butler.

Alloy Heat does have a small water-based cleaning machine on-site which it uses occasionally for certain applications. However, the cleaning quality is just not up to standard. "Since the parts are not sufficiently cleaned, when they are in the furnace, it starts smoking badly," Butler continued.

Arrowsmith from Midland Deburr has his own observation as well concerning the topic of water-based cleaning. "We have companies who went aqueous in the past and are now asking us to do solvent degreasing for them," said Arrowsmith.

"Since the solvent is transferred from the SAFE-TAINER™ System to the cleaning machine directly, there's virtually no human contact with the solvent, which is brilliant."

The new EVT GIGANT machine running on DOWPER™* MC has helped Alloy Heat Treatment to achieve high quality and consistent cleaning results.

Perfect interplay between new machine and DOWPER™* MC

In February 2022, a new EVT GIGANT machine was installed at Alloy Heat Treatment. Not only is the cleaning quality with DOWPER™* MC comparable with TRIC, what's more, the cleaning results remain repeatable and consistent. "It's almost like a one-to-one replacement for TRIC," commented Butler. To ensure safe transport, storage and handling of DOWPER™* MC, the solvent is delivered in the SAFE-TAINER™ System, a closed loop solvent risk management measure. "Since the solvent is transferred from the SAFE-TAINER™ System to the cleaning machine directly, there's virtually no human contact with the solvent, which is brilliant," Butler remarked. Within the ensuing 11 months following the machine inception, no new solvent top up has been required. Compared to the previous time period, solvent consumption has gone down from 3 tonnes to virtually zero, giving Alloy Heat an operational saving of over 50%. The acidity and alkalinity of the solvent can be easily monitored and tested on-site using simple MAXICHECK™ solvent test kits once a week. So far, no addition of stabilizer has been required, a testament to the high stability of DOWPER™* MC.

COMPLEASE™ "MAKES PERFECT SENSE"

As part of the new machine deployment, Alloy Heat has also signed up to COMPLEASE™, a tailored chemical leasing package from SAFECHEM. This offering covers not only the supply of fresh solvent and take back of used solvent in the SAFE-TAINER™ System, but also associated service elements including test kits and stabilizers, lab services, solvent trainings as well as technical service and consultancy to ensure an efficient and optimized solvent cleaning process – all for a fixed monthly cost.

"COMPLEASE™ is one of the best things we've done. We have a fixed cost every month and can get all the services we need. It just makes perfect sense," said Butler.

Arrowsmith shares a similar view whose company Midland Deburr has been a loyal customer of COMPLEASE™ for over 5 years. "COMPLEASE™ is good because it helps spread the costs. It was particularly useful when we replaced TRIC in our two cleaning machines with PERC back in 2020. We didn't have to make a financial outlay all at once and could instead spread the costs over a period of time."

"COMPLEASE™ is one of the best things we've done. We have a fixed cost every month and can get all the services we need. It just makes perfect sense."

As Alloy Heat Treatment and Midland Deburr have shown – optimal cleaning depends on the right combination of machine technology, cleaning agent and application technology. When done properly, the critical cleaning process can be transformed into a value adding step that drives operational and resource efficiency as well as significant time and cost savings – in short, creating a competitive edge that can directly impact the bottom line.

About Midland Deburr & Finish Ltd

- "One stop shop" for sub-contract, component vibro deburring, solvent degreasing and casting impregnation.
- Customer industries: Automotive, Aerospace & Formula One
- Cleaning fleet: 2 EVT machines running on DOWPER™* MC (perchloroethylene)

SAFECHEM EUROPE GMBH
Tersteegenstr. 25
40474 Duesseldorf
Germany

Phone: +49 211 4389-300
Email: service@safechem.com

www.safechem.com

SAFECHEM
be responsible

230201-0723