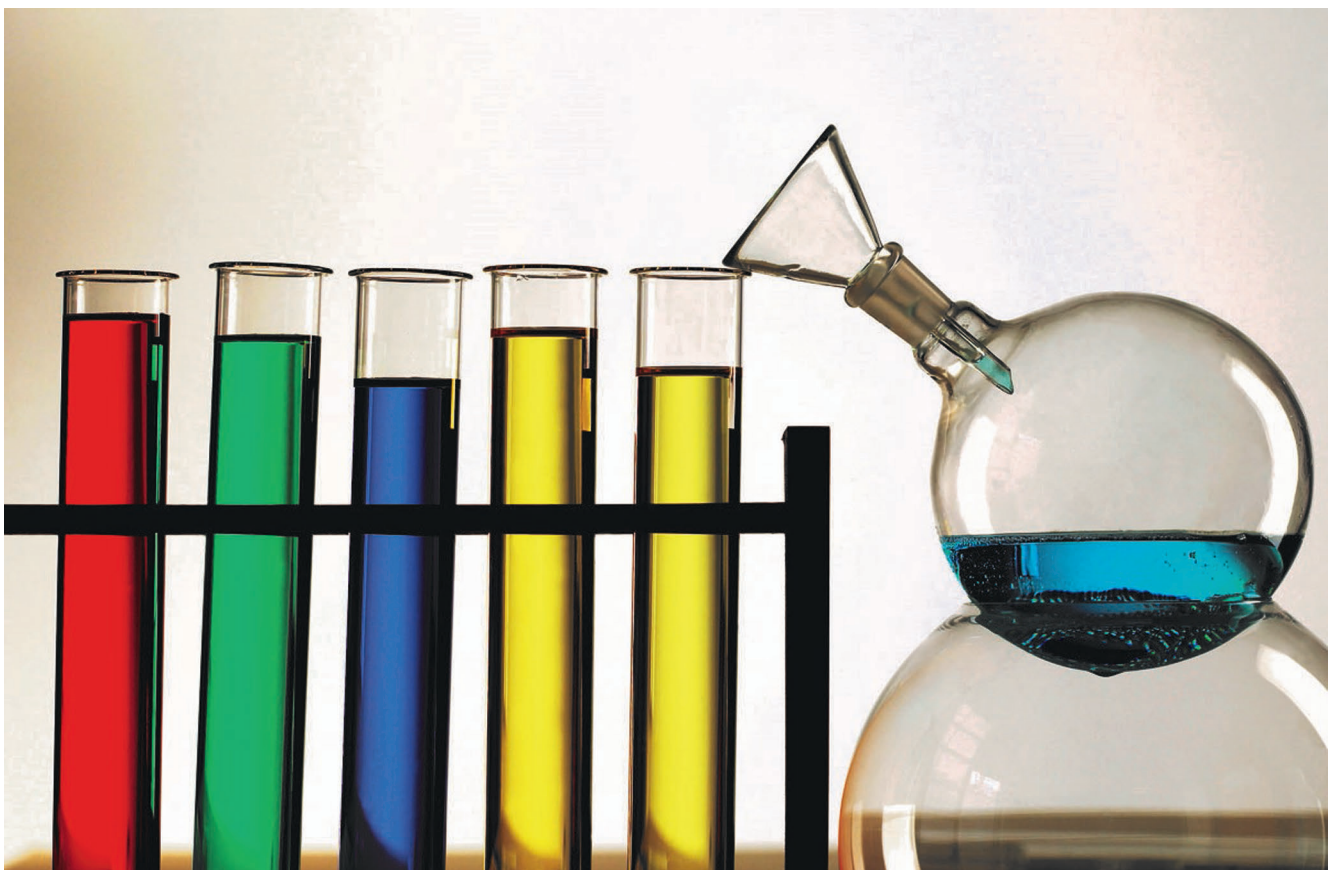


Replacements for Problem Solvents

Cleaning of Production Equipment

Companies are now required under the REACH regulation on chemicals to replace products that are hazardous to employees with environmentally and user-friendly alternatives. Färber & Schmid GmbH offers a number of substitutes for the “stalwarts” among solvents. The second part of this series looks at replacing methylene chloride and acetone and removing isocyanate.



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Faced with the narrower classifications and labeling requirements imposed on established solvents by REACH, many users and processors are looking for functional alternatives. Aside from technical functionality, they are usually targeting low toxicity, good environmental properties and workplace health and safety factors. Färber & Schmid offers a range of cleaning products that serve as alternatives to the critical substances.

A supplier of polyurethane anti-wear coatings for dump trucks and engineered materials-handling parts was using

methylene chloride to dissolve isocyanate in a repair kit that it shipped to customers seeking to repair damaged areas in a coating.

Air-Freighting Methylene Chloride Is a No-Go Nowadays

The kit is used by numerous international customers, but it could no longer be air-freighted around the globe once methylene chloride was classified as being toxic to the unborn child. Following a detailed discussion with the

customer's application engineer on site, Resin-Clean HPT-D1 was recommended. This specialty product is not subject to labeling requirements and belongs to a new generation of environmentally friendly solvents. Accelerated tests and extensive long-term trials that included adhesion studies were conducted before the product was given the final go-ahead. As a result, there are no longer any issues with getting the repair kit to users around the world.

A processor of polyester polymer concrete was using methylene chloride



Fig. 1. A win-win situation: the mixing screws in this polymer concrete line are now purged with a specialty cleaning agent. This saves costs, protects employees and consumes only a small fraction of the chemicals used previously. © Färber & Schmid

to purge his mixing screws. Methylene chloride is non-flammable and was previously authorized for use in lines that did not have any explosion protection measures. The new regulations required the processor to find a functional alternative that addressed the issue of explosion protection, while delivering the specified cleaning performance in full. Close cooperation with the manufacturer of the machines in the line led to the use of Resin-Clean EXP-3/M-V2, an efficient specialty cleaning agent that met all of the processor's requirements. A circulation-tank system was added to the mixing-screw and casting section. This enabled the processor to boost cleaning performance and reduce costs. Compared to the case for methylene chloride, the amount of chemicals used for regular line cleaning is now a fraction of what it once was (Fig. 1).

Seeking a Replacement for Acetone – But No Interactions, Please

When planning a new project for a large casting line for polyester and epoxy resins, a manufacturer of semi-finished thermoset articles wanted to spare himself the additional expense of incorporating explosion protection into the line and was now faced with the problem of finding a substitute for the acetone in use up until then. He also had to address the issue of the high levels of fugitive emissions gener-

ated from the use of large quantities of acetone annually. The cleaning specifications at the location were very high, because acetone is generally recognized as a very good solvent and is still highly popular throughout the resin-processing industry. As cost efficiency was also key in this case and the prospective cleaning agent was to be recycled by means of distillation, it had to be amenable to distillation yet not interact with the resins during cleaning, downstream storage, and distillation. Resin-Clean HPT-PU 05 met these requirements in their entirety. The line now operates in a zone that does not require explosion-protection measures and to the satisfaction of the user. The Resin-Clean HPT-PU 05 is continuously recycled on a dedicated vacuum distillation unit in a never-ending process. Consumption and associated emissions have been slashed, and this has yielded substantially lower costs in terms of raw materials use and logistics.

Removing Isocyanate Overnight from an Agitation Bath

Owing to a lack of alternatives, a producer in the construction chemicals sector had been cleaning his isocyanate tanks only sporadically by hand, if at all. Over the years, this inadequate cleaning regime had led to considerable layer build-up. During a discussion about a project for cleaning mobile production

containers, a comment about stationary isocyanate containers eventually morphed into the dominant topic. It transpired that numerous PUR processors had occasionally also had cleaning problems with isocyanate contaminants in the past and that there was already a highly effective product available for this task. Resin-Clean HPT-73/DB has repeatedly demonstrated in practice that cured isocyanate contaminants can be chemically removed by adopting a coordinated approach to the underlying cleaning chemistry. The production tank was filled with an IBC (1000 kg) of Resin-Clean HPT-73/DB and kept agitated overnight. As a result, the isocyanate contaminants came away from the tank surface over large areas. The cleaning performance of Resin-Clean HPT-73/DB can be boosted, and exposure times shortened, by heating. The user now cleans the container at regular intervals to prevent material build-up. The cleaning agent can be reused several times in this application, and that helps to keep the cost of maintenance cleaning down at a very low level. ■

Info

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Part 1 of this Series

The first part of this series focuses on cleaning equipment used in PUR processing. It appeared in *Kunststoffe international* 5/2022.

Digital Version

A PDF file of the article can be found at
www.kunststoffe-international.com/archive

German Version

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