

# Chemical Spray Stripping Made Simple

The use of modern, specially coordinated processes and plant engineering means that chemical paint removal from coating accessories and incorrectly coated parts is now safe, economical and environmentally friendly.

The use of automatic spray stripping systems for removing coatings from metal components is becoming increasingly widespread. In the automotive supply industry and in many other sectors, these systems have already become indispensable. By using spray stripping systems, companies can themselves safely and cost-effectively strip incorrectly coated production components and coating accessories that have a relatively thin coating without mechanical damage and without harming the base materials. In those cases when the stripping process is not hand-

led centrally, in other words when it is incorporated into the production process, the ideal choice is a modular system from ESC in Geislingen, Germany. These high-quality systems are easy to use, reliable and cost-effective.

Chemical stripping is the least damaging process for removing coatings from light alloys or intricate components. The properties of the components are not affected and no mechanical or thermal stresses or damage are caused.

Despite these unquestionable benefits, in practice many companies regard chemical stripping with a certain degree

of caution. In many cases, chemical stripping is still equated with conventional immersion tanks and spray rinsing stands. It is also associated with large quantities of foul smelling, water polluting liquids and with physical effort and stress for employees.

## Adaptable System Designs

This type of process has long since become obsolete. The latest stripping systems offer users stripping processes that are safe, easy to use and specially designed for thinly coated ferrous and non-ferrous components, such as coating accessories, which as a result of the improved bonding must be stripped in a shorter period of time. No additional equipment is needed to accommodate environmental requirements.



*A modern coating removal operation with several stripping and rinsing modules and a central suction unit using waste gas washers*

Depending on the dimensions of the parts involved, closed modules are generally used for chemical stray stripping. The stripping and rinsing processes take place one after another in separate spraying machines, which, depending on the job, can be combined with the coating removal plant itself. Parts can be quickly and easily moved between the individual spraying machines in baskets using a mobile truck system. A range of modules with a usable diameter and height of up to 2 m is available as standard. Special modules can be built to order.

The modular concept allows companies to build up a system in gradual stages and makes it easy to extend the capacity of the system at any time.

**The spray process:** The individual spray modules use a spray rotation system. A pump supplies the stripping agent or the rinsing agent from an integral storage tank (containing between 140 and 850 litres depending on the type of machine) to a three-dimensional spraying system. The parts to be stripped and cleaned pass through the stripping system in rotating wash baskets, allowing the parts to be sprayed from all sides.

**Stripping:** Depending on the job in question, the stripping modules are filled with a stripping agent for ferrous or non-ferrous metals. The working temperature is between 80 °C and 120 °C. Spray stripping is between four and five times faster than using an immersion tank. For each cathaphoretic, acrylate or polyester coating, stripping takes between 10 and 15 minutes. The time needed can be reduced by increasing the temperature of the stripping agent.

**Rinsing:** Several different rinsing processes or combinations of processes are available. The choice of the most suitable process will depend on the quality, corrosion protection and waste water requirements.

### Solvent Stripping without Gas Emissions

The European VOC guidelines set limits on the emissions of volatile organic compounds resulting in particular

from the use of organic stripping agents. Varying quantities of solvent vapour are produced by the different processes depending on the application temperature. In an industrial context, the stripping agents are mainly solvent-based and are used at temperatures between 80 °C and 120 °C in order to make the stripping process as fast and effective as possible.

Heating the solvent increases the vapour pressure and therefore the volatility of the stripping agent. The solvent vapours that are produced are removed in a controlled manner through waste gas pipes or they escape through openings in the machinery.

In the past, the vapour was fed into a waste gas cleaning system or out over the roof of the building. The new system from ESC (TSH) has an integrated vapour condenser with a closed cooling circuit.

This means that it is no longer necessary to remove the vapour. By cooling and circulating the vapour, the volume is reduced to the level necessary to lower the pressure in the spray stripping chamber. In addition, the parts are cooled at the end of the stripping process, which means that the emissions produced when the plant is opened and the parts are removed are kept to a minimum. The process uses specially developed stripping agents with a high boiling point that have a comparatively low vapour pressure and condense relatively easily.

### Complete Solution from One Supplier

With no need for a waste gas pipe, the requirements for the site of the stripping systems are simply a smooth floor, sufficient ceiling height and a power supply. Chemical spray stripping systems now offer complete solutions, including process technology, stripping agents and the optional removal of waste materials by the manufacturer. The specially developed, polyglycol-based stripping agents are biodegradable and not harmful to the environment, since they contain no chlorated hydrocarbons, n-methyl-2-pyrrolidone,

dimethylformamide or alkanolamines. No MAK values are specified for the ingredients.

Because of the high flashpoint of the stripping agents, the regulations for flammable liquids do not apply. Stripping agent contaminated with sludge is simply pumped back into the containers in which the chemicals were supplied using the pump and drainage system supplied as standard and returned to the manufacturer.

### Obvious Cost Benefits

A standard system consisting of a stripping module, a rinsing module, a truck system and a safety collection tank costs between EUR 30,000 and EUR 100,000 depending on the size of the plant and the equipment. The cost of in-house coating removal is between 50% and 70% lower than job stripping. This saving means that the plant will in most cases have paid for itself in nine months to two years.

The operating costs vary depending on whether ferrous or non-ferrous metals are to be stripped. The cost of the full chemical service can vary significantly and forms the major part of the running costs. The full chemical service includes the delivery of the stripping agent, the removal of waste materials, container management and all transport costs.

The amount of coating to be stripped is also a decisive factor in the cost, as this will determine the amount of chemicals used and the amount of waste materials produced. For example, the removal of a kilogram of cathaphoretic coating, paint or powder on an aluminium substrate costs around EUR 15 and on an iron substrate only around EUR 6.50. This means that stripping an incorrectly coated aluminium part with 10 grams of coating in-house will cost around 15 cents per part and stripping a similar iron part only 6.5 cents.

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