In-House Coating Removal

Cost-Effective Stripping of Incorrectly Coated Parts

More and more companies are deciding to carry out coating removal in-house for cost and time reasons. This article describes machines and processes for in-house stripping.

There are many different methods of stripping metal components. However, none of the processes can be used in all circumstances. Each process must be chosen and adapted to the individual application. When choosing a suitable process, it is important to ensure that the coating removal system meets the company's requirements, is cost-effective and easy to use, and complies with all the relevant environmental and safety regulations.

Chemical Stripping – Opinions and Prejudices

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. As a result, the process is ideally suited to stripping wrongly coated production parts.

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 often with physical effort and stress for employees.

Working methods of this kind are outdated and workpieces are now generally stripped and rinsed in enclosed spray modules, providing that they are of a suitable size.

Rapid Spray Stripping

Amongst all the different methods of chemical stripping, the spray process is generally the fastest and produces the best results, because the stripping effect of the chemical agent is combined with the cleaning power of the spray jet.

The spray units are very compact, take up very little space and can be adapted to meet special requirements. As the units are small, clean and easy to use, they can be integrated into the production process.

Choosing the Right System Design

The decisive factors in choosing the right spray unit are:

- the size of the workpieces to be stripped
- the type of stripping agent to be used (water-based or organic)

Different ranges of modules with a usable diameter of between 900 and 2000 mm and a height of between 480 and 2100 mm are available as standard. In water-based coating removal systems, a single module is often used, in which the stripping and rinsing processes are carried out automatically one after another and therefore only one spray module is needed. This type of system can also be set up to produce no waste water. If the coating which is being removed takes the form of flakes or scales, an optional filter module is also available, which can automatically remove the scales and flakes from the chemical cycle and prevent interruptions to the operation of the system or its complete breakdown.

In the case of organic-based stripping systems, the stripping and rinsing processes take place one after another in separate spraying modules, which, depending on the task, can be combined to create a complete coating removal system.

The work pieces are moved between the individual spraying machines on horizontal trucks. This allows the user to move fully-laden parts baskets with no effort. A wide range of accessories is available for these machines to meet users' individual requirements.

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. For example, if you want to increase the capacity of a standard system consisting of a stripping module and a rinsing module by 100 % or 200 %, you simply need to add a second or third stripping module, as the existing rinsing module can accommodate several stripping modules because of its significantly shorter processing cycle.

The individual spray modules use a spray rotation system. A pump supplies the stripping agent or the rinsing agent from an integral storage tank to a three-dimensional spraying system. The parts to be stripped and cleaned pass through the spraying system in rotating wash baskets, allowing the parts to be sprayed from all sides.

Depending on the stripping agent, the operating temperature in the stripping process is between 80 °C and 120 °C. The rinsing process is generally carried out at room temperature.

Costs and Benefits

When calculating the operating costs, the decisive factor is whether the stripping agent being used is:

- a water-based stripping system or
- an organic stripping system.

The costs of the full chemical service for organic stripping systems are around three times higher than those for water-based systems. The full chemical service includes the delivery of the stripping agent, the removal of waste materials, container management and all transport costs. The other costs, such as energy and repair costs, amount to between 5 and 10 % of the full chemical service costs. Staff costs do not generally need to be taken into account, as the operating staff's time can be saved elsewhere in the process, which will compensate for any costs incurred.

The critical factors in determining the operating costs are the amount of chemicals used and the amount of waste materials produced, which in turn are in linear relation to the amount of coating. This means that the stripping costs depend on the proportion of coating to be removed and not, as in job stripping, on the total weight of the parts to be stripped.

Taking into account the standard market price for the full chemical service of 3 to 4 euros per kilogram for organic stripping systems and 1 to 1.50 euros per kilogram for water-based systems, the costs per kilogram of coating removed are as follows:

- Stripping ferrous metals that are resistant to caustic solutions – 5 to 7.50 euros
- Stripping non-ferrous metals (such as aluminium) or galvanised ferrous metals (such as zinc-plated sheets) – 15 to 20 euros

Figures ESC:

The stripped parts are unloaded by truck.

The example of these handles shows how the baskets in the stripping system can be loaded with several layers of parts.

This means that in-house stripping of a faulty aluminium component with 5 grams of coating will cost only 8 cents per component and the equivalent iron part only 3 cents per part.

When is In-House Coating Removal Cost-Effective?

The cost of removing the coating from faulty coated parts in-house is around 50 % lower than job stripping. This saving means that the investment of between 40,000 and 100,000 euros will in most cases have paid for itself within nine months to two years.

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