



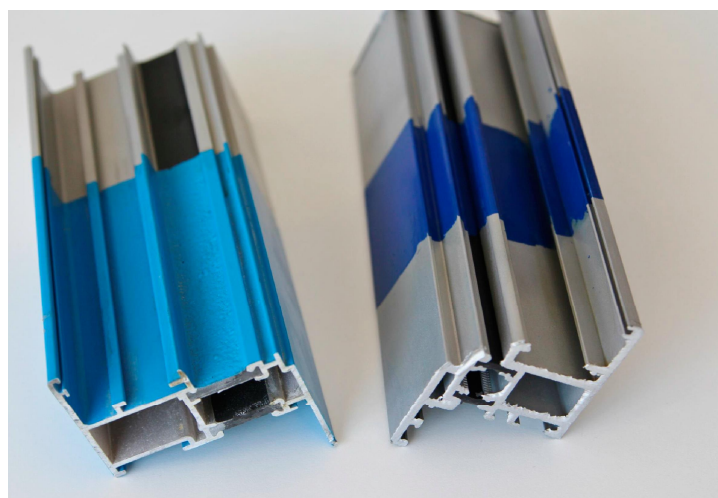
Information on the International Quality Mark



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Aluminium profiles with plastic webs

1. Introducing the QUALISTRIP Quality Mark

The Internationale Qualitätsgemeinschaft für die industrielle Entlackung von Metallen und Kunststoffen e.V. (QUALISTRIP) is an international quality association for the stripping of metals and plastics that was founded in 2000 by seven stripping plants and manufacturers of coating strippers.

In 2010 the quality association's members decided to affiliate to Verband für die Oberflächenveredelung von Aluminium e.V. (VOA). Since then VOA has been able to award the Quality Mark in accordance with QUALISTRIP's Quality and Inspection Regulations.

The aim of the QUALISTRIP Quality Mark is

- to create uniform regulations for industrial stripping
- to ensure the quality of the stripping process
- to enable quality-assured stripping processes to be labelled with the Quality Mark.

In order to fulfil these aims, the associated stripping plants subject themselves to a specified audit by an independent testing institute. In addition, coating strippers can only be used after they have received permission (an approval) to use the Quality Mark. If a stripping plant receives permission to use the QUALISTRIP Quality Mark (a licence), it may only advertise with the Quality Mark for the period for which the licence has been granted.

The QUALISTRIP Quality Mark offers stripping plants certainty and unambiguity in contracts with customers and promotes a further improvement in stripping techniques because the QUALISTRIP Quality and Inspection Regulations can be integrated into an existing QM system. This results in a reduction in the effort needed for auditing.

Membership of VOA and the acquisition of the QUALISTRIP Quality Mark thus offer major benefits to the stripping user.

In order to obtain a licence (stripping plants) or an approval (manufacturers of coating strippers), all of the requirements laid down in the Quality and Inspection Regulations must be fulfilled. The QUALISTRIP Inspection Committee, whose spokesperson is a member of the Technical Committee of VOA, makes a decision based on the results of the tests.



Powder-coated rack

2. Assured quality

The customer has the assurance that stripping will be carried out in accordance with the prescribed Quality and Inspection Regulations of the QUALISTRIP quality association. This should eliminate damage due to processing. If controls are non-existent or only partial, damage can occur, as the following example shows:

If an aluminium precision part with drilled holes that has undergone a high degree of processing effort is treated with an unsuitable coating stripper, removal of aluminium occurs in the holes and makes it impossible to process the part further.

The definition of precise process steps in the QUALISTRIP Quality and Inspection Regulations enhances the quality of the stripping and prevents cases of damage. The quality association only allows coating strippers to be used that have successfully completed an approval procedure carried out by an independent testing institute and have been released by the Inspection Committee.



Aluminium roof rail



Coated glasses

3. The stripping

3.1 General

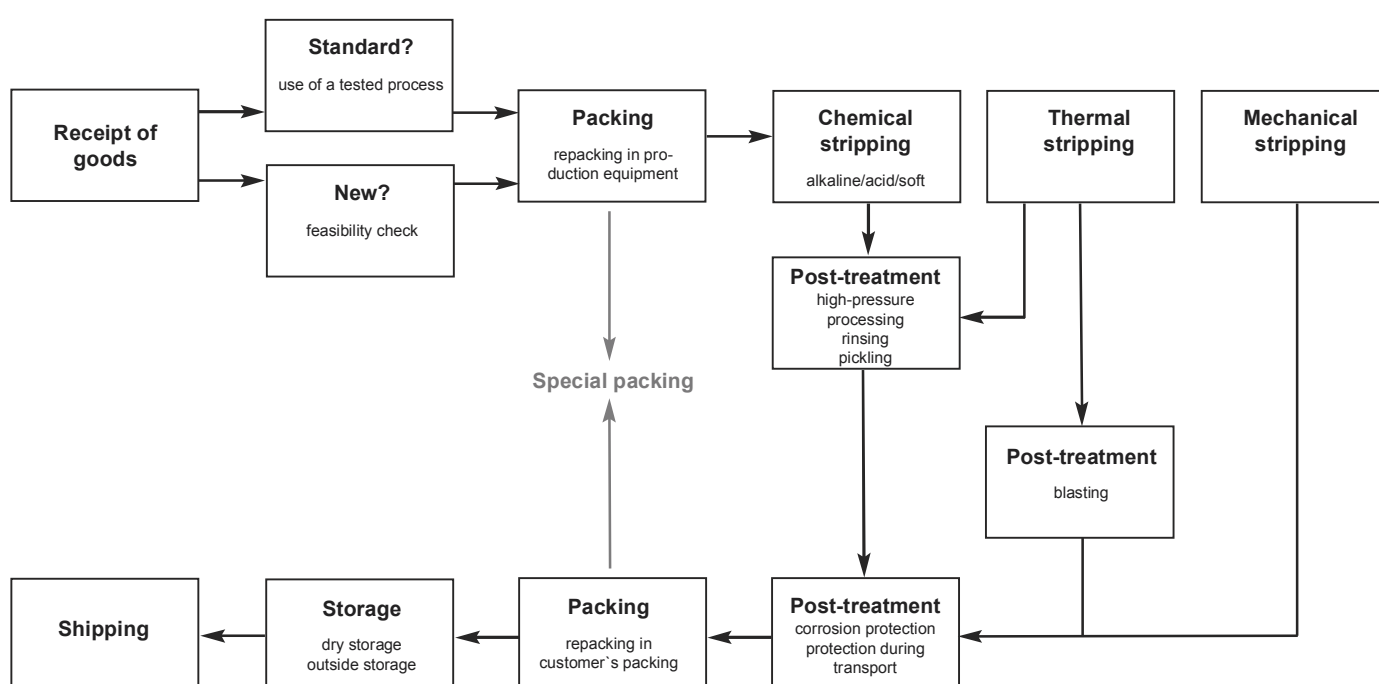
In today's world, quality assurance and the economic aspect of coating and lacquering is becoming more relevant for companies. All types of incorrectly coated or lacquered components are recycled, as it were, by stripping them and then returning them to the material loop. Auxiliary tools such as hangers, cross members, hooks, etc., are stripped or decoated in order to be able to use them again in the production process.

3.2 Stripping processes

Basically one differentiates primarily between the following types of industrial stripping:

- alkaline/acidic chemical stripping
- soft stripping (solvent-based stripping)
- thermal stripping
- mechanical stripping.

The steps that occur during stripping are clearly shown in the following diagram. Feasibility checks have to be carried out for goods that are to be subjected to stripping for the first time. This involves carrying out stripping on samples to determine the materials, coating stripper or stripping process, stripping times, or a suitable post-treatment for the stripped surfaces. These samples then have to be presented to the customer so that it can subject them to suitable testing of the coatability and thus give its approval for using the process.



The forms of packing should be chosen in such a way that if possible the parts to be stripped can already be sorted at the coater's plant into packing that can subsequently be used for transport and fed directly into the stripping process at the stripping plant. If standardised racks are not suitable, special racks have to be developed in close co-operation between the stripping plant and the coater. Special packing reduces the complete handling of the goods to be stripped when it comes to both faulty coatings and auxiliary coating equipment. Economic and high-grade stripping/decoating can then be guaranteed.

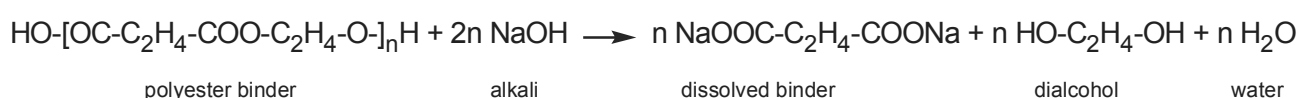
Of course it is not always feasible to provide special packing. In this case, standard packing or special packing available internally at the stripping plant is then used. However, all parts usually arrive in their original packing, possibly with additional intermediate layers such as cardboard, anti-tarnish paper, etc., as agreed with the coater, and are returned to the coater in the same way.

3.3 Stripping from a chemical point of view

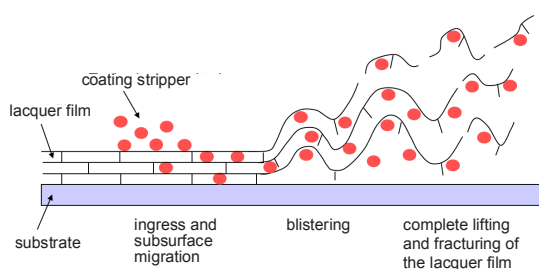
Unlike thermal or mechanical stripping, a physico-chemical reaction takes place between the lacquer binder and the coating stripper during chemical stripping. The most important mechanisms of chemical stripping are physical dissolution and swelling and the chemical decomposition of the lacquer binder.

The dissolution of the lacquer occurs as a fine dispersion or in the form of a skin or pancake and is mainly determined by the chemical interaction between the coating stripper and the lacquer binder.

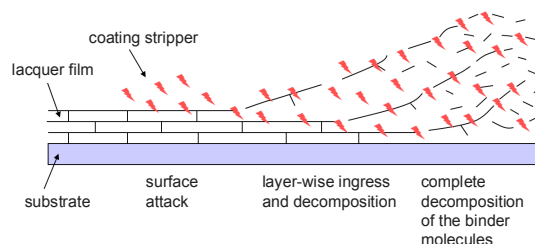
Chemical decomposition takes place according to differing reactions, such as the saponification or alkaline hydrolysis of polyesters, depending on the binder in the lacquer:



Skin-like separation as a result of subsurface migration/swelling



Finely dispersed separation as a result of chemical decomposition





Skin-like separation

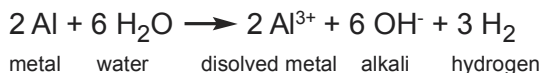


Finely dispersed separation

Material compatibility of different substrates:

Metallic surfaces (e.g. aluminium alloys):

During the stripping process, chemical reaction causes changes in the lacquer binder and degrading. If water enters the stripping medium (e.g. wet parts) or incorrect process management (incorrect addition of highly alkaline additives), attack occurs on the surface of the substrate.



Conversion coatings:

Conversion coatings (containing phosphates, chromium (VI or III) or oxides, etc.) are soluble in all aqueous alkaline coating strippers. In contrast, these coatings are regarded as being insoluble to the greatest possible extent in selected solvent-based coating strippers.

Plastic as substrate surfaces:

Diverse problems can arise when stripping plastics, such as decomposition of polymers, leaching of plasticisers, or ingress of the coating stripper into the substrate. On the basis of today's state of the art it is therefore not possible to strip incorrectly coated production parts without changing their properties.

It is imperative to carry out prior testing of other parts.

4. Stripping processes and their effect on the base material

Industrial stripping can be divided into the following four categories:

4.1 Anhydrous solvent stripping (soft stripping)

This is regarded as the gentlest form of stripping and is used for high-grade parts made from light metal, die-cast zinc, non-ferrous metal, or galvanised sheet.

As a general rule, professionally executed soft stripping does not attack metallic base materials. Inorganic conversion coatings (chromate, phosphate) are also barely attacked, but they have to be removed prior to recoating.

4.2 Alkaline or acidic stripping (partly anhydrous or mixed with solvents)

Aqueous alkaline stripping can be used for ferrous alloys and alloy steels and non-ferrous metals (excluding aluminium) without any surface changes occurring. Phosphate layers are destroyed, however, and have to be built up again.

Acid stripping (anhydrous) can be used for ferrous materials as well as for aluminium. Conversion coatings on the metals are attacked or removed. The parts are highly susceptible to corrosion if there is no temporary corrosion protection.



Spraying process



Immersion process

4.3 Thermal stripping (stripping oven or fluidised bed)

Lacquering equipment such as hooks, gratings and skids are usually delacquered by thermal stripping. Depending on the substrate, microstructural changes are possible as are changes in the magnetic properties or spring characteristic.

Thermal stripping is carried out during a narrowly controlled process window and it is eco-friendly because it is an effluent-free process.



Coated auxiliary parts for thermal stripping



Oven for thermal stripping

4.4 Mechanical stripping (high-pressure waterjet or shot-blasting)

When stripping with high-pressure water the coatings are peeled from the workpiece using a waterjet at a pressure of approx. 800-2500 bar. The water can be used in a closed loop using a complex system to filter out the coating that is removed.

In shot-blasting the shot is applied to the workpieces via wheel blasters or using compressed air. Steel granules, sand, glass beads or plastic granules can be used as the blasting medium. Bare surfaces with different surface roughnesses are obtained depending on the blasting medium used. Blasting can also affect the surface strength or density. The blasting media are circulated in a closed loop until a preset grain size is reached; blasting shot that is too fine is filtered out together with coating residues and abraded metal particles.

The suitability of the process is strongly dependent on the geometry of the parts and the coating to be removed.



Continuous-feed blasting unit



Continuous-feed blasting unit, 35 m long



Blasting station (shot-blasting technology)

5. Post-treatment and surface quality following stripping

5.1 Chemical post-treatment

After chemical stripping the stripped items are subjected to a post-treatment as follows:

- pre-rinsing with water
- processing using a high-pressure waterjet
- final rinsing.

Depending on the customer's requirement, additional operations may be necessary:

- drying (if required)
- pickling / rust removal
- temporary corrosion protection (passivation)
- long-term conservation (oils).



Cast aluminium gearbox housings after stripping



Before and after cleaning

5.2 Mechanical post-treatment (shot-blasting)

This post-treatment is mostly used after thermal stripping to remove scale and ash residues in equal measure.

Parts that exhibit traces of deep corrosion are usually also subjected to blasting. If a surface needs to be corrosion-free, it has to be passivated or conserved after shot-blasting.



Shot-blasting equipment with overhead conveyor

5.3 Corrosion protection

5.3.1 Conversion coating as protection during transport

Inorganic conversion coatings mostly remain partially intact if gentle chemical stripping processes are used; this is the case in particular with chromate and phosphate compounds and anodised layers which thereby offer short-term corrosion protection during transport and temporary storage.

However, the new organic conversion coatings that are being used as substitutes for chromium dissolve in coating strippers. It is necessary therefore to apply temporary corrosion protection.

The old conversion coatings have to be removed and built up again in any case before reapplying the coating in order to achieve properties of equivalent quality.

5.3.2 Protective measures (temporary corrosion protection of bare metal)

Essentially one differentiates between two types of protective measure: aqueous passivation or use of non-water-miscible water-dispelling agents.

Products containing amines, phosphates or nitrites are mostly used in aqueous passivation. These do not generally affect the subsequent chemical coating pretreatment. Emulsions of oils or wax components are used to provide longer term corrosion protection. These products are difficult to remove, though.

Water-dispelling agents form a liquid protective film on the workpiece; this evaporates to a greater or lesser extent depending on the product formulation. A corrosion inhibiting oil is often added to products as a non-volatile component.

Proper removal of the protection requires having a suitable pretreatment. It makes sense to carry out a preliminary test to clarify its effectiveness in order to avoid faulty coating.



Galvanised parts after stripping

6. Quality assurance

The holders of the Quality Mark have committed themselves to quality assurance in the form of regular inspections that are documented.

An independent testing institute specified by VOA undertakes regular inspection of the stripping plants and their adherence to the prescribed in-house controls. Based on the results of the testing institute's inspection and their examination by the Inspection Committee of VOA, the Quality Mark is awarded for the time period specified in the regulations. This means the stripping plant and the manufacturer of the coating stripper are subjected to third-party inspection.

Before a coating stripper is approved by QUALISTRIP, the requirements given in the quality regulations for a coating stripper are checked – also by an independent institute. Every stripping plant operates in accordance with the international QUALISTRIP Quality Mark's current Quality and Inspection Regulations for industrial stripping and is awarded a licence for a limited period by VOA. These Quality and Inspection Regulations regulate the following for the stripping plant:

1. Requirements regarding the coating stripper
2. Requirements regarding plant and equipment
3. Requirements regarding the material to be stripped
4. Requirements regarding the stripping process
5. Inspection measures
6. Requirements regarding stripped parts
7. Requirements regarding packing and shipment.

7. How to obtain the international QUALISTRIP Quality Mark

The prerequisite for being awarded the QUALISTRIP Quality Mark is the carrying out of the verification process in accordance with the Quality Mark's Quality and Inspection Regulations and acceptance by VOA. Stripping plants are awarded a licence for a limited period in accordance with the Quality and Inspection Regulations. Manufacturers of coating strippers are awarded an approval.

Membership of VOA is open to ordinary or supporting members. As far as stripping is concerned, any stripping plant or coating plant with in-house stripping facilities can become an ordinary member.

Manufacturers of coating strippers can only be accepted as supporting members of VOA.

More detailed information on VOA and QUALISTRIP is available on the VOA website:

www.voa.de



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