



Coated steel or aluminium piecwork must withstand a variety of environmental influences. GSB Quality Seals provide internationally accredited product assurance.

Editorial

Corrosion Protection – Pre-treatment Quality



As a Quality Association for the piecwork coating of building components, GSB International strives to continually improve and assure the quality standards of coatings on Aluminium as well as steel, whereby besides the

coating material and process itself, the pre-treatment of the parts to be coated is of vital importance to the quality of the end result.

In the first place, the pre-treatment is targeted at ensuring the secure adhesion of the coating material (either powder or liquid lacquer) to the surface and secondly to provide effective protection from corrosion.

All pre-treatments must conform to the strict quality guidelines set by GSB, whereby conventional chrome pre-treatments are currently under discussion in terms of their potential risks to human health and the environment. As a result, GSB has for some time supported and contributed to the introduction of chrome-free pre-treatment processes and has developed stringent quality controls that govern the licensing process of any such systems.

In conjunction with laboratory tests, field trials are carried out at a GSB approved coating plant and samples are exposed to natural weathering in the Netherlands for a period of three years.

The GSB continually reviews its quality guidelines for pre-treatments to incorporate the latest technological advances and environmental considerations, making the Association a reliable partner to building contractors, architects and metal construction companies.

J. Verstappen
Vice Chairman of the Board

Quality Standards of Aluminium Pre-treatments and their Practical Application

The last Info Letter reported in great detail and most interestingly on the weather proofing of new powder lacquers with extreme weatherproof systems producing positive results in terms of meeting current requirements. In this day and age it is particularly important for colours to provide long term retention of gloss and intensity as this is the only way for an object to retain its worth and ensure that the onlooker continues to enjoy its unique colour brilliance.

What if, however, over time corrosion sets in taking away the splendour of the most fantastic colour brilliance due to the fact that the lacquer starts to bubble and detach in places from the surface? By that time it is too late to consider the pre-treatment which at the end of the day is at the root of all corrosion problems and is the first point of reference if the lacquer fails to stick or shows any possible signs of corrosion.

Fair enough, the situation is not quite as bleak in reality as over the past 30 years the GSB Quality Guidelines have made and continue to make a significant contribution towards ensuring that high standards of assured quality are

continually achieved and developed further.

Pre-treatment Options

The pre-treatment remains a key element to the entire coating process and gains in importance still if one considers the large number of options and alternative pre-treatments that are available today. At this moment in time, 16 different chrome free and non rinse systems are licensed and it appears more and more difficult for the user to clearly distinguish between these in the way they were able to with the classic yellow chromating options. Working with alternative pre-treatments definitely requires an assessment of the surface



University Hospital Mainz
Powder Coating with chrome-free Pre-treatment: PBS Schreiner GmbH & Co. KG / Germany



treatment as a whole, from the semi finished state to the final coating process whereby an appropriate consultation process with the chemical manufacturer becomes an absolute necessity.

Additional factors to be considered are the huge variety of processing plants used for the pre-treatment of piecework. There are emersion and spray varieties ranging from vertical emersion tanks to horizontal spray configurations which all provide different benefits in their practical application in terms of flexibility, continuity or productivity. This is why the GSB allows for optimum individuality in the chemical pre-treatment process.

In the interest of the best possible quality result, the Quality Regulations accommodate a number of different pre-treatment plants and processes to ensure that operators are able to meet the standard required and deliver a quality assured product. As such a conversion treatment can be achieved through conventional yellow or green chromating, or one of the new approved

chrome free systems as well as pre-anodising.

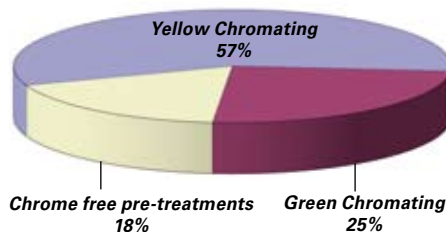
Practical research shows that at the 50 GSB coaters tested operating a total of 61 plants, classical yellow chromating is still the most frequently used representing 57% of pre-treatment applications. At 18% however, new alternative treatment processes are not far behind green chromating with 25%. Pre-anodising as a stand alone process is not widely used and therefore not graphically represented.

80% of European members operating

outside Germany favour yellow chromating, most of which are working with emersion tanks as a pre-treatment option.

This is not entirely surprising as the application parameters of classic yellow chromating are tried and tested and operators appreciate the low maintenance emersion tank system and its uncomplicated process. On the other hand, environmental risks and potential dangers to people associated with Chrome IV must not be underestimated and ongoing discussions will keep these issues in the forefront for some time to come. If it was just a matter of technical benefits, the advantages of yellow and green chromatising would be hard to beat and pose a constant challenge to the alternative chrome free systems.

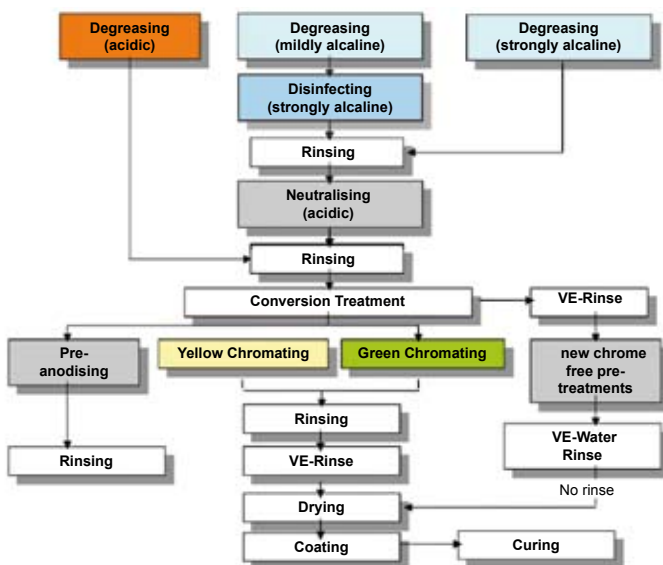
Pre-treatment systems operated by approved Standard Coaters



Source: GSB

Once again, Germany is leading from the front when it comes to the implementation of environmentally friendly processes and for some 10 years chrome free systems have established themselves in the market with a number of practical applications now available. Based on either ROHS Guidelines, EU Guidelines for old carriers or local waste water regulations chrome free pre-treatment processes offer a very realistic alternative to yellow and green chromating. Most are non rinse systems or used in combination with a quick rinsing process. The conversion layer is built up with a slightly acidic pH value of 3 – 4, which does somewhat restrict subsequent activity and means that any mistakes made during the degreasing and disinfecting processes are difficult to rectify. Consequently it is highly recommended that particular care is taken with these specific processes.

Pre-treatment Processes at a Glance





*left: Don Stroy Moskau /
System Supplier: Kawneer Alcoa Aluminium Deutschland, Inc.
Powder Coating with chrome-free Pre-treatment:
TK Oberfläche GmbH, Bielefeld / Germany*

*center: Hyatt Hotel Ekaterinburg /
System Supplier: Kawneer Alcoa Aluminium Deutschland, Inc.
Powder Coating with chrome-free Pre-treatment:
TK Oberfläche GmbH, Bielefeld / Germany*

*right: University Hospital Frankfurt Main /
Powder Coating with chrome-free Pre-treatment:
PBS Schreiner GmbH & Co. KG, Grebenau / Germany*

Disinfecting

Disinfecting should not only remove the natural oxide film but also tackle the underlying micro-celluloid deformation layer which is the result of extreme heat to the Aluminium associated with rolling, thermionic and extrusion processes and is considered the main cause of filiform corrosion. Technical experts say that the deformation layers contain metallic oxides and inter-metallic phases, which are chemically active in causing corrosion. The actual thickness of the deformation layers depends on the degree of heat and can vary tremendously. For disinfecting purposes, abrasion levels of $> 1 \text{ g/m}^2$ relating to alloys EN AW 6060 and EN AW 6063 are recommended with the final process being carried out in an acidic environment.

Premium Coaters

Since 2007 GSB Coaters have the opportunity of applying for „Premium Coater“ status (please refer to Info Letter 4). Premium Coaters are required to keep more detailed records and execute a higher level of in house controls, with set regulations and careful surveillance assuring the continued high quality standard provided by the Premium Coater. Additionally higher demands in terms of corrosion protection have to be met at the initial licensing stage:

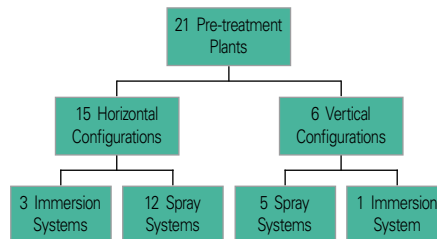
- 1000 hours of acetic acid salt spay testing in accordance with DIN EN ISO 9227
- 1000 hours of filiform corrosion testing in accordance with DIN EN 3665

This depth of pre-treatment testing guarantees high levels of corrosion protection even on exposed objects. To safeguard continued quality assurance Premium Coaters are subject to twice yearly surveillance testing.

However, the highest possible quality standard can only be achieved once Premium Coaters use coating materials classed as „Master Standard“, whereby it should be said that even coatings classified as „Standard“ have been meeting the high quality levels demanded by the market for many years.

At this moment in time a total of 13 GSB coaters are licensed as „Approved Premium Coaters“. Looking at those coaters in regard to the types of plants they use for pre-treatment, following combination results: out of 21 licensed plants, 3 are emersion set ups, 12 are horizontal spray configurations and 6 are vertical plants, with one being

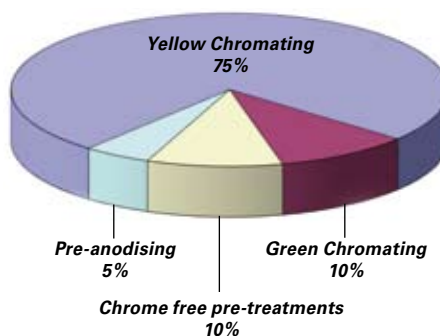
Pre-Treatment Configurations used by the 13 approved GSB Premium Coaters



Source: GSB

set up as an emersion pre-treatment. Taking a further step to analyse the actual pre-treatment systems 75% are

Pre-treatment systems operated by the 13 approved Premium Coaters



Source: GSB

working with yellow chromating, 10% use green chromating and another 10% are availing themselves of alternative chrome free pre-treatments. The remaining 5% operate with pre-anodising techniques.

This shows that even at the pinnacle of the „Premium“ standard, chrome free pre-treatments deliver a reliable service, which means that environmentally friendly systems are by no means a regression in terms of achievable quality, whereby it must be conceded that chrome free systems are less flexible and at times more sensitive. This becomes critical when working with galvanised steel and aluminium, but as long as the pre-treatment process is strictly controlled and the chemicals during the emersion and rinsing processes are analysed carefully, any sensitivity issues are entirely manageable. In fact, these procedures represent stricter quality controls in themselves, which are ultimately required for the „Premium“ Standard.

Quite rightly the pre-treatment process should and must be elementary to the entire coating process, whereby minimizing costs and the effective streamlining of the process are essential in remaining competitive. Since their introduction to the market some 10 year ago, chrome free pre-treatments are not only used in Standard quality coatings but have now started to penetrate the Premium market.

Nowadays architects, builders and metal construction companies have the option of conventional chromating, chrome free processing or pre-anodising, whereby the location of the object as well as environmental conditions should be considered in the appropriate selection of a suitable pre-treatment.

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International GSB Training Course in Copenhagen

All GSB approved coaters throughout Europe are obliged to attend GSB training seminars which are a key element to ongoing GSB quality assurance at international level. Besides the training seminar held on 29th/30th September 2008 at Schwäbisch Gmünd, GSB hosted a course in English at Copenhagen on 3rd/4th November.

Over 20 delegates from GSB coaters all over Europe attended this seminar covering "Conveyance of basic knowledge concerning the present GSB-Quality Regulations AL 631 and their realization". Additional focus areas were new additions to the Quality Guidelines, the high quality standards required of GSB coaters in areas such as in-house control, pre-treatment processes, the revised classification of coating materials and the implications of damages. The seminar which was booked to full capacity received highly positive feedback from all those who attended.

The GSB International will continue to offer training seminars and courses in 2009.

EU Chemical Regulation REACH Info Event

As announced in Info Letter No 5, GSB International together with the Association for German Lacquer Industries (VdL) hosted an Info Event at Schwäbisch Gmünd on the EU Chemical Regulation REACH.

REACH was introduced on 1st June 2007 and represents a framework of new legislation which affects GSB members and their clients alike. The REACH legislation rules the registration, evaluation and authorisation of around 30,000 chemicals across Europe. It is envisaged that by 2018 detailed dossiers relating to the properties and potential risks of all chemicals produced and/or sold within Europe should be recorded and logged centrally.

Delegates on this well attended seminar were advised that all parties involved in the supply chain, including metal construction companies, must now practice a proactive and effective exchange of information and the active exchange of different viewpoints demonstrated the uncertainties that continue to exist within the industry in terms of working with REACH. With pre-registration closed as at the end

of November effective from 2009 only pre-registered chemicals are permitted to be produced and imported within the EU.

GSB International and VdL will continue to closely follow and report on the REACH process.



*Coating of Aluminium Profiles,
Metallbeschichtung Landau GmbH/Germany*



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