

COLOURED AND COLOURLESS PRETREATMENT BEFORE COATING, ACCORDING TO QUALICOAT AND GSB CERTIFICATION

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Even if there are a lot of different and good alternatives to hexavalent-chrome treatment before powder coating, it remains one of the most used and reliable systems.

Due its corrosion protection properties and easiness of use it is considered the target to reach for other products.

In particular the knowledge and experience about such processes guarantees the best quality and performance. In fact the strength of this product is the possibility to understand the quality of the layer without laboratory tests but directly online from the operators.

Different technologies can be used as alternatives to hexavalent chrome products. These products require advanced care and frequent laboratory tests because they are more susceptible to non-perfect treatments. This is the main reason why these products have not replaced completely the hexavalent-chrome based ones.

For this reason Italtecnocom has developed a new colored chrome-free application that allows easy-use of the hexavalent chrome products without the toxicity and dangerousness.

With the use of this new product the operators are able to understand the occurred passivation and the quality of the layer directly online.

In conclusion, there are a large number of chrome-free formulations developed by several suppliers with very good results in laboratory tests but a lot of these products have problems in every day industrial use.

For this reason it is important that the product is easy to use and also that the supplier's technicians are capable of properly training the customer's operators. This is what we at Italtelco do and this is the reason of our success in the application of new technologies.

Background of the technology

One of the most banal stereotypes is the idea that aluminum is a non-perishable material, perhaps because, compared to steel, does not show the macroscopic phenomenon that goes by the name of rust.

Now industry experts know that this is not true because the aluminum, exposed to air, has a natural tendency to oxidize itself. This should be a natural barrier against corrosion if he hadn't three big negative characteristics:

- the thickness of the layer is infinitesimal (<0.2 micron)
- the oxide layer is easy to dissolve in the atmospheric conditions
- the growth of the oxide layer is extremely irregular and the layer is not uniform

For that reason it is important to treat the surface in order to offer a good protection. The two main process used for aluminium profiles are:

1. Anodizing
2. Powder coating

In our paper we will analyze the importance of the chemical treatment before powder coating in order to prevent corrosion and to have a strong adherence of the paint layer.

Alugold SCR – coloured chrome free system:

During the last years a new process has been developed in order to obtain coloured layers. The main advantage of this new type of conversion layer is to allow immediate visual checks by the operators, in a similar manner to what happened with traditional chromic processes. The analytical control of the bath and the conversion layer are very easy and no special instruments are required.

This new process makes a coloured conversion layer that guarantees a strong paint adhesion and a very good corrosion resistance in conformance with the International Quality standards. It can be included in the range of new technologies named "nanotechnologies".

It is important to remark and emphasize that the Alugold SCR process produces a coloured layer which has a real relation to the quality of the passivation. So that it really indicates whether the passivation layer has been deposited according to the best conditions.

The process has already been homologated by Qualicoat and is already used in many different plants worldwide.

The conversion layer has a low electrical resistivity. The treated material, therefore, may be used for applications where this property is required.

Operating conditions

Before conversion the aluminium material must be treated as follows:

1. Degrease and deoxidize the pieces by using the following treatments:

- Alkaline degreasing
- Rinsing
- Acid deoxidizing

OR

- Acid degreasing

during this stage it is required to etch at least 1 g/m² of metal.

1. Water rinse.
2. Demineralised water rinse (< 50 µSm).
3. Treat the pieces with ALUGOLD /8 as follow:

DIPPING:	Temperature:	25-35°C
	Treatment time:	1 - 2 minutes
	pH:	5.0 – 5.8
	ALUGOLD SCR:	40 g/l

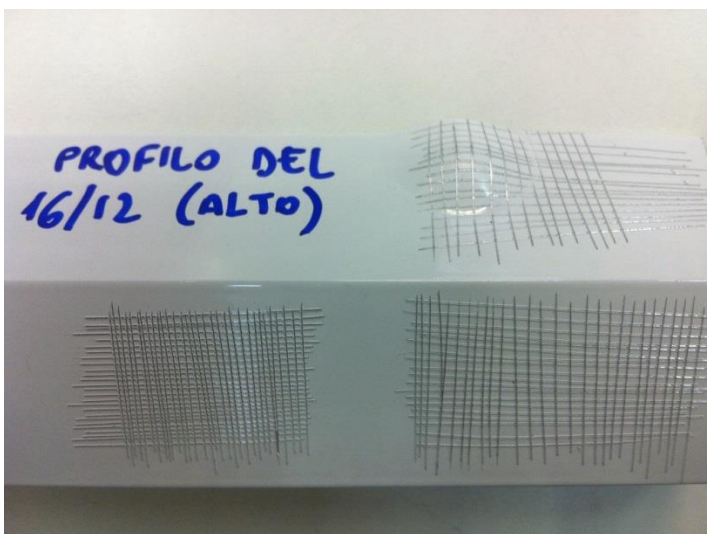
SPRAY:	Temperature:	25-35°C
	Treatment time:	1 - 2 minutes
	pH:	5.0 – 5.8
	ALUGOLD SCR:	20 – 40 g/l
	Spray pressure:	1 – 1.5 bar

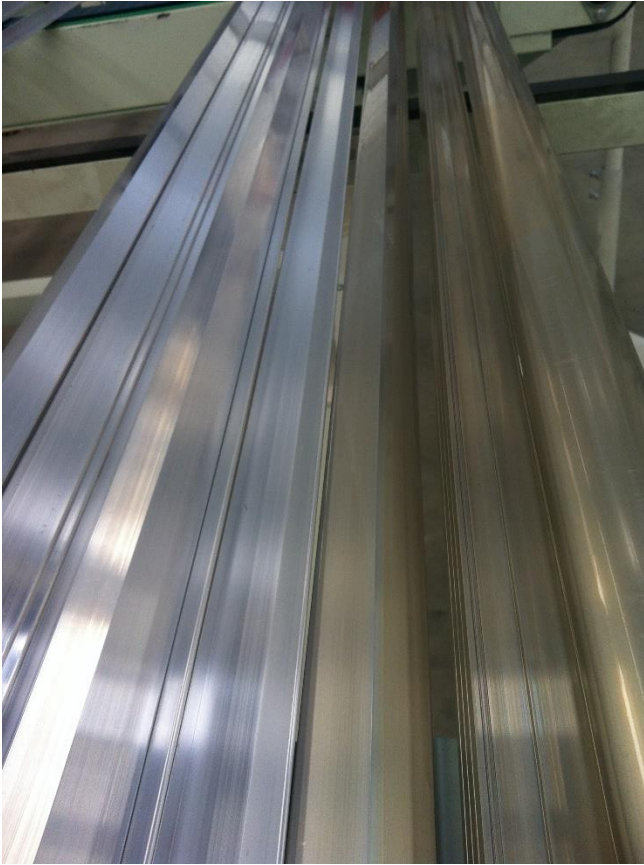
4. Demineralised water rinse (< 30 µSm).
5. Drying.

Final evaluation

Alugold SCR has been tested and approved by Qualicoat. The product passed and exceeded all the tests in order to evaluate the corrosion protection properties and the adhesion.

	Alugold SCR
Adhesion	100% Class 0
Impact test	100% NO Defects
Humidity test (1000 hours)	100% No Defects
Resistance to humid atmospheres containing sulphur dioxide	CONFORM
Acetic Salt Spray (1000 hours)	OK
Pressure cooker test	OK
Filiform Corrosion (Lockheed Test)	Max. 1 mm
Outdoor exposure (1 year)	OK





Conclusions

While there are a lot of colorless chrome-free products that have good performances, it is not true as regards the colored version.

After some years of trials, laboratory researches and technical presentations we made a lot of industrial experience with colored chrome free products.

Alugold SCR is used all over the world in different plants, including horizontal, vertical and compact ones.

Due to its easiness of use for the operators and the stability towards pollutants and not-perfectly clean water, the product is more and more required from the market.

References

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