



Basics about Quality Assured
Coating for Window and
Facade Components for
Architects and Planners

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Executive Summary

Every architect and planner knows the problem that one is always expected to be the expert in every field. It is expected to know every single detail of a project - from the foundation to the roof tile.

The difficulty is that a project involves so many different areas, each of which has its own experts. To have this expert knowledge for all areas as a single person is simply impossible. Usually there is a need for small summaries for individual topics, in which the respective topic is simply explained and even more importantly: contact persons and suggested solutions for the most important problems are listed.

In this white paper of the GSB International e.V. the coating of window and facade components is explained in a clear and straightforward manner for architects and planners. Furthermore, questions are listed that need to be addressed when planning the coatings for various projects. The aim is to ensure simple planning and to avoid errors in advance, which can lead to a costly aftermath.



Coating of Window and Facade Components for Architects and Planners

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1. The GSB International

The GSB offers assured quality for coated surfaces made of aluminium and steel by defining standards that go beyond the norms of the industry in order to ensure that architects, building owners and industrial partners maintain the value and lasting attractiveness of their facades, buildings and products.

2. Coating

Every architect and planner has to deal with the coating of aluminium and steel components in his everyday life - be it coated elements of an aluminium facade, steel parts of a structural framework or frames of windows and doors.



Usually the coatings are the showpiece of a building. They ensure, for example, that the corporate identity of a company can be carried to the outside by using the building or that the building can be integrated into the environment of other buildings in a surrounding area.

But what exactly needs to be taken into account when planning coatings so that the desired effect is achieved and maintained for a long time? To understand this, it is important to understand how exactly coatings are applied to components.

2.1. Coating Procedures

Components made of aluminium, steel and galvanized steel for architectural applications are coated using coating powder or liquid paint.

2.2. Powder Coating

In the following, we will explain coating with the help of powder coating. The process begins with the component to be coated - for example, an aluminium sheet for a facade. In this context, the material used is also referred to as the "substrate". First of all the component gets cleaned and degreased. Depending on the requirements of the coating, a so-called conversion layer is applied afterwards. This is used to enhance the adhesion between metal and coating and to provide corrosion protection.

The components will then be dried. This entire process is termed pretreatment and is done by using so-called pretreatment chemicals.

This is followed by the application of the coating powder. As the name suggests, coating powder has the appearance of a fine powder whose color corresponds to the later color of the coating. In most cases, the application is fully automated by coating automates. These are

equipped with several paint guns. During the process, the paint guns electrostatically charge the coating powder. This causes the coating powder to adhere to the earthed component. In cases of more complex part geometries, robots are also used for the application. However, this is more common in automotive and mechanical engineering sectors. The third step is the curing of the coating powder. For the curing process the coated components are moved into a curing oven.

2.3. Coating using Liquid Paint

In principle, coating with liquid paint is largely similar to coating with coating powder. In this case, however, the lacquer is a liquid. Electrostatic charging is not necessary in this case.

3. Quality Assurance of Coatings in the Field of Architecture

After studying this section, it is easy to understand that extensive quality assurance of the products and processes used at every step of the process chain is essential for the avoidance of errors. For this reason, GSB certifies the quality of the pre-treatment chemicals, coating powders and liquid paints - the so-called coating materials - as well as the processes of the companies that apply the coating powder - the coaters. The quality regulations of the GSB are therefore quite comprehensive. For this reason, the following sections provide a brief overview of the most important aspects of certification in the three areas.

3.1. Quality Assurance for Pretreatment Chemicals

The pretreatment chemicals are an essential part of the process chain. GSB tests a wide range of parameters when

certifying pretreatment chemicals. The adhesion of the coating applied after pretreatment is tested using various test methods. Corrosion protection is also tested. These tests are carried out on sample sheets coated in accordance to the GSB quality regulations. They are carried out by independent accredited testing institutes and take place both conventionally in the laboratory and under real conditions. Under the most severe climatic conditions for the coatings, the test sheets are placed in the Netherlands in Hoek van Holland. The maritime climate there, combined with the industrial environment, is the ultimate test. The test plates are placed there for up to 10 years. In the case of pretreatment chemicals, a distinction is made between different quality levels - depending on the area of application.

3.2. Quality Assurance for Coating materials

Similar to the pretreatment chemicals, the coating powders and the liquid paints are also put through rigorous testing. Also here the tests are carried out by independent accredited testing institutes. In addition to extensive tests in laboratories, sample sheets coated according to GSB regulations are also tested under real conditions. However, in this case, the outsourcing will take place in the US State of Florida. The aim in this case is to test the resistance to UV radiation. The strong sunlight in Florida is a real test in this regard. Depending on the quality level, the sheets are stored and tested for up to 10 years. That is to ensure that the coating retains its attractive color and a high level of residual gloss after years in outdoor areas with appropriate cleaning. Depending on the application, GSB offers various certifications and quality levels.

3.3. Quality Assurance for Coaters

The companies that carry out the coatings also have to meet extensive quality regulations if they intend to join the circle of GSB-certified coaters. Independent testing institutes carry out two unannounced audits per year on behalf of the GSB. The coating process, operating equipment and the factory's own production controls are tested. Within the scope of this factory production control, the companies are obliged to carry out extensive tests. Test sheets dedicated to this purpose are run through the entire coating process. After coating, they are checked by the coaters.

For example, a test sheet is bent in the so-called mandrel bending test and the adhesive strength of the coating is then examined. This is just one example of the many tests that are carried out as part of the factory production control.

The comparison of the laboratory, which all GSB-certified coaters must own, with a torture chamber is quite accurate at this point. Every step of the process is closely monitored - from incoming and outgoing goods inspection to temperature measurement in the curing oven.

The frequency of the controls is closely timed. An example is that the coaters are obliged to measure the thickness of the coatings twice an hour. Furthermore, the coaters have to provide a comprehensive documentation of their results.

This documentation is checked during the audits. In addition, finished coated sheets of the coaters are tested in independent testing institutes. As with pretreatment chemicals and coating materials, there are also various certifications for the coaters. Here too, the quality depend entirely on the later field of use of the coatings.

4. Planning of Coatings in the Field of Architecture

When planning a coating in the field of architecture, the architect or planner must ask himself various important questions and take these into account when issuing tenders. As has already been seen, there are different quality levels for pretreatment chemicals, coating materials and coaters. Therefore, it is important to ask yourself some questions during project planning to select the right quality level for the expected application.

4.1. Used Metal

First of all, it must be determined which metal will be coated. The GSB certifies coatings for aluminium, steel and galvanized steel.

4.2. Corrosivity Class

It must be specified what corrosion protection the coating must provide. This depends on the external conditions to which the coated components are exposed. For example, is there a coastal climate or is the building located somewhere in the inland? There are so-called corrosivity classes to meet these requirements. Based on this classification, the corrosivity class required for the planned project can be selected. The planning assistance of the GSB offers help at this point (see [Section 5.](#)).

4.3. UV Resistance

Further it is important to know, to which UV exposure the planned project will be exposed. Should it be located in moderate latitudes or for example in Florida? Are the coated components exposed to direct sunlight?

4.4. Color Tone

For architects in particular, the color tone plays a major role in the design of a building. But not every color is available for all areas of application. Particularly in the case of highly UV-resistant coatings, the choice is limited because not all colors have the same UV resistance. This affects, for example, strong yellow, orange and red shades.

5. GSB Planning Assistance

With the different requirements presented here, it is easy to lose track of the situation. To make planning easier, the GSB has developed a planning assistance for coating aluminium especially for architects and planners.

5.1. Tender Text

The result of this planning assistance is a text for the tenders, which contains all necessary quality requirements for pretreatment, coating material and coaters. The sum of these three factors ultimately determines the quality of the coated aluminium. As an architect and planner, you can quickly prepare and download a tender text online according to your requirements for coated aluminium. Assistance is also provided in the classification of corrosion resistance requirements. With these results, the corresponding GSB-certified coaters, pretreatment chemicals and coating materials can be selected directly afterwards on the GSB homepage.

5.2. Project Seal

After completion of the coating, the coaters can generate a project seal. As the first quality association, GSB International has created a seal that provides clear and reliable information about the quality of the coating. The following is an example of a project seal:



6. Additional Information

Do you have further consulting needs? We would be happy to give you further assistance! On-site trainings are also possible. For further information, please follow the links below.

Planning Assistance:	Link
GSB Certified Pretreatment Chemicals:	Link
GSB Certified Coating Materials:	Link
GSB Certified Coaters:	Link

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