IGSB-INFO 2

FIRE PROTECTION COATINGS: DESIGN IN PERFECTION

IGSB
ASSOCIATION FOR FIRE PROTECTION COATINGS

IGSB-INFO 2 | Issue 3, 2025
Publisher: Interessengemeinschaft
Brandschutz-Beschichtungen e. V. (IGSB e. V.)

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For ease of readability, gender-specific differentiation is omitted. Corresponding terms apply equally to all genders in the sense of equal treatment.

Content

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Editorial

A corrosion coating protects steel from corrosion, a fire protection coating protects it in case of fire. Both protection systems are therefore functional coatings that are equally needed in architectural steel construction.
Very high demands are usually placed on the visual appearance of corrosion protection. Modern fire protection systems today can certainly meet the same high visual standards.

Fire protection coatings create valuable time so that people can leave a danger zone in time in case of fire, and rescue forces and fire departments can concentrate on their primary tasks. The function of a fire protection coating is defined by standards and regulations and is extremely important. It can be vital! Nevertheless, with the products available today, it is no longer necessary to subordinate the visual appearance to the fire protection function.

Since the introduction of fire protection coatings, raw materials have been significantly improved, formulations optimized, and application methods coordinated with coating products and applications. Modern fire protection coatings can be processed in such a way that they cannot be distinguished from a corrosion protection system.

Since components are not always in the direct field of vision, but are sometimes far from the viewer or hidden behind cladding, the visual appearance should be considered in addition to the function when planning fire protection coatings. Unlike the function, this is not regulated by standards and should therefore be agreed upon and defined between the client and the coating company as part of the procurement process. If there is no consensus here, expectations cannot be met or exceeded. The visual appearance of a fire protection coating depends on the coating material and the processing method and can therefore be directly related to costs.

With the first edition of this brochure in 2015, the IGSB already showed what possibilities modern fire protection coatings offer and at the same time created a standard with which their visual appearance can be divided into quality levels. We find these quality levels in many specifications today. They have helped many clients to clearly define their requirements and the applicators to meet these requirements.

Thank you very much for appreciating our work in this way. We are pleased if this continues to be the case. Use this brochure in tendering and procurement processes, create a clear decision-making basis and clear conditions.

Further information about us, our goals and offers can be found on the website
www.igsb.eu.

If you have any questions or suggestions, please feel free to contact us. We look forward to your feedback.

Dr. Michael Overs
International Farbenwerke GmbH

Fire protection coatings enable a harmonious combination of safety requirements and aesthetic demands.

Designing with Fire Protection Coatings

Fire Protection Coatings in Steel Construction

Intumescent fire protection coatings serve to protect steel structures from excessive heat exposure. The coatings, which are only a few millimeters thick, foam up in case of fire and form a several centimeter thick, fine-pored protective layer.

A coating system usually consists of the primer, the intumescent coating, and a topcoat. The primer serves as corrosion protection and adhesion base. The intumescent coating foams up in case of fire and protects the component from excessive heating. The topcoat provides coloration and protects the intumescent coating from moisture and other weather influences. Furthermore, it can increase ease of cleaning. In order to meet the requirements of building owners, products have also been developed in recent years where only one or two layers are required. Among other things, there are fire protection systems for dry indoor areas where the topcoat can be omitted, and systems where all three functions mentioned can be fulfilled by a single layer.
Fire protection coatings are characterized by their high versatility. The fast-drying, impact-resistant coating systems combine corrosion and fire protection with long fire resistance durations of up to three hours (R180).

Fire protection coatings are applicable in almost any environment. For indoor areas, for example, there are a variety of emission-free protection systems that contribute to high indoor air quality. The systems can also be used in existing buildings, and with the appropriate system selection, it is even possible to subsequently increase the fire resistance class.

Fire protection coatings form an insulating carbon foam in case of fire, which delays the heating of the steel component.

Durability and Maintenance-Free Operation

Fire protection coatings are maintenance-free and can protect steel structures for decades when properly applied. UV-stable topcoats retain their original color even with high sun exposure.

If contamination occurs, for example in highly frequented areas, the coatings can be cleaned by blowing off, vacuuming, or light brushing, as well as - if recommended by the manufacturer - with water and suitable cleaning agents.

Basically, fire protection coatings are impact-resistant. Therefore, no damage is to be expected with proper handling. Should damage nevertheless occur, it can be easily repaired so that the repair of the damaged area is no longer visible afterward.
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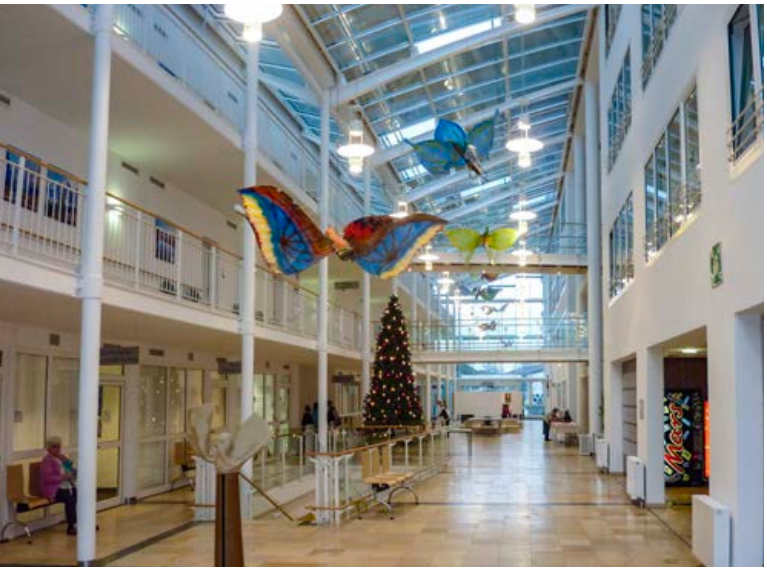
The color design is almost limitless - in addition to all common RAL colors, iron mica-containing DB colors are also possible for special accents.

Color Selection

Color selection is an essential criterion for controlling the effect of steel structures. The architect has hardly any limits when planning fire protection coatings: Topcoats are available in all RAL and NCS colors. Special accents can be set with iron mica-containing DB colors.

If pure corrosion protection coatings are also chosen in addition to fire protection coatings, care must be taken to ensure that the two coating systems are color-coordinated for a uniform overall appearance.

Fire protection coatings are impact-resistant, durable, and maintenance-free. They are therefore also suitable for use in highly frequented areas.



A targeted color choice emphasizes the character of a steel structure and sets design accents.

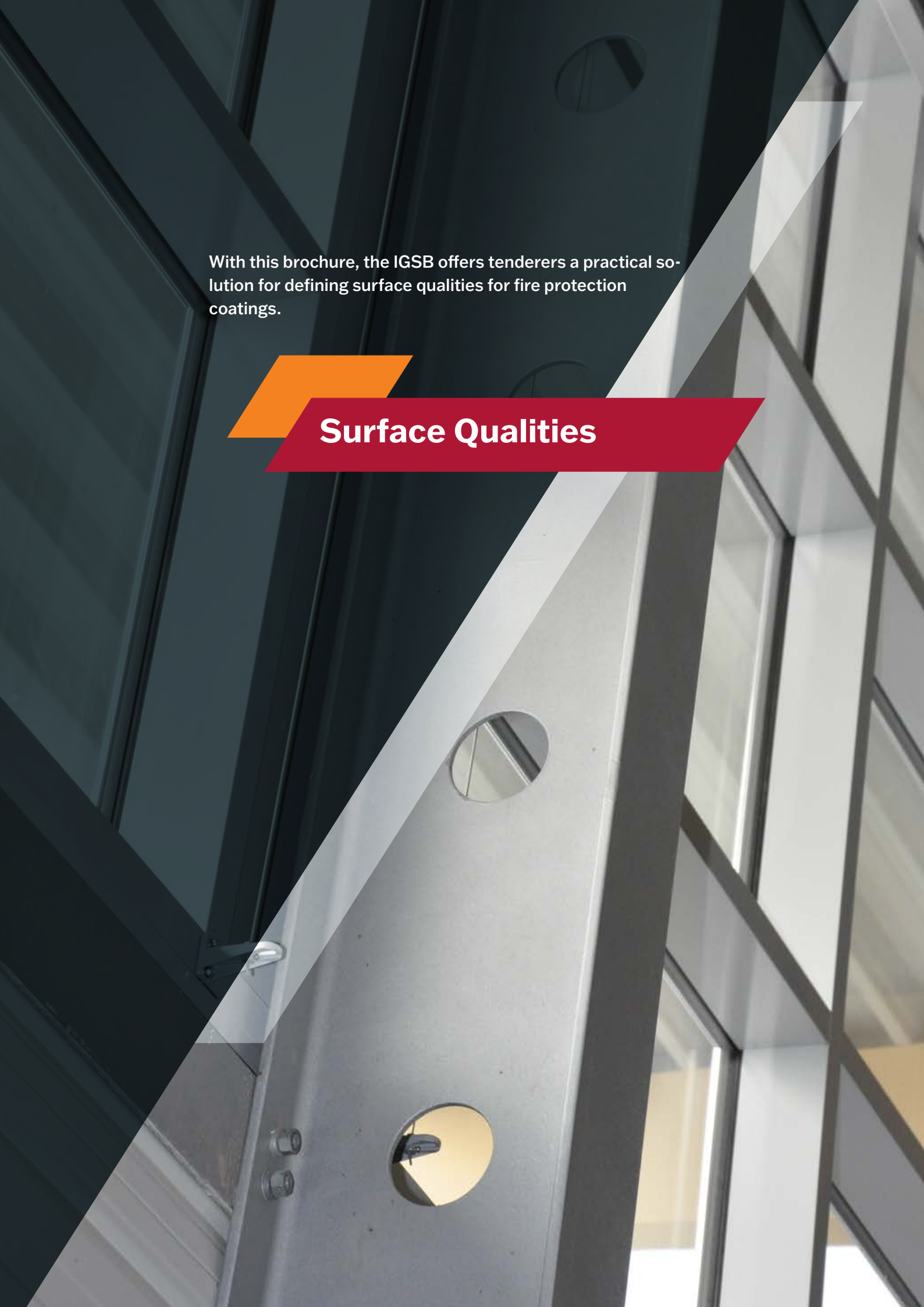
The fire protection coating in the Mercedes-Benz Center in Munich perfectly fulfills the high aesthetic demands of the automotive industry.

Surface Design

With appropriate preparation and care, the surface of fire protection coatings does not differ significantly visually from other coating systems.

It is important that all parties involved agree on the surface quality to be achieved from the beginning. The tendering guidelines and quality levels of the IGSB described in the following chapters help here. In addition, textured surfaces are also possible on request.

Furthermore, it should be noted that certain types of topcoats - depending on the application method - create different surface qualities. For example, iron mica paints do not allow a completely uniform visual appearance due to their material-typical properties if they are not applied using the spray method. This should be taken into account when defining a surface quality to be achieved.



With this brochure, the IGSB offers tenderers a practical solution for defining surface qualities for fire protection coatings.

Surface Qualities

Introduction

To ensure that the expected surface quality is understood in the same way by all parties involved, the IGSB has therefore defined the three surfaces described below with the specific designations Q1, Q2, and Q3.

The IGSB thus gives the tenderer a tool that also meets their requirements for the visual appearance, for example in the case of a representative function of the building. The same applies if no requirements are placed on the visual appearance of the fire protection coating. In these cases, a simple technical coating (Q1) is sufficient.

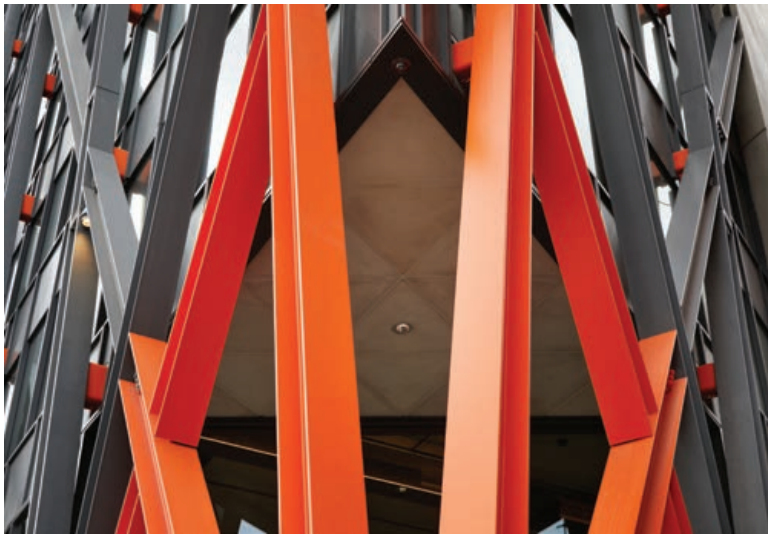
It is recommended to use the quality levels defined by the IGSB throughout and to refer to the IGSB in the tender and offer texts. The qualities of the IGSB are merely recommendations that have no legal binding and are not standardized or normed. The IGSB therefore assumes no guarantee for the definitions. For the specific construction project, advice should in any case be obtained from a manufacturer and/or applicator. This can support the right color choice and the selection of the quality level best suited for the specific application case.

Sample Surface Recommended

When tendering a surface of quality Q3, it is recommended to have a sample surface produced. This can be helpful to coordinate and fix the expected surface quality. The sample surface should accordingly reflect the later overall image and be aligned with the respective project.

The creation of the sample surface is to be listed as a separate item in the bill of quantities. The size of the expected sample surface should also be clearly defined. This can correspond to the size of a DIN A4 sheet or include the coating of an entire component under real application conditions (in the factory or on the construction site).

It should be taken into account that a sample surface produced on site may require a large number of trips and the real site conditions may not yet be available at this time. Therefore, factory production is generally recommended.



A joint coordination of the desired surface quality ensures that all expectations are met.

Surface Q1: Technical Coating

Quality level 1 (Q1) is suitable for surfaces for which no requirements are placed on the visual appearance. Examples are steel profiles in industrial areas or in non-visible areas, e.g., above suspended ceilings. Here, the intumescent coating can also be applied using the brush or roller method. Of course, even in cases where the visual appearance does not play a role, the recognized rules of technology must be observed.

Surface Q2: Standard Execution

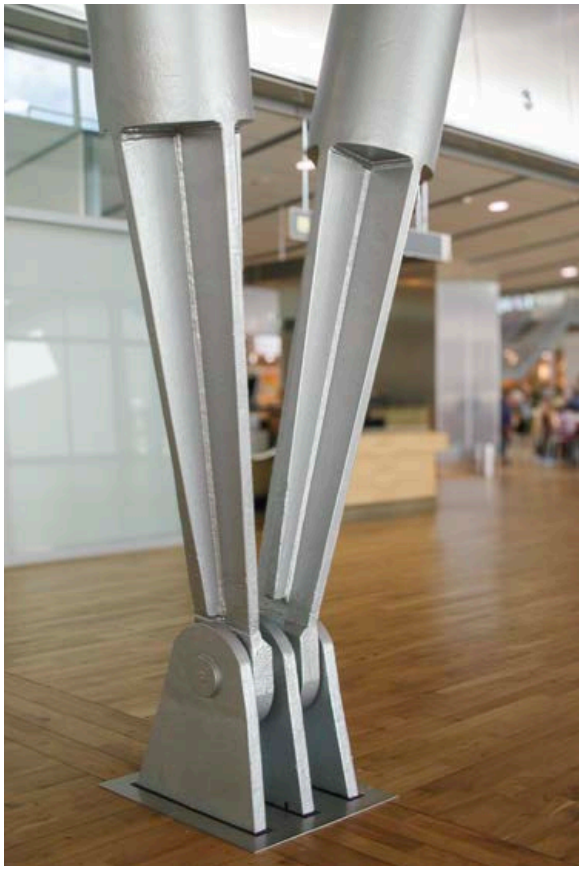
Quality level 2 (Q2) serves to describe surface qualities for which low requirements are placed on the appearance. The application of the fire protection coating can be done using brush and roller or using the airless method. Brush marks, runners, drips, inclusions, and curtains should not be visually perceptible from a distance of five meters in Q2.

If no or only low requirements are placed on the visual appearance of a fire protection coating, quality levels Q1 or Q2 are best suited.

Surface Q3: Decorative Coating

Quality level 3 (Q3) is mainly required for steel components that are directly accessible or visible, e.g., columns in the entrance area of representative buildings. These should have a decorative visual appearance at a distance of three meters. This means that brush marks, runners, drips, inclusions, and curtains should not be visually perceptible from this distance. The coating should be applied in the factory or on the construction site with a powerful airless device. The evaluation of the surface by the client is to be carried out after completion of the entire system.

Surfaces of quality Q3 have a uniform appearance from a distance of three meters.



Factors Influencing Surface Quality

Today, technology in the field of fire protection coatings has advanced to the point where the highest quality surfaces can be achieved regardless of the geometry and size of the components. However, the following factors influencing surface quality should always be considered during tendering, awarding, and application:

1. Expertise of the Applicator
The applicator must always be trained on the product used, not just on the application method itself. He should also be able to demonstrate sufficient experience, especially for surfaces of quality level 3 (Q3).

2. Environmental Conditions
Material, component, and air temperature as well as humidity and dew point can influence the result. They must therefore be monitored during application.

3. Accessibility of Components
For high requirements on surface quality (Q3), a room scaffold may need to be kept on site. If this is not possible for economic or time reasons, the coating should be done at the factory.

4. Time Planning
The uniform application of a coating system requires necessary care. The applicator must therefore have sufficient time available, especially for decorative coatings. The drying times required between the application of individual layers are also of great importance for the appearance. In case of time pressure, factory application can lead to a considerable shortening and optimization of the construction process.

5. Application Methods and Equipment
Fire protection coatings can be applied either using the airless spray method, with brushes, or with a roller. The use of the airless method enables the creation of the highest quality surfaces. When applying fire protection coatings with a brush, brush marks are often visible due to the technology. Processing with a roller leads to a uniform structure of the surface. Unless a type of execution has been specified or excluded by the bill of quantities or the manufacturer's instructions, it is up to the contractor which coating method to use.

Perfect surfaces can be produced with the airless spray method. Processing with a roller is also possible and leads to a largely homogeneous appearance.

A detailed description of the desired service is an essential factor to ensure a smooth process.

Planning and Tendering

Detailed Description Required

As with all construction services, the tenderer is obliged to describe the expected service in such a way that the bidder can create a well-founded calculation without extensive preliminary work. All bidders should thus be enabled to calculate their service accordingly.

With clear statements on the required surface quality of the fire protection coatings, it can be ensured that the later surface condition corresponds to the ideas of the building owner. A detailed specification serves not only the later assessment but primarily the quality description in the context of tendering and calculation. Terms such as "ready for painting, ready for coating, ready for surface, free of grazing light" and similar, not clearly defined specifications, are not suitable for describing the desired quality.

Generally, manufacturers and/or applicators should already be involved in the planning, who can provide advice for optimization with their expertise. These can then possibly also help to formulate the bill of quantities precisely enough.

Requirements to be Defined

In addition to the desired surface quality, further requirements for the fire protection coating should be described in the tender. These include, among others:

- the fire protection class to be achieved
- the corrosivity class to be achieved
- the chemical resistance (e.g., for industrial requirements)
- suitability for wet rooms (e.g., swimming pools, showers, kitchens, etc.)
- the required surface hardness (e.g., impact and abrasion resistant)
- special requirements regarding pollutants and emissions (e.g., halogen or solvent-free, AgBB conformity, DGNB and/or EPD verification)
- specification of desired colors and color effects as well as any special surface structure aimed for

For living spaces, particularly low-emission coatings are available that meet the highest environmental and health standards.

Interessengemeinschaft Brandschutz-Beschichtungen e. V. (IGSB) sees itself as a competence center for all questions related to intumescent coatings and actively participates in important topics of standardization and related public discussions in order to inform IGSB members in a timely and current manner. At the same time, it also provides advisory support to all interested market participants on the topic of fire protection coatings.

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- advises building owners, planners, steel constructors, processors, etc. on questions related to technologies and products
- promotes the use of fire protection coatings
- provides support for planning and execution
- promotes and accompanies scientific collaborations
- builds an extensive range of information on the topic of "fire protection coatings in steel construction" on its website www.igsb.eu

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