



GSB

INTERNATIONAL

Coated Aluminium & Steel.

Approved Quality.

International Quality Regulations for the Coating of Building Components

GSB AL 631-1

GSB ST 663-1

General Regulations

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- 1 General
- 2 Membership application form



1	<i>Responsibility</i>	2
2	<i>Legal regulations</i>	2
3	<i>Scope of application</i>	2
4	<i>Amendments to the quality regulations</i>	2
5	<i>General procedural regulations</i>	2
5.1	General	2
5.2	Right of use	3
5.3	Holder of the quality seal	3
5.4	Holder of the material approval	3
5.5	Expiry of the right of use	3
5.6	Monitoring compliance with the quality regulations	4
5.6.1	General	4
5.6.2	Test and monitoring costs	4
5.7	Objection	4
5.8	Publications	4
5.9	Correspondence	4
6	<i>Training</i>	4
6.1	Training course	4
6.2	Internal training	5
7	<i>Recommendations on the coating of components</i>	5
7.1	General	5
7.2	Aluminium	5
7.3	Steel and galvanised steel	7
8	<i>Terminology</i>	9
9	<i>Abbreviations index</i>	10

1 Responsibility

Quality Regulations GSB AL 631 and/or GSB ST 663 are compiled and issued by GSB International and continuously updated in accordance with the decisions made at the general meetings.

The new version or amendment replaces all previous editions. The current version published and issued in German language on behalf of GSB International is legally binding. Translations are not legally binding.

2 Legal regulations

The holder of the quality seal and/or material license must observe local laws and regulations. These quality regulations do not cover inspections by GSB International.

3 Scope of application

These quality regulations apply to the coating of the following types of construction components:

- **Aluminium and its alloys**
- **Steel**
 - steel
 - Continuously hot-dip coated steel (EN 10346)
 - Hot-dip galvanised steel (ISO 1461, single-piece galvanisation)

Coatings are applied to semi-finished products, semi-finished and finished components and prefabricated constructions for structures before their installation. Products checked and approved in accordance with the quality regulations are used to pre-treat surfaces and produce coatings.

These quality regulations do not provide regulations on selecting coating materials; they only make recommendations (section 7). The selection must be made by the client or in consultation with the client, in accordance with the weathering and corrosive conditions.

These regulations do not apply to individual coatings produced on site and coil coating.

These quality regulations do not apply to maintaining and cleaning coated components. For this information, please refer to the RAL-RZ 632 quality and test specifications.

4 Amendments to the quality regulations

Amendments and updates to these quality regulations to conform with new standards will be suggested by the quality committees (QC) and require the approval of the Board to be effective.

Major technical changes require the consent of members. They come into force after a minimum period of four weeks after publication or on the specified date.

5 General procedural regulations

5.1 General

The award of the quality seal and the license for pre-treatment chemicals and coating materials require full membership of GSB International. To become a member, the membership application must be completed and signed so that it is legally binding.

The quality seal and the material approval for pre-treatment chemicals and coating materials from GSB International only apply to products for which a right of use or license has been granted in accordance with quality regulations AL 631 and ST 663.

The holder of the quality seal or the material approval for pre-treatment chemicals and coating materials is responsible for complying with the quality regulations and must make regular quality checks.

GSB International is entitled and obligated to check and monitor compliance with GSB AL 631 and/or GSB ST 663.

5.2 Right of use

To ensure fair competition and avoid misuse, the Board can issue special regulations on the use of the quality seal and the material approval for pre-treatment chemicals and coating materials in standard and joint advertising material. This must not impede individual advertising. The same principle on fair competition applies here.

5.3 Holder of the quality seal

GSB International is solely entitled to have equipment produced for depicting the quality seal/ the material approval (metal stamps, punches, printing blocks, seals, rubber stamps etc.) and to define the use of this equipment.

A coating company that has been granted the right to use the respective quality seal/ the material approval is permitted to put it on business documents, online-communication channels and printed materials.

A coating company which has had its quality seal withdrawn must return the corresponding certificate immediately. They are not entitled to payments being reimbursed. The same applies if the quality seal has expired in any other way.

The coating company must immediately inform its customers that the quality seal has been withdrawn.

5.4 Holder of the material approval

Manufacturers of pre-treatment chemicals and coating materials are only permitted to use the material approval number for products which meet the requirements of these quality regulations and have been approved.

Manufacturers who have had their material approval for pre-treatment chemicals and coating materials withdrawn must return the corresponding certificate immediately. They are not entitled to payments being reimbursed. The same applies if the material approval has expired in any other way.

Manufacturers of pre-treatment chemicals and coating materials must immediately inform their customers that they no longer have the material approval.

5.5 Expiry of the right of use

The right to use the quality seal and/or the material approval will expire when the membership ends in accordance with the membership rules.

The right of use also expires in the following cases:

- GSB International ceases activity in the field(s) in which the quality seal/ the material approval applied
- It was revoked in accordance with the articles of association and if all financial and other obligations of the holder of the quality seal in respect of GSB International are met
- After insolvency proceedings have begun, the meeting of creditors decides against the holder of the quality seal or the material approval for pre-treatment chemicals and coating materials continuing to trade on the reporting date in accordance with sections 156 and 157 of the German Insolvency Order
- Insolvency proceedings are not opened due to insufficient assets
- Insolvency proceedings cease due to insufficient assets
- There are comparable insolvency conditions in other jurisdictions
- The holder of the quality seal or the material approval enters into liquidation voluntarily
- The quality seal or the license has been withdrawn in accordance with these quality regulations

5.6 Monitoring compliance with the quality regulations

5.6.1 General

Monitoring of compliance and monitoring of quality regulations is transferred by GSB-CERT to a test institute accredited in accordance with ISO/IEC 17025 or is carried out by an expert trained and approved by GSB.

5.6.2 Test and monitoring costs

The coating company or material manufacturer must bear all the test and monitoring costs for a quality seal and for the material approval for pre-treatment chemicals and coating materials.

The current fee regulations of GSB International apply.

5.7 Objection

Members have a right to object to any decision made by GSB-CERT and the Board on the basis of these quality regulations.

The objection must be made in writing to the offices of GSB within four weeks of receiving the decision. Reasons must be given for the objection.

If an objection is made, the decision will only become effective after the end of the objection proceedings.

No other legal recourse is permitted after the objection proceedings.

5.8 Publications

GSB International is entitled to publish the following information for members in newsletters and/or the internet:

- Award of the quality seal and the material approval
- Suspension of the material approval
- Expiry of the material approval and the right to use the quality seal
- Colours which are no longer approved with information on the year they were disallowed

GSB News is only for internal use and must not be passed to third parties.

5.9 Correspondence

All correspondence with the offices of GSB must be made in writing. E-mails and faxes are only valid if the offices of GSB have confirmed their receipt.

6 Training

6.1 Training course

The holder of the quality seal and the material approval must send at least one member of their technical staff to a training course at GSB International at intervals of 2 years. The training courses are concluded with a written exam.

New members must attend the next training course. A certificate is issued to prove participation.

Other interested parties are also permitted to take part in training courses.

6.2 Internal training

All members of GSB International are advised to train their employees on the quality regulations at regular intervals.

7 Recommendations on the coating of components

7.1 General

When selecting the right coating for a component, consider the atmospheric conditions so you can prevent corrosion in the long term and maintain the desired appearance.

The choice of pre-treatment process and coating should be made according to the location of the building.

The GSB coaters with the additional seal Sea Proof Plus (C 5) document the highest current level of corrosion protection for coated aluminium components.

7.2 Aluminium

According to what we currently know, filiform corrosion can occur in certain areas (maritime climates with high relative humidity). Pre-anodising (anodically generated conversion layer) has proven to be particularly good as the pre-treatment in such circumstances.

Chemical conversion layers and passivation are practical alternatives if – when degreasing, pickling with an alkali and post-treating with acid – precautionary measures are taken to remove the microcrystalline deformation layer that triggers filiform corrosion.

The table below shows the division of coating materials in classes Florida 1, 3, 5 and 10 and the corresponding UV resistance.

Coating material	UV resistance	Natural weathering in Florida	Colour palette
Florida 1	Standard	1 year	All RAL and many special colours
Florida 3	High	3 years	Limited in accordance with information given by manufacturer
Florida 5	Very high	5 years	Very limited in accordance with information given by manufacturer
Florida 10	Extremely high	10 years	Very limited in accordance with information given by manufacturer

Table 1: Classification of the coating materials in the classes Florida 1,3,5 and 10 and the corresponding UV-resistance

Weathering class	Corrosion effect	Atmospheric environment	Recommended pre-treatment	Corrosion test	Recommended cleaning interval
GSB - Countryside (C2)	Low	Slightly dirty countryside, city and moderate industrial environment	Chromium-free / chromate-free Containing chrome	Condensation – constant climate	Annually
GSB - Industrial (C3)	Moderate	Industrial atmosphere with corrosive exhaust gases and coastal areas with moderate salt content	Chromium-free / chromate-free Containing chrome	AASS	Annually
GSB - Sea Proof (C4)	High	Coast with medium salt content	Chromium-free with documented process Chromate-free / Containing chrome	FFC (≤ 0.30) and AASS	Annually
GSB - Sea Proof Plus (C5)	Very high	Coast with high salt content, open sea	Pre-anodising	FFC (≤ 0.10) and AASS	2 x per year

Table 2: Weathering classes and recommended pretreatment.

Notes: Designations based on DIN EN ISO 9223; see EN 1999-1-1 and EN 1090-3 for corrosion behaviour and corrosion protection for aluminium in construction.

7.3 Steel and galvanised steel

When choosing the surface pre-treatment and the coating composition, the corrosion categories and the expected term of protection (ISO 12944-1, DIN 55633, E DIN 55633-1, DIN 55634) have to be taken into account.

Surface Pretreatment/ Preparation	Primer coating(s)			Top Coatings			Coating system		Expected duration of protection (see ISO 12944-1)															
	Binders	Number of layers	Target layer thicknessµm	Binders	Number of layers	Target layer thicknessµm	Number of layers	Total coating thicknessµm	Corrosivity category															
									C2				C3				C4				C5			
									L	M	H	VH	L	M	H	VH	L	M	H	VH	L	M	H	
S	-	-	-	SP, PUR,PVDF	1	80	1	80	x	x	x	x	x	x	x	x	x							
AP	-	-	-	SP, PUR,PVDF	1	80	1	80	x	x	x	x	x	x	x	x	x							
ZP	-	-	-	SP, PUR,PVDF	1	80	1	80	x	x	x	x	x	x	x	x	x	x						
Cr	-	-	-	SP, PUR,PVDF	1	80	1	80	x	x	x	x	x	x	x	x	x	x	x					
S	-	-	-	EP/SP	1	80	1	80	x	x	x	x	x	x	x	x	x							
AP	-	-	-	EP/SP	1	80	1	80	x	x	x	x	x	x	x	x	x							
ZP	-	-	-	EP/SP	1	80	1	80	x	x	x	x	x	x	x	x	x	x				x		
Cr	-	-	-	EP/SP	1	80	1	80	x	x	x	x	x	x	x	x	x	x				x		
S	EP	1	60	SP, EP/SP,PUR, PVDF	1	70	1	130	x	x	x	x	x	x	x	x	x	x	x			x	x	
AP	EP	1	60	SP, EP/SP,PUR, PVDF	1	70	1	130	x	x	x	x	x	x	x	x	x	x	x			x	x	
ZP	EP	1	60	SP, EP/SP,PUR, PVDF	1	70	1	130	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
AP	EP	1	60	SP, EP/SP,PUR, PVDF	1	70	1	130	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	

Table 3: Examples of powder coating systems on piece galvanised steel

S = sweep, AP =alternative pretreatment, ZP = zinc phosphate, Cr = chromating,

EP = epoxy resin, SP = polyester resin, EP/SP = epoxy-polyester resin

EP and EP/SP do not meet the requirements for UV resistance of outdoor weathering

L, M, H, VH indicate the protection time to be achieved by the coating in the respective corrosivity category:

L (Low) up to 7 years,

M (medium) 7-15 years

H (High) 15-25 years

VH (very high) over 25 years

The corrosivity categories C 2 - C 5 refer to the corrosion protection effect of the coating on the zinc coating:

C 2 = low, C 3 = medium, C 4 = high, C 5 = very high

Surface Pretreatment/ Preparation	Primer coating(s)			Top Coatings			Coating system		Expected duration of protection (see ISO 12944-1)																			
									Corrosivity category																			
	Binders	Number of layers	Target layer thicknessµm	Binders	Number of layers	Target layer thicknessµm	Number of layers	Total coating thicknessµm	C2				C3				C4				C5							
L									M	H	VH	L	M	H	VH	L	M	H	VH	L	M	H	VH					
Sat 2 1/2	-	-	-	SP, PUR,PVDF	1	80	1	80	x	x	x		x	x														
AP	-	-	-	SP, PUR,PVDF	1	80	1	80	x	x	x		x	x														
ZP	-	-	-	SP, PUR,PVDF	1	80	1	80	x	x	x	x	x	x	x	x					x							
Sat 2 1/2	-	-	-	EP/SP	1	80	1	80	x	x	x		x	x														
AP	-	-	-	EP/SP	1	80	1	80	x	x	x		x	x														
ZP	-	-	-	EP/SP	1	80	1	80	x	x	x	x	x	x	x	x					x							
Sat 2 1/2	EP	1	80	SP, EP/SP,PUR, PVDF	1	70	1	150	x	x	x	x	x	x	x	x					x	x						x
AP	EP	1	80	SP, EP/SP,PUR, PVDF	1	70	1	150	x	x	x	x	x	x	x	x					x	x						x
ZP	EP	1	80	SP, EP/SP,PUR, PVDF	1	70	1	150	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x		

Table 4: Examples of powder coating systems on steel

SA = blasting, AP = alternative pretreatment ZP = zinc phosphate,

EP = epoxy resin, SP = polyester resin, EP/SP = epoxy-polyester resin

EP and EP/SP do not meet the requirements for UV resistance of outdoor weathering

L, M, H, VH indicate the protection time to be achieved by the coating in the respective corrosivity category:

L (Low) up to 7 years,

M (medium) 7-15 years

H (High) 15-25 years

VH (very high) over 25 years

The corrosivity categories C 2 - C 5 refer to the corrosion protection effect of the coating on the zinc coating:

C 2 = low, C 3 = medium, C 4 = high, C 5 = very high

8 Terminology

Term	Significance
Inspector	Inspector who carries out monitoring tests in the coating and galvanisation companies.
Certificate with quality seal	Certificate which is granted once the final certification level is reached
Coated components	Components which have been coated by a coater (aluminium or steel)
Coater (aluminium)	Company which coats aluminium components with powder or liquid paint.
Coater (steel)	Company which coats steel components or galvanised steel components with powder or liquid paint.
Coating material	Powder or liquid paint
DI water	Deionised water
Extended certificate	Time extension for a certificate after extension test is passed
Extension of certificate	Performance of additional tests for meeting stricter quality standards
Extension test	Test which is carried out to extend the maximum duration of validity for a certificate.
GSB Office	Headquarters of GSB: Fritz-Vomfelde-Straße 30 40547 Düsseldorf, Germany Tel.: 00 49 211 - 47 96 - 450 / - 451 Mail: info@gsb-international.de https://gsb-international.de
Inspector handbook	Description of the inspection and material tests
Manufacturer of coating materials	Manufacturer of powder / liquid paints
Manufacturer of pre-treatment chemicals	Manufacturer of chemicals which are required for the pre-treatment of components to be coated
Repeat test	Test which is carried out following failed extension test.
Two-layer system	A two-layer system consists of two paint layers applied successively to a substrate, whereby the first layer needs to be completely cured or stoved before the second layer is applied.
Weathering station	Stand on which the samples are subjected to external free weathering.

9 Abbreviations index

Abbreviation	Significance
AASS	Acetic acid salt spray
AL	Aluminium
ASTM	American Society for Testing and Materials
FPC	Factory Production Control
GSB AI 631	GSB quality guidelines for aluminium
GSB AI 631-X	The last number in the quality guideline designation for aluminium stands for the different versions: <ul style="list-style-type: none"> - 1: General section - 2: Pre-treatment chemicals - 4: Coating materials - 5: Coaters - 7: Measurement and test procedures - 8: Standards and guidelines
GSB-CERT	The group of assessors in the quality committees for the following tests: pre-treatment chemicals, coating materials, coaters (steel & aluminium)
GSB ST 633	GSB quality regulations for steel
GSB ST 633-X	The last number in the quality guideline designation for steel stands for the different versions: <ul style="list-style-type: none"> - 1: General section - 2: Pre-treatment chemicals - 3: Galvanisation companies - 4: Coating materials - 6: Coaters - 7: Measurement and test procedures - 8: Standards and guidelines
ISO	International Organization for Standardisation
MEK	Methyl ethyl ketone
MSDS	Material safety data sheet
NSS	Neutral salt spray
RPA	Rest potential analysis
SDS	Safety data sheet
ST	Steel
TDS	Technical data sheet

General provisions

Section 2 – Membership Application form



The undersigned company hereby applies to **GSB International** to become a:

full member - coater¹

full member - galvanizer¹

full member - manufacturer of coating materials¹

full member - manufacturer of pre-treatment chemicals¹

supporting member¹

The undersigned company confirms that has taken note of the following and hereby accepts it without reservation as binding on itself:

- the International Quality Guidelines of GSB International e.V.
- the Statutes of Association of GSB International e.V. and
- the contribution scheme of GSB International e.V.

Company:	
Street/No.:	
Post code/ location/country:	
VAT:	

Type of contact:	Decision-makers/managing directors (with voting rights):
First name:	
Last name:	
Position:	
Phone number:	
email address:	

¹ Please tick the appropriate box

General provisions

Section 2 – Membership Application form



Type of contact:	GSB examinations (GSB main contact):
First name:	
Last name:	
Position:	
Phone number:	
email address:	

Type of contact:	Invoicing
First name:	
Last name:	
Position:	
Phone number:	
email address:	

.....
Place and date

.....
Signature and company stamp

By registering as a contact person, I acknowledge that personal data is stored and used internally by GSB in connection with all matters relating to GSB quality guidelines. The data is subject to the provisions of the basic data protection regulation VO (EU) 2016/679.