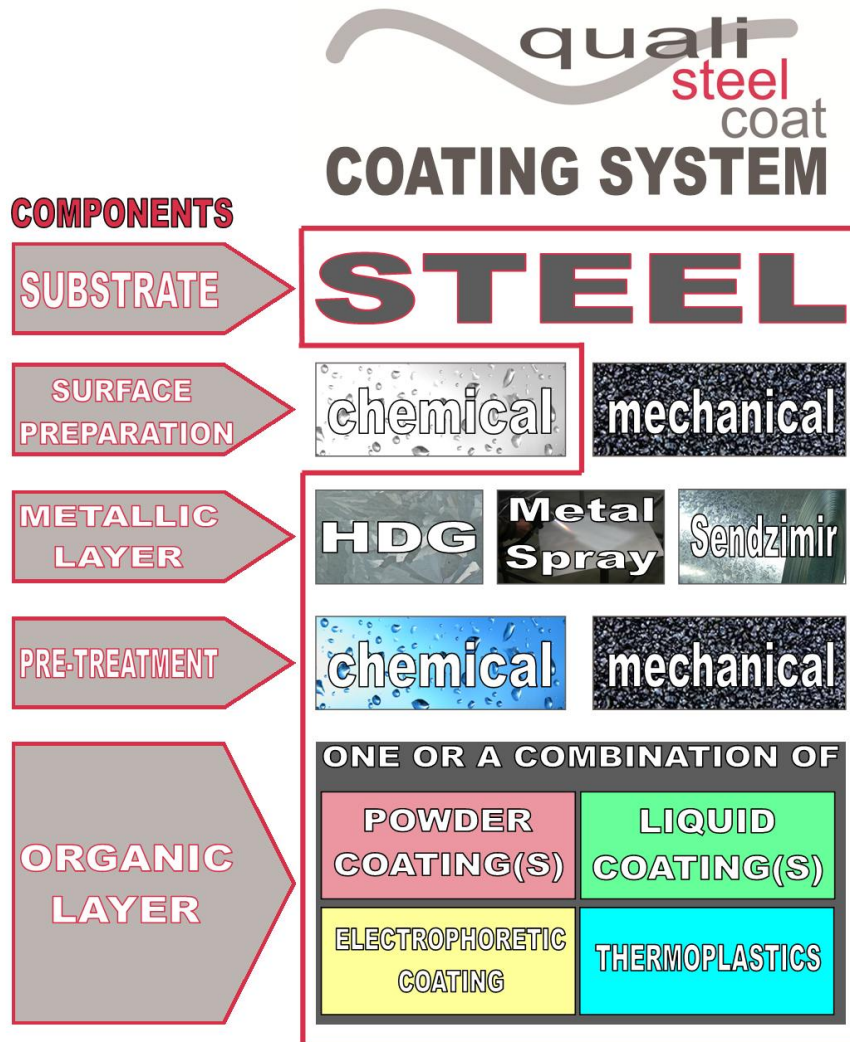


Chapter 7 APPROVAL OF COATINGS

7.1 Terminology of the process steps

In the following figure, the definition of the several preparations and layers is visual:



- The substrate is always STEEL
- Before the eventual application of a metallic layer, the surface is prepared in a mechanical or chemical way. For metal spray the surface is blasted. Galvanised steel is chemically prepared. This chemical preparation is not subject of the scope of the QUALISTEELCOAT-specifications. Some coating systems do not contain a metallic layer.
- Before the application of the organic layer, the substrate with or without the metallic layer, is always pre-treated. The pre-treatment is part of the whole coating system and is describes as a mechanical or chemical pre-treatment.
- The organic layer is one or a combination of one or more powders coatings, liquid coatings of has as a first layer a electrophoretic primer. The organic layer can also be a thermoplastic coating. The complete composition of the organic layer(s) is well defined in the QUALISTEELCOAT COATING SYSTEM.

7.2 Scope of the approval

In order to maintain optimal performance of the paint systems applied by the QUALISTEELCOAT licensed coating applicators, the quality of the coating supplied by coating manufacturers is tested. In this part of the specification, the test methods and acceptable test result limits are given.

A QUALISTEELCOAT COATING SYSTEM is defined by:

- The presence and the type of the metallic layer.
- Type of surface pre-treatment (chemical/mechanical)
- Number and type of organic layers
- Finish of the topcoat (gloss level and smooth/textured) cfr. Qualicoat.

7.3 Examples of coating systems

Examples of powder coating systems are given in Appendix 4.

Examples of liquid coating systems are given in accordance with ISO EN 12944-5.

7.4 Rules

Any change in the formula of the coating, for example bonding agent (resins and/or hardening agents), as well as additives, means that the product will be regarded as a new product, which, consequently requires separate QUALISTEELCOAT approval. Furthermore, the manufacturer must renew his application for approval should the visual appearance of the final coating show changes (textural or wood effect).

For liquid coating: The manufacturer must not use the approval for a smooth surface. The systems finished using a full colour are different from systems using MIO finishes. The stipulation of textures is subject to QUALISTEELCOAT-drafts.

Any organization may submit a coating system for approval. The applicant has to provide complete and accurate information of the system and the Corrosivity Category for which the system has been tested. The information to be provided includes details on the successive coating layers applied, film thickness and the product's data sheets. If QUALISTEELCOAT is satisfied that the test results comply with the Corrosion Category requirements in question, approval will be granted, stating the relevant Corrosion Category.

For powder coating, Qualisteelcoat approvals of multi-layer systems with Qualicoat-approved topcoats, can be extended. See 7.7.1.1. Additional Extensions of the approval of Coating Systems

From the 1st of January 2015, the licensees shall use QUALISTEELCOAT-approved powder coatings.

7.5 Laboratory

To have a coating system approved, an EN ISO 17025 accredited laboratory recognised by QUALISTEELCOAT must be requested to test the system. The laboratory will prepare the test panels. Technical data sheets and safety data sheets must be provided for all the coatings in the system. The systems are accepted in accordance with the corrosivity category stipulated by the applicant.

The laboratory submits the test report to the National Association. If there is no National Association in the country in question, the report will be sent to QUALISTEELCOAT. The Technical Committee evaluates the test report and decides whether the product will be granted approval. Approval is granted provided that the test results meet the requirements.

Should approval be withheld based on unsatisfactory test results, the manufacturer of the tested product will be informed in detail as to the reasons for withholding the approval.

Weathering resistant systems granted temporary approval will receive final approval upon receipt of satisfactory weathering test results. If not, the temporary approval is withdrawn.

7.6 Approval number

When approved, the system will obtain a QUALISTEELCOAT identification number with the addition of "PI" for interior coating systems, "PE" for exterior coating system, and the Corrosivity Category for which the system has been tested.

Certain test results from approved laboratories, collected to obtain other quality labels, may be used as test results for QUALISTEELCOAT. This only applies to artificial weathering and outdoor exposure tests.

The laboratory's test results related to obtaining approval from other quality assurance systems for the given coating systems may be used, provided that the tests conducted comply with these specifications.

A visit by the general licensee – or by QUALISTEELCOAT in countries without a national association – may be required. The applicant will pay the costs of such a visit.

7.7 Approvals of coatings

7.7.1. Approval of powder coating

7.7.1.1. Powder coating systems (Quick Guide)

Choice of the QUALISTEELCOAT Coating System

The powder supplier can only request an approval for a Coating System Type defined in the table in 7.7.1.1.b. (yellow fields)

He has to define precisely the system targeted and to describe the process used to coat the panels provided (Chemical pre-treatment or mechanical and complete pre-treatment process including pre-treatment process steps).

Coating Systems

Substrate (metallic and/or electroph. layer incl.)	Coating System Number	Numbre of organic layers (excl. Electrophoretic)	Type of Pre- treatment	Corrosivity Class Targeted (Only High for approval)			
				C2 H	C3 H	C4 H	C5 H
Steel	ST1	1 layer	Mechanical				
			Chemical				
	ST2	2 layers	Mechanical				
			Chemical				
	ST3	3 layers	Mechanical				
			Chemical				
Sendzimir	SZ1	1 layer	Mechanical				
			Chemical				
	SZ2	2 layers	Mechanical				
			Chemical				
	SZ3	3 layers	Mechanical				
			Chemical				
HDG	HD1	1 layer	Mechanical				
			Chemical				
	HD2	2 layers	Mechanical				
			Chemical				
	HD3	3 layers	Mechanical				
			Chemical				
Metal Spray	MS1	1 layer					
	MS2	2 layers					
Electrophoretic	EC1	1 layer	Chemical				
	EC2	2 layers	Chemical				

Additional extensions of the QUALISTEELCOAT APPROVAL

- For systems with one organic layer, the Qualisteelcoat-approval is only valid for the respective gloss category (cfr. Qualicoat categories) and finish (smooth or textured).
- For multi-organic layers, the Qualisteelcoat-approval can be valid for different Qualicoat-approved topcoats of the same supplier. Those Qualicoat-approvals (P-nrs) need to be communicated to the laboratory before granting an approval or the renewal.

7.7.1.2. Type of test panels

Test panels	Purpose	Substrate	Application	Dimensions
Type A	Mechanical tests	Test panels + Coating Systems	Applied by laboratory at lowest curing conditions (lowest temperature, lowest corresponding time according TDS)	105 x 190 x 0,75 mm (ref. GB26S/W/OC Etalon) Bare steel + zinc phosphate
Type B	Corrosion test	Substrate + Surface Preparation + Coating Systems	Applied by the powder supplier or by the laboratory	140 x 70 x 2 mm Type 12-03
Type C	Florida	EN AW5005 + Coating Systems	Applied by laboratory at lowest curing conditions (lowest temperature, lowest corresponding time according TDS)	300 x 100 x 2 mm

7.7.1.3. Required tests

For the initial approval, the following colour has to be tested: white, RAL 9010.

Test	Ref. QSC	Type panel	Norm	Requirements
Gloss	2-a-10	A	ISO 2813	see 2.3.4.10
Film Thickness of metallic and organic coatings	2-a-9	A, B, C	ISO 2808 + ISO 19840 + ISO 12944-5	According to system description
Adhesion	2-a-1	B	ISO 16276-2 + ISO 2409	0 - 1
Direct Impact Test	2-a-3	A + B	ISO 6272-1	> 2,5 Nm
Resistance to boiling water	2-b-3	B	EN 13438	See 2.3.4.15
Resistance to mortar(*)	2-b-2	B	ISO 2813	See 2.4.1.
Neutral Salt Spray Test Neutral Salt Spray Test	2-b-4	B	ISO 9227	See table 7.7.1.3.a. below
Resistance to continuous condensation	2-b-5	B	ISO 6270	See table 7.7.1.3.b. below
Resistance to humid atmosphere containing sulpherdioxide	2-b-7	B	ISO 3231	30 cycles only for C5I
Accelerated weathering test (*)	2-a-8	A	ISO 11341	See 2.4.6.
Natural weathering test Florida (*)	2-a-9	C	ISO 2810	See 2.4.7.
Determination of resistance to liquids	2-b-6	B	ISO 12944-6	only for C5I, see 2.4.4.

Table 7.7.1.3.a. Requirements for the Neutral Salt Spray tests for the approval of Powder Coatings.

	Coating System Type: ST1, ST2, ST3, EC1, EC2 (test with scribe)	Coating System Type: SZ1, SZ2, HD1, HD2, MS1, MS2 (test without scribe)
EXTERIOR C3H	No loss of adhesion, no blistering, no rust breakthrough, M ≤ 2 mm after 480 h	No loss of adhesion, no blistering, no rust breakthrough after 480 h
EXTERIOR C4H	No loss of adhesion, no blistering, no rust breakthrough, M ≤ 2 mm after 720 h	No loss of adhesion, no blistering, no rust breakthrough after 720 h
EXTERIOR C5H	No loss of adhesion, no blistering, no rust breakthrough, M ≤ 2 mm after 1440 h	No loss of adhesion, no blistering, no rust breakthrough after 1440 h

Table 7.7.1.3.b. Requirements for the Resistance to Continuous Atmosphere

C2 INTERIOR	120 h
C3 EXTERIOR	240 h
C4 EXTERIOR	480 h
C5 EXTERIOR	720 h

No loss of adhesion, no blistering, no rust breakthrough after the mentioned number of hours in the test cabinet.

7.7.1.4. Number of test panels Type B for the laboratory

This part describes the number test panels type B that are necessary to execute all tests.

Adhesion	1
Direct impact	1 (substrate not too thick)
Resistance to boiling water	3 (not necessary for metal sprayed panels)
Resistance to mortar	3 (not for Qualicoat approved topcoat)
Neutral Salt Spray test	6 for C5H, 5 for C4H, 4 for C3H
Resistance to continuous condensation	3 (for all categories)
Resistance to humid atmosphere containing sulpherdioxide	3 (only for C5I)
Resistance to liquids	9 (only for C5I)

Coating System Number	Substrate + metallic layer	Number of organic layers	Corrosivity Class Targeted					
			C2 H	C3 H	C4 H	C5M H	C5I H	
ST1	Steel	1 layer	14					
ST2 & ST3		Multi-layer	14	15	16			
SZ1	Sendzimir	1 layer	14	15				
SZ2 & SZ3		Multi-layer	14	15	16			
HD1	HDG	1 layer	14	15	16			
HD2 & HD3		Multi-layer	14	15	16	17	29	
MS1	Metal Spray	1 layer	11	12	13			
MS2		Multi-layer	11	12	13	14	26	
EC1	Electrophoretic	1 layer	14	15	16			
EC2		Multi-layer	14	15	16	17	29	

7.7.1.5. Renewal of Approval of Powder Coatings

Timing

Every (2) years, the supplier of the coating supplies the laboratory the necessary coating, test panels for the tests.

Tests

The tests to be executed are the same for the renewal as for the initial granting. A summary of these tests can be found in the required tests in 7.7.1.3..

Choice of colour and finish

Each two years, the WG Approval of PC defines the colour that has to be tested. Initial the rotations of RAL 9005, 7016, 6005 is foreseen.

If there are different QUALICOAT P-numbers under the QUALISTEELCOAT-approval, a rotation of the different P-numbers has to be done.

Procedure of renewal

The test report has to be submitted to QUALISTEELCOAT. The test report will be evaluated by the Technical Committee, which decides on renewal or withdrawal of the approval. In case the results of the tests meet the requirements, the approval is renewed. In case of non-compliance, the tests are repeated on samples taken from another batch. In case the second testing does not lead to satisfactory results, the approval is immediately withdrawn. The supplier of the tested product can submit a new application for approval but not within three months of the withdrawal.

7.7.2. Approval of liquid coatings

Under construction by Working Group Liquid Paints.

7.7.3. Approval of thermoplastics

Under construction by Working Group Thermoplastics.