



16th Edition of the QUALICOAT Specifications – Update Sheet – SPEC-US06

Subject: Reorganisation of the list of tests in Chapter 4

Specifications WG

Proposal/Request: When preparing the draft Update Sheets Nos. 4 and 5, the Specifications WG found that the numbering of the tests made it difficult to update Chapter 4. The proposal is to remove the numbers.

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Amendments to the Specifications:

- 4.1.3 Tests for granting an approval
- 4.1.7 Assessment of test results
- 4.2.1 Laboratory tests and Florida exposure
- 4.2.4 Assessment of the Florida test results
- Appendix A10 (removal of test numbers)

Author: Specifications WG
Pascale Bellot

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4.1.3 Tests for granting an approval¹

The following tests shall be made:

- Colour ([2.1.](#))
- 1) - Gloss ([2.2.](#))
- 2) - Coating thickness ([2.3.](#))
- 3) - Dry adhesion ([2.4.1](#))
- 4) - Indentation ([2.5.](#))
- 5) - Cupping test ([2.6.](#))
- 6) - Bend test ([2.7.](#))
- 7) - Impact test ([2.8.](#))
- 8) - Resistance to humid atmospheres ([2.9.](#))
- 9) - Acetic acid salt spray resistance ([2.10.](#))
- 10) - Accelerated weathering test ([2.12.](#))
- 11) - Polymerisation test ([2.14.](#))
- 12) - Resistance to mortar ([2.15.](#))
- 13) - Wet adhesion ([2.4.2](#))
- 14) - Condensation water test ([2.17.](#))
- 15) - Water spot test ([2.20.](#))
- Scratch and mar resistance test (Martindale) ([2.21.](#))
- 16) - Natural weathering (Florida) ([2.13.](#))

The tests shall be made on three test panels (for mechanical tests) and on three test samples (for corrosion tests) coated by a laboratory approved by QUALICOAT.

¹ A summary of tests and requirements for powder coatings is given in [Appendix A10.](#)

4.1.7 Assessment of test results

[...]

- If the results of all tests (excluding the natural weathering test) ~~tests 1 to 15~~ meet the requirements for all basic colours, the approval or extension shall be granted.
- If the results of all tests (excluding the natural weathering test) ~~tests 1 to 15~~ meet the requirements for the basic colours but not for the metallic one, an approval shall be granted for all colours excluding the metallic ones.
- If the results of any of the tests (excluding the natural weathering test) ~~1 to 15~~ on a basic colour do not meet the requirements, the manufacturer of the organic coating material tested shall be informed that no approval or extension can be granted for the time being, stating the details and reasons.
- If the results of all tests (excluding the natural weathering test) ~~tests 1 to 15~~ are satisfactory for the metallic colour but not for the basic colours, the manufacturer of the organic coating material tested shall be informed that no approval can be granted for the time being, stating the details and reasons.

The approval shall be confirmed if the results of ~~test 16~~ the natural weathering test in Florida are satisfactory for all basic colours.

[...]

4.2.1.1 Renewal of class 1 and class 1.5 approvals

Consistent quality of approved organic coating materials is monitored with all the tests ~~4 to 16~~ listed in § 4.1.3 being performed on two colours chosen from the three colours specified by QUALICOAT each year. One metallic colour specified by QUALICOAT (RAL 9006 and RAL 9007 alternately) shall also be tested every year if there is an extension for metallic colours.

4.2.1.2 Renewal of class 2 and class 3 approvals

Consistent quality of approved systems is monitored annually with all the tests ~~4 to 16~~ listed in § 4.1.3 being performed on two colours chosen from the three colours of the same RAL family² specified by QUALICOAT each year, excluding critical RAL colours³.

If a powder supplier himself considers a colour or a family specified by QUALICOAT to be critical, he shall inform QUALICOAT and this information will be mentioned on the approval certificate and be published on the QUALICOAT website. QUALICOAT will specify an alternative colour or family for the renewal.

One metallic colour specified by QUALICOAT (RAL 9006 and RAL 9007 alternately) shall also be tested every year if there is an extension for metallic colours.

² For a definition and list of RAL families, see [Appendix A11](#).

³ For a definition and list of critical colours, see [Appendix A11](#).

4.2.4. Assessment of the Florida test results

The Florida Working Group shall submit the test results to QUALICOAT.⁴

For classes 1 and 1.5

- The approval shall be renewed if the result of the natural weathering test in Florida (~~test 16~~) is satisfactory.
- If the result is unsatisfactory for one colour, the colour shall be banned.

For classes 2 and 3

- If the colour change result is unsatisfactory for two colours of the same RAL family, the RAL family shall be banned.
- If the gloss retention result is unsatisfactory for two colours of the same RAL family, only those two colours shall be banned.

If a manufacturer has failed for any reason to submit the required colours to the laboratory on time and if no samples were sent to Florida as a result, two renewal colours specified by the Florida Working Group and one metallic colour (if there is an extension for metallic colours) shall be banned.

⁴ See Procedure for the Florida test (PFLO).

A10 – Summary of requirements for the approval of organic coating materials (all classes)

TESTS	STANDARDS	QUALICOAT SPECIFICATIONS			
		CLASS 1	CLASS 1.5	CLASS 2	CLASS 3
COLOUR 2.1	ISO 11664-4	The colour deviation from the certified RAL card shall not be greater than the limit prescribed in Appendix A8.	Same as class 1	Same as class 1	Same as class 1
GLOSS 2.2	ISO 2813	Permissible variation from the nominal value specified by the coating supplier: Gloss cat. 1: 0 – 30 +/- 5 units Gloss cat. 2: 31 - 70 +/- 7 units Gloss cat. 3: 71 – 100 +/- 10 units	Same as class 1	Same as class 1	Same as class 1
COATING THICKNESS 2.3	ISO 2360	Minimum thickness = 60 µm None of the values measured may be less than 80% of the specified minimum value	Same as class 1	Same as class 1	Minimum thickness= 50 µm None of the values measured may be less than 80% of the specified minimum value
DRY ADHESION 2.4.1	ISO 2409	The result shall be 0.	Same as class 1	Same as class 1	Same as class 1
BUCHHOLZ INDENTATION 2.5	ISO 2815	Minimum 80 with the specified required coating thickness	Same as class 1	Same as class 1	Same as class 1
CUPPING TEST 2.6	ISO 1520	Minimum 5 mm Using normal corrected vision, the coating shall not show any sign of cracking or detachment.	Minimum 5 mm Using normal corrected vision, the coating shall not show any sign of detachment following the <u>tape pull adhesion test</u> .	Same as class 1.5	Same as classes 1.5
BEND TEST 2.7	ISO 1519	Using normal corrected vision, the coating shall not show any sign of cracking or detachment.	Using normal corrected vision, the coating shall not show any sign of detachment following the <u>tape pull adhesion test</u> .	Same as class 1.5	Same as classes 1.5
IMPACT TEST 2.8	ISO 6272 ASTM D 2794	Using normal corrected vision, the coating shall not show any sign of cracking or detachment.	Using normal corrected vision, the coating shall not show any sign of detachment following the <u>tape pull adhesion test</u> .	Same as class 1.5	Same as classes 1.5

TESTS	STANDARDS	QUALICOAT SPECIFICATIONS			
		CLASS 1	CLASS 1.5	CLASS 2	CLASS 3
RESISTANCE TO HUMID ATMOSPHERES 2.9	ISO 3231	<p>After 24 cycles No infiltration exceeding 1 mm on both sides of the scratch, and no change in colour or blisters in excess of 2 (S2) according to ISO 4628-2.</p>	Same as class 1	Same as class 1	Same as class 1
ACETIC ACID SALT SPRAY RESISTANCE 2.10	ISO 9227	<p>Testing time: 1000 hours</p> <p>RATING A = 3 samples ok, 0 not ok RATING B = 2 samples ok, 1 not ok RATING C = 1 sample ok, 2 not ok RATING D = 0 sample ok, 3 not ok</p> <p>Evaluation:</p> <p>A/B : test result satisfactory C: test result unsatisfactory (repetition of the AASS test) D: test result unsatisfactory (repetition of all laboratory tests)</p>	Same as class 1	Same as class 1	<p>Testing time: 2000 hours</p> <p>Evaluation: same as class 1</p>
ACCELERATED WEATHERING TEST 2.12	ISO 16474-2 (except for class 3)	<p>Exposure time: 1000 hours</p> <p>Gloss retention: at least 50%</p> <p>Colour change: according to the ΔE values stipulated in Appendix A7.</p>	<p>Exposure time: 1000 hours</p> <p>Gloss retention: at least 75%</p> <p>Colour change: not greater than 75% of the limits prescribed in Appendix A7</p>	<p>Exposure time: 1000 hours</p> <p>Gloss retention: at least 90%</p> <p>Colour change: not greater than 50% of the limits prescribed in Appendix A7</p>	<p>Exposure time: 3 years in Florida</p> <p>Gloss retention: at least 80%</p> <p>Colour change: not greater than 50% of the limits prescribed in Appendix A7</p>
POLYMERISATION TEST 2.14 OPTIONAL		<p>Ratings:</p> <p>1: very dull and quite soft coating 2: very dull coating which can be scratched with a finger-nail. 3: slight loss of gloss i.e. less than 5 units 4: no perceptible change. Coating cannot be scratched with a finger-nail.</p> <p>Evaluation:</p> <p>1/2: test result unsatisfactory 3/4: test result satisfactory</p>	Same as class 1	Same as class 1	Same as class 1
RESISTANCE TO MORTAR 2.15	EN 12206-1 par. 5.9	There shall not be any change in appearance/colour after the mortar test.	Same as class 1	Same as class 1	Same as class 1



TESTS	STANDARDS	QUALICOAT SPECIFICATIONS			
		CLASS 1	CLASS 1.5	CLASS 2	CLASS 3
WET ADHESION 2.4.2	ISO 2409	Using normal corrected vision, the coating shall not show any sign of blistering or detachment.	Same as class 1	Same as class 1	Same as class 1
CONSTANT CLIMATE CONDENSATION WATER TEST 2.17	ISO 6270	Testing time: 1000 hours No blistering in excess of 2 (S2) according to ISO 4628-2; the maximum infiltration at the cross is 1 mm.	Same as class 1	Same as class 1	Testing time: 2000 hours No blistering in excess of 2 (S2) according to ISO 4628-2; the maximum infiltration at the cross is 1 mm.
WATER SPOT TEST 2.20	---	Colour change The ΔL value shall be less than 4	Same as class 1	Same as class 1	Same as class 1
SCRATCH AND MAR RESISTANCE TEST (Martindale) 2.21	CEN/TS 16611	Gloss retention <ul style="list-style-type: none"> 40% for coatings with smooth appearance 60% for organic coatings with structured appearance 	Same as class 1	Gloss retention 30% for coatings with smooth appearance 60% for organic coatings with structured appearance	Same as class 2
NATURAL WEATHERING TEST (FLORIDA) (2.13)	ISO 2810	5° south 4 panels per colour shade Exposure time: 1 year Gloss retention at least 50% Colour change: The ΔE values shall not exceed the maximum values stipulated in Appendix A7 .	5° south 7 panels per colour shade Exposure time: 2 years with an annual evaluation Gloss retention After 1 year : at least 65% After 2 years : at least 50% Colour change: After 2 years: within the limits prescribed in Appendix A7a .	5° south 10 panels per colour shade Exposure time: 3 years with an annual evaluation Gloss retention After 1 year : at least 75% After 2 years : at least 60% After 3 years : at least 50% Colour change: After 3 years: within the limits prescribed in Appendix A7b .	45° south 10 panels per colour shade Exposure time: 10 years with an evaluation after 3 and 7 years Gloss retention After 3 years: at least 80% After 7 years :at least 55% After 10 years: at least 50% Colour change: After 3 years : max. 50% of the limits prescribed in Appendix A7 After 10 years: within the limits prescribed in Appendix A7c .