

Coatings on plastic and metal parts

Topcoats and painted parts for motorcycles

Requirements and tests

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Foreword

The German version is binding.

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This Group Standard has been coordinated with the responsible departments of the BMW Group. Author, approver and reviewer are stored in and can be retrieved from the TERE system master data.

Amendments

The following amendments have been made to GS 97079:2011-02:

- Group Standard completely revised.

Previous editions

GS 97079: 2011-02

1 Scope and purpose

This Group Standard applies to all topcoats and painted parts for motorcycles.

This Group Standard specifies the quality requirements, tests, and release.

Topcoat refers to basecoats, clearcoats, single-coat topcoats, and pinstriping paint as single or multilayer coatings. This applies to both liquid paints and powder coatings.

2 Normative references

This Group Standard incorporates provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. The respective latest edition of the publication is applicable.

AA-0012	Discharge batch release of process materials
AA-0026	Aging resistance test
AA-0032	Evaluation of perforated technological panels by support of finger print method
AA-0054	Resistance of surfaces to car-wash machines
AA-0055	Chemical resistance test of surfaces
AA-0074	Non volatile components (solid content, ash, pigment content)
AA-0079	Determination of multi impact stone chip resistance
AA-0098	Determination of pH-value
AA-0101	Reflectometer value (gloss)
AA-0103	Determination of dry hiding power of base coats, primers and coating materials
AA-0129	CASS testing (copper chloride-acetic acid salt spray testing)
AA-0134	Dry scratch resistance test using crockmeter
AA-0136	Testing of resistance to pressure water jet (steam jet test)
AA-0137	Density determination
AA-0157	Preparation of panels for fingerprint analysis
AA-0161	Colour measurement on bodies and hang on parts
AA-0165	Non-volatile components, dry film density, unit consumption, VOC, volume solids
AA-0171	Outdoor weathering of coatings at Florida, USA
AA-0180	Cross hatch testing
AA-0213	Condensation water constant atmosphere test
AA-0224	Cyclic corrosion test

AA-0235	Accelerated weathering crack stability
AA-0254	Filmbuild measurement (Eddy current procedure and magnetic inductive procedure)
AA-0317	Determination of rest humidity of waterborne basecoat materials
AA-0318	Change in recipes or production site of process materials
AA-0324	Saltspray-test
AA-0340	Scalpel cut on CFK-parts with clear coating
AA-0361	Pot life of multi component lacquer
AA-0400	Determining paint material viscosity
AA-0403	Visual color comparison and metamerism test
AA-0550	Sagging behavior and popping properties of basecoats and clearcoats
AA-0588	Outdoor weathering of coatings at Regensburg and Dingolfing
AA-0612	Filiform corrosion test
DIN EN ISO 2431	Paints and varnishes; Determination of flow time by use of flowcups
DIN EN ISO 2719	Determination of flash point; Pensky-Martens closed cup method
DIN EN ISO 2808	Paints and varnishes; Determination of film thickness
DIN EN ISO 6603-2	Plastics; Determination of puncture impact behaviour of rigid plastics; Part 2: Instrumented puncture test
DIN EN ISO 15091	Paints and varnishes; Determination of the electrical conductivity and resistance
DIN EN ISO 16276-2	Corrosion protection of steel structures by protective paint systems; Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating; Part 2: Cross-cut testing and X-cut testing
GS 94006	Paints and varnishes; Clearcoat; Requirements and tests
PR 303.5	Alternating climate test for trim parts

3 Abbreviations

2K	Two-component
AA	Working instructions
BC	Basecoat
CFRP	Carbon fiber reinforced plastic
DS	Steam jet
GT	Cross hatch test
Gt	Unit for evaluation of the GT result
i.O.	OK
CH	Condensation-water atmosphere with constant humidity
E-coat	Cathodic dip coat
KW	Unit for visual evaluation
KWT	Alternating climate test
SI	Supplier integrator
N	Unit for evaluation of the ST result
n.i.O.	not Okay
NPE	Nonylphenol ethoxylate
NxP	N-organyl-pyrrolidone
OPE	Octylphenol ethoxylate
QMT	Quality Management Parts
ST	Stone chipping / multi-impact test
TWA	Technology Material and Process Analysis
UV	Ultraviolet

4 General

Paint materials shall always be considered to be semi-finished goods. The properties of a painted surface depend not only on the liquid paint or powder coating materials used, but also on how these are processed. Thus, the qualification of paint materials is subdivided into two consecutive steps:

- a) basic testing of the paint material. If results are positive, BMW will issue a basic approval;
- b) initial sample testing of painted parts (testing the coating). If results are positive, BMW will issue an initial sample parts approval.

Basic testing (a) comprises several individual tests and is carried out using painted test plates that are coated by the relevant paint manufacturer. A basic approval can be issued if a paint material meets the requirements specified in this Group Standard for its respective paint category. This is a prerequisite for paint line trials using real parts in production systems and conducted under series or near-series conditions.

The subsequent initial sample testing (b) also comprises several individual tests and is carried out on the resulting test parts. During random process monitoring, coated parts from the running (pre-) series undergo the same individual tests that are conducted during the initial sample test.

The test certificates are attached as annexes to this Group Standard. These specify the relevant individual tests that shall be performed for the:

- a) basic tests for each paint material category and
- b) initial sample tests (part coating tests) for each substrate category (i.e. for each blank material).

The data sheets are also attached as annexes. The liquid paint data sheets serve to define the new paint materials on the basis of physical measured values. The entire paint system and important process parameters shall be documented in the part identification data sheets.

The following basic test programs and data sheets are specified in the test certificates:

- | | |
|--|-----------|
| – Basic test for basecoats | (Annex A) |
| – Liquid paint data sheet for basecoats | (Annex B) |
| – Basic test for clearcoats | (Annex C) |
| – Liquid paint data sheet for clearcoats | (Annex D) |
| – Basic test for single layer topcoats | (Annex E) |
| – Basic test for UV-resistant E-coats | (Annex F) |
| – Basic test for powder topcoats | (Annex G) |
| – Basic test for powder clearcoats | (Annex H) |
| – Basic test for pinstriping paint | (Annex I) |
| – Coatability of new thermoplastics | (Annex J) |
| – Identification data sheet for new painted thermoplastics | (Annex K) |

The following initial sample test programs and data sheets are specified in the test certificates:

- | | |
|---|-----------|
| – Initial sample testing of painted thermoplastic parts | (Annex L) |
| – Identification data sheet for painted thermoplastic parts | (Annex M) |
| – Initial sample testing for painted metal parts | (Annex N) |
| – Identification data sheet for painted metal parts | (Annex O) |
| – Initial sample testing for painted CFRP parts | (Annex P) |
| – Identification data sheet for painted CFRP parts | (Annex Q) |
| – Initial sample testing of pinstriped parts | (Annex R) |
| – Identification data sheet for pinstriped parts | (Annex S) |

The test certificates and data sheets depicted in this Group Standard are solely for the purpose of exemplifying information. They make no claim to be current, and they cannot be used to enter measured values. The latest test certificates for entering values are available from the TWA as Excel files.

5 Basic test for paint materials

5.1 Test specimens

Flat test plates with a first-coat (and a second-coat if this is required by the relevant test certificate) are used as test specimens. The minimum number of test plates and test plate measurements that are required for each individual test are taken from the attached test certificates. We recommend coating at least twice the number of test plates to use as spares (e.g. for any cross-checking by BMW).

Test plates made from thermoplastics, CFRP, or metal can be used for 80 °C paint systems. The substrate selected shall be agreed upon beforehand with the TWA and shall be listed on the completed test certificate. No thermoplastic plates shall be used for paint systems with drying temperatures higher than 80 °C. Test plates for paint adhesion testing shall have an appropriate paint build-up (e.g. an appropriate primer shall be used that is also listed properly on the test certificate).

If series paint materials (e.g. primers or clearcoats) are also used when coating the test plates, the specifications of the corresponding technical data sheets shall be taken into account when they are being processed. Unless otherwise agreed with BMW, new paint systems for which there are currently no binding processing instructions available shall be presented to BMW using standardized process parameters for equivalent test plates. The paint manufacturer shall document all process parameters used and store this information in-house.

Details concerning the test plates shall be requested from the TWA.

5.2 Test system

During climatic stress and paint adhesion testing on both test plates and painted parts, the following mainly paint-material-specific properties are determined exclusively as part of a basic test:

- UV resistance in accordance with AA-0235;
- chemical resistance in accordance with AA-0055 (does not apply to paint coats underneath clearcoats);
- dry scratch resistance in accordance with AA-0134 (does not apply to matt clearcoats, matt single layer topcoats or paint coats underneath clearcoats).

These tests shall be performed only once for each paint material, providing that their composition does not change. They shall always be carried out on painted test plates, because parts do not possess the flatness required for these tests.

Each basic test certificate specifies further tests that are to be performed on painted test plates. The results of these are influenced to a greater extent by the process parameters or substrate selected.

5.3 Storage period/Sample conditioning

The paint shall have cured completely before the start of testing. Paint coats with a baking temperature below 120 °C shall therefore be stored for a minimum of 168 h (7 days) at room temperature. 48 h at room temperature are sufficient for systems baked at temperatures exceeding 120 °C.

5.4 Responsibilities

Usually, the paint manufacturer produces the test plates and conducts the basic test. They also enter the actual values into the corresponding test certificate and, if necessary, enter the target values into the liquid paint data sheet. The tested test plates and completed test certificate or data sheet shall be presented to the TWA. If the results are positive, the TWA will issue a basic approval. This is documented in the corresponding TWA test report.

5.5 Letter of confirmation

The prerequisites for the issuing of a basic approval also include confirmation of the following, which the paint manufacturer shall submit in writing to the TWA:

- confirmation that the material is free from NxP and OPE/NPE content (applicable only to liquid paints);
- verification of natural weathering results for the components used in accordance with AA-0171 (test duration of 1,5 years);
- confirmation that the paint formulation contains only non-fluorescing components.

5.6 Obligation to disclose changes

The TWA shall be informed prior to implementing planned changes to the paint formulation or to the production process of paint materials that have already been issued a basic approval (see AA-0318).

6 Initial sample testing of painted parts

6.1 Test specimens

Painted parts are used as test specimens. The corresponding test certificates in the attachment comprise the individual tests that shall be carried out on the initial near-series test parts (initial samples) or on parts from running series production. The topcoat materials used for these shall have been granted basic approval or be listed in the corresponding process specifications.

The design drawing specifies the part material (substrate). The correct cleaning, pretreatment and subsequent paint system shall be selected for the substrate in accordance with the relevant process specification.

The coatability of new plastic substrates shall be verified in accordance with the test certificate (Annex J) before further specifications are defined.

If there are process steps during series production, which are carried out after the coating process and which can change the coated surface in places, it shall be ensured that the test specimens have undergone these process steps as well before the tests are carried out. One such possible process step is machining, including the cooling lubricant used.

The operator shall specify the number of parts to be tested during paint testing, qualification, or a series-qualification test-run. For purchased parts, this may necessitate coordination with the QMT or supplier integrator. Validation of the different parts positions on the skid shall be taken into account. If the relevant blanks for future series production are not yet available at the time the first paint test is carried out, series production blanks which are identical in terms of their substrate and shaped as similarly as possible shall be used instead.

If possible, parts with different geometries shall be used for paint testing in order to identify possible weaknesses of a new paint material at an early stage.

Unless otherwise specified, the coating thickness interval specified in the manufacturer's technical data sheet shall be observed for each paint material used. The maximum total coating thickness specified in the relevant process specification shall not be exceeded. Furthermore, possible deviations of part-specific information on the drawing, or in the requirements specification or quality specification shall also be taken into account.

The color shall correspond to the currently valid color reference (usually the master sample) within its tolerances. When repairing a part by recoating, only colors of the same color groups may be painted over each other.

6.2 Test system

The functional properties (paint adhesion, behavior under climatic stress, and corrosion behavior if applicable) of the overall composite of the paint system and substrate are tested.

The test results depend on the paint materials used and also on the substrate, the pretreatment parameters and the coating process parameters. Thus, the required tests shall be repeated when fundamental changes are made to these influential parameters, see section 6.5.

Contrary to the basic test, these tests shall be carried out on a continual basis during process monitoring throughout series production, instead of only once.

6.3 Storage period/Sample conditioning

The paint shall have cured completely before the start of testing. Paint coats with a baking temperature of less than 120 °C shall therefore be stored for a minimum of 168 h (7 days) at room temperature. 48 h at room temperature are sufficient for systems baked at temperatures exceeding 120 °C.

6.4 Responsibilities

The parts supplier(s) carry out the initial sample testing of painted purchased parts, enter the actual values into the corresponding test certificate, and complete the part identification data sheet. If the parts supplier is not able to carry out the required individual test, they can contract this out to an accredited third-party testing laboratory. The QMT or supplier integrator responsible for the part issues the approval for painted purchased parts.

The TWA carries out the initial sample testing of painted in-house parts and enters the actual values into the corresponding test certificate. This requires the associated completed part identification data sheet, which the creator of the testing request shall submit to the TWA.

The approval of painted in-house parts is issued by the TWA using the associated TWA testing report, which also includes the test certificate.

6.5 Obligation to disclose changes

Changes to the coating process, such as the relocation to a new production site, changing the sub-supplier, or changes to the substrate shall be disclosed and require the retesting of the corresponding parts. The precise test scope for validation depends on the intended changes. If in doubt, the TWA shall be contacted for in-house parts, or the relevant QMT or supplier integrator for purchased parts.

The purchased parts supplier shall carry out this process validation and communicate this to the relevant QMT or supplier integrator before the change runs into series production. The relevant in-house specialist departments shall be informed in the case of in-house parts.

6.6 Parts with repair coatings

If a repair coating of faulty parts via complete re-coating using identical colors or the same color group has been planned for running series production, double-coated or multi-coated parts shall be validated using the same functional tests as for the first-coating. The same applies to partial repairs using first-coat or special repair materials. The latter shall also have been issued a basic approval as well as the first-coat materials.

6.7 Visual evaluation

Visual criteria such as the color and leveling (paint waviness) can be measured using the appropriate devices. However, the visual evaluation should be decisive, as the measured values taken from significantly bent surfaces can be inaccurate or impossible to determine due to the shape of the majority of motorcycle parts. In particular, painted series production parts shall be regularly compared to the color master sample to ensure color match.

6.8 Evaluation after thermal stress

Possible deformations of painted parts after climatic testing that involves heating the part shall not be evaluated, because the part was heated on its own and not in the installed condition or while in an appropriate bracket.

6.9 Transferability of initial sample test results

Test results cannot be transferred from one plastic substrate type to another in the case of paint systems on plastic substrates without a primer, i.e. basecoat or topcoat applied directly (primerless). For the initial sample test, such parts shall be tested in a manner that is strictly substrate-specific.

When introducing a new basecoat or topcoat, OK initial sample test results can be carried over to other plastic substrates only if the following prerequisites are met:

- the new paint system was tested on a part from a series plastic substrate type;
- the parts undergo a painting process using a series plastics primer;
- the parts made of other plastic substrate types are already in series production and undergo the same painting process, i.e. they have already been validated in conjunction with other basecoats or topcoats.

Final validation of these parts made from other plastic substrate types shall take place no later than the quality controls conducted during series production.

Test results cannot be carried over from one alloy to another in the case of paint systems on metal substrates without a primer and without E-coat, i.e. direct application of a basecoat or topcoat onto the passivation layer.

When introducing a new basecoat or topcoat, OK initial sample test results can be carried over to other alloys only when the following prerequisites have been met:

- the new paint system has been tested on a part made from a series production alloy;
- the parts undergo a coating process using series production pretreatment or passivation;
- the parts undergo a coating process using series production E-coat and/or primer;
- the parts made of other alloys are already in series production and undergo the same coating process, i.e. they have already been validated in conjunction with other basecoat or topcoats.

The carrying over of test results always requires the prior agreement of the TWA.

6.10 Corrosion testing of parts

After a corrosion test has been completed, it can be assessed whether the paint system adequately protects a metal substrate against corrosion. When introducing a new basecoat or topcoat, a corrosion test does not need to be carried out if the following prerequisites are met:

- the parts undergo a process chain using series production E-coat and/or primer;
- parts from the same process chain and with an identical substrate have already passed a corrosion test in conjunction with other topcoat systems.

However, in the case of paint systems without E-coat and without a primer (e.g. powder coated passivated cast alloy parts), the corrosion test shall be carried out using an appropriately coated part whenever a new basecoat or topcoat is to be introduced. The same applies whenever the substrate, passivation, E-coat, or the primer is changed (the latter applying only to paint systems without E-coat).

To fulfill the requirements of this Group Standard in terms of corrosion resistance, alloys shall be used for aluminum parts whose maximum copper content does not exceed 0,6 % (nominal value: 0,5 % plus tolerances).

However, aluminum parts that require a higher copper content due to design or production-related state-of-the-art reasons (e.g. in order to realize thinner wall thicknesses by means of high-pressure die casting procedures), shall either be anodized or primed prior to applying the topcoat. The requirements relating to the corrosion resistance of such parts shall be specified in a part-specific manner on the corresponding drawing. The TWA shall be contacted in the event of questions.

CFRP parts shall undergo corrosion testing only when they contain glued in or laminated metal parts. In this case, the corresponding corrosion test serves solely to test for any possible contact corrosion (metal to CFRP) and not to determine the corrosion resistance of the metal part in question.

6.11 UV tests for special paint systems

It is possible that topcoat systems on UV-sensitive substrates (e.g. epoxy-based substrates, E-coat or primers) have a too high UV transmission. Thus, they shall be tested separately on the original substrate for 1 500 h in accordance with AA-0235, unless:

- a primer that is not UV-sensitive has been applied between the topcoat layer(s) and the UV-sensitive substrate;
- the same paint system has already been validated in accordance with AA-0235 for another part that is not necessarily process-identical. In the case of a UV-sensitive substrate, the other part shall have the same substrate;
- the part in question is installed in the vehicle in a position that shields it from direct UV exposure (e.g. underneath a cover).

In order to correctly carry out a UV resistance test of such systems, test plates made of metal or substrate-identical CFRP with a paint system that is identical to that used on the part shall be used instead of actual parts.

6.12 Pinstriped parts

Pinstriping can be either on top of or underneath the topmost clearcoat layer. The relevant test certificate refers to parts whose pinstriping is painted and not affixed, i.e. not made of tape or foil.

X-cuts (cross-shaped cuts) shall be applied in the center of the pinstriping instead of crosshatch cuts.

The tests listed in the relevant test certificate (Annex R) are solely for the purpose of validating pinstriping. The full-surface, actual part coating shall be tested in accordance with the appropriate, substrate-specific test certificate.

It is sufficient to subject each test part only once to the climatic stresses in accordance with the test certificate for both validations. During the subsequent destructive adhesion tests, it shall be ensured that these are carried out in the appropriate areas (i.e. both on the pinstriping and on the areas that do not have pinstriping).


7 Batch test certificate

At the start of delivery to series production, all paint suppliers are obliged to create a batch test certificate for every batch produced that is delivered to BMW Motorrad and to present this to the TWA in accordance with AA-0012.


In the case of regular delivery to suppliers of BMW Motorrad, the supplier (parts supplier or sub-supplier/coater) and the paint manufacturer shall discuss and agree the procedure for batch test certificates.

A (Annex normative) Basic test for basecoats


Test Certificate for Motorcycle Basecoats: Basic Tests on Test Plates (Annex A)															
Plate No.	Size mm	No. of Plates	Test Criteria	Tests to be Performed											
				Plate 1			Plates 1 and 2		Plate 3		Plate 4				
			Standard Coating Build-up (Single Basecoat): Coating Thickness-Dependent Properties The appropriate gray shade (light/dark) of the undercoat (e.g. coil coating) shall be selected according to the color and documented.	Black-and-White Dry Hiding Power AA-0103		Color Stability AA-0032		Leveling/Waviness Visual evaluation		Popping Limit AA-0550		Sagging Limit AA-0550			
1	570 x 300	1	FAS test plate (basecoat wedge + series 2K clearcoat (constant process coating thickness)), manufactured in accordance with AA-0157	TARGET: Below the popping or sagging limits	(ACTUAL) µm	Measurably stable from	(ACTUAL) µm	OK from:	(ACTUAL) µm						
2	570 x 300	1	FAS test plate (basecoat: Constant process coating thickness + series 2K clearcoat wedge), manufactured in accordance with AA-0157: Only after prior agreement with BMW (e.g. in the case of coarse granular special-effect substances)					OK from:	(ACTUAL) µm						
3	570 x 300	1	Popping/sagging test plates (basecoat wedge + series 2K clearcoat (constant process coating thickness)), manufactured in accordance with AA-0550							TARGET ≥ (ACTUAL value for black-and-white hiding power)	(ACTUAL) µm	TARGET ≥ (ACTUAL value for black-and-white hiding power)	(ACTUAL) µm		
				Plate 1			Plates 1 and 2		Plates 1 to 3		Plate 4				
			Applicable Only to Dual Basecoat Paint Systems (BC1 ≠ BC2): Coating Thickness-Dependent Properties The appropriate gray shade (light/dark) of the undercoat (e.g. coil coating) shall be selected according to the color and documented.	Black-and-White Dry Hiding Power AA-0103		Color Stability AA-0032		Leveling/Waviness Visual evaluation		Popping Limit AA-0550		Sagging Limit AA-0550			
1	570 x 300	1	FAS test plate (BC1 wedge + BC2 (constant process coating thickness) + series 2K clearcoat (constant process coating thickness)), manufactured in accordance with AA-0157	TARGET: Below the popping or sagging limits	(ACTUAL) µm	Measurably stable from	(ACTUAL) µm	OK from:	(ACTUAL) µm						
2	570 x 300	1	FAS test plate (BC1 (constant process coating thickness) + BC2 wedge + series 2K clearcoat (constant process coating thickness)), manufactured in accordance with AA-0157			Measurably stable from	(ACTUAL) µm	OK from:	(ACTUAL) µm						
3	570 x 300	1	FAS test plate (BC1 + BC2: Constant process coating thickness + series 2K clearcoat wedge in each case), manufactured in accordance with AA-0157: Only after prior agreement with BMW (e.g. in the case of coarse granular special-effect substances in BC2)					OK from:	(ACTUAL) µm						
4	570 x 300	1	Popping/sagging test plate (BC1 wedge + BC2 (constant process coating thickness) + series 2K clearcoat (constant process coating thickness)), manufactured in accordance with AA-0550							TARGET ≥ (ACTUAL value for black-and-white hiding power)	(ACTUAL) µm	TARGET ≥ (ACTUAL value for black-and-white hiding power)	(ACTUAL) µm		
			Process Coating Thickness	Application/Process Window AA-0032		Application/Process Window AA-0032									
			Determined process window for the dry film (min./max.). Details for BC2 applicable only in the case of double basecoat paint systems (BC1 ≠ BC2)	BC1 minimum (ACTUAL) µm BC1 maximum (ACTUAL) µm		BC2 minimum (ACTUAL) µm BC2 maximum (ACTUAL) µm									
			Cloudiness Not applicable to single shade / solid colors	Cloudiness AA-0032 (visual evaluation)											
5	570 x 300	1	First-coat test plate. Coating build-up: (Please enter the substrate material and any applied primer here.)	TARGET ≤ Group 3 (ACTUAL)											
			Color Consistency Comparison between first-coat and second-coat (re-coated). Compare with master sample as well when rematching the color.	Color AA-0403 (visual evaluation)		Metamerism AA-0403 (visual evaluation)									
6	200 x 100	1	First-coat test plate: Coating build-up: (Please enter the substrate material, series primer and series 2K clearcoat here.)	TARGET ≤ KW 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ KW 1	(ACTUAL first-coat) (ACTUAL second-coat)								
7	200 x 100	1	Second-coat test plate: same basecoat and clearcoat as for first-coat test plate. Re-coat after max. 72 h, without sanding or priming in-between.												
			UV Accelerated Weathering in Accordance with AA-0235 Duration: 1 500 h. Test in coordination with the TWA at the paint manufacturer, at an external testing laboratory, or at BMW.	Surface Defects Visual evaluation after UV test: Blisters, cracks, leveling, gloss level, etc.		Color AA-0403 Comparison of visual evaluations before and after UV test:		Crosshatch Cut (GT) AA-0180 After UV test							
8	200 x 100	1	First-coat test plate: Coating build-up: (Please enter the substrate material, series primer and series 2K clearcoat here.)	TARGET = No or negligible change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)	TARGET ≤ Gt 1	(ACTUAL)						
			Paint Adhesion and Climatic Stress Testing of the overall composite comprising the substrate and paint system	Plates 9a and 10a Condensation-Water Atmosphere with Constant Humidity (CH) AA-0213 (Duration: 240 h)				Plates 9b and 10b Aging (Only on Plastic Plates) AA-0026 (Duration: 48 h at constant 100 °C)				Plates 9c and 10c Alternating Climate Test (KWT; Only on Plastic Plates) PR 303.5d (Duration: 240 h)		Plates 9d and 10d Stone Chipping (ST) AA-0079	Plates 9e and 10e Steam-Jet test (DS) AA-0136
				Crosshatch Cut (GT) AA-0180 Before CH		Surface Defects Visual evaluation 1 h/24 h after CH: Blisters, cracks, leveling, gloss level, etc.		Crosshatch Cut (GT) AA-0180 3 h after aging		Surface Defects Visual evaluation 3 h after aging: Blisters, cracks, leveling, gloss level, etc.		Crosshatch Cut (GT) AA-0180 Visual evaluation		Evaluation of the paint delamination	
9	200 x 100	5	First-coat test plate: Coating build-up: (Please enter the substrate material, series primer and series 2K clearcoat here.)	TARGET ≤ Gt 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET = No or negligible change	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ Gt 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET = No or negligible change	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ Gt 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET = No or negligible change	(ACTUAL first-coat) (ACTUAL second-coat)
10	200 x 100	5	Second-coat (= re-coated) test plate: same basecoat and clearcoat as for first-coat test plate. Re-coat after max. 72 h, without sanding or priming in-between.									TARGET ≤ N 2.5	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ 1 mm	(ACTUAL first-coat) (ACTUAL second-coat)
			The GT, ST, CH, Aging, KWT and DS tests are each performed on one first-coat test plate and one second-coat (re-coated) test plate. Metallic materials shall not be used for the test plates for tests conducted in accordance with AA-0026 (Aging) or PR 303.5d. If the evaluation is not OK 1 h after CH (AA-0213), the individual test or evaluation that returned not OK results shall be repeated 24 h after CH. The second test result is then valid.	Crosshatch Cut (GT) AA-0180 1 h/24 h after CH		Color AA-0403 Comparison of visual evaluations before and 1 h/24 h after CH		Stone Chipping (ST) AA-0079 3 h after aging		Color AA-0403 Comparison of visual evaluations before and 3 h after aging		Stone Chipping (ST) AA-0079		Color AA-0403 Comparison of visual evaluations before and after KWT	
				TARGET ≤ Gt 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ KW 2	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ N 2.5	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ KW 2	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ N 2.5	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ KW 2	(ACTUAL first-coat) (ACTUAL second-coat)
The substrate material for test plates 5–10 (metal or plastic) shall be discussed and agreed on beforehand with the TWA.															



B (Annex normative) Liquid paint data sheet for basecoats

 BMW Motorrad	Liquid Paint Data Sheet for Motorcycle Basecoats (Annex B)				
	General Data			Waterborne Basecoat (WBC)	Solventborne Basecoat (SBC)
Paint Manufacturer					
Color					
BMW Color Code					
Formula Number					
Effect Pigment Group					
Batch Number					
First Application (Plant or Site/Painting Line)					
Physical Wet Material Properties					
Test Standard	Properties	Unit	Target Value	WBC Actual Value	SBC Actual Value
AA-0400	Application viscosity	mPas	1/2		
AA-0098	pH value (waterborne basecoat)		1/2		-
DIN EN ISO 2719	Flashpoint (waterborne basecoat)	°C	≥ 55		-
DIN EN ISO 2719	Flashpoint (solventborne basecoat)	°C	≥ 21	-	
AA-0137	Wet paint density at 20 °C	g/ml	1/2		
AA-0165	VOC content, without water	lb/gal	1/2		
AA-0165	VOC content, with water	lb/gal	1/2		-
AA-0074	Solid content in delivery viscosity	Wt. %	1/2		
AA-0165	Solid volume in delivery viscosity	Vol %	1/2		
Manufacturer's specification	Coverage amount for 100 % coverage	g/m ²	1/2		
AA-0165	Unit consumption	g/(μm x m ²)	1/2		
AA-0165	Dry film thickness	g/cm ²	1/2		
AA-0317	Residual moisture before applying clearcoat	Wt. %	1/2		-
Manufacturer's specification	Storage stability	Months	≥ 6		
1) Shall be specified by the paint manufacturer					
2) Final target values are specified in the batch test certificate after the third batch. The values are not retroactively carried over to the test certificate.					


C (Annex normative) Basic test for 2K clearcoats

 BMW Motorrad	Test Certificate for 2K Clearcoats for Motorcycles: Basic Tests on Test Plates (Annex C)								
	Tests shall be conducted in accordance with GS 94006, Annexes C.1 and C.2, unless otherwise agreed with the TWA.								
	The corresponding test certificates shall be completed (available from the TWA).								
	When doing so, the following changes to GS 94006, Annexes C.1 and C.2, shall be taken into account:								
Scratch Resistance	Car wash brush in accordance with AA-0054:				Omitted				
Weathering	Outdoor weathering in accordance with AA-0588:				Omitted				
	Outdoor weathering (AA-0171), test duration:				1,5 years				
	Xenon test (AA-0235), test duration:				1 500 h				
	Puncture Impact Behavior				Test in accordance with DIN EN ISO 6603-2: Omitted				
Aging	Test in accordance with AA-0026, duration/temp.:				48 h/100 °C				
Chemical Resistance	Test in accordance with AA-0055 (adapted for motorcycles):								
Resistance against Super E10 Fuel (Altered Method 1)									
5 min at RT: Trickling from a burette onto the tilted test plate				30 s trickling at RT; however, test plate warmed at 80 °C for 30 min beforehand					
TARGET ≤ Grade 2		(ACTUAL)		TARGET ≤ Grade 2		(ACTUAL)			
Resistance against Operating Supplies (Method 2)									
BMW Engine and Cold Cleaner		BMW Motorcycle Cleaner			BMW Engine Oil SAE 15W-50		BMW brake fluid DOT 4 LV		
TARGET ≤ Grade 2		(ACTUAL)		TARGET ≤ Grade 2		(ACTUAL)		TARGET ≤ Grade 3	(ACTUAL)
Testing in Gradient Oven (Method 6)									
Sulphuric acid 1 %		Hydrochloric acid 10 %			Sodium hydroxide 5 %				
TARGET ≥ 40 °C		(ACTUAL) °C		TARGET ≥ 40 °C		(ACTUAL) °C		TARGET ≥ 40 °C	(ACTUAL) °C

D (Annex normative) Liquid paint data sheet for clearcoats


Liquid Paint Data Sheet for Motorcycle Clearcoats (Annex D)					
BMW Motorrad		General Data	Component A (wet clear paint)	Component B (hardener)	
Paint Manufacturer					
Material Designation					
Formula Number					
Batch Number					
Mixing Ratio (Wt)					
Mixing Ratio (Vol.)					
First Application (Plant or Site/Painting Line)					
Chemical and Physical Wet Material Properties					
Test Standard	Properties	Unit	Target Value	Tolerance	Actual Value
AA-0400	Delivery viscosity (component A)	mPas	≤ 130	± 5	
DIN EN ISO 2431	Delivery viscosity (component A)	s			
AA-0165	Solid volume (component A in delivery viscosity)	Vol%		± 5	
AA-0074	Solid volume (component A in delivery viscosity)	Wt.-%		± 5	
Manufacturer's specification	Storage stability (component A)	Months	≥ 6		
AA-0400	Delivery viscosity (hardener)	mPas		± 5	
DIN EN ISO 2431	Delivery viscosity (hardener)	s			
AA-0137	Density at 20 °C (hardener)	g/ml			
AA-0165	Solid volume (hardener in delivery viscosity)	Vol%		± 5	
AA-0074	Solid content (hardener in delivery viscosity)	Wt.-%		± 2	
Manufacturer's specification	Storage stability (hardener)	Months	≥ 6		
Manufacturer's specification	Isocyanate content (hardener)	Wt.-%		± 0,4	
DIN EN ISO 15091	Electrical resistance (ready-to-spray mixture)	kΩ	> 350		
AA-0074	Solid content (ready-to-spray mixture)	Wt.-%	≥ 46		
AA-0400	Application viscosity (ready-to-spray mixture)	mPas		± 5	
DIN EN ISO 2431	Application viscosity (ready-to-spray mixture)	s			
AA-0137	Density at 20 °C (ready-to-spray mixture)	g/ml			
AA-0165	Dry film thickness at 20 °C	g/cm³			
AA-0165	Unit consumption	g/(µm x m²)	< 3,0		
Manufacturer's specification	Light stabilizer/UV absorber content	Wt.-%	Σ ≥ 1,5		
Manufacturer's specification	Light stabilizer/free radical scavenger content	Wt.-%	Σ ≥ 1,5		
AA-0361	Pot life (ready-to-spray mixture)	h	0,5		
DIN EN ISO 2719	Flashpoint (basecoat or hardener)	°C	≥ 21		

E (Annex normative) Basic test for 2K single layer topcoats


Test Certificate for 2K Single Layer Topcoats for Motorcycles: Basic Tests on Test Plates (Annex E)																					
Plate No.	Size mm	No. of Plates	Test Criteria	Tests to be Performed																	
			Color Match, Gloss and Leveling Comparison between first-coat and second-coat (= re-coat). Compare with master sample as well when rematching the color.	Color AA-0403 (visual evaluation)		Metamerism AA-0403 (visual evaluation)		Gloss Level Visual evaluation		Leveling/Waviness Visual evaluation		<div> BMW Motorrad</div>									
1	200 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material and any applied primer and its color here.)	TARGET ≤ KW 1	(ACTUAL first-coat)	TARGET ≤ KW 1	(ACTUAL first-coat)	TARGET = within tolerance	(ACTUAL first-coat)	TARGET = within tolerance	(ACTUAL first-coat)										
2	200 x 100	1	Second-coat (= re-coated) test plate: same topcoat as for first-coat test plate. Re-coat after max. 72 h, without sanding or priming in-between.		(ACTUAL second-coat)		(ACTUAL second-coat)		(ACTUAL second-coat)												
			Dry Scratch Resistance Applicable only in the case of glossy colors	Gloss Level before Crockmeter AA-0101 (measurement)		Crockmeter AA-0134 (calculated from the measured values)		Gloss Level after Crockmeter AA-0101 (measurement)													
3	200 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material and any applied primer here.)	Measured value (gloss level units)	(ACTUAL)	TARGET ≥ 30 % (rel. residual gloss)	#WERT!	Measured value:	(ACTUAL)												
			Chemical Resistance in Accordance with AA-0055 (Adapted for Motorcycles) Visual evaluation	Resistance against Super E10 Fuel (Altered Method 1) 5 min at RT: Tricking from a burette onto the tilted test plate				Resistance against Operating Supplies (Method 2) 30 s trickling at RT; however, test plate warmed at 80 °C for 30 min beforehand BMW Engine and Cold Cleaner				BMW Motorcycle Cleaner		BMW Engine Oil SAE 15W-50		BMW brake fluid DOT 4 LV		Testing in Gradient Oven (Method 6) Sulphuric acid 1 % Hydrochloric acid 10 % Sodium hydroxide 5 %			
4	200 x 100	6	First-coat test plate. Coating build-up: (Please enter the substrate material and any applied primer here.)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 3	(ACTUAL)						
5	570 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material and any applied primer here.)												TARGET ≥ 40 °C	(ACTUAL) °C	TARGET ≥ 40 °C	(ACTUAL) °C	TARGET ≥ 40 °C	(ACTUAL) °C	
			UV Accelerated Weathering in Accordance with AA-0235 Duration: 1 500 h. Test in coordination with the TWA at the paint manufacturer, at an external testing laboratory, or at BMW.	Surface Defects Visual evaluation after UV test: Blisters, cracks, leveling, gloss level, etc.		Color AA-0403 Comparison of visual evaluations before and after UV test:		Crosshatch Cut (GT) AA-0180 After UV test													
6	200 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material and any applied primer here.) <i>Crosshatch cut test in acc. with AA-0180: Applicable only in the case of multicoat paint systems</i>	TARGET = No or negligible change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)	TARGET ≤ Gt 1	(ACTUAL)												
			Paint Adhesion and Climatic Stress Testing of the overall composite comprising the substrate and paint system	Plates 7a and 8a Condensation-Water Atmosphere with Constant Humidity (CH) AA-0213 (Duration: 240 h)				Plates 7b and 8b Aging (Only on Plastic Plates) AA-0026 (Duration: 48 h at constant 100 °C)				Plates 7c and 8c Alternating Climate Test (KWT; Only on Plastic Plates) PR 303.5d (Duration: 240 h)				Plates 7d and 8d Stone Chipping (ST) AA-0079		Plates 7e and 8e Steam-Jet test (DS) AA-0136			
				Crosshatch Cut (GT) AA-0180 Before CH	Surface Defects Visual evaluation 1 h/24 h after CH: Blisters, cracks, leveling, gloss level, etc.		Crosshatch Cut (GT) AA-0180 3 h after aging	Surface Defects Visual evaluation 3 h after aging: Blisters, cracks, leveling, gloss level, etc.		Crosshatch Cut (GT) AA-0180 1 h after KWT	Surface Defects Visual evaluation 1 h after KWT: Blisters, cracks, leveling, gloss level, etc.		Evaluation of the paint delamination		Measuring of the paint delamination						
7	200 x 100	1-5		First-coat test plate. Coating build-up: (Please enter the substrate material and any applied primer here.)	TARGET ≤ Gt 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET = No or negligible change	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ Gt 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET = No or negligible change	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ Gt 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET = No or negligible change	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ N 2.5	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ 1 mm	(ACTUAL first-coat) (ACTUAL second-coat)	
8	200 x 100	1-5	Second-coat (= re-coated) test plate: same topcoat as for first-coat test plate. Re-coat after max. 72 h, without sanding or priming in-between.																		
			Testing in accordance with AA-0213 (CH) is mandatory; further tests shall not be conducted unless agreed upon beforehand with the TWA. If testing in accordance with AA-0026 (Aging) or PR 303.5d is to be carried out, metallic materials shall not be used for the test plate. The GT, ST, CH, Aging, KWT and DS tests are each performed on one first-coat test plate and one second-coat (re-coated) test plate. If the evaluation is not OK 1 h after CH (AA-0213), the individual test or evaluation that returned not OK results shall be repeated 24 h after CH. The second test result is then valid.	Crosshatch Cut (GT) AA-0180 1 h/24 h after CH		Color AA-0403 Comparison of visual evaluations before and 1 h/24 h after CH		Stone Chipping (ST) AA-0079 3 h after aging		Color AA-0403 Comparison of visual evaluations before and 3 h after aging		Stone Chipping (ST) AA-0079 1 h after KWT		Color AA-0403 Comparison of visual evaluations before and 1 h after KWT							
				TARGET ≤ Gt 1	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ KW 2	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ N 2.5	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ KW 2	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ N 2.5	(ACTUAL first-coat) (ACTUAL second-coat)	TARGET ≤ KW 2	(ACTUAL first-coat) (ACTUAL second-coat)						

The material for test plates 1 to 8 (metal or plastic) shall be discussed and agreed on beforehand with the TWA.


F (Annex normative) Basic test for UV-resistant E-coats

Test Certificate for UV-Resistant E-coats (Cataphoretic Paint) as a Single Layer Topcoat for Motorcycles: Basic Tests on Test Plates (Annex F)																
Plate No.	Size mm	No. of Plates	Test Criteria	Tests to be Performed												
			Color Match, Gloss and Leveling Leveling: Always evaluate. Everything else: Compare to master sample only when rematching the color	Color AA-0403 (visual evaluation)		Gloss Level Visual evaluation		Leveling/Waviness Visual evaluation		<div> BMW Motorrad</div>						
1	200 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material, pretreatment and E-coat here.)	TARGET ≤ KW 1	(ACTUAL)	TARGET = within tolerance	(ACTUAL)	TARGET = within tolerance	(ACTUAL)							
			Dry Scratch Resistance <i>Applicable only in the case of gloss colors</i>	Gloss Level before Crockmeter AA-0101 (measurement)		Crockmeter AA-0134 (calculated from the measured values)		Gloss Level after Crockmeter AA-0101 (measurement)								
2	200 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material, pretreatment and E-coat here.)	Measured value:	(ACTUAL)	TARGET ≥ 30 % relative residual gloss	#WERT!	Measured value:	(ACTUAL)							
			Chemical Resistance in Accordance with AA-0055 (Adapted for Motorcycles) Visual evaluation	Resistance against Super E10 Fuel (Altered Method 1)				Resistance against Operating Supplies (Method 2)				Testing in Gradient Oven (Method 6)				
				5 min at RT: Tricking from a burette onto the tilted test plate	30 s trickling at RT; however, test plate warmed at 80 °C for 30 min beforehand		BMW Engine and Cold Cleaner		BMW Motorcycle Cleaner		BMW Engine Oil SAE 15W-50		BMW brake fluid DOT 4 LV		Sulphuric acid 1 %	
3	200 x 100	6	First-coat test plate. Coating build-up: (Please enter the substrate material, pretreatment and E-coat here.)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 3	(ACTUAL)	Hydrochloric acid 10 %
4	570 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material, pretreatment and E-coat here.)									TARGET ≥ 40 °C	(ACTUAL) °C	TARGET ≥ 40 °C	(ACTUAL) °C	Sodium hydroxide 5 %
			UV Accelerated Weathering in Accordance with AA-0235 Duration: 750 h. Test in coordination with the TWA at the paint manufacturer, at an external testing laboratory, or at BMW.	Surface Defects Visual evaluation after UV test: Blisters, cracks, leveling, gloss level, etc.		Color AA-0403 Comparison of visual evaluations before and after UV test:										
5	200 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material, pretreatment and E-coat here.)	TARGET = Negligible to moderate change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)									
			Condensation-Water Atmosphere with Constant Humidity (CH) in Accordance with AA-0213 Duration: 240 h. Testing of the overall composite comprising the substrate and paint system	Crosshatch Cut (GT) AA-0180 Before CH		Crosshatch Cut (GT) AA-0180 1 h after CH		Surface Defects Visual evaluation 24 h after CH: Blisters, cracks, leveling, gloss level, etc.		Color AA-0403 Comparison of visual evaluations before and 24 h after CH						
6	200 x 100	2	First-coat test plate. Coating build-up: ungalvanized steel plate (Chemetall Gardobond C), pretreated in plant 03.10 series process. E-coat: (please enter here.)	TARGET ≤ Gt 1	(ACTUAL)	TARGET ≤ Gt 1	(ACTUAL)	TARGET = No or negligible change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)					
7	200 x 100	2	First-coat test plate. Coating build-up: aluminium plate (Chemetall Gardobond 26-1/6800/AA6014), pretreated in plant 03.10 series process. E-coat: (please enter here.)	TARGET ≤ Gt 1	(ACTUAL)	TARGET ≤ Gt 1	(ACTUAL)	TARGET = No or negligible change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)					
8	200 x 100	2	First-coat test plate. Coating build-up: pretreated steel plate (Chemetall Gardobond 26S/6800/OC), E-coat: (please enter here.)	TARGET ≤ Gt 1	(ACTUAL)	TARGET ≤ Gt 1	(ACTUAL)	TARGET = No or negligible change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)					
			Cyclic Corrosion Test in Accordance with AA-0224 Duration: 7 cycles/weeks. Test in coordination with the TWA at the paint manufacturer, at an external testing laboratory, or at BMW.	Rust Creep		Blistering		Edge Corrosion		Rusting Degree						
6	200 x 100	1	First-coat test plate. Coating build-up: ungalvanized steel plate (Chemetall Gardobond C), pretreated in plant 03.10 series process. E-coat: (please enter here.)	TARGET: Ud ≤ U2	(ACTUAL)	TARGET: B ≤ B1	(ACTUAL)	TARGET: K ≤ K2	(ACTUAL)	TARGET: Ri ≤ 1	(ACTUAL)					
7	200 x 100	1	First-coat test plate. Coating build-up: aluminium plate (Chemetall Gardobond 26-1/6800/AA6014), pretreated in plant 03.10 series process. E-coat: (please enter here.)	TARGET: Ud ≤ U2	(ACTUAL)	TARGET: B ≤ B1	(ACTUAL)	TARGET: K ≤ K2	(ACTUAL)	TARGET: Ri ≤ 1	(ACTUAL)					
8	200 x 100	1	First-coat test plate. Coating build-up: pretreated steel plate (Chemetall Gardobond 26S/6800/OC), E-coat: (please enter here.)	TARGET: Ud ≤ U2	(ACTUAL)	TARGET: B ≤ B1	(ACTUAL)	TARGET: K ≤ K2	(ACTUAL)	TARGET: Ri ≤ 1	(ACTUAL)					

G (Annex normative) Basic test for single layer powder topcoats


Test Certificate Single Layer Powder Topcoats for Motorcycles: Basic Tests on Test Plates (Annex G)																						
Plate No.	Size mm	No. of Plates	Test Criteria				Tests to be Performed															
1	570 x 300	1	Cloudiness <i>Not applicable to single shade / solid colors or bonded special-effect substances.</i>				Cloudiness AA-0032 (visual evaluation)		<div> BMW Motorrad</div>													
			First-coat test plate. Coating build-up: (Please enter the substrate material and any applied E-coat / primer here.)				TARGET ≤ Group 3	(ACTUAL)														
2	200 x 100	1	Color Match, Gloss and Leveling Leveling: Always evaluate. Everything else: Compare to master sample only when rematching the color				Color AA-0403 (visual evaluation)		Metamerism AA-0403 (visual evaluation)		Gloss Level Visual evaluation		Leveling/Waviness Visual evaluation									
			First-coat test plate. Coating build-up: (Please enter the substrate material and any applied E-coat / primer and its color here.)				TARGET ≤ KW 1	(ACTUAL)	TARGET ≤ KW 1	(ACTUAL)	TARGET = within tolerance	(ACTUAL)	TARGET = within tolerance	(ACTUAL)								
3	200 x 100	1	Dry Scratch Resistance <i>Applicable only in the case of gloss colors</i>				Gloss Level before Crockmeter AA-0101 (measurement)		Crockmeter AA-0134 (calculated from the measured values)		Gloss Level after Crockmeter AA-0101 (measurement)											
			First-coat test plate. Coating build-up: (Please enter the substrate material and any applied E-coat / primer here.)				Measured value:	(ACTUAL)	TARGET ≥ 30 % relative residual gloss	#WERT!	Measured value:	(ACTUAL)										
4	200 x 100	6	Chemical Resistance in Accordance with AA-0055 (Adapted for Motorcycles) Visual evaluation				Resistance against Super E10 Fuel (Altered Method 1)				Resistance against Operating Supplies (Method 2)				Testing in Gradient Oven (Method 6)							
			First-coat test plate. Coating build-up: (Please enter the substrate material and any applied E-coat / primer here.)				5 min at RT: Trickling from a burette onto the tilted test plate	30 s trickling at RT; however, test plate warmed at 80 °C for 30 min beforehand	BMW Engine and Cold Cleaner	BMW Motorcycle Cleaner	BMW Engine Oil SAE 15W-50	BMW brake fluid DOT 4 LV	Sulphuric acid 1 %	Hydrochloric acid 10 %	Sodium hydroxide 5 %							
5	570 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material and any applied E-coat / primer here.)				TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 3	(ACTUAL)	TARGET ≥ 40 °C	(ACTUAL) °C	TARGET ≥ 40 °C	(ACTUAL) °C	TARGET ≥ 40 °C	(ACTUAL) °C
6	200 x 100	1	UV Accelerated Weathering in Accordance with AA-0235 Duration: 1 500 h. Test in coordination with the TWA at the paint manufacturer, at an external testing laboratory, or at BMW.				Surface Defects Visual evaluation after UV test: Blisters, cracks, leveling, gloss level, etc.		Color AA-0403 Comparison of visual evaluations before and after UV test:		Crosshatch Cut (GT) AA-0180 After UV test											
			First-coat test plate. Coating build-up: (Please enter the substrate material and any applied E-coat / primer here.). Crosshatch cut test in acc. with AA-0180. Applicable only in the case of multicoat paint systems.				TARGET = No or negligible change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)	TARGET ≤ Gt 1	(ACTUAL)										
7	200 x 100	4	Paint Adhesion and Climatic Stress Testing of the overall composite comprising the substrate and paint system				Condensation-Water Atmosphere with Constant Humidity (CH) AA-0213 (Duration: 240 h)															
							Crosshatch Cut (GT) AA-0180 Before CH		Crosshatch Cut (GT) AA-0180 1 h after CH		Surface Defects Visual evaluation 24 h after CH: Blisters, cracks, leveling, gloss level, etc.		Color AA-0403 Comparison of visual evaluations before and 24 h after CH									
First-coat test plate. Coating build-up: (Please enter the substrate material and any applied E-coat / primer here.)				TARGET ≤ Gt 1	(ACTUAL)	TARGET ≤ Gt 1	(ACTUAL)	TARGET = No or negligible change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)											

H (Annex normative) Basic test for powder clearcoats

Test Certificate for Powder Clearcoats for Motorcycles: Basic Tests on Test Plates (Annex H)																										
Plate No.	Size mm	No. of Plates	Test Criteria	Tests to be Performed																						
			Inherent Color	Color AA-0403 (visual evaluation)		<div></div>																				
1	200 x 100	1	First-coat test plate, white undercoat, one half (100 x 100 mm) coated with powder clearcoat. Undercoat: Do not use wet paint but white coil coating or powder coat. Coating build-up: (Please enter the substrate material and coating build-up here.)	TARGET ≤ KW 1	(ACTUAL)																					
			Gloss and leveling	Gloss Level Visual evaluation		Gloss Level AA-0101 (measurement)		Leveling/Waviness Visual evaluation																		
2	200 x 100	1	First-coat test plate Build-up: (Please enter the substrate material and coating build-up here.)	TARGET = within tolerance	(ACTUAL)	Measured value:		(ACTUAL)	TARGET = within tolerance		(ACTUAL)															
			Dry Scratch Resistance <i>Applicable only in the case of glossy powder clearcoats</i>	Gloss Level before Crockmeter AA-0101 (measurement)		Crockmeter AA-0134 (calculated from the measured values)		Gloss Level after Crockmeter AA-0101 (measurement)																		
3	200 x 100	1	First-coat test plate Build-up: (Please enter the substrate material and coating build-up here.)	Measured value:		(ACTUAL)	TARGET ≥ 30 % relative residual gloss		(ACTUAL)	Measured value:		(ACTUAL)														
			Chemical Resistance in Accordance with AA-0055 (Adapted for Motorcycles) Visual evaluation	Resistance against Super E10 Fuel (Altered Method 1)				Resistance against Operating Supplies (Method 2)				Testing in Gradient Oven (Method 6)														
				5 min at RT: Tricking from a burette onto the tilted test plate		30 s tricking at RT; however, test plate warmed at 80 °C for 30 min beforehand		BMW Engine and Cold Cleaner		BMW Motorcycle Cleaner		BMW Engine Oil SAE 15W-50		BMW brake fluid DOT 4 LV		Sulphuric acid 1 %		Hydrochloric acid 10 %		Sodium hydroxide 5 %						
4	200 x 100	6	First-coat test plate Build-up: (Please enter the substrate material and coating build-up here.)	TARGET ≤ Grade 2		(ACTUAL)	TARGET ≤ Grade 2		(ACTUAL)	TARGET ≤ Grade 2		(ACTUAL)	TARGET ≤ Grade 2		(ACTUAL)	TARGET ≤ Grade 3		(ACTUAL)								
5	570 x 100	1	First-coat test plate Build-up: (Please enter the substrate material and coating build-up here.)															TARGET ≥ 40 °C		(ACTUAL) °C	TARGET ≥ 40 °C		(ACTUAL) °C	TARGET ≥ 40 °C		(ACTUAL) °C
			UV Accelerated Weathering in Accordance with AA-0235	Surface Defects Visual evaluation after UV test: Blisters, cracks, leveling, gloss level, etc.		Color AA-0403 Comparison of visual evaluations before and after UV test:		Crosshatch Cut (GT) AA-0180 After UV test																		
6	200 x 100	1	First-coat test plate Build-up: (Please enter the substrate material and coating build-up here.) Crosshatch cut test in acc. with AA-0180: Applicable only in the case of multicoat paint systems	TARGET = No or negligible change		(ACTUAL)	TARGET ≤ KW 2		(ACTUAL)	TARGET ≤ Gt 1		(ACTUAL)														
			Paint Adhesion and Climatic Stress Testing of the overall composite comprising the substrate and paint system	Condensation-Water Atmosphere with Constant Humidity (CH) AA-0213 (Duration: 240 h)																						
				Crosshatch Cut (GT) AA-0180 Before CH		Crosshatch Cut (GT) AA-0180 1 h after CH		Surface Defects Visual evaluation 24 h after CH: Blisters, cracks, leveling, gloss level, etc.																		
7	200 x 100	4	First-coat test plate Build-up: (Please enter the substrate material and coating build-up here.)	TARGET ≤ Gt 1		(ACTUAL)	TARGET ≤ Gt 1		(ACTUAL)	TARGET = No or negligible change		(ACTUAL)														


The color of the undercoat shall be discussed and agreed on beforehand with the TWA. Exception: test plate no. 1 is always white underneath the powder clearcoat.

I (Annex normative) Basic test for pinstriping paint


Test Certificate for Pinstriping Paint for Motorcycles (on and under Clearcoat): Basic Tests on Test Plates (Annex I)																			
Plate No.	Size mm	No. of Plates	Test Criteria	Tests to be Performed															
			Chemical Resistance in Accordance with AA-0055 (Adapted for Motorcycles) Visual evaluation Applicable only in the case of pinstriping on top of clearcoat	Resistance against Super E10 Fuel (Altered Method 1)				Resistance against Operating Supplies (Method 2)						Testing in Gradient Oven (Method 6)					
				5 min at RT: Tricking from a burette onto the tilted test plate	30 s trickling at RT; however, test plate warmed at 80 °C for 30 min beforehand	BMW Engine and Cold Cleaner	BMW Motorcycle Cleaner	BMW Engine Oil SAE 15W-50	BMW brake fluid DOT 4 LV	Sulphuric acid 1 %		Hydrochloric acid 10 %		Sodium hydroxide 5 %					
1	200 x 100	6	First-coat test plate. Build-up: (Please enter the substrate material and coating build-up here.)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 2	(ACTUAL)	TARGET ≤ Grade 3	(ACTUAL)				
2	570 x 100	1	First-coat test plate. Build-up: (Please enter the substrate material and coating build-up here.)											TARGET ≥ 40 °C	(ACTUAL) °C	TARGET ≥ 40 °C	(ACTUAL) °C	TARGET ≥ 40 °C	(ACTUAL) °C
			UV Accelerated Weathering in Accordance with AA-0235 Duration: 1 500 h. In the case of pinstriping on and under clearcoat. Test in coordination with the TWA at the paint manufacturer, at an external testing laboratory, or at BMW.	Surface Defects		Color		X-Cut Adhesion Test		<div> BMW Motorrad</div>									
				Visual evaluation after UV test: Blisters, cracks, leveling, gloss level, etc.		AA-0403 Comparison of visual evaluations before and after UV test:		See "Test Certificate for Pinstriped Motorcycle Parts" Paint delamination after UV test											
3	200 x 100	1	First-coat test plate. Coating build-up: (Please enter the substrate material and any applicable applied primer here.)	TARGET = No or negligible change	(ACTUAL)	TARGET ≤ KW 2	(ACTUAL)	TARGET ≤ 1 mm	(ACTUAL)										




J (Annex normative) Coatability of thermoplastic substrates

	Test Certificate for the Coatability of Thermoplastic Substrates (Annex J)									
	Presentation on test plates using a triple-coat build-up. Substrate material, pretreatment/activation and coating parameters shall be documented in the identification data sheet (Annex K).			Primer 1		Primer 2		Primer 3		
				WBC (color 1)		WBC (color 2)		WBC (color 3)		
				2K Solventborne Clearcoat for Plastics						
				Coating materials shall be discussed and agreed with the TWA.						
Testing Instructions		Infos	Target Value	Actual Value	Evaluation	Actual Value	Evaluation	Actual Value	Evaluation	
AA-0180		Crosshatch testing (GT)		≤ Gt 1						
AA-0079		Stone chipping test (ST)		≤ N 2,5						
AA-0213		Condensation-water atmosphere with constant humidity (CH) Duration: 240 h	Visual evaluation (blisters, cracks, leveling, gloss level, etc.)	No to negligible change						
			Color evaluation (AA-0403) after climatic stress	≤ KW 2						
			GT (AA-0180) after climatic stress	≤ Gt 1 after 1 h						
				≤ Gt 1 after 24 h						
AA-0026		Aging resistance 48 h at 100 °C	Visual evaluation (blisters, cracks, leveling, gloss level, etc.)	No to negligible change						
			Color evaluation (AA-0403) after climatic stress	≤ KW 2						
			ST (AA-0079) after climatic stress	≤ N 2,5						
			GT (AA-0180) after climatic stress	≤ Gt 1						
PR 303.5d		Alternating climate test Duration: 240 h	Visual evaluation (blisters, cracks, leveling, gloss level, etc.)	No to negligible change						
			Color evaluation (AA-0403) after climatic stress	≤ KW 2						
			ST (AA-0079) after climatic stress	≤ N 2,5						
			GT (AA-0180) after climatic stress	≤ Gt 1						
AA-0136		Steam-Jet test (DS)	Paint delamination	≤ 1 mm						
DIN EN ISO 2808		Determining coating thickness (Please specify the method used)	The target values shall be taken from the technical data sheets and entered:	Primer:	µm					
				Basecoat:	µm					
				Clearcoat:	µm					


K (Annex normative) Identification data sheet for painted thermoplastics

 BMW Motorrad	Material and Process Data of Painted Thermoplastic Test Plates Ident Data (Annex K)
Substrate Data	
Plastic type (e.g. PA, PC, PBT, etc.)	
Granulate: Trade name and manufacturer	
Inherent color	
Details regarding Paintwork	
Cleaning	
Activation	
Primer: Type and manufacturer	
Coating thickness	
Drying conditions	
Details regarding the sanding of the primer	
manufacturer	
Coating thickness	
Drying conditions	
Clearcoat: Type and manufacturer	
Coating thickness	
Drying conditions	
Coater/painter	
Paint shop/site	
Method of application	
Painting date	


L (Annex normative) Initial sample test for painted thermoplastic parts


	Initial sample test certificate for painted thermoplastic motorcycle parts (Annex L)				
	Testing instructions	Infos	Target value	Actual value	Evaluation
AA-0403	Visual color evaluation and metamerism test	Color reference: BMW master sample	≤ KW 1		
AA-0161	Color measurement (optional)	For matt paints: In accordance with AA-0403	D ≤ 1,7		
AA-0101	Reflectometer value (gloss level; optional)	Glossy coats: Measuring angle = 20 ° Matt paints: Measuring angle = 60 °	≥ 80 GE (glossy) or same as master sample (matt)		
AA-0180	Crosshatch cut adhesion test (GT)	Select the correct line spacing in accordance with the total coating thickness.	≤ Gt 1		
AA-0079	Stone chipping test (ST)	The component shall not have an excessively bent shape.	≤ N 2,5		
AA-0213	Condensation-water atmosphere with constant humidity test (CH) Duration: 240 h Regeneration period after test is completed: 1 h. Only for not OK results: Extend to 24 h and then re-evaluate.	Visual evaluation of the surface (e.g. blisters, cracks, gloss level, leveling, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	≤ KW 2		
		Crosshatch cut adhesion test (AA-0180)	≤ Gt 1		
AA-0026	Aging resistance test Duration: 48 h at 100 °C constant temperature. Regeneration period after test is completed: 3 h	Visual evaluation of the surface (e.g. blisters, cracks, gloss level, leveling, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	≤ KW 2		
		Stone chipping test (AA-0079)	≤ N 2,5 after 3 h		
		Crosshatch cut adhesion test (AA-0180)	≤ Gt 1 after 3 h		
PR 303.5d	Alternating climate test (KWT) Duration: 240 h For PC-Blends Shortened alternating climate test (test will pass the center part only 2 times instead of 4 times)	Visual evaluation of the surface (e.g. blisters, cracks, gloss level, leveling, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	≤ KW 2		
		Stone chipping test (AA-0079)	≤ N 2,5		
		Crosshatch cut adhesion test (AA-0180)	≤ Gt 1		
AA-0136	Steam-Jet test (DS)	Evaluation of delamination	≤ 1 mm		
DIN EN ISO 2808	Determination of the coating thickness in accordance with DIN EN ISO 2808 (The method shall be noted)	Specifications for max. total coating thickness: - Refer to process specification (substrate-specific) - If necessary: Refer to drawing or similar (part-specific)	Maximum total coating thickness in accordance with BMW specifications		

M (Annex normative) Identification data sheet for painted thermoplastic parts

 <p>BMW Motorrad</p>	<p>Material and process data of painted plastic parts (thermoplastics) Ident data (Annex M)</p>
Basic data	
Component designation	
Drawing number/Part number	
System supplier	
Coater/painter	
Blank part data	
Blanks supplier	
Plastic type (e.g. PA, PC, PBT, etc.)	
Granulate: Product name and manufacturer	
Inherent color	
Details regarding paintwork	
Cleaning	
Activation	
Primer: Manufacturer, product number	
Coating thickness	
Drying conditions	
Details regarding the sanding of the primer	
Basecoat/2K topcoat: Color, manufacturer, product no.	
Coating thickness	
Drying conditions	
Clearcoat: Manufacturer, product number	
Coating thickness	
Drying conditions	
Paint shop/site	
Method of application	
Painting date	

N (Annex normative) Initial sample test for painted metal parts

	Initial sample test certificate for painted metal motorcycle parts (Annex N)				
	Testing instructions	Infos	Target value	Actual value	Evaluation
AA-0403	Visual color evaluation and metamerism test	Color reference: BMW master sample	\leq KW 1		
AA-0161	Color measurement (optional)	For matt paints: In accordance with AA-0403	$D \leq 1,7$		
AA-0101	Reflectometer value (gloss level; optional)	Gloss coats: Measuring angle = 20° Matte paints: Measuring angle = 60°	≥ 80 GE (glossy) or same as master sample (matt)		
AA-0180	Crosshatch cut adhesion test (GT)	Select the correct line spacing in accordance with the total coating thickness.	\leq Gt 1		
AA-0079	Stone chipping test (ST)	The component shall not have an excessively bent shape.	\leq N 2,5		
AA-0213	Condensation-Water Atmosphere with Constant Humidity test (CH) Duration: 240 h Regeneration period after test is completed: 1 h. Only for not OK results: Extend to 24 h and then re-evaluate.	Visual evaluation of the surface (e.g. blisters, cracks, gloss level, leveling, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	\leq KW 2		
		Crosshatch cut adhesion test (AA-0180)	\leq Gt 1		
AA-0136	Steam-Jet test (DS)	Evaluation of delamination	≤ 1 mm		
AA-0254	Determination of the coating thickness	Details of max. total coating thickness: - Process specification (substrate-specific) - If necessary: drawing or similar (part-specific)	Maximum total coating thickness in accordance with BMW specifications		
Applicable only in the case of topcoats on UV-sensitive substrates (e.g. epoxy materials) without a UV-resistant intermediate primer coat:					
AA-0235	Accelerated weathering in Xenon test device Duration: 1 500 h	Testing of coated plates. Visual evaluation (e.g. discoloration, leveling, gloss level, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	\leq KW 2		
		Crosshatch cut (AA-0180)	\leq Gt 1		

	Additional corrosion tests depends on the part in question; The TWA shall be contacted in cases of doubt.				
	Testing instructions	Infos	Target value	Actual value	Evaluation
AA-0224	Cyclic corrosion test <i>Do not perform on parts made of wrought aluminum alloys.</i>	7 cycles/weeks for painted parts made of steel or cast aluminum ¹⁾ (incl. cast alloy rims)	Rust creep $U_d \leq U_2^{2)}$ Blistering $B \leq B1$ Edge corrosion $K \leq K_2^{3)}$ Welding seam corrosion $S \leq S_2^{4)}$ Rusting degree $R_i \leq 1$		
		5 cycles/weeks for painted magnesium die-cast parts	Rust creep $U_d \leq U1$ Blistering $B \leq B1$ Edge corrosion $K \leq K_3^{3)}$		
AA-0129	CASS-Test	96 h for painted wrought aluminum alloy parts (incl. light alloy forged rims)	Rust creep $U_d \leq U1$ Blistering $B \leq B1$ Edge corrosion $K \leq K_2^{3)}$		
AA-0612	Filiform corrosion test	Only for diamond cut alloy rims	Rust creep $U_d \leq U2$		


¹⁾ In the case of aluminum alloys with a copper content of max. 0,6 %. The number of cycles/weeks shall be indicated on the drawing for alloys with a higher copper content.

²⁾ Infiltration of $U_4 \leq 4$ mm is permissible in the case of zinc-coated steel parts.


³⁾ Only the percentage of red rust is evaluated for zinc-coated steel. For aluminum, only the percentage of white rust is evaluated.

⁴⁾ The corroded proportion shall be evaluated for each part (i.e. in relation to the total length of all welding seams) and not for each welding seam.

0 (Annex normative) Identification data sheet for painted metal parts


 BMW Motorrad	Material and process data of painted metal parts Ident data (Annex O)
Basic data	
Component designation	
Drawing number/Part number	
System supplier	
Coater/painter	
Blank part data	
Blanks supplier	
Material/Alloy	
Process (cast/forged/deep drawing process, etc.)	
Details regarding paintwork	
Cleaning: Procedure and cleaning agent	
Compressed-air blasting: Blasting agent	
Pretreatment/Passivation: Manufacturer, product no.	
E-coat manufacturer, product number	
E-coat contract coater	
E-coat facility/location	
E-coat thickness	
E-coat drying conditions	
E-coating date	
Primer: Manufacturer, product number	
Coating thickness	
Drying conditions	
Details regarding the sanding of the primer	
Basecoat/2K topcoat: Color, manufacturer, product no.	
Coating thickness	
Drying conditions	
Clearcoat: Manufacturer, product number	
Coating thickness	
Drying conditions	
Paint shop/site	
Method of application	
Painting date	

P (Annex normative) Initial sample test for painted CFRP parts


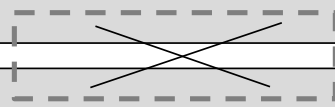
	Initial sample test certificate for painted carbon fiber reinforced plastic (CFRP) motorcycle parts (Annex P)				
	Testing instructions	Infos	Target value	Actual value	Evaluation
AA-0403	Visual color evaluation and metamerism test	Color reference: BMW master sample	\leq KW 1		
AA-0161	Color measurement <i>(optional; not applicable to carbon fiber reinforced plastics clearcoating)</i>	For matt paints: In accordance with AA-0403	$D \leq 1,7$		
AA-0101	Reflectometer value <i>(gloss level; optional)</i>	Glossy coats: Measuring angle = 20 ° Matt paints: Measuring angle = 60 °	≥ 80 GE (glossy) or same as master sample (matt)		
AA-0340	Scalpel cut adhesion test		Delamination ≤ 1 mm		
AA-0079	Stone chipping test (ST)	The component shall not have an excessively bent shape.	\leq N 2,5		
AA-0213	Condensation-Water Atmosphere with Constant Humidity test (CH). Duration: 240 h Regeneration period after test is completed: 1 h. Only for not OK results: Extend to 24 h and then re-evaluate.	Visual evaluation of the surface (e.g. blisters, cracks, gloss level, leveling, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	\leq KW 2		
		Scalpel cut adhesion test (AA-0340)	Delamination ≤ 1 mm		
AA-0026	Aging resistance test Duration: 42 days at 80 °C constant temperature Regeneration period after test is completed: 3 h	Visual evaluation of the surface (e.g. blisters, cracks, gloss level, leveling, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	\leq KW 2		
		Stone chipping test (AA-0079)	\leq N 2,5 after 3 h		
		Scalpel cut adhesion test (AA-0340)	Delamination ≤ 1 mm after 3 h		
PR 303.5d	Alternating climate test (KWT) Duration: 240 h	Visual evaluation of the surface (e.g. blisters, cracks, gloss level, leveling, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	\leq KW 2		
		Stone chipping test (AA-0079)	\leq N 2,5		
		Scalpel cut adhesion test (AA-0340)	Delamination ≤ 1 mm		
AA-0136	Steam-Jet test (DS)	Evaluation of delamination	≤ 1 mm		
DIN EN ISO 2808	Determination of the coating thickness in accordance with DIN EN ISO 2808 (The method shall be noted)	Specifications for max. total coating thickness: - Process specification (substrate-specific) - If necessary: drawing or similar (part-specific)	Maximum total coating thickness in accordance with BMW specifications		
Applicable only in the case of metal parts that have been glued or laminated:					
AA-0324	Salt spray test Duration: 240 h	Visual evaluation of the metal part	No to negligible contact corrosion		
Applicable only in the case of UV-sensitive substrates (e.g. epoxy resin) under paint systems without a UV stable primer:					
AA-0235	Accelerated weathering in Xenon test device Duration: 1 500 h Regeneration period after test is completed: none	Testing of coated plates. Visual evaluation (e.g. leveling, gloss level, etc.)	Negligible to moderate change		
		Comparison of visual color evaluations (AA-0403) before and after test	\leq KW 2		
		Scalpel cut adhesion test (AA-0340)	Delamination ≤ 1 mm		

Part-specific limit samples shall be specified wherever necessary.

Q (Annex normative) Identification data sheet for painted CFRP parts

 <p>BMW Motorrad</p>	<p>Material and process data of painted carbon fiber reinforced plastic (CFRP) parts Ident data (Annex Q)</p>
<p>Basic data</p>	
Component designation	
Drawing number/Part number	
System supplier	
Coater/painter	
<p>Blank part data</p>	
Blanks supplier	
Resin type (e.g. epoxy, PA, etc.)	
Resin: Manufacturer, product number	
<p>Details regarding paintwork</p>	
Cleaning	
Sanding	
Primer: Manufacturer, product number	
Coating thickness	
Drying conditions	
Details regarding the sanding of the primer	
Basecoat/2K topcoat: Color, manufacturer, product no.	
Coating thickness	
Drying conditions	
Clearcoat: Manufacturer, product number	
Coating thickness	
Drying conditions	
Paint shop/site	
Method of application	
Painting date	


R (Annex normative) Initial sample test for pinstriped parts

	Initial sample test certificate for pinstriped motorcycle parts (Annex R)				
	Testing instructions	Infos	Target value	Actual value	Evaluation
DIN EN ISO 16276-2	X-cut adhesion test on the pinstriping: Refer to AA-0180 for specifications for the cutting tools, cutting procedure and adhesive tape. The two cuts intersect each other on the pinstripe (X-cut) and form an angle of 30° to 45° in the longitudinal direction of the pinstripe. Tesa 4657 adhesive tape (dashed outline in the schematic diagram on the right) shall be affixed lengthwise on the pinstripe and the cut in accordance with AA-0180 and pulled off after no more than 5 minutes.	Evaluation of delamination	≤ 1 mm		
					
		Drawing			
AA-0136	Steam-jet test (DS) on the pinstriping	Evaluation of delamination	≤ 1 mm		
AA-0213	Condensation-Water Atmosphere with Constant Humidity test (CH) Duration: 240 h Regeneration period after test is completed: 1 h. Only for not OK results: Extend to 24 h and then re-evaluate.	Visual evaluation of the surface (e.g. blisters, cracks, leveling, gloss level, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	≤ KW 2		
		X-cut adhesion test (DIN EN ISO 16276-2) on the pinstriping.	≤ 1 mm		
Extras for Thermoplastic Parts:					
AA-0026	Aging resistance test Duration: 48 h at 100 °C constant temperature. Regeneration period after test is completed: 3 h	Visual evaluation of the surface (e.g. blisters, cracks, leveling, gloss level, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	≤ KW 2		
		X-cut adhesion test (DIN EN ISO 16276-2) on the pinstriping.	≤ 1 mm after 3 h		
PR 303.5d	Alternating climate test (KWT) Duration: 240 h For PC-Blends Shortened alternating climate test (test will pass the center part only 2 times instead of 4 times)	Visual evaluation of the surface (e.g. blisters, cracks, leveling, gloss level, etc.)	No to negligible change		
		Comparison of visual color evaluations (AA-0403) before and after test	≤ KW 2		
		X-cut adhesion test (DIN EN ISO 16276-2) on the pinstriping.	≤ 1 mm		

The requirements described here apply only to the area of the painted pinstripes.

The substrate-specific test certificates describe the relevant requirements for the full-surface part coating.

S (Annex normative) Identification data sheet for pinstriped parts

 <p>BMW Motorrad</p>	<p>Material and process data of pinstriped parts Ident data (Annex S)</p>
<p>Basic data</p>	
Component designation	
Drawing number/Part number	
System supplier	
Coater/Painter/Pinstriper	
Pinstriping on top of or underneath clearcoat	
<p>Blank part data</p>	
<p>Refer to the separate ID parts documentation for the painted base component</p>	
<p>Details regarding paintwork</p>	
<p>Refer to the separate ID parts documentation for the painted base component</p>	
<p>Details of pinstriping</p>	
Details of sanding of the paint coat prior to pinstriping	
Cleaning (in the case of sanding)	
Pinstriping Paint: Color, manufacturer, product number	
Drying conditions	
Clearcoat (only when used after pinstriping): Manufacturer, product number	
Clearcoat thickness	
Clearcoat drying conditions	