

| § "A" : TEST EQUIPMENT

NOTE: *The equipment required for testing is listed in the relevant "Material Standards" indicated in § "B".*

| § "B" : REFERENCES

- | | |
|------------|---|
| 50180 | Corrosion tests. TMD |
| 50184 | Provisions for the non – metallic materials – Climatic tests (of paints, enamels, etc.). TMD |
| 50449 | Determination of surface scratching/abrasion of paint and/or plastic supports by brushing device. TMD |
| 50451 | Accelerated atmospheric agent aging. TMD |
| 50451/01 | Accelerate aging in sunlight. TMD |
| 50457 | Tests of non – metal materials – Determination of brightness of paints, varnishes and enamels by glossometer. TMD |
| 50461 | Coating adhesion test. TMD |
| 50470 | Determination of paint, enamel, etc., resistance to water. TMD |
| 50471/01 | Test of resistance to the ultraviolet light alternated to humidity. TMD |
| 50473 | Determination of the resistance of paints, enamels, etc. to gasoline. TMD |
| 50473/01 | Determination of the resistance of painting products to chemical aggressions. TMD |
| 50488 | Determination of resistance to abrasion of protection coatings and bituminous paints through shots. TMD |
| 50488/01 | Resistance of paint, enamel, protection agents, etc. to stone blows. TMD |
| 50493/04 | Organic coatings – Determination of resistance to blister sub – film corrosion propagation (Scab in door). TMD |
| 9.01102 | Quality of supplies. CFO |
| 9.01103 | Product quality and conformity certificate. CFO |
| 9.55367 | Adhesive tapes with single – side coating. CMD |
| 9.55650/02 | Permanent vinyl protective agents. CMD |
| 9.55772 | Synthetic pastel enamels for motor – vehicle body. CMD |
| 9.55776/01 | Double layer metalized enamels for vehicle body and commercial vehicles. CMD |
| 9.55846 | Temporary protective agents for body. CMD |
| 9.55848 | Substituted by Proc. Spec. 9.55842 |

| § "C" : ANNEXES

- | | | |
|--|---|--|
| | 1 | Product Technical Data Sheet (All Classes) |
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1. GENERAL

The painting coatings to be tested can be primer, finishing single layer, or can be constituted by multiple layers (e.g.: cataphoresis + powder, primer + enamel etc.). These coatings are applied on various metallic parts for protecting them from corrosion and atmospheric agent aggressive action.

1.1. USE

1.1.1. This Procurement Specification applies to the following parts:

- a) parts coated with one or more layers of paint:
 - pre-coated or not pre-coated via electrolysis;
 - obtained and not obtained from semi-finished products by means of an inorganic coating;
 - to be installed both inside and outside the vehicle;
 - exposed or not exposed to the atmospheric agents and/or sunlight;
 - with a complex and simple shape.
- b) primer painted and vehicle color enamel finished after being assembled on the body on line.

1.2. CLASSIFICATION, INDICATION ON DRAWING AND DATA PROCESSING CODE NUMBER

CLASS	DESIGNATION FOR INDICATION ON DRAWING		UTILIZATION	DATA PROCESSING CODE NUMBER	
	NEW	OLD (Proc. Spec. 9.55848)		NEW	OLD (Proc. Spec. 9.55848)
A	VRNT/A  as per Proc. Spec. 9.55842	VRNT/A	Parts that are not in direct contact with the atmospheric agents	702	713
B ₁	VRNT/B ₁  as per Proc. Spec. 9.55842	---	Parts that are in direct contact with the atmospheric agents, but not with the sunlight	703	---
B ₂	VRNT/B ₂  as per Proc. Spec. 9.55842	---	Parts that are in direct contact with the atmospheric agents and the sunlight	704	---
C ₁	VRNT/C ₁  as per Proc. Spec. 9.55842	VRNT/B	Parts that are exposed, based on the position on the vehicle, to corrosion not exposed to sunlight	233	714
C ₂	VRNT/C ₂  as per Proc. Spec. 9.55842	VRNT/D	Parts that are exposed, based on the position on the vehicle, to corrosion exposed to sunlight	234	716
D _{1A} <input type="checkbox"/>	VRNT/D _{1A}  as per Proc. Spec. 9.55842	VRNT/C	Critical parts that are exposed, based on the position on the vehicle, to corrosion not exposed to sunlight	298	715
D _{1B}	VRNT/D _{1B}  as per Proc. Spec. 9.55842	VRNT/E	Critical parts that are exposed, based on a position that has special aesthetic importance on the vehicle, to corrosion exposed to sunlight	299	717
D _{1c}	VRNT/D _{1c}  as per Proc. Spec. 9.55842	---	Very critical parts that are exposed, based on the position on the vehicle, to corrosion not exposed to sunlight	236	---
D ₂	VRNT/D ₂  as per Proc. Spec. 9.55842	---	Parts with primer finishing that need vehicle color enamel	706 to be continued	---

to be continued

CLASS	DESIGNATION FOR INDICATION ON DRAWING		UTILIZATION	DATA PROCESSING CODE NUMBER	
	NEW	OLD (Proc. Spec. 9.55848)		NEW	OLD (Proc. Spec. 9.55848)
E	VRNT/E as per Proc. Spec. 9.55842	---	Stainless steel parts, in aluminum or coated via electrolysis, that are painted due to aesthetic reasons	705	---
F1	VRNT/F1 as per Proc. Spec. 9.55842	---	Parts that are critical for corrosion and abrasion, not exposed to sunlight	352	---

- Replaces the previous Class **D1**
- ▶ Indicate the required color

1.2.1. NOTE FOR HEXAVALENT CHROMIUM

In compliance with the European Directive regulations on end-of- life vehicles (2000/53/CE), already adopted in Procurement Specification 9.01102 Annex CK, for ecological and environmental reasons, it is necessary to eliminate completely hexavalent chromium compounds (Cr VI) from the vehicles, by July 1st, 2007.

To this end, as from July 1st, 2006, all coatings containing hexavalent chromium shall no longer be supplied to Fiat Auto.

During the transition period, with regard to the European market, the intervention strategy adopted by Fiat Auto is the following.

- For new models, with first type- approval date after January 1st, 2004, complete removal of hexavalent chromium from all the new Drawing issues (Powertrain components included).

NOTE: Therefore the obligation to remove hexavalent chromium as from January 1st, 2004 **does not apply** to:

- car-derived vehicles (e.g. van, pick- up, SW, etc.),
- face-lifting,
- restyling,
- extensions of type-approval for engine types not foreseen at first launch, of models with first type-approval date prior to January 1st, 2004.
- For new drawing issues, relative to models already in production in December 2003, and for the drawings of components already in production or carry over, even if destined for new models with first type-approval after January 1st, 2004, complete removal of hexavalent chromium by July 1st, 2006.

The competent E.&D. Bodies must authorize possible deviations from these general regulations.

2. PRODUCT QUALIFICATION REQUIREMENTS

- 2.1. *Submit the component being examined and/or its sections or parts to the specific controls and tests foreseen in the following paragraphs checking the compliance of the test result with the values/limits prescribed in the design and/or in the enclosed "Specifications Data Sheet", relatively to the specific class. It is recommended to prepare at least 2 samples for every test.*

Expose the component being examined to the corrosion tests (Salty Fog, Scab in Door), in the accelerated aging chambers and climatic chambers (thermo-damp heat steady and thermal shock), by simulating the position it has inside the vehicle.

If, for the particular component geometry, it is not possible to obtain the necessary specimens for the tests directly from the component, foresee the realization of specific specimens consisting of the same material and final painting/decoration cycle.

2.2. **Test Environment** (if indicated otherwise)

temperature: 23 ± 5 °C
atmospheric pressure: 860 to 1060 mbar
relative humidity: 45 to 70 %

- 2.3. **Visual inspection**: *the layer must be continuous and uniform. The aspect must be similar to the registered sample of reference, without superficial defects or porosities.*

- 2.4. **Thickness**: *according to the used material/product technical data sheet, specified on the qualification data sheet issued by D.A.P.I. or specific drawing, or supplier's self - qualification plan.*

2.5. **Adhesion**

2.5.1. **Classes A , B₁, B₂, C₁, C₂, D_{1A} , D_{1B}, D_{1C} , D₂ and E**

Carry out the test according to the modalities and equipment described in Standard 50461, making use of adhesive tape of type L (Proc. Spec. 9.55367). Compare the measured values with the prescribed limits. If foreseen, repeat the test at the end of the aging procedures after reconditioning for 2 hours at environmental temperature and compare with the prescribed limit.

2.5.2. **Class F₁**

Carry out the test according to the modalities and the equipment described by the Procurement Specification 9.55650/02.

2.5.3. Repeat the adhesion after the tests of “Resistance to water”, “Resistance to humidity” and “Accelerated aging to the atmospheric agents” after component drying and conditioning in test environment (§ 2.2) for 120 min.

2.6. Resistance to gasoline

2.6.1. Carry out the test according to the methodology and the equipment described in Std. 50473 Method B.

2.6.2. Dry the part and condition it in test environment (§ 2.2) for 120 min., then evaluate visually the surface conditions by comparing with the prescribed limit.

2.7. Resistance to mineral oil

2.7.1. Carry out the test according to the methodology and the equipment described in Standard 50473/01 Method C.

2.7.2. Carry out the operation indicated in point 2.6.2.

2.8. Resistance to water immersion test

2.8.1. Immersion for 24 h

2.8.1.1. Carry out the test following the procedures and the equipment described by Standard 50470 at a temperature of 60 ± 2 °C for 24 h.

2.8.1.2. Carry out the operation indicated in point 2.6.2 then measure the adhesion as indicated in § 2.5.

2.8.2. Immersion for 48 h (only for Classes D_{1A}, D_{1B} and D_{1C})

2.8.2.1. Carry out the test following the procedures and the equipment described by Standard 50470 at a temperature of 40 ± 2 °C for 48 h.

2.8.2.2. Carry out the operation indicated in point 2.6.2 then measure the adhesion as indicated in § 2.5.

2.9. Resistance to humidity

2.9.1. Carry out the test according to the procedures and the equipment described in Standard 50184 Method B at a temperature of 40 ± 1 °C with relative humidity of 95 to 100%, for the following duration:

- 150 h for the **Classes A, B₁, B₂, C₁ and C₂**
- 300 h for the **Classes D_{1A}, D_{1B}, D₂, E and F₁**
- 500 h for the **Class D_{1C}**

2.9.2. Carry out the operation indicated in point 2.6.2 then measure the adhesion as indicated in § 2.5.

2.10. Resistance to corrosion

2.10.1. Salt spray fog test

Expose the part to the salty fog according to the procedures and the equipment described by Standard 50180 Method B₁ for the duration indicated below:

- 100 h for the **Classes B₁ and B₂**;
- 300 h for the **Classes C₁ and C₂**;
- 500 h for the **Classes D_{1A}, D_{1B}, D₂ and F₁**;
- 750 h for the **Classes D_{1C}**.

NOTE:

- 1) *If the part is in galvanized sheet iron, use Method A₁.*
- 2) *For the Classes C₁, D_{1A} and D_{1C} in the case of a box – type component: at the end of the test it is necessary to verify the internal corrosion propagation by sectioning the component itself.*

2.10.2. Resistance to blister sub -- film corrosion (Scab in door) for galvanized sheet iron parts Expose the galvanized iron part to the test according to the procedures and the equipment described by Standard 50493/04, without immersion for 120 h in water and without stone blows, for the duration indicated below:

- 300 h for the Classes **C₁** and **C₂**;
- 500 h for the Classes **D_{1A}**, **D_{1B}**, **D_{1C}**, **D₂** and **F₁**;

NOTE: for the Classes **C₁**, **D_{1A}** and **D_{1C}** in the case of a box – type component: at the end of the test it is necessary to verify the internal corrosion propagation by sectioning the component itself.

2.11. Determination of the resistance to chemical aggressions

2.11.1. Carry out the test according to the methodology and the equipment described in Standard 50473/01 Method A.

2.11.2. Visually evaluate the sample surface conditions by comparing the results with the prescribed limits, after having lightly polished the surface to be examined.

NOTE: As concerns brightness as new ≤ 70 gloss carry out the measurement without polishing the surface to be measured.

2.12. Accelerated aging under atmospheric agents and subsequent adhesion

2.12.1. Obtain 1 specimen of dimensions 150 × 70 mm from the part to be tested and submit it to aging in W.O. with Xenon lamps, according to the methodology and the equipment described in Standard 50451, for the duration indicated below:

- 750 h for the Classes **B₂** and **C₂**;
- 1500 h for the Classes **D_{1B}**, **D₂** and **E**;

2.12.2. At the end of aging, check the conditions of the sample visually after conditioning it for two hours at environmental temperature and compare with the prescribed limit.

2.12.3. Measure the adhesion according to Standard 50461 and the brightness according to Standard 50457 on the sample after polishing the surface to be measured slightly with polishing paste, by comparing the results with the prescribed limits.

NOTE: As concerns brightness as new ≤ 70 gloss carry out the measurement without polishing the surface to be measured.

2.13. Accelerated aging under artificial sunlight (F.O.) and subsequent adhesion (only on Classes A and B₂ for parts inside the passenger compartment)

2.13.1. Obtain a specimen of dimensions 150 × 70 and submit it to aging according the methodology and the equipment described in Standard 50451/01 for the duration indicated below:

- 150 h for objects that have limited exposure to light (e.g.: lower side of the dashboard);
- 300 h for objects that are exposed to the light (e.g.: upper side of the dashboard);

- 2.13.2. Assess the conditions of the sample after reconditioning it for 2 h at environmental temperature and compare with the prescribed limit.
- 2.13.3. Repeat steps as per point 2.12.3.
- 2.14. **Resistance to UV rays and subsequent adhesion** (only on Classes D_{1B}, D₂ and E with aesthetical finishing that is different from the embossed black color, e.g.: roof rack bars or body dye components)
- 2.14.1. Obtain 1 specimen of dimensions 150 × 70 mm from the part to be tested and submit it to aging according to the methodology and the equipment described in Standard 50471/01 for 400 h.
- 2.14.2. Repeat steps as per points 2.13.2 and 2.13.3.
- 2.15. **Resistance to stone blow**
- 2.15.1. Obtain 2 specimens of dimensions 100 × 200 mm from the part to be tested.
- 2.15.2. Carry out the test according to the modalities and the equipment described by Standard 50488/01, then expose the specimen in salty fog for 24 h according to the Standard 50180.
- 2.15.3. At the end of the test visually check the specimen surface conditions by comparing with the prescribed limit.
- 2.16. **Waxing and de - waxing test**
- 2.16.1. Obtain 2 specimens of dimensions 100 × 200 mm from the part to be tested.
- 2.16.2. Carry out the test using the protective wax of class B as per Proc. Spec. 9.55846 suitably prepared for the application (see indications shown in the Supplier's Data Sheet).
- 2.16.3. Prepare separately the dewaxing solution (see indications shown in the Supplier's Data Sheet).
- 2.16.4. Submit the specimen to aging for 200 h in W.O. with Xenon lamp (as an alternative for 150 h in W.O. with carbon-arc lamps without additional UV lamps) according to the methodology described in Standard 50451.
- NOTE:** *alternatively leave a specimen exposed outside for 10 days.*
- 2.16.5. At the end of aging, remove the wax protection by using the specific dewaxing agent prepared as indicated in point 2.16.3 then compare the results with the prescribed limits.

2.17. Resistance to abrasion

- 2.17.1. Obtain 2 specimens of dimensions 70 × 150 mm from the part to be tested.
- 2.17.2. Carry out the test according to the methodology and the equipment described in Standard 50488.
- 2.17.3. At the end of the test visually check the specimen surface conditions by comparing with the prescribed limit.

2.18. Scratching test by car – wash

- 2.18.1. Obtain 2 specimens of dimensions 100 × 200 mm from the part to be tested.
- 2.18.2. Measure the brightness on the specimens before washing according to the methodology and the equipment described in Standard 50449.
- 2.18.3. Carry out the test always according to the modalities and the equipment described in Standard 50449 or, as an alternative, by means of 10 washing cycles at the automated wash plant (car- wash).
- 2.18.4. Measure again the brightness according to Standard 50457, then evaluate the external surface conditions of the specimen by comparing with the prescribed limits.

NOTE: As concerns brightness as new ≤ 70 gloss carry out the measurement without polishing the surface to be measured.

3. REQUIREMENTS FOR SUPPLIES CONTROL

(by Qualità di Stabilimento)

The supply check has to be carried out according to the directives mentioned in P.S. 9.01102/01 (Reserved Distribution).

4. REQUIREMENTS FOR THE SUPPLIER

The Supplier must meet the requirements included in P.S. 9.01102 "QUALITY OF SUPPLIES".

4.1. Supplies for product qualification

The Supplier must produce the product quantity indicated in the purchase order attaching the required Quality and Conformity Certificate (see P.S. 9.01103); all the characteristics required by the annexed "Specifications Data Sheet" shall be checked. No "non-conformity" is allowed.

4.2. Supplies for production

The supplied product shall comply with the drawing requirements and this Procurement Specification. When defining the production process to be followed and the test severity, the Supplier must consider the classes of importance that Fiat gave to each characteristic which the requirements refer to (see § 5).

NOTE: *During both product qualification and supply check, checks can be carried out on components that underwent non – destructive tests (indicated by NM in § 5); if the component underwent destructive tests (M), it can no longer be used for other tests or checks, unless otherwise specified.*

5. CHARACTERISTIC CLASSIFICATION TABLE

CHARACTERISTIC CLASSIFICATION		TYPE OF TEST	
Visual inspection	Major	NM	
Thickness		NM	
Adhesion		M	
Resistance to gasoline		M	
Resistance to mineral oil	Minor	M	
Resistance to water immersion test	Major	M	
Resistance to humidity		M	
Resistance to corrosion		Salty fog	M
		Scab in door	M
Determination of the resistance to chemical aggressions		M	
Accelerated aging under atmospheric agents and subsequent adhesion		M	
Accelerated aging under the artificial sunlight (F. O.) and subsequent adhesion		M	
Resistance to UV rays and subsequent adhesion	Minor	M	
Resistance to stone blow	Major	M	
Waxing and de-waxing test	Minor	M	
Resistance to abrasion	Major	M	
Scratching test by car- wash		M	

Class A

CHARACTERISTICS		TEST CONDITIONS	LIMITS
Visual inspection		---	§ 2.3
Thickness		---	§ 2.4
Adhesion	Brand new	§ 2.5.1 and Standard 50461	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part ≤10%
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and flatness are allowed
Resistance to humidity		§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Accelerated ageing in artificial sunlight ✨		§ 2.13 and Standard 50451/01 Method A	Adhesion parameter: Ad1 No color variations are allowed

✨ Only for parts that can be reached by sunlight

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Class B₁

CHARACTERISTICS		TEST CONDITIONS	LIMITS
Visual inspection		---	§ 2.3
Thickness		---	§ 2.4
Adhesion	Brand new	§ 2.5.1 and Standard 50461	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part ≤10%
Resistance to gasoline		§ 2.6 and Standard 50473	No surface defects are allowed (e.g.: spots, blistering and removals) in comparison to the unexposed part
Resistance to mineral oil		§ 2.7 and Standard 50473/01 Method C	No surface defects are allowed (e.g.: spots, blistering, removals) in comparison to the unexposed part
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity		§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Salt spray fog corrosion strength		§ 2.10.1 and Standard 50180 Method B ₁	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥2 mm from the incision lines, and ≥2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed.
Accelerated ageing in artificial sunlight ✨		§ 2.13 and Standard 50451/01 Method A	Adhesion parameter: Ad1 No color variations are allowed
Resistance to stone blow ■		§ 2.15 and Standard 50488/01	Degree : 7B

✨ Only for parts that can be reached by sunlight

■ The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog

Class B ₂		
CHARACTERISTICS	TEST CONDITIONS	LIMITS
Visual inspection	---	§ 2.3
Thickness	---	§ 2.4
Adhesion	Brand new	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"	§ 2.5.1 and Standard 50461 Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"	Loss of hardness and adhesion in comparison to the unexposed part 10%
	After "Accelerated aging by atmospheric agents"	Variations are not allowed in comparison to the unexposed part ≥10%
Resistance to gasoline	§ 2.6 and Standard 50473	No surface defects are allowed (e.g.: spots, blistering and removals) in comparison to the unexposed part
Resistance to mineral oil	§ 2.7 Standard 50473/01 Method C	No surface defects are allowed (e.g.: spots, blistering, removals) in comparison to the unexposed part
Resistance to water immersion test	§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity	§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Salt spray fog corrosion strength	§ 2.10.1 and Standard 50180 Method B ₁	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥2 mm from the incision lines, and ≥2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed.
Determination of the resistance to chemical aggressions	§ 2.11 and Standard 50473/01 Method A	Spots with color shades that are different from the unexposed sample ones are not allowed. A light opacity and a hardly perceivable dye change in comparison to the unexposed sample is accepted
Accelerated aging by atmospheric agents	§ 2.12 and Standard 50451	Variations are not allowed in comparison to the unexposed part, superficial macro-defects (chalking, cracks, blistering, etc.), variation of brightness, after a light polishing, with film removal ≤1 μm not exceeding 5% of the initial value. Adhesion parameter: Ad1.
Resistance to stone blow ■	§ 2.15 and Standard 50488/01	Degree : 7B
Waxing and de-waxing test	§ 2.16 and Proc. Spec. 9.55846	Removal of the protection agent must not cause paint film spots, removals, inclusions, blistering and detachments

■ The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog

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Class C₁

CHARACTERISTICS		TEST CONDITIONS	LIMITS
Visual inspection		---	§ 2.3
Thickness		---	§ 2.4
Adhesion	Brand new	§ 2.5.1 and Standard 50461	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part ≤10%
Resistance to gasoline		§ 2.6 and Standard 50473	No surface defects are allowed (e.g.: spots, blistering and removals) in comparison to the unexposed part
Resistance to mineral oil		§ 2.7 Standard 50473/01 Method C	No surface defects are allowed (e.g.: spots, blistering, removals) in comparison to the unexposed part
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity		§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Resistance to corrosion	Salt spray fog test	§ 2.10.1 and Standard 50180 Method B ₁ or A ₁	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥2 mm from the incision lines, and ≥2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed \square
	Scab in door	§ 2.10.2 and Standard 50493/04	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥4 mm from the incision lines, and ≥4 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed \square
Resistance to stone blow ■		§ 2.15 and Standard 50488/01	Degree : 7B

- The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog
- \square Inside boxes: 2 corrosion points $\varnothing \leq 3$ mm every 5 cm² of the inner surface (at least 2 cm apart) are allowed.
In the contact and welding areas: sub-film propagation ≥ 4 mm from the contact point.

Class C ₂		
CHARACTERISTICS	TEST CONDITIONS	LIMITS
Visual inspection	---	§ 2.3
Thickness	---	§ 2.4
Adhesion	Brand new	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"	§ 2.5.1 and Standard 50461 Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"	Loss of hardness and adhesion in comparison to the unexposed part ≤10%
	After "Accelerated aging by atmospheric agents"	Variations are not allowed in comparison to the unexposed part ≥10%
Resistance to gasoline	§ 2.6 and Standard 50473	No surface defects are allowed (e.g.: spots, blistering and removals) in comparison to the unexposed part
Resistance to mineral oil	§ 2.7 Standard 50473/01 Method C	No surface defects are allowed (e.g.: spots, blistering, removals) in comparison to the unexposed part
Resistance to water immersion test	§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity	§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Resistance to corrosion	Salt spray fog test	§ 2.10.1 and Standard 50180 Method B ₁ or A ₁ After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub- film propagation ≥2 mm from the incision lines, and ≥2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed
	Scab in door	§ 2.10.2 and Standard 50493/04 After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub- film propagation ≥4 mm from the incision lines, and ≥4 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed
Determination of the resistance to chemical aggressions	§ 2.11 and Standard 50473/01 Method A	Spots with color shades that are different from the unexposed sample ones are not allowed. A light opacity and a hardly perceivable dye change in comparison to the unexposed sample is accepted
Accelerated aging by atmospheric agents	§ 2.12 and Standard 50451	Variations are not allowed in comparison to the unexposed part, superficial macro-defects (chalking, cracks, blistering, etc.), variation of brightness, after a light polishing, with film removal ≤1 μm not exceeding 5% of the initial value. Adhesion parameter: Ad1.

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Class C₂

CHARACTERISTICS	TEST CONDITIONS	LIMITS
Resistance to stone blow ■	§ 2.15 and Standard 50488/01	Degree : 7B
Waxing and de- waxing test	§ 2.16 and Proc. Spec. 9.55846	Removal of the protection agent must not cause paint film spots, removals, inclusions, blistering and detachments

■ The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog

Class D _{1A}			
CHARACTERISTICS		TEST CONDITIONS	LIMITS
Visual inspection		---	§ 2.3
Thickness		---	§ 2.4
Adhesion	Brand new	§ 2.5.1 and Standard 50461	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part ≤10%
Resistance to gasoline		§ 2.6 and Standard 50473	No surface defects are allowed (e.g.: spots, blistering and removals) in comparison to the unexposed part
Resistance to mineral oil		§ 2.7 Standard 50473/01 Method C	No surface defects are allowed (e.g.: spots, blistering, removals) in comparison to the unexposed part
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity		§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Resistance to corrosion	Salt spray fog test	§ 2.10.1 and Standard 50180 Method B ₁ or A ₁	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub – film propagation ≥2 mm from the incision lines, and ≥2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed 2
	Scab in door	§ 2.10.2 and Standard 50493/04	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub – film propagation ≥4 mm from the incision lines, and ≥4 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed 2
Resistance to stone blow ■		§ 2.15 and Standard 50488/01	Degree : 7B

■ The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog

2 Inside boxes: 2 corrosion points $\varnothing \leq 3$ mm every 5 cm² of the inner surface (at least 2 cm apart) are allowed.
In the contact and welding areas: sub – film propagation ≥4 mm from the contact point.

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Class D_{1B}

CHARACTERISTICS		TEST CONDITIONS	LIMITS
Visual inspection		---	§ 2.3
Thickness		---	§ 2.4
Adhesion	Brand new	§ 2.5.1 and Standard 50461	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part ≤10%
	After "Accelerated aging by atmospheric agents"		Variations are not allowed in comparison to the unexposed part ≥10%
Resistance to gasoline		§ 2.6 and Standard 50473	No surface defects are allowed (e.g.: spots, blistering and removals) in comparison to the unexposed part
Resistance to mineral oil		§ 2.7 and Standard 50473/01 Method C	No surface defects are allowed (e.g.: spots, blistering, removals) in comparison to the unexposed part
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity		§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Resistance to corrosion	Salt spray fog test	§ 2.10.1 and Standard 50180 Method B ₁ or A ₁	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥ 2 mm from the incision lines, and ≥2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed
	Scab in door	§ 2.10.2 and Standard 50493/04	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥ 4 mm from the incision lines, and ≥4 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed
Determination of the resistance to chemical aggressions		§ 2.11 and Standard 50473/01 Method A	Spots with color shades that are different from the unexposed sample ones are not allowed. A light opacity and a hardly perceivable dye change in comparison to the unexposed sample is accepted
Accelerated aging by atmospheric agents		§ 2.12 and Standard 50451	Variations are not allowed in comparison to the unexposed part, superficial macro-defects (chalking, cracks, blistering, etc.), variation of brightness, after a light polishing, with film removal ≤1 μm not exceeding 5% of the initial value. Adhesion parameter: Ad1.

cont'd

Class D₁B

CHARACTERISTICS	TEST CONDITIONS	LIMITS
Resistance to UV rays and subsequent adhesion	§ 2.14 and Standards 50471/01, 50457 and 50461	Adhesion parameter: Ad1 Aesthetic coating color changes, alterations are not allowed. For the bright and semi-opaque finishing, a variation of 5% in brightness is allowed; for the opaque finishing 10% and a light dye variation are allowed
Resistance to stone blow ■	§ 2.15 and Standard 50488/01	Degree : 7B
Waxing and de-waxing test	§ 2.16 and Proc. Spec. 9.55846	Removal of the protection agent must not cause paint film spots, removals, inclusions, blistering and detachments
Scratching test by Car-wash	§2.18 and Standard 50449	Paint removal and loss of brightness are not allowed

- The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog

Class D1C

CHARACTERISTICS		TEST CONDITIONS	LIMITS
Visual inspection		---	§ 2.3
Thickness		---	§ 2.4
Adhesion	Brand new	§ 2.5.1 and Standard 50461	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part $\leq 5\%$
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part $\leq 10\%$
	After "Accelerated aging by atmospheric agents"		Variations are not allowed in comparison to the unexposed part $\geq 10\%$
Resistance to gasoline		§ 2.6 and Standard 50473	No surface defects are allowed (e.g.: spots, blistering and removals) in comparison to the unexposed part
Resistance to mineral oil		§ 2.7 Standard 50473/01 Method C	No surface defects are allowed (e.g.: spots, blistering, removals) in comparison to the unexposed part
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity		§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Resistance to corrosion	Salt spray fog test	§ 2.10.1 and Standard 50180 Method B ₁ or A ₁	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥ 2 mm from the incision lines, and ≥ 2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed
	Scab in door	§ 2.10.2 and Standard 50493/04	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor Sub-film propagation ≥ 4 mm from the incision lines, and ≥ 4 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed \square
Determination of the resistance to chemical aggressions		§ 2.11 and Standard 50473/01 Method A	Spots with color shades that are different from the unexposed sample ones are not allowed. A light opacity and a hardly perceivable dye change in comparison to the unexposed sample is accepted
Resistance to stone blow ■		§ 2.15 and Standard 50488/01	Degree : 7B

■ The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog.

\square Inside boxes: 2 corrosion points $\varnothing \leq 3$ mm every 5 cm² of the inner surface (at least 2 cm apart) are allowed. In the contact and welding areas: sub-film propagation ≥ 4 mm from the contact point.

Class D₂

CHARACTERISTICS		TEST CONDITIONS	LIMITS	
			AS IT IS	AFTER FINISHING■
Visual inspection		---	§ 2.3	After finishing with the body enamels, the painted layer must not show defects, the brightness must be the one that is indicated in the Procurement Specification related to the used enamel
Thickness		---	§ 2.4	---
Adhesion	Brand new	§ 2.5.1 and Standard 50461	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges	
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part ≤5%	
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part ≤10%	
	After "Accelerated aging by atmospheric agents"		---	Variations are not allowed in comparison to the unexposed part ≥10%
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed	
Resistance to humidity		§ 2.9 and Standard 50184Method B	No dye blistering, stains, removal or variation are allowed	
Resistance to corrosion	Salt spray fog test	§ 2.10.1 and Standard 50180 Method B ₁ or A ₁	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥2 mm from the incision lines, and ≥2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed	
	Scab in door	§ 2.10.2 and Standard 50493/04	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥4 mm from the incision lines, and ≥4 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed	
Determination of the resistance to chemical aggressions		§ 2.11 and Standard 50473/01 Method A	Spots with color shades that are different from the unexposed sample ones are not allowed. A light opacity and a hardly perceivable dye change in comparison to the unexposed sample is accepted	
Accelerated aging by atmospheric agents		§ 2.12 and Standard 50451	---	1 Adhesion parameter: Ad1

■ The finishing painting must be carried out according to the Proc. Spec. 955772 or 9.55776/01 depending if double layer metallized or pastel enamel is used

1 Variations are not allowed in comparison to the unexposed part, superficial macro – defects (chalking, cracks, blistering, etc.), variation of brightness, after a light polishing, with film removal ≤ 1 µm not exceeding 5% of the initial value

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Class D₂

CHARACTERISTICS	TEST CONDITIONS	LIMITS	
		AS IT IS	AFTER FINISHING ■
Resistance to UV rays and subsequent adhesion	§ 2.14 and Standards 50471/01, 50457 and 50461	Adhesion parameter: Ad1 Aesthetic coating color changes, alterations are not allowed. For the bright and semi-opaque finishing, a variation of 5% in brightness is allowed; for the opaque finishing 10% and a light dye variation are allowed	
Waxing and de-waxing test	§ 2.16 and Proc. Spec. 9.55846	---	Protection agent removal without superficial defects
Resistance to stone blow ■	§ 2.15 and Standard 50488/01	Degree : 7B	
Scratching test by Car-wash	§2.18 and Standard 50449	-	Paint removal and loss of brightness are not allowed

- The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog

Class E

CHARACTERISTICS		TEST CONDITIONS	LIMITS
Visual inspection		---	§ 2.3
Thickness		---	§ 2.4
Adhesion	Brand new	§ 2.5.1 and Standard 50461	No detachment of the paint coat from the squared surface is allowed, but only the removal of burrs from the square edges
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part ≤10%
	After "Accelerated aging by atmospheric agents"		Variations are not allowed in comparison to the unexposed part ≥10%
Resistance to gasoline		§ 2.6 and Standard 50473	No surface defects are allowed (e.g.: spots, blistering and removals) in comparison to the unexposed part
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity		§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Determination of the resistance to chemical aggressions		§ 2.11 and Standard 50473/01 Method A	Spots with color shades that are different from the unexposed sample ones are not allowed. A light opacity and a hardly perceivable dye change in comparison to the unexposed sample is accepted
Accelerated aging by atmospheric agents		§ 2.12 and Standard 50451	Variations are not allowed in comparison to the unexposed part, superficial macro-defects (chalking, cracks, blistering, etc.), variation of brightness, after a light polishing, with film removal ≤1 μm not exceeding 5% of the initial value. Adhesion parameter: Ad1.
Resistance to UV rays and subsequent adhesion		§ 2.14 and Standards 50471/01, 50457 and 50461	Adhesion parameter: Ad1 Aesthetic coating color changes, alterations are not allowed. For the bright and semi-opaque finishing, a variation of 5% in brightness is allowed; for the opaque finishing 10% and a light dye variation are allowed
Resistance to stone blow ■		§ 2.15 and Standard 50488/01	Degree : 7B
Waxing and de-waxing test		§ 2.16 and Proc. Spec. 9.55846	Protection agent removal without superficial defects

■ The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog

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Class F₁

CHARACTERISTICS		TEST CONDITIONS	LIMITS
Visual inspection		---	§ 2.3
Thickness		---	§ 2.4
Adhesion	Brand new	§ 2.5.2 and Proc. Spec. 9 5 650 0	The adhesion must be greater than the cohesion of the material itself
	After "Resistance to water"		Loss of hardness and adhesion in comparison to the unexposed part ≤5%
	After "Resistance to humidity"		Loss of hardness and adhesion in comparison to the unexposed part ≤10%
Resistance to water immersion test		§ 2.8 and Standard 50470	No blistering, stains, removal and opacity are allowed
Resistance to humidity		§ 2.9 and Standard 50184 Method B	No dye blistering, stains, removal or variation are allowed
Resistance to corrosion	Salt spray fog test	§ 2.10.1 and Standard 50180 Method B ₁ or A ₁	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥2 mm from the incision lines, and ≥2 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed
	Scab in door	§ 2.10.2 and Standard 50493/04	After exposure neither corrosion points of the support material (iron, zinc, aluminum etc.) nor sub-film propagation ≥4 mm from the incision lines, and ≥4 mm from the component sharp edges and corners are allowed. Also paint film blistering, removals and detachments from the support are not allowed
Resistance to stone blow ■		§ 2.15 and Standard 50488/01	Degree : 7B
Resistance to abrasion		§ 2.17 and Standard 50488 (10kg of grit or based on the technical data sheet of the protection agent used)	Neither the painted support nor the base metal must be visible

■ The indicated value is referred to the corrosion points on the plate after 24 h exposure in salty fog