

**PAINT COATINGS  
APPLIED TO MECHANICAL METAL PARTS**

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**THIS NORME REPLACES NORMES B15 5105 AND B20 1100***This is a translation, the French original shall be used in all cases of litigation**Date of translation : 01/05/1996***CONTENTS**

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**1.OBJECT**

This standard defines the various paint coatings (single or multi-layers) applicable to mechanical metal parts in terms of :

- their location on the vehicle,
- their constituent materials.

It indicates the symbols to adopt and sets the requirements to be met by these coatings.

**Important :**

This standard does not apply, under any circumstance, to paint coatings on « dress » or « body » parts or to additional anti-corrosion protection products.

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## 2.EXPRESSION ON DOCUMENTS

The application of the requirements of this standard is specified on documents by the following expressions :

- PAINT.
- Colour followed by the sample reference (colour) when specified.
- Coding of the characteristics of this paint including :
  - a mandatory code for the MINIMUM requirements (see § **Minimum requirements**).
  - If required, the code(s) for SPECIFIC requirements (see § **Specific requirements**) placed each time between dashes (see examples).
- The reference number of this standard (See following examples).

### Example 1 :

BLACK PAINT 250 norme B15 5220 designates a black paint coating for a mechanical part exterior to the passenger compartment (in cast iron for example or in forged steel) which must meet the MINIMUM requirements of code 250 (see § **Minimum requirements**) and without SPECIFIC requirements requested in conformity with this standard.

### Example 2 :

BROWN-RED PAINT 500 – GR – TE - Norme B15 5220 designates a brown-red paint coating for a mechanical part exterior to the passenger compartment (in uncoated sheet metal for example) which must meet the MINIMUM requirements of code 500 (see § **Minimum requirements**) and to SPECIFIC requirements (see § **Specific requirements**) of resistance to chipping (GR) and resistance to high temperatures (TE) specified in this standard.

### Important reminder :

In specific cases of parts which are electrolytically zinc plated or galvanised, then painted, 2 expressions must mandatorily figure on documents :

- 1) The symbol for zinc coating which is expressed in conformity with the standard specific to the coating adopted which is :
  - electrolytic deposit of zinc,
  - zinc plated by dipping (galvanisation).
- 2) The symbol for the paint adopted (colour, characteristics, etc.) which is expressed in conformity with this standard.

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### 3.DEFINITIONS

- Parts exterior to the passenger compartment :  
These are parts which are located outside the passenger compartment and which are consequently in contact with water, salt or mud.  
These are located on the exterior of the vehicle in relation to seals (for doors, tailgate, sunroof, ...) or in the interior of some openings (Example : door interior...).
- Interior parts : these are parts inside the passenger compartment or boot in relation to seals.
- Paint coating : this is a film of paint, without detail of thickness or friction coefficients (see Remark) obtained after applying one or several coats of paint to a part independently of the process used.

**Remark :**

The application of a paint coating, in conformity with this standard, to parts requiring guaranteed assembly clearances (examples : shafts, bores, threaded parts, ...), must always be the subject of a Specific Design so that all the requirements necessary for assembling these parts are guaranteed by the supplier (s).

For this purpose, maximum paint thicknesses concerning the various functional areas of the part may be specified on the drawing.

### 4.CHARACTERISTICS AND REQUESTED REQUIREMENTS

As a general rule, the characteristics of a paint coating must be examined only after conditioning at  $23\text{ °C} \pm 2\text{ °C}$  with  $50\% \pm 5\%$  relative humidity :

- 7 days after application in the case of a paint drying in ambient atmosphere.
- 24 hours after stoving in the case of a paint drying in an oven.

A paint coating must always meet one of the MINIMUM levels of requirements (see below). Furthermore, in some cases, SPECIFIC requirements may be requested since the location of parts justifies it (Example : parts exposed to chipping, etc.).

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#### 4.1.MINIMUM REQUIREMENTS

Three levels of MINIMUM requirements are used to characterise the paint coatings of this standard (see table below).

Any of these levels of requirements according to the code selected is allocated according to the location of parts on the vehicle and/or according to the type of support to which the paint is applied.

Documents	Characteristics	EXPRES. OF RESULTS	Codes and minimum requirements					
			48		250		500	
			Interior parts		Exterior parts			
			Materials					
			ALL METAL PARTS	- Cast iron - Forged steel - All electro-zinc plated parts – Sherardising process (1)	- Uncoated sheets - Electro-zinc plated or galvanised sheets - Al or Zn alloys - All electro-zinc plated or galvanised parts not in bulk (1)			
D25 1075	Adhesion – Cross hatch test	Grading	a or b ; see note (4)	a or b	a or b ; see note (4)			
D17 1058	Salt spray test							
	- Duration	Hours	48	250	500			
	- Oxidation full panel including weld beads (2)	Grading	0	Cast iron : 2 Other material : 0	case N° 1 : ≤ 2* case N° 2 : 0**			
D27 1571	- Blistering	Grading	0	0	0			
D17 1058	- Detachment from score marks (3)	mm	≤ 3	≤ 3	≤ 3			
	- Oxidised edges/total length of edges	%	≤ 20	≤ 20	≤ 20			
D25 1075	- Adhesion after cross hatch test	Grading	a or b ; see note (4)	a or b	a or b ; see note (4)			
D23 1001	Resistance to cupro-acetic salt spray (CASS - TEST)		Al or Zn Alloys	Others	(-)	Al or Zn Alloys	Others	
	- Duration	Hours	8	(-)		72	(-)	
	- Overall rate of corrosion	%	≤ 1			≤ 1		
	- Local rate of corrosion	%	≤ 30			≤ 30		
	- Detachment from score mark	mm	≤ 3			≤ 3		
D27 1327	Resistance to immersion in water							
	- Duration	Days	3	10	10			
	- Blistering and change of colour	Grading	0	0	0			
D25 1075	- Adhesion – Cross hatch test	Grading	a or b	a or b	a or b			
	Immersion 7 days at 100 °C in oil in conformity with B71 2210							
D25 1075	- Adhesion after cross hatch test	Grading	a or b	a or b	a or b			
D25 1298	- Loss of PERSOZ hardness in relation to a new condition	%	≤ 20	≤ 20	≤ 20			

\* Case N° 1 = parts which include weld beads : the requirement ≤ 2 must be observed in every point of the part and, in particular, by the weld splatter and beads.

\*\* Case N° 2 = parts with no weld bead.

- A dash (-) means that there is no requirement.

- See following note for (1), (2), (3), (4).

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**Reminder :**

Requirements for the resistance to corrosion.

The characteristics for the resistance to corrosion of a paint coating must not be confused with those of the part itself; the latter depends also upon the constituent material of the part :

- A painted steel part rusts as soon as the paint coating begins to deteriorate or is scratched.
- A part which is electro-zinc plated or galvanised then painted, benefits, after deterioration of the paint coating, from the protection provided by the zinc. Placed in the same conditions as a steel part not coated with zinc, it will therefore assume its function for a longer period.

**Note :**

*(1) The treatment of parts in large quantity (in bulk) or singly is not comparable. Electro-zinc plated or galvanised painted parts must also meet the requirements set in the standards specific to these coatings.*

*(2) In the case of iron supports : red oxidation (rust) and in other cases : white oxidation (Example : Aluminium, zinc coated supports).*

*(3) In the case of electro-zinc plated or galvanised or even zinc alloy support, there are no requirements for this characteristic.*

*(4) In the case of a painted mechanical part including one or more weld beads, a maximum detachment is allowed here (providing the part is not subjected to a mechanical stripping before painting), in a new condition or after the salt spray test, of :*

- *4 mm wide within an area of 25 mm from each side of the weld bead.*
- *10 mm wide on the reverse side and along the weld bead.*

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## 4.2.SPECIFIC REQUIREMENTS

In certain cases, the paint coating of parts must withstand very severe stresses (Example : Temperature, chipping, etc.).

In this case, the paint coating must mandatorily meet one of the MINIMUM level of requirements defined in the previous paragraph, but furthermore, some SPECIFIC requirements (see table below) may be specified, if necessary (see Note).

**Note :** *These requests for SPECIFIC requirements expressed by a code in conformity with paragraph **Expression on documents**, must remain infrequent and always be justified, for reason of the extra costs they generate (application range and specific paints).*

Specific characteristics	Code	Document	Tests	Expression of results	Requirements
Resistance to chipping (1)	GR	D24 1312	Resistance to chipping - Flaking	Grading	≤ 3
Resistance to temperature (200 °C to 300 °C) (2)	TE	D17 1058	Heat the part at 300 °C for 15 min then allow to cool. Resistance to salt spray for 96 hours Oxidation full panel	Grading	0
Resistance to synthetic brake fluid (suivant B71 2430)	SY	D25 1075 D25 1298	Immersion 7days at 100 °C in the brake fluid - Adhesion to cross hatch - Loss of PERSOZ hardness in relation to a new condition	Grading %	a or b ≤ 50
Appearance (3)	AS	D15 1343	Visual comparison of colours in a light chamber		No drop or running Conformity to sample Uniform colour
Resistance to direct sunlight (exterior parts)	LE	D27 1389 D25 1413 D15 5084	Artificial ageing on the weatherometer on flat test specimens. Duration : 576 h (pyrex filters)	Loss of gloss % (4) Colour variation (Δ E)	≤ 30 ≤ 4 (5)
Resistance to light (interior parts in passenger compartment)	LH	D47 1431	Colour fastness to Xenotest 150 at 90 °C Duration : 300 h	Grading (Grey scale)	≥ 4

(1) Paint on its own cannot provide protection to parts highly exposed to chipping or to abrasion by solid particles (Example : sand, dust, mud). In these cases, a suitable protective device which does not belong to the field of this standard must be specified (Example : shield, sheathing, cured PVC, etc.).

(2) No paint (with organic binder) can withstand temperatures greater than 300 °C. Beyond this temperature, other types of coating are to be specified.

(3) Requirements for appearance to be used only very exceptionally on particularly visible parts.

(4) Values of gloss are measured at a 60°angle. Gloss after artificial ageing is measured on non polished parts.

(5) Requirements valid for dark colours, to be confirmed for pale colours.

## 5.RECORDS AND REFERENCE DOCUMENTS

### 5.1.RECORDS

#### 5.1.1.CREATION

- OR : 01/12/1991 – CREATION OF THE NORME

#### 5.1.2.SUBJECT OF THE MODIFICATION

- A : 01/04/1995 – MODIFICATIONS TO § 2., TABLES IN § 5.1. AND 5.2. – ADDITION OF NOTE 4.
- B : 26/03/1997 – INTRODUCED INTO IDEM (*French only*).

### 5.2.REFERENCE DOCUMENTS

#### 5.2.1.PSA DOCUMENTS

##### 5.2.1.1.Normes

B712210, B712430, D151343, D155084, D171058, D231001, D241312, D251075, D251298, D251413, D271327, D271389, D271571, D471431.

##### 5.2.1.2.Others

#### 5.2.2.EXTERNAL DOCUMENTS

### 5.3.EQUIVALENT TO :

### 5.4.CONFORMS TO :

### 5.5.KEY WORDS