

**COATINGS AND PARTS IN THE PASSENGER COMPARTMENT
COLOUR FASTNESS TO WATER
SEA WATER AND PERSPIRATION**

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No use restriction*This is a translation, the French original shall be used in all cases of litigation**Date of translation : 16/01/2006***FOREWORD**

This document is equivalent to the Renault SAS and RENAULT TRUCKS Groups document of reference D47 1020.

The equivalence applies to the first level; it does not concern the reference documents. It must not be modified without prior consultation with the Standards Departments of this Group.

*It is in conformity with the agreement reached between these Groups and PSA PEUGEOT CITROEN in **June 2005**.*

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PSA PEUGEOT - CITROËN

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RECORDS

Suffix	Date	Type of modifications
OR	01/10/1979	CREATION OF THE NORME
A	01/09/1992	COMPLETE REWRITE OF THE NORME
B	01/06/1994	MODIFICATION TO § 1., 3.3., 5., 6. and 7.
C	24/09/1997	INTRODUCED INTO IDEM (<i>French only</i>)
D	27/05/1999	FOR NEW DESIGNS, THIS NORME REPLACES METHODS D47 1021, D47 1022,....., D47 1025.
E	16/02/2000	REWRITE OF § 4., 5. AND APPENDIX DELETED
F	12/01/2006	MODIFICATIONS TO THE FOREWORD AND § 5.4. AND 5.5.

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1.OBJECT AND FIELD OF APPLICATION

The object of this method is to determine the colour fastness to water, sea water and perspiration of materials and parts in the passenger compartment.

It applies to materials such as textiles, plastic coated textiles, hide trims, plastics in sheet form as well as plastic parts in the passenger compartment.

2.REFERENCE DOCUMENTS

2.1.NORMES

D15 1343	COLOURED MATERIALS - VISUAL COMPARISON OF COLOURS IN A LIGHT CHAMBER.
NF EN ISO 105-A01	TEXTILES – COLOUR FASTNESS OF DYES - PART A01 : GENERAL TEST PRINCIPLES.
ISO 105-A02	TEXTILES. COLOUR FASTNESS OF DYES - PART A02 : GREY SCALE TO ASSESS THE DETERIORATIONS.
ISO 105-A03	TEXTILES. COLOUR FASTNESS OF DYES - PART A02 : GREY SCALE TO ASSESS THE COLOUR TRANSFERS.

2.2.REGULATIONS

Not applicable.

2.3.OTHER DOCUMENTS

Not applicable.

2.4.EXPRESSION ON DOCUMENTS

Not applicable.

3.TERMINOLOGY AND DEFINITION

A dictionary (glossary) of the main terms and their definitions used within the "Direction des Plates-formes, des Techniques et des Achats" can be consulted in-house via the DPTA glossary.
([Nectar](http://nectar.inetpsa.com) : <http://nectar.inetpsa.com>). This glossary is constantly up-dated.

3.1.DEFINITIONS

Not applicable.

3.2.ACRONYMS

Not applicable.

4.TEST METHOD PRINCIPLE

A test specimen of the material to be tested and a non coloured reference woven textile soaked with water, sea water or perspiration are left in contact under pressure for a given period of time. The test specimen and the non coloured reference woven textile are dried. The deterioration of the test specimen and the colour transfer onto the non coloured reference woven textile are assessed against the grey scale.

5.EQUIPMENT AND REAGENTS

5.1.RIGID PLATES

In glass or acrylic plastic 115 mm x 60 mm.

5.2.TEST APPARATUS

consisting of a stainless steel frame 115 mm x 60 mm in base dimensions in which a 50 newton load is placed so that a pressure of approximately 12,5 kPa must be applied to the test specimens.

5.3.NON COLOURED REFERENCE WOVEN TEXTILES

Reference textiles in wool or polyacrylic or polyester or polyamide or cotton or acetate 100 mm x 40 mm or reference textiles in multifibres from the same materials (6 times 17 mm) x 40 mm.

Non coloured reference woven textiles must have a canvas backing of 100 g/m² to 125 g/m² in weight and contain no dressing or residual chemical products or chemically damaged fibres, or optical bluing. Cotton must be bleached, other woven textiles must be cleaned but not bleached (see norme NF EN ISO 105-A01).

5.4.GREY SCALE

To assess the deteriorations defined by the standard ISO 105-A02 and the grey scale to assess the colour transfers onto non coloured reference woven textiles defined by the standard ISO 105-A03. These two scales are graduated by half-point steps.

Note : *Textiles (§ 5.3.) and grey scale (§ 5.4.) may be obtained through ADSOL or ATLAS sdl.*

5.5.MASKING DEVICES

Used to assess the contrast in colour on the different aged test specimens. They consist of neutral grey (RSA – Renault TRUCKS) or black cards (PSA), in which windows of 30 mm x 30 mm are made, 20 mm apart maximum. The neutral grey colour is approximately that of the lightest band on the grey scale for the assessment of deterioration (§ 5.4.) (for example CHARTE neutral grey card from KODAK). The colour black is that of the grey scale masking device (§ 5.4.).

5.6.VENTILATED OVEN

Set to 37°C ± 2°C.

5.7.BALANCE

Accurate to the nearest 0,1 gram.

5.8.SOLUTIONS

5.8.1.DISTILLED WATER

5.8.2.SEA WATER

Synthetic to 30 g/l of sodium chloride (NaCl) prepared from mineralised or distilled water.

5.8.3.BASIC PERSPIRATION CONTAINING PER LITRE OF DISTILLED WATER

- 5 g of sodium chloride,
- 0,5 g of L(+) – histidine monochlorhydrate to 1 molecule of water (C₆H₁₀ClN₃O₂, H₂O),
- 5 g of di-sodium hydrogenphosphate to 12 molecules of water (Na₂HPO₄, 12H₂O).

If required, pH will be adjusted to pH 8 using a sodium hydroxide decinormal solution (NaOH).

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5.8.4.ACID PERSPIRATION CONTAINING PER LITRE OF DISTILLED WATER

- 0,5 g of L(+)- histidine monochlorhydrate to 1 molecule of water ($C_6H_{10}ClN_3O_2$, H_2O),
- 5 g of sodium chloride (NaCl),
- 2,2 g of sodium dihydrogenphosphate to 2 molecules of water (NaH_2PO_4 , $2H_2O$).

If required, pH will be adjusted to pH 5,5 using a sodium hydroxide decinormal solution (NaOH).

Note : *The two solutions (§ 5.8.3.and § 5.8.4.) must be kept away from light. The pH of the solutions must be checked each time before use. The maximum time of use is one month after preparation.*

6.PREPARATION OF SOLUTIONS

Not applicable.

7.REPRESENTATIVENESS OF TEST SPECIMENS OR SAMPLES

The test specimens or samples must be representative of the scale to be characterised. To provide this representativeness, it is necessary to find out the basic characteristics of the population studied. The selection criteria for the test specimens or samples must be specified in the Test Report (RE), in conformity with norme A10 0156.

8.PREPARATION OF TEST SPECIMENS

8.1.FOR WOVEN OR KNITTED TEXTILES, THEIR COMPOSITES AND THEIR MATERIALS IN SHEET FORM

- Take a test specimen 100 mm x 40 mm.
- The test specimen thickness is that of the material.

Note : *Cut out the test specimens without marking them so that the marker ink does not bleed onto the textile during the test.*

8.2.FOR THREADS

Knit the thread and proceed as indicated in § 8.1. or form a layer of parallel threads between two textiles (§ 5.3.) and sew along the two opposite sides to maintain the thread in place and form a composite test specimen.

8.3.FOR SOLID MATERIALS

Cut out the test specimen over a thickness of 1 mm to 2 mm so that the reverse face is flat and parallel to the right side.

9.PROCEDURE

- Place the test specimen on a plate (§ 5.1.) the right side facing upwards.
- Using the balance (§ 5.7.), weigh the reference textile which will be immersed in one of the solutions (§ 5.8.) required to obtain a bath ratio 50/1, which is the ratio between the volume of liquid used in millilitres and the weight of the reference textile in grams.
- Immerse the piece of reference textile (§ 5.3.) in one of the solutions (§ 5.8.) at ambient temperature for at least 5 min.
- Remove the piece of reference textile (§ 5.3.) from the solution and place it at the centre of the test specimen taking care not to wet the reverse side of the material (textile support, cellular material, etc.).
- Place the assembly on a second plate (§ 5.1.) then the 50 N load.
- Place the assembly in an oven (§ 5.6.) for 4 hours \pm 15 minutes.
- Remove the composite test specimen from the oven, separate the test specimen from the reference textile (§ 5.3.) and dry in the air at a temperature below 60°C.
- Repeat the test with each solution.

10.REMARKS

Not applicable.

11.TEST REPORT AND EXPRESSION OF RESULTS

11.1.EXPRESSION OF RESULTS

Assess the deterioration of the test specimen and the colour transfer onto the non coloured reference woven textile using the grey scale (§ 5.4.) according to the details given in standards ISO 105-A02 and ISO 105-A03, in the lighting conditions defined in test method D15 1343.

To assess the differences in colour, cover the test specimens, and master samples using the masking devices (§ 5.5.) in order to compare identical surfaces and tone down the effect of neighbouring colours.

Express :

- the colour fastness index for the deterioration of the various dyes or prints on each type of non coloured reference woven textile used
- the colour fastness index for the dye transfer from the various dyes or prints onto each type of non coloured reference woven textile used; any intermediate index allocated by means of the grey scale in half-point steps must be indicated by two figures separated by a slash / (for example 4/5).

For the test with the non coloured reference multifibre woven textile, take the worst result. If in doubt, carry out a test for confirmation with a non coloured reference woven textile (format 100 mm \times 40 mm) of the same composition as the fibre on which an anomaly has been detected

11.2.TEST REPORT

As well as the results obtained, the test result must indicate :

- the reference to this method,
- the material references and the name of the Supplier,
- the special test conditions,
- the operating details not specified in the method as well as any incidents likely to have affected the results.