

**PAINT COATINGS AND SIMILAR PRODUCTS
STAINING**

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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 : 29/07/2004***1.OBJECT AND FIELD OF APPLICATION**

The object of this method is to identify the resistance of paint films and similar products to staining or attack by different products likely to come into contact with them.

The table in appendix 1 gives the list of relevant products. Products not mentioned in this table may be treated in a similar way.

2.PRINCIPLE

The product being considered is applied to the test specimen coated with paint or similar product. After an accelerated ageing test by exposure to light if applicable, the staining and attack on the paint are examined.

3.EQUIPMENT AND REAGENTS**3.1.EQUIPMENT FOR APPLYING THE PRODUCT**

Such as :

3.1.1.SPRAY GUN FOR AIRLESS OR AIRMIX SPRAYING

3.1.2.PIPETTE OR SYRINGE OF 2 ML CAPACITY

3.1.3.GLASS STIRRING ROD OR PAINT BRUSH

3.1.4.MOULDS FOR PASTE PRODUCTS

dimensions : 20 mm diameter, 2 mm thickness.

3.1.5.STEEL PARALLELEPIPED

with a base of 30 x 50 mm approximately and fitted with an extra load so that the total weight is $500 \text{ g} \pm 10 \text{ g}$, for rubbers and flexible plastics.

3.2.VENTILATED ADJUSTABLE OVEN

to $\pm 1 \text{ }^{\circ}\text{C}$ with a maximum of $200 \text{ }^{\circ}\text{C}$.

3.3.HPLR 400 SOLAR LAMP WITH NER 400 REFLECTOR

or any other lamp with the same performances (see appendix 3).

3.4.CONDITIONED ROOM

at $23 \text{ }^{\circ}\text{C} \pm 2 \text{ }^{\circ}\text{C}$ and $50 \% \pm 5 \%$ relative humidity.

3.5.CLEANING LIQUID

Petroleum ether at $65\text{-}95 \text{ }^{\circ}\text{C}$ or alcohol at $95 \text{ }^{\circ}\text{GL}$ or, if required, another volatile solvent which does not stain the paint.

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3.6.APPROVED PAINT POLISHING PRODUCT

3.7.WHITE OR COTTON CLOTHS

3.8.MASK (CARDBOARD OR SHEET STEEL PIECES)

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4.TEST SPECIMENS

The painted sheet steel test specimens (dimensions 120 x 200 mm) shall be produced according to the current production range.

They must be of recent application. The period of time between the test and the baking shall be a maximum of 48 hours. In the case of test on finish paints, the tests shall be carried out on a minimum of 4 finishes :

- 1 light colour (white or beige),
- 1 dark colour (blue or black),
- 1 metallic colour,
- 1 metallic colour with finish clear coat (double layer).

Other supports : different paints, plastic film, textile, shall be used according to the circumstances ; it is advisable to remain as close as possible to production conditions.

5.APPLICATIONS OF THE PRODUCT TO BE TESTED TO THE SUPPORT

According to circumstances, one of the following application procedures shall be used (see table in appendix 1 and diagrams in appendix 2).

5.1.LIQUID PRODUCTS

Apply the test liquid so that two drops of 20 mm diameter approximately are produced on the test specimens.

- Liquid products : by means of a pipette or syringe (3.1.2).
- Viscous products : by means of stirring rod, a syringe or a paint brush.

5.2.PASTE PRODUCTS

Deposit two discs of the product, 20 mm in diameter and 2 mm thick by means of the moulds (3.1.4).

5.3.SPRAYED PRODUCTS

5.3.1 On one half of the plate, apply the product to be tested with a spray gun (3.1.1).

5.3.2 On the other half of the plate, deposit two drops as per the method of operation defined in § 5.1.

5.4.SHEETS AND ADHESIVES

Apply to the test specimen two rectangles of sheets or adhesives of 25 x 40 mm dimensions.

5.5.RUBBERS AND FLEXIBLE PLASTICS

- Place two strips of approximately 25 x 40 mm of the sample on the test specimen, taking care, if necessary, that the surface of the strip in contact with the paint is the same as on the vehicle. Cover the strip with the weight specified in § 3.1.5 after inserting, if necessary, if the thickness of the strip is not regular, a sheet of flexible polyurethane foam of several millimetres thickness between the strip and the weight.
- Place the test specimen horizontally (with its weight, if required) in the oven (3.2) set according to the requirements of standard documents : 70 hours at 80 °C or 14 hours at 100 °C.

6.STAINING TEST

Carry out in sequence the following operations :

Observation :

Certain operations may be omitted according to circumstances (see table in appendix 1).

6.1 Deposit the products as per the instructions in the table of appendix 1.

6.2 Expose the plates to the ambient air of the laboratory for the time specified in the table of appendix 1.

6.3 In the case where the product is not exposed to a solar lamp, note the staining according to the scale defined in paragraph 7.0.

6.4 Expose the plates to a solar lamp (3.3) for the time specified in the table of appendix 1, protecting half the plate by using a mask (3.8).

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6.5 Clean the plate with a suitable liquid (3.5).

6.6 Note any staining (according to the scale defined in paragraph 7.0).

6.7 If necessary, carry out additional exposure to the solar lamp (see table in appendix 1). If this exposure is merely optional, it will only be carried out where staining occurs.

6.8 If applicable, (see table in appendix 1), introduce the plate into the oven for 20 minutes at 100 °C to simulate retouch of an area which, in principle, is protected.

6.9 Proceed with a new rating according to the scale defined in paragraph 7.0.

6.10 If necessary, polish the plate (see table in appendix 1) (if there is staining) using the product (3.6) by means of a cloth (3.7).

6.11 Note the staining according to the grading scale defined in paragraph 7.0.

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7.EXPRESSION OF RESULTS

It is carried out by comparison between the part subjected to staining and parts which are intact with and without mask.

Record visually :

- loss of gloss, change in colour, softening, swelling.

Make the distinction between :

- staining by contact, limited to the contact area,
- staining by migration on the periphery of the contact area.

The rating must be carried out according to the following scale :

0 : no change in colour, no softening.

1 : light softening.

2 : slight change in colour or loss of gloss without softening.

3 : change in colour with softening or pronounced softening.

4 : pronounced change in colour (with or without softening).

5 : more significant damage to the film (partial dissolving, blistering, detachment ...).

Apart from the rating, the staining observed must be indicated and it must be stated whether it was obtained :

- without exposure to the solar lamp E0,
- after initial exposure to the solar lamp E1,
- after a second exposure to the solar lamp E2.
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8.TEST REPORT

As well as the results, the test report must state :

- the products tested,
- the supplier's reference,
- identification of the finish paints,
- the operating details not specified in the method as well as any incident likely to have affected the results.
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REFERENCE DOCUMENT

PSA DOCUMENT

Test method : D47 1408.

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Appendix 1 (1/2)

LIST OF PRODUCTS

PRODUCTS	Method of application	Exposure to ambient air (§ 6.2)	Exposure to solar lamp with product (§ 6.4)	Exposure to solar lamp after cleaning (§ 6.7)	Possibility of simulating introduction into retouch oven if specified on standard documents (§ 6.8)	Possibility of polishing (§ 6.10)	Remarks (*)
Polish, insect remover, shampoo	§ 5.1	24 h	-	If required 24 h	no	no	
Cold deconditioning product	§ 5.1	24 h	-	If required 24 h	no	no	
Hot deconditioning product	§ 5.1	24 h	-	If required 24 h	no	no	
Sulphuric acid 34° baumé	§ 5.1	24 h	-	-	no	no	(5)
Brake fluid	§ 5.1	30 min	3 h	If required 24 h	yes	yes	
Oil	§ 5.1	30 min	24 h	If required 24 h	yes	yes	
Antifreeze	§ 5.1	-	6 h	If required 24 h	yes	yes	
Glass wash liquid	§ 5.1	-	24 h	If required 24 h	no	no	
Fuels : - Petrol - Diesel	§ 5.1 § 5.1	5 min 5 min	24 h 24 h	- -	no no	no no	(4) (5) (4)
Solvents : xylol, alcohol ...	§ 5.1	5 min	24 h	If required 24 h	no	no	(4) (5)
Cleaning products (solvents and others)	§ 5.1	5 min	-	If required 24 h	no	no	
Box sections, underbody, engine clear coat	§ 5.1	30 min	24 h	If required 24 h	yes	yes	(1)
Adhesives	§ 5.1 ou § 5.2 according to consistency	30 min	24 h	If required 24 h	yes	yes	(2)
Grease	§ 5.2	30 min	24 h	If required 24 h	yes	yes	
Sealants – Anti-chipping products	§ 5.2	30 min	24 h	If required 24 h	yes	yes	(2)
Body conditioning products	§ 5.3	30 min	48 h	24 h	no	no	
Internal adhesive protective product	§ 5.4	30 min	24 h	-	yes	no	(2)
External adhesive protective product	§ 5.4	30 min	48 h	24 h	yes	no	(2)
Rubbers and plastics	§ 5.5	30 min	24 h	If required 24 h	no	no	(6)
Glass wipe blade	§ 5.1	5 min	24 h	If required 24 h	no	no	(3) (6)

(*) For remarks (1) to (6), see appendix 1 (2/2).

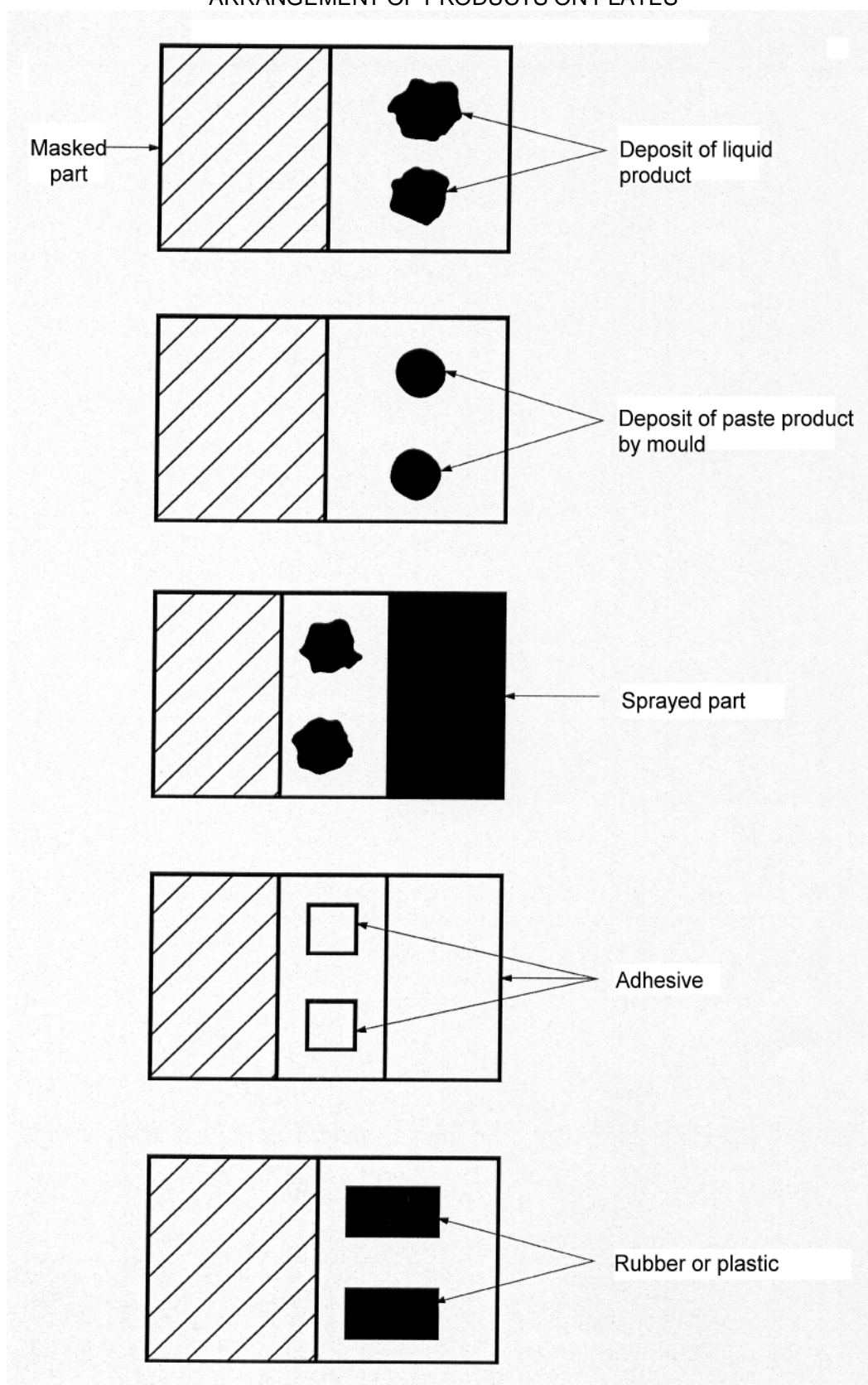
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Appendix 1 (2/2)**REMARKS**

- (1) The test is carried out on normal painted plates as well as on painted plates covered with humid Protex by spraying.
- (2) In the case of a product undergoing production stoving after application, the same stoving is carried out in the laboratory before exposure to the solar lamp.
- (3) In this particular case, the liquid used for the staining test is obtained by decoction of the glass wiper blades to be tested in the glass wash liquid diluted with water to 50 % (refer to the method of operation described in test method D47 1098).
- (4) For fuels and volatile solvents, three successive applications of 0,2 ml of product are made. These are carried out at regular intervals of 5 minutes in the same place on the plate.
- (5) In the case of petrol and xylol, a specific softening test may be carried out in order to test the hardness of the paint film : softening is assessed 2 minutes after the application of a drop of product to be tested.
- (6) For rubbers and plastics, two cases arise :
 - conventional rating for all colours (if applicable, measurement of colour variations by colorimetry),
 - specific case : possibility on the white colour to carry out a grading using the grey scale.
This assessment does not allow the performance on other finish paints to be pre-judges (double layered dark colours ...) ; in this case, carry out the normal procedure.

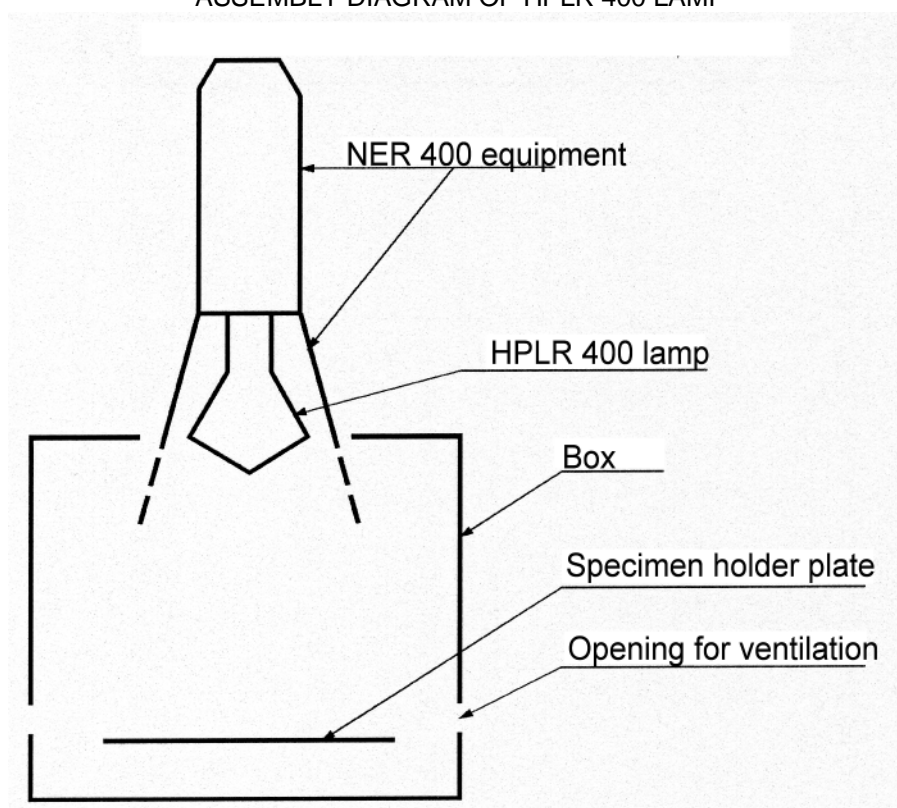
Appendix 2

ARRANGEMENT OF PRODUCTS ON PLATES



Appendix 3

ASSEMBLY DIAGRAM OF HPLR 400 LAMP



EQUIPMENT

- Box and lamp support.
- Philips HPLR 400 lamp avec NER 400 equipment (including a standard electrical unit NE 400 and screen R 400).
- Hourly counter.

EXPOSURE CONDITIONS

- The distance from the front of the lamp to the top of the test specimen is equal to 400 mm.
- Exposure area of test specimens, horizontal circle of 200 mm radius around the lamp axis.
- Maximum operating period for the lamp : 5 000 hours.

9.RECORDS AND REFERENCE DOCUMENTS

9.1.RECORDS

9.1.1.CREATION

- OR : 01/05/1981 – CREATION OF THE NORME.

9.1.2.SUBJECT OF THE MODIFICATION

- A : 09/06/1997 – INTRODUCED INTO IDEM (*French only*)
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9.2.REFERENCE DOCUMENTS

9.2.1.PSA DOCUMENTS

9.2.1.1.Normes

D471098.

9.2.1.2.Others

9.2.2.EXTERNAL DOCUMENTS

9.3.EQUIVALENT TO :

9.4.CONFORMS TO :

9.5.KEY WORDS