

**PAINTS – LACQUERS AND SIMILAR PRODUCTS
RUBBERS
NATURAL AGEING TEST**

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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 : 20/05/2004***1.OBJECT AND FIELD OF APPLICATION**

The object of this norme is to present the factors which must be taken into consideration in order to carry out ageing in the natural atmosphere of a single-layer or multi-layer system for a rubber, coated or not with a smooth or appearance varnish.

2.PRINCIPLE

The test consists of exposing samples to the elements, in a defined climate. After the specified exposure period, the test specimens are examined and the loss of gloss, variance of colours and damage to the film are determined for painted parts.

For rubber parts, the test specimens are complete parts or are test specimens taken from parts.

3.EQUIPMENT**3.1.SPRAYING MATERIAL,**

According to test method D59 1170.

3.2.SOFT BRUSH,

With varying diameter or width according to the dimension of the selected plate (or sponge). For rubbers, long bristle brush, width 50 mm.

3.3.SUPPORT,

According to the appendix, for an angle of 45°.

3.4.GLOSS MEASUREMENT EQUIPMENT,

According to test method D25 1413.

3.5.DAYLIGHT EQUIPMENT (LIGHT CHAMBER),

According to test method D15 1343.

3.6.COLORIMETER,

According to test method D25 5479 and complemented by test methods D15 5083 and D15 5084.

3.7.STOVING OVEN (PAINTED OR VARNISHED TEST SPECIMENS),

Adjusted to ± 2 °C with a maximum of 200 °C (convection).

3.8.STOVING OVEN (PAINTED OR VARNISHED TEST SPECIMENS),

Adjusted to ± 2 °C infrared defined by test method D55 1171.

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3.9.THICKNESS MEASURING EQUIPMENT (PAINTED OR VARNISHED TEST SPECIMENS),

According to test method D26 5316.

3.10.EQUIPMENT FOR MEASURING TENSION OF FILMS (PAINTED OR VARNISHED TEST SPECIMENS),

According to test method D25 5463.

3.11.GREY SCALE,

For the evaluation of degradations, according to norme NF EN 20105-A02.

Use the nine degree scale with a black border.

Note : *The grey scales may be obtained from ADSOL, 37-39, rue de Neuilly – 92110 CLICHY.*

3.12.JOSEPH PAPER

3.13.LINT-FREE CLOTH

4.PREPARATION OF TEST SPECIMENS

4.1.PAINTS AND SIMILAR PRODUCTS

The minimum dimensions of test specimens shall be 200 mm x 100 mm x 0,7 mm coated with the system conforming to the technical specifications.

4.2.RUBBER PARTS OR TEST SPECIMENS

Expose entire parts or samples taken from parts, these must be of sufficient dimensions.

Clean rubber parts or test specimens according to § 5.2..

5.METHOD OF OPERATION

5.1.PAINTS AND SIMILAR PRODUCTS

- Prepare the test specimens in accordance with the technical specification.
- Measure the test specimen gloss level (3.4.), the colour (3.6.) and the tension (3.10.).
- Place the test specimen on the support provided for this purpose, for a period of time defined in agreement with the parties concerned, or quoted by the technical specification. The gradient can be 45° and 60°.
- When the test is completed:
 - Wash 2/3 of the test specimen in a solution of distilled water containing 5 % neutral wetting agent, using the soft brush (3.2.) or a sponge, rinse the surface of the test specimen with distilled water, wipe with Joseph paper (3.12.) or a lint-free cloth (3.13.).
 - Polish the remaining 1/3 of the test specimen with polishing water.
- Measure the gloss and the colour on both sections.

5.2.RUBBERS

5.2.1.PRELIMINARY CLEANING

- Completed on the day of the exposure, for all parts and test specimens.
- Clean the parts or test specimens with a 50/50 solution by volume of demineralised-water / ethanol applied on a white cotton lint-free cloth (3.13.).
- During cleaning, the cloth must be well impregnated but without excess and the test specimens or parts must not be subjected to any specific stresses (rubbing).

5.2.2.INSTALLATION ON SUPPORTS

- Place the parts or test specimens on the supports provided for this purpose, according to the Appendix, inclined at an angle of 45° and orientated towards the south.
- The duration of the exposure shall be defined by the technical specification or in agreement with the interested parties.

5.2.3.PERIODIC CLEANING

- Cleaning at a natural ageing site is carried out every 15 days.
- Sprinkle, using a hand held spray containing demineralised water, the entire surface of the sample or part, brush lightly using the brush (3.2.), tilt the whole surfaces of the test specimen or part at 45°, the bending of the bristles must be approximately 50 %. Complete 5 to-and-fro movements.

5.2.4.CLEANING BEFORE GRADING

5.2.4.1.Rough grading,

dusting of the test specimens or parts using the brush (3.2.), then grading according to the grey scale (3.11.).

5.2.4.2.Grading after cleaning,

cleaning of the test specimens or parts with the mixture (5.2.1.) and the brush (3.2.) then grading according to the grey scale (3.11.)

Note : *An intermediate cleaning with demineralised water between (5.2.4.1) and (5.2.4.2.) may be carried out on rubber formulations which can be reactivated with ethanol (whitening).*

6.EXPRESSION OF RESULTS

6.1.PAINTS AND SIMILAR PRODUCTS

- Express the loss of gloss in % using the gloss measurement equipment (3.4.).
- Express the colour variation by eye under the daylight equipment (3.5.), or measure the variation in colour according to test method D25 5479.
- Note surface defects using test methods D17 1058, D27 1327 and norme B15 5020.

6.2.RUBBERS

- After cleaning (5.2.4.), allocate a grading using the grey scale (3.11.) in the environment of the daylight equipment, illuminant D₆₅, (3.5.).
- Note potential variations in colour, gloss and appearance.
- Note potential appearance differences between moulded areas and extruded areas.
- The test specimen or reference test specimen is to be kept in darkness at a temperature of 4 °C ± 2 °C individually wrapped in aluminium foil.

7.TEST REPORT

7.1.PAINTS AND SIMILAR PRODUCTS

The test report must show, in addition to the results:

- the reference of this method,
- the paint system used, single-layer or multi-layer,
- the stoving or drying conditions,
- the application conditions (gun, brush , etc.),
- the thickness of the film,
- the polishing conditions,
- the weather during exposure, the location, the angle, and the duration of exposure,
- a climatological statement may be attached,
- operating details not specified in the method, as well as any incidents likely to affect the results.

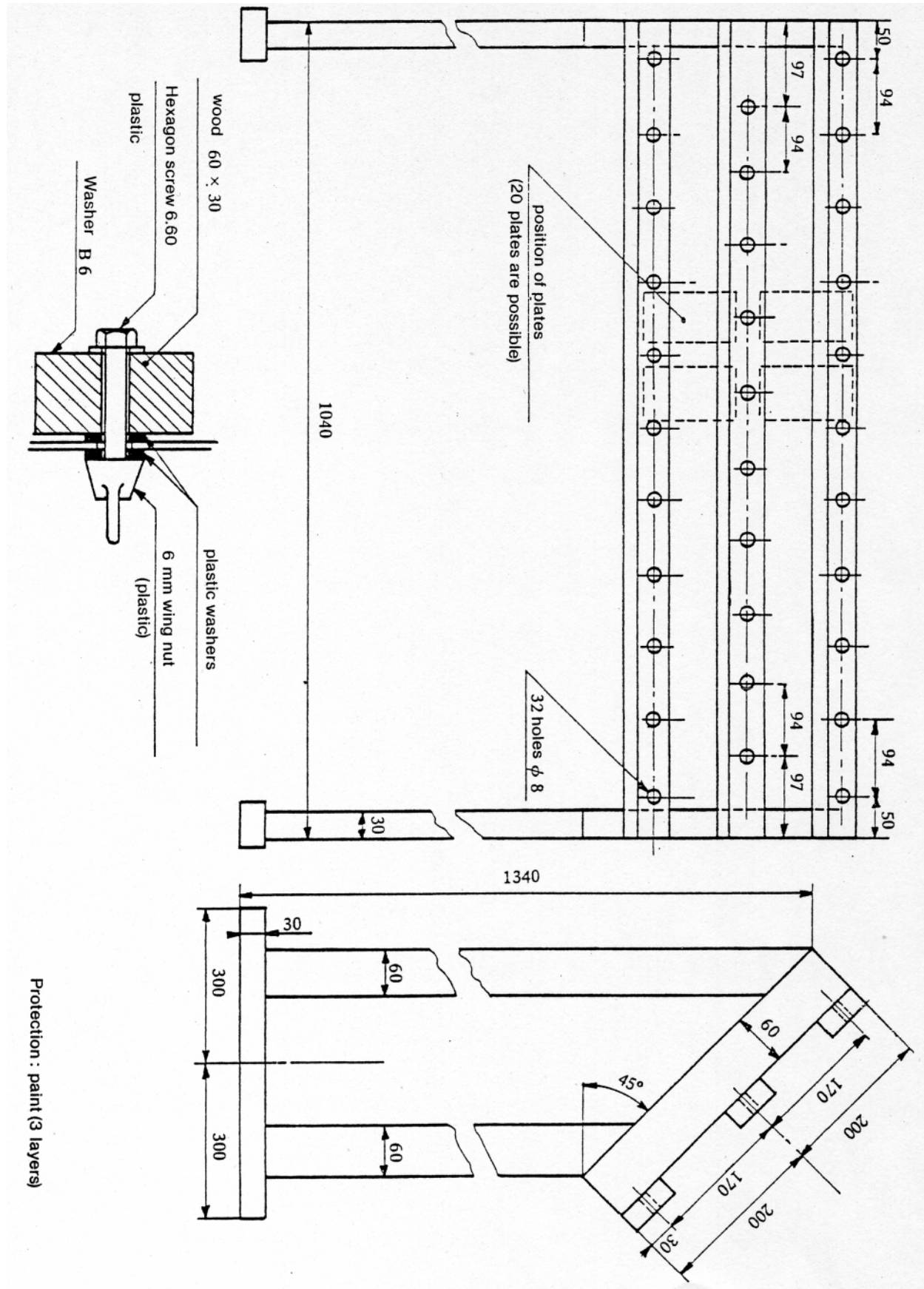
7.2.RUBBER

The test report must show, in addition to the results:

- the reference of this method,
- the entire reference of the mixture,
- the reference and nature of the possible surface coating,
- the surface appearance modifications of the sample or reference test specimen,
- operating details not specified in the method, as well as any incidents likely to affect the results.

Appendix

TEST SPECIMEN PLATES SUPPORT



8.RECORDS AND REFERENCE DOCUMENTS

8.1.RECORDS

8.1.1.CREATION

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

8.1.2.SUBJECT OF THE MODIFICATION

- C: 23/09/2002 – ADDITION OF RUBBERS TO THE TEST METHOD
- B: 22/12/1997 – CORRECTION OF THE INTRODUCTION TO IDEM

8.2.REFERENCE DOCUMENTS

8.2.1.PSA DOCUMENTS

8.2.1.1.Normes

B15 5020	PAINT COATINGS – DEFINITION OF SPECIFIC TERMS
D15 1343	COLOURED MATERIALS – VISUAL COMPARISON OF COLOURS IN A LIGHT CHAMBER
D15 5083	OPAQUE COLOURED PRODUCTS – POINT OF COLOUR (SPECTROCOLORIMETRY)
D15 5084	OPAQUE AND TRANSPARENT COLOURED PRODUCTS – CALCULATIONS OF COLORIMETRIC VARIATIONS (1976 CIE LAB SYSTEM)
D17 1058	MATERIALS AND COATINGS – SPRAY SALT TEST OF 5% NaCl AND METHODS OF GRADING
D25 1413	PAINT COATINGS – RUBBERS AND PLASTICS – MEASUREMENT OF GLOSS
D25 5463	PAINT COATINGS – ORANGE PEEL AND DEPTH OF IMAGE MEASUREMENT
D25 5479	REVÊTEMENTS DE PEINTURES – MESURE DE L'ÉCART DE TEINTE (SPECTROPHOTOMETRIE MULTI-ANGLE)
D26 5316	ORGANIC COATINGS ON A MAGNETIC OR NON-MAGNETIC SUPPORT – NON-DESTRUCTIVE MEASUREMENT OF THICKNESS
D27 1327	PAINT COATINGS – RESISTANCE TO IMMERSION IN WATER (FORD TANK)
D55 1171	ADHESIVES MASTICS AND PAINTS – LABORATORY STOVING CONDITIONS
D59 1170	PAINTS AND SIMILAR PRODUCTS – APPLICATION BY MANUAL OR AUTOMATIC SPRAYING IN A LABORATORY

8.2.1.2.Others

8.2.2.EXTERNAL DOCUMENTS

NF EN 20105-A02	TEXTILES – ESSAIS DE SOLIDITÉ DES TEINTURES – PARTIE A02 : ÉCHELLE DE GRIS POUR L'ÉVALUATION DES DÉGRADATIONS.
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8.3.EQUIVALENT TO:

8.4.CONFORMS TO:

8.5.KEY WORDS