

PAINT COATINGS
ASSESSMENT OF A CLEARCOAT FINISH POTENTIAL

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Restrictions described in the normeThis Méthode d'Essai **CANCELS** and **REPLACES** document MXP_PEI00_0023*This is a translation, the French original shall be used in all cases of litigation**Date of translation : 05/11/2001***1. OBJECT AND FIELD OF APPLICATION**

The object of this méthode is to observe and measure the finish (gloss, orange peel and image depth) of a complete paint film in terms of thickness of the clearcoat finish.

It applies to finish clearcoats.

2. PRINCIPLE

On a substrate (metal foil) coated with specified undercoats, as per Appendix 1, the basic thickness recommended by the Supplier is deposited in vertical or horizontal application, which is covered, in the same position, with a defined clearcoat thickness. After drying, the finish obtained is observed and measured.

By repeating the operation with different clearcoat thicknesses from 20 µm to 60 µm, the following curve may be traced :

$$\text{Orange peel} = f(\text{thickness})$$

for horizontal and vertical surfaces.

3. EQUIPMENT**3.1. SHEET METAL PLATES (METAL FOIL)**

500 mm x 300 mm, of thickness 0,8 mm coated with base and primer surfacer used in the relevant site.

3.2. APPLICATION EQUIPMENT

defined in Appendix 1.

3.3. VENTILATED OVEN

minimum working volume 250 l, regulated to the nearest 2° C within the temperature range of 20° C to 250 ° C in order to obtain the stoving profiles defined in Appendix 1.

3.4. THICKNESS MEASURING EQUIPMENT

according to méthode d'essai D26 5316.

3.5. CHRONOMETER**3.6. VISCOMETRIC CUP AND RELATED EQUIPMENT**

to adjust the dilution for the application of tested materials according to méthodes d'essai D55 1016 and D55 1339.

3.7. APPLICATION BOOTH

with forced air.

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3.8. ADHESIVE PAPER

25 mm wide.

3.9. EQUIPMENT FOR FINISH MEASUREMENT

according to méthodes d'essai D25 1413 and D25 5463.

4. METHOD OF OPERATION

4.1. ASSESSMENT OF THE HORIZONTAL FINISH POTENTIAL

4.1.1. CLEARCOAT NOZZLE ADJUSTMENT

- To check the thickness of the deposited clearcoat, stick adhesive paper according to diagram in Appendix 2.
- Set the slide speed to 4 m/min, then adjust the application of the clearcoat with the mini-bell (shaping air, tension, flow rate), in order to obtain a 40 µm film in 2 identical thickness layers.

4.1.2. FINISH COAT APPLICATION

- Apply the diluted base at the nominal thickness on a test specimen in horizontal position.
- Pre-dry in the conditions defined in the range (flash off).
- Remove the adhesive paper.
- Apply 2 layers of clearcoat at the specified thickness.
- Pre-dry in the conditions defined in the range (flash off).

Remark : For practical reasons, depending on the means available, applications may be carried out in a vertical position, taking care to carry out the flash off and stoving phases in a horizontal position.

4.1.3. STOVING OF FINISH COATS

- Pre-stove the plate for 10 min at 80° C in the position of the application in one oven.
- Maintaining the same position, stove in a second oven at 140° C for 20 min or in the specific conditions of the site, according to Appendix 1.
- Leave to cool at ambient temperature.

4.1.4. MEASUREMENTS

- Measure the thickness of the deposited clearcoat where the adhesive has been applied and check that the application is homogeneous by measuring the thicknesses in various points of the plate.
- Proceed with visual observations and with the measurement of finish coats. Calculate the mean of the values obtained over 9 points taken from the measuring area, according to Appendix 2 :
 - general observation of the finish according to norme B15 5020 for the description of defects.
 - record the thickness of pittings as they appear, if applicable,
 - orange peel and image depth according to méthode d'essai D25 5463 and gloss according to méthode d'essai D25 1413.

4.1.5. TESTS ONTO OTHER PLATES

- Other clearcoat thicknesses (20 µm, 30 µm, 50µm and 60 µm, one per plate) are obtained by varying the conveyor speed, without modifying the jet, by applying the following formula :

$$Vc_1 = Vc_0 \times \text{thickness}_0 / \text{thickness}_1$$

In which :

Vc_0 = conveyor speed at the measured thickness

Vc_1 = conveyor speed to obtain the desired thickness

thickness₀ = measured thickness

thickness₁ = desired thickness

Note : *The base thickness is not modified during these different tests.*

4.2. ASSESSMENT OF THE VERTICAL FINISH POTENTIAL

The same procedure is repeated by carrying out in a sequence, the application, flash off and stoving operations specified in the range in vertical position.

During observation of the plates, the thickness of the run or sliding which appears shall be noted, if applicable.

5. EXPRESSION OF RESULTS

Indicate the result of the observation of the plates and the mean values obtained for the measurements of orange peel, image depth and gloss in terms of the thicknesses recorded on horizontal and vertical plates.

Trace the graph of the curves :

Orange peel = f (horizontal thickness)

Orange peel = f (vertical thickness)

6. TEST REPORT

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

- the reference to this méthode,
- the thicknesses deposited,
- the equipment and application parameters,
- the stoving conditions used,
- the references of the materials used,
- the operating details not specified in the method as well as any possible incidents likely to have affected the results.

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Appendix 1

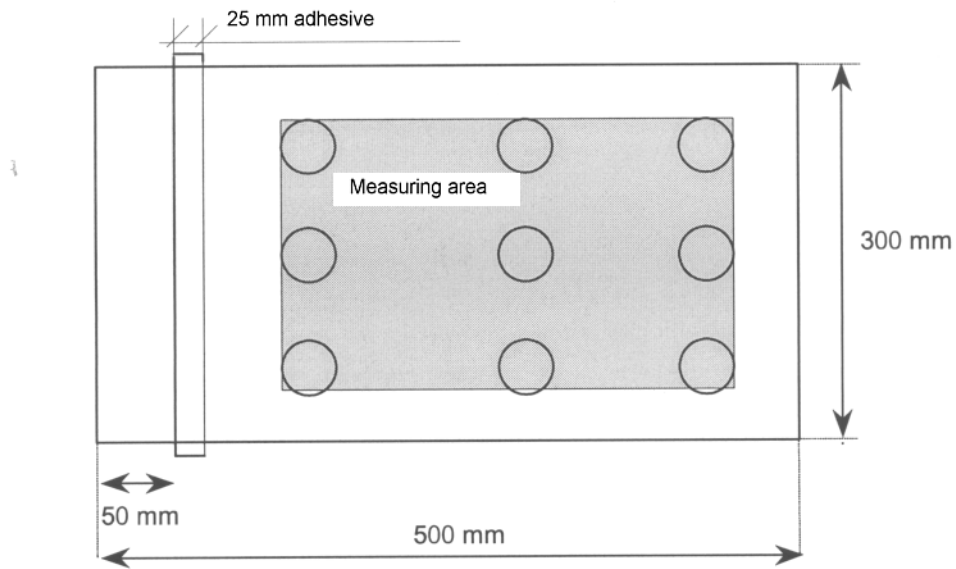
DEFINITION OF PARAMETERS TO BE USED FOR EACH RANGE

Appendix identical to that of Méthode d'Essai D25 5470

PITTING LIMIT ASSESSMENT OF FINISHING PAINTS

Appendix 2

DIAGRAM OF THE TEST PLATE



7. RECORDS AND REFERENCE DOCUMENTS

7.1. RECORDS

7.1.1. CREATION

- OR : 29/06/2001 – CREATION OF THE METHODE D'ESSAI.

7.1.2. SUBJECT OF THE MODIFICATION

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7.2. REFERENCE DOCUMENTS

7.2.1. PSA DOCUMENTS

7.2.1.1 Normes

B15 5020	COATINGS OF PAINT - DEFINITION OF SPECIFIC TERMS
D25 1413	COATINGS OF PAINT, RUBBERS AND PLASTICS – GLOSS MEASUREMENT
D25 5463	COATINGS OF PAINT - MEASUREMENT OF ORANGE PEEL AND IMAGE DEPTH
D26 5316	COATINGS – ORGANIC ON MAGNETIC OR NON-MAGNETIC METAL SUPPORT – NON DESTRUCTIVE MEASUREMENT OF THE THICKNESS
D55 1016	ADHESIVES, PAINTS AND SIMILAR PREPARATIONS – CONSISTENCY (CUP METHOD)
D55 1339	PAINTS AND SIMILAR PREPARATIONS – RATE OF DILUTION

7.2.1.2. Others

7.2.2. EXTERNAL DOCUMENTS

7.3. EQUIVALENT TO :

7.4. CONFORMS TO :

7.5. KEY-WORDS