

**PAINT COATINGS AND SIMILAR PRODUCTS
ERICHSEN PRESSING**

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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 : 14/11/2003***FOREWORD***This document is in technical conformity with RNUR test method n° 1342.**It must not be modified without the agreement of RNUR.***1.OBJECT AND FIELD OF APPLICATION**

The object of this method is to evaluate the resistance of a coat of paint, or similar products, on a metal support, to be assessed for changes in appearance, cracking or loss of adhesion when the support is slowly and regularly pressed into a cup shape.

This test must be carried out on the whole paint system, or on each individual coat, in order to evaluate the characteristics of each separate coat.

2.PRINCIPLE

The test consists of subjecting the specimen, coated with paint, to slow regular deformation by pressing, then the specimen is examined for changes in appearance, cracking or loss of adhesion of the coat to its support.

The specimen must be painted on one side only, the pressing is carried out on the unpainted side.

The rest may be carried out:

- Either to determine the minimum pressing depth required to produce appearance changes or the first signs of cracking or loss of adhesion of the paint coating. (Procedure A)
- Or to check that the paint coat complies with a specific requirements, by pressing to a given depth. (Procedure B)

3.EQUIPMENT**3.1.PRESSING DEVICE**

The pressing device comprises the following main elements :

- Die with hard surface with inner diameter of $27 \text{ mm} \pm 0,05 \text{ mm}$ of which the surface in contact with the test specimen is polished,
- A retaining ring of which the surface in contact with the specimen must be polished,
- A punch comprising a sphere or part of a sphere made of very hard polished steel, diameter $20 \text{ mm} \pm 0,05 \text{ mm}$. The punch must not turn and the centre of the spherical part must never be more than 0,1 mm from the axis of the die.
- A hydraulic system to ensure the punch advances at a speed of $12 \text{ mm/min} \pm 1 \text{ mm/min}$.

The ERICHSEN type 225 equipment meets these requirements.

3.2.MEASURING DEVICE

The measuring device must allow the measurements of the advance of the punch to within 0,05 mm.

- Magnifying glass, with magnification of 10X.

4.TEST SPECIMENS

4.1.TEST SPECIMEN DIMENSIONS

The dimensions of the test specimens are:

- Minimal length:
 - 70 mm if there are three test specimens,
 - 210 mm if there is only one test specimen,
- Minimal width:
 - 70 mm,
- Thickness of between 0,3 and 1,2 mm (according to the technical specification).

4.2.PREPARATION OF TEST SPECIMENS

- Measure the thickness of the coat according to test method D26 5316 with a precision of $\pm 10 \%$ or ± 5 micrometres.
- The conditions concerning the preparation of the surface treatment, application and drying of paint coats, as well as the thickness, must be those given in the technical specifications of the product to be examined and must be included in the test report.
- The test specimens must never be cut from a bigger panel after the application of paint.
- The thickness of the coat of paint must be known with an accuracy of $\pm 10 \%$ or ± 5 micrometres whichever is the smaller figure.

4.3.CONDITIONING OF TEST SPECIMENS

Prior to the test, the specimen must be left, for 1 to 2 hours according to the technical specifications, in an enclosure with a temperature of $23 \text{ }^{\circ}\text{C} \pm 2 \text{ }^{\circ}\text{C}$ and relative humidity of $50 \% \pm 5 \%$.

5.METHOD OF OPERATION

5.1.TEST CONDITIONS

Run the test in a work area maintained at a temperature of $23 \text{ }^{\circ}\text{C} \pm 2 \text{ }^{\circ}\text{C}$ and relative humidity of $50 \% \pm 5 \%$.

5.2.TEST PROCEDURE

5.2.1.PROCEDURE A

- Grip the test specimen between the retaining ring and the die, the paint coat must be against the die, and the spherical tip of the punch in contact with the test panel (position 0 of the measuring device). The central axis of the punch must meet the specimen at least 35 mm from each edge.
- The spherical tip of the punch must advance at a constant speed into the test specimen until the appearance changes or cracking or loss of adhesion occurs. This must be observed with a magnifying glass with a power of 10.
- Carry out three pressings. If these are performed on the same test specimen, they must be separated by at least 70 mm (centre to centre).

5.2.2.PROCEDURE B

- Grip the test specimen between the retaining ring and the die, the paint coat must be against the die, and the spherical tip of the punch in contact with the test panel (position 0 of the measuring device). The central axis of the punch must meet the specimen at least 35 mm from each edge.
- The spherical tip of the punch must advance at a constant speed into the test specimen until the specified depth is reached. Release the test specimen and immediately examine the coat of paint with the magnifying glass (10X).
- Carry out three pressings. If these are performed on the same test specimen, they must be separated by at least 70 mm (centre to centre).

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6.EXPRESSION OF RESULTS

6.1.PROCEDURE A

- Give the distance travelled by the punch, from position 0 measured in millimetres to within 0,1 mm; individual values and the arithmetic mean.
- If the difference between extreme values is more than 5 %, re-run the complete test.

6.2.PROCEDURE B

- Indicate whether the coat of paint conforms to the specification in question, and if there are changes in appearance, or cracking or loss of adhesion between the paint and support or between the two layers of paint.
- The three results obtained must be identical.

7.TEST REPORT

The test report must state, as well as the procedure (A or B) used and the test results:

- The characteristics of the support: dimensions (thickness to within 0,01 mm), type of metal if other than the metal given in the method.
- The conditions of application and drying of the coat.
- The thickness of the paint coat in millimetres, with an accuracy corresponding to the lower of the following tolerances: ± 10 % or ± 5 micrometres and the number of coats,
- The test conditions, temperature and relative humidity, if these are different from those set by the method.

The test report must also mention all procedural details not given in this documents, as well as any incidents that may affect the results.

REFERENCE DOCUMENTS:

PSA DOCUMENTS

Test Method : D26 5316.

8.RECORDS AND REFERENCE DOCUMENTS

8.1.RECORDS

8.1.1.CREATION

- OR : 01/05/1979 – CREATION OF THE PSA NORME. REPLACING ASSOCIATION NORME N° 1342

8.1.2.SUBJECT OF THE MODIFICATION

- A: 26/02/1997 – INTRODUCTION TO IDEM (French only)
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8.2.REFERENCE DOCUMENTS

8.2.1.PSA DOCUMENTS

8.2.1.1.Normes D26 5316

8.2.1.2.Others

8.2.2.EXTERNAL DOCUMENTS

8.3.EQUIVALENT TO:

REN1342

8.4.CONFORMS TO:

8.5.KEY WORDS