

**PARTS CONTAINING PLASTIC ELEMENTS
REACTION TO HEAT IN A NON-RADIANT DRY OVEN**

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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 : 18/11/2008*

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RECORDS

Suffix	Date	Type of modifications
OR	01/10/1977	CREATION OF THE NORM.
A	01/02/1985	COMPLETE REWRITE OF THE NORM.
B	01/08/1997	INTRODUCED INTO IDEM
C	29/01/2008	SETTING WITH THE NEW FORMALISM OF STANDARDS D. SUPPRESSION OF THE FOREWORD OF COMMON STANDARD WITH RENAULT GROUP. CONFIRMATION OF THE TECHNICAL CONTENTS OF THE STANDARD.

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1.OBJECT AND FIELD OF APPLICATION

The object of this méthode is to assess the reaction of thermoplastic parts to a prolonged exposure to dry heat from the point of view of shrinkage, deformation and modification in appearance.

This test must only be carried out for the inspection of moulding stresses.

It applies to all parts containing plastic elements fitted onto vehicles such as facia, steering wheel, radiator grille, lamps, door opening handles, ...

2.REFERENCE DOCUMENTS

2.1.NORMS

A10 0156 TEST REPORT - REDACTION

2.2.REGULATIONS

Not applicable.

2.3.OTHERS DOCUMENTS

Not applicable.

3.TERMINOLOGIE ET DEFINITION

A dictionary (glossary) of the main terms and their definitions used within the activities of the Department "Amont Technico-Industriel" can be consulted in-house via the 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.PRINCIPLE OF THE TEST METHOD

The method consists of placing the parts to be examined in a ventilated oven, previously raised to the selected temperature, for a determined time.

The temperature and the duration of the test are set in the documents.

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5.EQUIPMENT

5.1.OVEN

Including a forced pulsed air device allowing uniform temperature to be obtained in all the space available and the selected temperature to be retained throughout the duration of the test.

The oven must include a regulating device such that the temperature does not vary by more than $\pm 2^{\circ}\text{C}$ around the chosen value during the test and by more than $\pm 1^{\circ}\text{C}$ from one extremity of the part to the other.

The internal dimensions of the oven must be such that the part tested does not touch, under any circumstances, the walls or the floor of the oven and does not disturb the air circulation.

5.2.GRILLE

Placed at mid-height in the oven so as to prevent contact of the parts with the oven floor,

5.3.CALIBRATED THERMOMETERS

Graduated in $0,5^{\circ}\text{C}$, placed in Erlenmeyer flasks filled with vaseline or thermocouples connected to a temperature recording device.

5.4.FIXTURE FOR FIXING THE PART TO BE EXAMINED

In conditions as close as possible to the fixing method used on the vehicle.

5.5.EQUIPMENT REQUIRED FOR MAKING VISIBLE MARKS ON THE PART TO BE EXAMINED

5.6.SUITABLE MEASURING INSTRUMENTS

Such as : rules, marking tools, vernier calipers, beam compass and others.

6.PREPARATION OF THE SOLUTIONS

Not applicable.

7.REPRESENTATIVENESS OF 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 norm A10 0156.

In case of doubt about sampling, to contact PSA service *DTI/DITV/PMXP/ECH/PMLD* to know the directives to be followed.

8.PREPARATION OF THE TEST SPECIMEN

Not applicable.

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9.PROCEDURE

- Fix the part to be examined on the fixture, in the conditions stipulated in the documents or, failing that, in known conditions of use (in particular, tightening torques for fixing screws).
- Draw, on the part, in the main directions (length and width for example), reference marks at a given distance apart, measured to the nearest 0,1% using a suitable instrument, with the part previously conditioned at $23\text{ °C} \pm 2\text{ °C}$ for a minimum of 2 hours.
- Measure also to the nearest 1/2 mm, using the most suitable instruments depending on the shape of the part, the dimensions which play an important role in its strength in use (for example on a facia : dimensions of the opening for the speedometer, ashtray housing, ...).

Note : *If the possible deformation of a part between its fixing points needs to be assessed, measure the corresponding dimension with a beam compass.*

- Set the temperature of the oven to the value defined in the documents.
Wait for the temperature to stabilise before introducing the part to be examined into the oven.
- When the part to be examined includes several areas subjected, in use, to various temperatures, subject the part successively to a test at each of these temperatures, if possible, spacing these out in steps of 10 °C in an ascending order.
In this case, it is also advisable to carry out a test on another part, taking it directly to the maximum temperature.
- Place the part in the oven in suitable conditions without subjecting it to stresses not specified in its function. In the case of parts passed through in free condition, position them in such a way as to reduce the stresses linked to their weight. Observe any defects.
- The duration of the test is as specified in the documents.
- Remove the part from the oven and allow to return to ambient temperature.
- Observe its appearance, then measure the dimensions again between the reference marks and the dimensions of the part.

Note :

- *For a post shrinkage measurement, the minimum time between moulding of the part and the test must be 48 hours.*
- *If the expansion of a part when hot needs to be measured, the test must be carried out on a part already subjected to a post shrinkage treatment at the same temperature.*

10.REMARKS

Not applicable.

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11.EXPRESSION OF THE RESULTS

- Calculate the dimensional variations of the part, in the various directions, as a percentage of the measured initial lengths, with elongations allocated the sign + and shrinkages the sign -.
- Calculate the variations in millimetres in other measured dimensions.
- Note, in addition, modifications in appearance (such as grain, colour, gloss...) and the deformations observed.

12.TEST REPORT

The format and minimum contents of the test report are defined in the norm A10 0156.

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

- the reference to this méthode,
- the duration and temperature of the test,
- the designation of the part, the drawing number and the name of the supplier,
- details of the material,
- the reference marks indicating the date of manufacture,
- the specific conditions of the test if these differ from the conditions indicated in the documents and the position of the part in the oven.