

**MATERIALS AND PARTS FOR AUTOMOTIVE EQUIPMENT  
AGEING ACCORDING TO A GIVEN CLIMATIC CYCLE**

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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 : 21/04/1997***1. OBJECT AND FIELD OF APPLICATION**

The object of this méthode is to define the climatic ageing cycles to which materials or parts for automotive equipment are subjected.

**2. PRINCIPLE**

To subject the materials or parts to be tested to one of the ageing cycles described in the method of operation and to subsequently check whether there is deterioration of the mechanical, physical characteristics or of the aspect.

**3. EQUIPMENT****3.1. CLIMATIC ENCLOSURE PROGRAMMABLE TO :**

- $-30^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $-20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $100^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $120^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $95\% \pm 5\%$  relative humidity,
- $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $95\% \pm 5\%$  relative humidity.

**Note :** *If a programmable climatic enclosure (3.1.) is not available, use enclosures (3.2.), (3.3.) and (3.4.).*

**3.2. HUMIDITY ENCLOSURE ADJUSTABLE TO :**

- $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $95\% \pm 5\%$  relative humidity,
- $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $95\% \pm 5\%$  relative humidity.

**3.3. VENTILATED DRY HEAT ENCLOSURE ADJUSTABLE TO :**

- $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $100^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $110^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $120^{\circ}\text{C} \pm 2^{\circ}\text{C}$ .

**3.4. REFRIGERATED ENCLOSURE ADJUSTABLE TO :**

- $-20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,
- $-30^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ,

**3.5. ENCLOSURE OR ROOM CONDITIONED TO :**

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

#### 4. PREPARATION OF TEST SPECIMENS

The dimensions and the number of test specimens are those indicated for the determination of the characteristics before ageing.

If there are no particular References, the plastic parts must be tested and fitted in "vehicle" position.

#### 5. METHOD OF OPERATION

The parts or test specimens are to be subjected to one of the climatic cycles defined as follows :

Cycle	Enclosures used		Duration (hours)	Temperature (°C)	Relative humidity (%)	References to be shown on documents
<b>A</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - A
		+				
		3.3.	6 ± 1	85	-	
<b>AF</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - AF
		+				
		3.4.	3 ± 1	- 20	-	
		+				
		3.3.	6 ± 1	85	-	
<b>B</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - B
		+				
		3.3.	6 ± 1	100	-	
<b>BF</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - BF
		+				
		3.4.	3 ± 1	- 20	-	
		+				
		3.3.	6 ± 1	100	-	
<b>C</b>	3.1.	3.2.	16 ± 1	85	95	D47 1309 - C
		+				
		3.3.	6 ± 1	85	-	
<b>CF</b>	3.1.	3.2.	16 ± 1	85	95	D47 1309 - CF
		+				
		3.4.	3 ± 1	- 20	-	
		+				
		3.3.	6 ± 1	85	-	

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<b>Cycle</b>	<b>Enclosures used</b>		<b>Duration (hours)</b>	<b>Temperature (°C)</b>	<b>Relative humidity (%)</b>	<b>References to be shown on documents</b>
<b>D</b>	3.1.	3.2.	16 ± 1	85	95	D47 1309 - D
		+				
		3.3.	6 ± 1	100	-	
<b>DF</b>	3.1.	3.2.	16 ± 1	85	95	D47 1309 - DF
		+				
		3.4.	3 ± 1	- 20	-	
		+				
		3.3.	6 ± 1	100	-	
<b>E</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - E
		+				
		3.3.	6 ± 1	70	-	
<b>EF</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - EF
		+				
		3.4.	3 ± 1	- 20	-	
		+				
		3.3.	6 ± 1	70	-	
<b>G</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - G
		+				
		3.3.	6 ± 1	110	-	
<b>GF</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - GF
		+				
		3.4.	3 ± 1	- 20	-	
		+				
		3.3.	6 ± 1	110	-	

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<b>Cycle</b>	<b>Enclosures used</b>		<b>Duration (hours)</b>	<b>Temperature (°C)</b>	<b>Relative humidity (%)</b>	<b>References to be shown on documents</b>
<b>H</b>	3.1.	3.2.	16 ± 1	85	95	D47 1309 - H
		+				
		3.3.	6 ± 1	120	-	
<b>HF</b>	3.1.	3.2.	16 ± 1	85	95	D47 1309 - HF
		+				
		3.4.	3 ± 1	- 30	-	
		+				
		3.3.	6 ± 1	120	-	
<b>J</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - J
			6 ± 1	85	95	
<b>JF</b>	3.1.	3.2.	16 ± 1	40	95	D47 1309 - JF
		+				
		3.4.	3 ± 1	- 20	-	
		+				
		3.3.	6 ± 1	85	95	

- To avoid thermal shock, the change in temperature must be carried out at a speed in the order of 2°C/min.
- It is necessary to dry out the enclosure when there is a change from an ambience with humidity to an ambience without humidity.
- When the humidity rate is not specified (dash), the ambience is without humidity.
- For successive tests in the enclosures (3.2.), (3.3.) and (3.4.) allow for 30 to 60 minutes stabilisation at ambient temperature and at each change of enclosure so as to minimise thermal shocks.
- At the end of the cycle(s), the test specimens are left for 24 hours in the refrigerated enclosure (I3.5.).
- The reference of the cycle to be carried out and the number of cycles are given in the documents.
- Determine the characteristics of materials which have been subjected to the climatic cycles given with the same methods as those used for materials in a new condition (resistance, flexibility, elongation, burst, etc.).

## 6. EXPRESSION OF RESULTS

Note the percentage (%) of deterioration, if applicable, together with any variations in aspect.

## 7. TEST REPORT

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

- the reference to this méthode,
- the reference and the number of cycles carried out,
- the reference of the materials or parts tested,
- the percentage of deterioration, if applicable,
- the changes in aspect or dimensions,
- the length of time for the defects to appear,
- the operating details not specified in the method as well as any incidents likely to have affected the results.

## 8. RECORDS AND REFERENCE DOCUMENTS

### 8.1. RECORDS

#### 8.1.1. CREATION

- OR : 01/11/1981 – CREATION OF THE PSA NORME. REPLACES THE ASSOCIATION NORME No. 1309.

#### 8.1.2. SUBJECT OF THE MODIFICATION

- A : 01/03/1985 : 2<sup>nd</sup> EDITION : COMPLETE REWRITE.
- B : 27/08/1996 : 3<sup>rd</sup> EDITION : COMPLETE REWRITE WITH FOREWORD DELETED.

### 8.2. REFERENCE DOCUMENTS

#### 8.2.1. PSA DOCUMENTS

##### 8.2.1.1. Normes

##### 8.2.1.2. Others

#### 8.2.2. EXTERNAL DOCUMENTS

### 8.3. EQUIVALENT TO :

### 8.4. CONFORMS TO :

### 8.5. KEY-WORDS

CLIMATIQUE, GARNISSAGE, VIEILLISSEMENT  
(*Climatic, Trim, Ageing*).