PURPOSE

This Standard covers accelerated test procedures and equipment for determining the effects of sunlight on dyed or colored interior trim materials during vehicle service.

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Change	Date	Description
=	June, 91	5th Edition – Fully revised. (DA)
=	04/08/02	6th Edition – Method C deleted. (FD)

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§ "A": TEST EQUIPMENT

A–1) Carbon–arc type light–exposure apparatus (FADE–OMETER) (§ D–D/1)

A–2) Xenon–arc type light–exposure apparatus (XENOTEST) (§ D–D/2)

NOTE: *Equivalent test equipment may be substituted but must be equal or superior in performance. Any test equipment specified in references (§ "B") shall be added to equipment above (§ "A").*

§ "B": REFERENCES

| 7639 | Textiles – Colorfastness – Xenon–arc type light exposure

§ "C": ANNEXES

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§ "D": DESCRIPTION OF TEST EQUIPMENT – INSTALLATION AND MAINTENANCE INSTRUCTIONS

D/1

FADE–OMETER (§ A, item 1)

Atlas Type 18 FR Fade—Ometer or the equivalent with carbon—arc light source.
Apparatus shall be installed in a well—ventilated location free from dust and gases.

D/1.1

Service conditions

D/1.1.1

Apparatus is designed for operation with a 208 to 250 V power supply. For this purpose it is provided with a power transformer with 6 numbered positions which shall be adjusted on the basis of mains voltage as shown below.

Knob position	1	2	3	4	5	6
Mains voltage (V)	250	240	230	220	215	208

D/1.1.2

After approximately 15 minutes of operation, the voltage of the arc shall be between 120 and 145 V, and electrical current between 15 and 17 amperes. Adjustment is through a control panel—mounted knob with four positions.

D/1.1.3

Line and arc voltage are read on the same voltmeter by changing voltmeter switch from "Line" to "Arc".

D/2

XENOTEST (§ A, item 2)

Xenotest Type 150 s or 450 manufactured by Quarz Lampen of Hanau.
Apparatus shall be installed in a well—ventilated location free from dust and gases.
An extraction hood shall be provided.

D/2.1

Service conditions and maintenance requirements

D/2.1.1

Service conditions shall be as specified by Manufacturer.

D/2.1.2

Remove and clean nozzles daily.

D/2.1.3

Change deionized water once a month and clean trays.

D/2.1.4

Change xenon—arc lamps at intervals indicated by Manufacturer.

1

GENERAL

Test methods for "Accelerated ageing in sunlight" are classified by type of light source as shown below.

METHOD	EXPOSURE
A	Carbon—arc type light—exposure (FADE—OMETER)
B	Xenon—arc type light—exposure (XENOTEST)

1.1

Scope

Methods described herein are used to perform environmental tests to determine any deterioration in appearance, physical properties and/or service characteristics of any type of dyed on

— colored organic material

— trim.

2

CLASSIFICATION AND TEST CONDITIONS

2.1

On the basis of test conditions, environmental tests are classified according to severity level so that effects of differing intensity with respect to those encountered during service on vehicle may be simulated.

2.2

Parameters

2.2.1

Severity level for each test depends exclusively on test duration, as temperature, relative humidity and light sources are fixed.
Test parameters for each method are as follows:

Method	Apparatus		Light source	Temperature	Relative humidity	Exposure
A	FADE—OMETER		Carbon—arc	60 ± 2°C	55 ± 3%	Continuous
B	XENOTEST	150 S	Xenon—arc lamp with 7 IR filters	50 ± 2°C	75 ± 3%	Alternating day/night cycles
		450		83 ± 3°C	20 ± 10%	

2.3

Test duration

2.3.1

Duration of test (with a tolerance of ± 15 minutes or ± 1% according to chosen exposure period) depends upon the ageing period to be simulated and shall be selected from the following chart:

Test duration		
24	96	300 (*)
48	120	500
72 (*)	150 (*)	750

(*) Recommended exposure periods simulating three degrees of exposure:
- 72 h — Parts which are not directly exposed (e.g. headliners)
- 150 h — Indirectly exposed parts (e.g. seat trim)
- 300 h — Directly exposed parts (e.g. instrument panels)

3

TEST PROCEDURES

3.1

FADE–OMETER (Method A)

3.1.1

Place specimen of material or specimen with coating under test in the specimen drum of Fade—Ometer as per § D—D/1. Suitably secure specimen.

NOTE: *Unless otherwise specified in applicable Standards, exposure period (see para. 2.3) in test chamber shall be maintained without interruption.*

3.1.2

Operation and maintenance requirements

3.1.2.1

Working days

Operation shall take place between 9.00 am and 8.00 am of the following day (total 23 h), with the 24th hour (from 8.00 to 9.00 am) being reserved for maintenance, replacing carbons, and cleaning equipment. In particular, the globes must be washed daily with water and non—abrasive soap; after 2000 hours of use, globes shall be exchanged for new ones as they become less transparent with continued use. The absorbent fabric used to cover the frames shall be washed monthly in boiling water containing approximately 1.5% of sulphonated fatty alcohol and subsequently rinsed with fresh water.
During the maintenance period, exchange the specimens in the lower part of the drum with those in the upper part.

3.1.2.2

Holidays

Equipment inactive; specimens shall be left inside.

3.2

XENOTEST (Method B)

3.2.1

Place specimens in specimen holders as directed in UNI 7639 and expose under conditions indicated in para. 2.3.
Express lightfastness using the Blue Wool Lightfastness standard.

3.2.2

As an alternative, test may be simplified by masking haft of specimen. Expose specimen under the conditions indicated in para. 2.2 for the duration specified in para. 2.3.

4

INTERPRETATION OF RESULTS

4.1

Inspect material or trim under test. Characteristics shall satisfy requirements of applicable Procurement Specification.

4.2

Tests carried out in the different apparatuses (Fade—Ometer or Xenotest) will require different exposure periods in order to produce the same degree or color loss.

4.3

To establish an exact correlation, expose specimen in one apparatus.

4.4

After achieving a specified color loss (4 on the grey scale), expose a second specimen in the other apparatus until the same color loss (4 on the grey scale) is produced.

4.5

Ratio of test durations indicates severity correlation of tests performed with the two apparatuses. In general, 1 hour of Fade—Ometer exposure corresponds to 1.3 hours of exposure in the Xenotest 450 or 2.7 hours in the Xenotest 150 s with test conditions as specified in para. 2.2.