DETERIORATION OF POLYURETHANE MATERIALS AFTER HUMIDITY AGEING

Application

This method is used to determine the resistance to deterioration of materials based on polyurethane, e.g. polyurethane foam and polyurethane coated textiles after humidity ageing at high temperature and mild pressure.

The percentage change in the physical characteristics of the materials under test e.g. tensile strength, elongation at break, compression set and compression load deflection are determined.

Where possible the test must be performed on the same specimen before and after ageing (e.g. compression load deflection).

Apparatus Required

Mechanical Convection Oven

Capable of maintaining a temperature of 70 +/- 1 °C.

Autoclave

Capable of maintaining a temperature within 3 °C in the range of 100 °C to 125 °C, capable of withstanding a pressure of 150 kN/m^2, provided with a "minimum water fuse alarm", pressure regulating valve, safety valve, and must be equipped with a screen above the water level for carrying the test specimens.

Demineralised Water

For the autoclave.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Date	Action	Revisions
2001 03 27	Revised	Editorial – no technical change A. Cockman
1994 02 28		

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Procedure

1. According to the requirements of the different tests, cut specimens of prescribed dimensions from the material under test.

   If the same specimen cannot be used for both tests, i.e. before and after humidity ageing, the required number of specimens of identical type must be provided.

2. Unless otherwise specified, condition specimens for 24 h at 23 +/- 2 °C and a relative humidity of 50 +/- 5 %, prior to determination of original properties (values before ageing).

3. Check the specimen values before ageing (C) according to the requirements of the relevant material specification.

4. Add demineralised water to the autoclave but keep water level below the screen and set for the required temperature.

Method A	105 +/- 3 °C
Method B	120 +/- 3 °C

5. When water is boiling place specimens on the screen without touching each other or any metal except the screen.

6. Shut autoclave but leave the pressure regulating valve open to drive out entrapped air. The valve is closed 2 minutes after the appearance of steam and the time of the test is started at this point.

7. The exposure time in the autoclave is as follows:

Method A	3 hours
Method B	5 hours

8. After the specified period turn off the heat, release the steam pressure, immediately remove the test specimens and dry for 16 hours in the oven at 70 +/- 1 °C.

   Condition test specimens at 23 +/- 2 °C and a relative humidity of 50 +/-5 %, if not otherwise specified for minimum 2 hours and maximum 24 hours, and test the specimens according to the relevant material specification.

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