STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
Methods of Test for Sealers and Adhesives for Automotive Purposes

AS 1937.6—1977
DETERMINATION BY PRESSURE EXTRUDIOMETER OF THE CONSISTENCY OF SEALERS

Incorporating Corrigendum 1—1977

6.1 SCOPE. This method describes the procedure for determining the consistency or pumpability of sealers for automotive purposes and like applications by means of a pressure extrudiometer.

6.2 PRINCIPLE OF METhOD. A quantity of sealer is extruded through an orifice under prescribed conditions, and either—

(a) the time taken for the extrusion of a specified mass of sealer after steady flow conditions have been established is measured (Procedure A); or

(b) the mass of sealer extruded in a given time after establishment of prescribed conditions is measured and then converted by calculation into a time value for a specified mass (Procedure B).

Extrusion in both cases is performed under a prescribed pressure by means of an extrudiometer (pressure-type rheometer).

6.3 TEST TEMPERATURE. All tests shall be conducted at a temperature of 25·0± 0·5°C.

6.4 APPARATUS AND MATERIALS.

(i) A pressure extrudiometer complete with a series of nozzles and a filler tube in accordance with the requirements given in Fig. 6.1.*

(ii) A means of effectively cleaning the orifice of the replaceable nozzle after use, such that the bore is not scored or damaged in any manner.

NOTE: A pipe cleaner, carefully used, has been found satisfactory for this purpose.

(iii) (a) For Procedure A — 11 cm diameter filter papers.

(b) For Procedure B — a lightweight receptacle such as a paper cup.

(iv) An accurate timing device of suitable running time and graduated in intervals of 0·1 s, e.g. a good quality stopwatch.

(v) A precision type thermometer graduated in intervals of 0·1 °C in the range of—

(a) 19°C to 31°C conforming to AS R33† if of the short-stem type; or

(b) 20°C to 45°C conforming to AS R34‡ if of the long-stem type;

or temperature-recording instruments of like accuracy and suitable range.

(vi) A top pan balance (see Fig. 6.1) of 100 g capacity and accurate to within 0.1 g.

(vii) A suitable air supply together with a pressure gauge accurate to within 7 kPa (see Clause 6.5.1(d) below).

(viii) A suitable solvent for cleaning the equipment.

6.5 PROCEDURE.

6.5.1 Common Initial Stages for Procedures A and B.

(a) Condition the sealer and relevant equipment at the test temperature for 24 h.

(b) Where the test sample can be poured, fill the tube of the extrudiometer with the sealer material.

Where the material cannot be poured, use the filler tube to fill the extrudiometer.

NOTE: It is recommended that this be done prior to conditioning. Use of the filler tube should avoid undue mixing or agitation which may cause significant disruption of any gel structure (which could be an important characteristic of some sealers) thereby giving erroneous results.

In either case, suitable precautions shall be taken to ensure complete inclusion of the follower plunger and that air is not entrapped in the test material.

(c) Using the nozzle prescribed for the particular test, immediately assemble the apparatus with the orifice approximately 100 mm above the balance pan, or open top of the receptacle, as appropriate, at the commencement of extrusion.

(d) Ensure that regulated line pressure air is immediately available at the pressure prescribed for the test and then proceed in accordance with one or the other (or both if need be) of the Procedures A or B as prescribed or as considered will best meet prevailing circumstances.

NOTE: Pressures of 70, 140, 280, 420, and 560 kPa are commonly used with the material under test.

6.5.2 Continuation for Procedure A.

(a) Place a filter paper on the balance pan immediately under the extrudiometer and centred with the orifice, and then bring the balance to zero.

* An instrument of the type illustrated is obtainable from Thermax (Aust.) Pty Ltd, 12 Norton Summit Road, Magill, South Australia.

† AS R33, Short Solid-stem Thermometers for Precision Use.

‡ AS R34, Long Solid-stem Thermometers for Precision Use.