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AS 2369.2 (Int)—1990
(Expires 31 December 1991)

Interim Australian Standard®

Materials for solar collectors for swimming pool heating

Part 2: Flexible or plasticized polyvinylchloride

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STANDARDS AUSTRALIA

This Interim Australian Standard was prepared by Committee CS/28, Solar Water Heaters. It was approved on behalf of the Council of Standards Australia on 21 May 1990 and published on 17 September 1990.

The following interests are represented on Committee CS/28:

Australian and New Zealand Solar Energy Society
Australian Gas Association
CSIRO, Division of Building, Construction and Engineering
Department of Administrative Services, Australian Construction Services
Department of Business and Consumer Affairs, N.S.W.
Department of Energy, N.S.W.
Department of Industrial Relations and Employment, N.S.W.
Department of Mines and Energy, N.T.
Department of Primary Industries and Energy
Electricity Supply Association of Australia
Engineering and Water Supply Department, S.A.
Gas and Fuel Corporation of Victoria
Master Plumbers and Mechanical Services Association of Victoria
Melbourne and Metropolitan Board of Works
Metal Trades Industry Association of Australia
Solar Energy Industries Association of Australia
Trade Practices Commission
University of New South Wales
Victorian Solar Energy Council

Additional interests participating in preparation of Standard:

Plastics Institute of Australia
Rubber Manufacturers' Association of Australia

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PREFACE

This Interim Standard was prepared by the Standards Australia Committee on Solar Water Heating, in response to proposals from the Victorian Solar Energy Council, and the Rubber Manufacturers' Association of Australia.

Heating of swimming pools to extend the swimming season is becoming popular in the cooler regions of Australia, and solar heating is being recognized as cost effective for this purpose. A Standard for solar heating of swimming pools has been prepared, and in addition to this it was felt that a Standard specifying the necessary properties of collectors was needed. The use of rubber collector strips is common both for household and public pool heating, and this Part of the Standard deals with polyvinylchloride.

The requirements of this Interim Standard are based on well established test methods for elastomeric materials. The tests have been selected for their relevance to collector performance and service life.

Although this Interim Standard cannot quantify service life due to the difficulty in defining and controlling the many factors which affect solar collectors, the criteria used herein are based on the performance of materials that have been shown to have a satisfactory performance in pool heating applications.

Standards Australia invites comment on this Interim Standard from persons and organizations concerned with the subject. The date for expiry of comment is *December 31, 1991* at which time (or earlier) this Interim Standard will be either withdrawn, or revised in the light of comments received.

During the life of this document, the committees will monitor all comment on the use of the document.

Attention is drawn to the fact that this document is an Interim Australian Standard only and should be regarded as a draft Standard and hence liable to alteration after the expiry date.

This document is not to be regarded as an Australian Standard until issued as such by the Association.

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Interim Australian Standard
Materials for solar collectors for swimming pool heating

Part 2: Flexible or plasticized polyvinylchloride

1 SCOPE This Interim Standard specifies the properties of polyvinylchloride (PVC) used in the manufacture of unglazed collectors intended for solar heating of swimming pools. The Standard is applicable to products used for collectors which take the form of flexible tubing, or absorber strips comprising water passages joined by a web.

The requirements of this Standard are based on the assumption that the solar pool heating systems in which these materials are used will be installed in accordance with AS 3634, and that the pool water will be maintained in accordance with AS 3633.

2 REFERENCED DOCUMENTS The documents below are referred to in this interim Standard.

AS

1180 Methods of test for hose made from elastomeric materials
Method 5A: Hydrostatic pressure—Burst test
Method 5B: Hydrostatic pressure—Proof test

1683 Methods of Tests for rubber
Method 11: Tension testing of vulcanized rubber
Method 15: Indentation hardness of rubber and plastics by means of a durometer
Method 20: Standard temperatures, humidities and times for conditioning and testing test pieces.

3633 Private swimming pools—Water quality

3634 Solar heating systems for swimming pools

ASTM G 53 Recommended Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV—Condensation Type) for Exposure of Nonmetallic Materials)

3 GENERAL The material is required to be evaluated under three conditions—

(a) as manufactured (qualification tests);

(b) after exposure to chemicals; and

(c) after accelerated weathering.

Conditions (b) and (c) are not cumulative and are applied to separate test pieces.

4 FORMULATION The formulation for PVC solar absorbers shall be such that product will satisfactorily withstand the service conditions and meet the requirements of this Standard. As part of the formulation, the mix may include the addition of a suitable chemical for the purpose of inhibiting the growth of micro-organisms. Any such chemical shall, as present in the final product, be essentially insoluble in normal treated pool water, as described in AS 3633.

Any change in the formulation or conditions of manufacture will generally necessitate reassessment of the material, particularly with regard to accelerated weathering, burst pressure, and common pool chemicals.

5 TEST PIECES Test pieces shall be taken from the finished product e.g. web for tests described in 7.1 to 7.3.

The test pieces required for 7.4 and 7.5 shall be the sample of the finished tube or absorber strip containing multiple water passages. The free length of tube after attachment of fittings shall be nominally 1 m.

6 REQUIREMENTS When determined by the appropriate tests specified in Clause 7 and conditions specified in Clauses 8, 9 and 10 the material properties will be within the limits specified in Table 1.

7 DETERMINATION OF PROPERTIES OF THE MATERIAL

7.1 Hardness Hardness shall be determined in accordance with AS 1683.15 using a type A durometer, 10 sec delay reading.

7.2 Tensile strength Tensile strength shall be determined in accordance with AS 1683.11, using a dumbbell test piece, die C.