

Australian Standard[®]

**Urea-formaldehyde foam thermal
insulation—In situ set foam**

This Australian Standard was prepared by Committee BD/58, Thermal Performance and Insulation of Dwellings. It was approved on behalf of the Council of Standards Australia on 27 August 1992 and published on 15 February 1993.

The following interests are represented on Committee BD/58:

Acceptable Standards of Construction Committee, N.S.W.
Aluminium Development Council
Association of Municipal Electricity Authorities, Victoria
Australian Cellulose Insulation Manufacturers Association
Australian Clay Brick Association
Australian Construction Services—Department of Administrative Services
Australian Federation of Consumer Organizations
Australian Institute of Building
Australian Institute of Refrigeration Air Conditioning and Heating
Australian Uniform Building Regulations Coordinating Council
Business and Consumer Affairs, N.S.W.
Co-opted members
Department of Industry Technology and Resources, Victoria
Department of Mines and Energy, South Australia
Division of Building, Construction and Engineering, CSIRO
Fibreglass Insulation Manufacturers Association of Australia
GMI Council of Australia
Housing Industry Association, Australia
Hydro-Electric Commission, Tasmania
Master Builders Construction and Housing Association of Australia
Ministry of Housing and Construction, Victoria
Royal Australian Institute of Architects
The Association of Consulting Engineers, Australia
The Plastics Institute of Australia
Thermal Insulation Contractors Association, N.S.W.
University of Adelaide
University of Melbourne
Victorian Solar Energy Council

Review of Australian Standards. To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

This Standard was issued in draft form for comment as DR 81065.

Australian Standard[®]

**Urea-formaldehyde foam thermal
insulation—In situ set foam**

First published as AS 4073—1993.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 7815 7

PREFACE

This Standard was prepared by the Standards Australia Committee on Thermal Performance and Insulation of Dwellings. It has been prepared in conjunction with AS 4074, which deals with the test methods for raw materials and AS 4075, which gives requirements for installation of wet-set foam. Both of these Standards should be read in conjunction with this Standard.

It deals with the performance requirements of set urea-formaldehyde foam, which is produced from resins, foaming agent and compressed air, the components being supplied separately to a foam-generating gun. The foam generated in the gun should be fully expanded on ejection and, while mobile, is placed within building cavities where it sets within a specified time and dries by diffusion and evaporation of its water content.

Because of the developments in materials and techniques which the process can utilize and in order not to restrict innovation and development, the properties required of the raw materials are not specified in this or related Standards. It should be noted, however, that the resins have a limited shelf life and will undergo changes and ultimately become unsuitable for use. Therefore the properties of the set foam depend on the suitability of the component materials.

Particular attention has been given to the standard method for sampling and determining the free formaldehyde content of wet-set foam and formaldehyde off-gassing of dry-set foam. Also a performance requirement has been included for set foam when exposed to elevated temperature and humidity. Since this Standard is restricted to foam catalyzed with phosphoric acid, a corrosiveness test is not considered to be required.

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

CONTENTS

	<i>Page</i>
1 SCOPE	5
2 REFERENCED DOCUMENTS	5
3 DEFINITIONS	5
4 MATERIALS	5
5 THERMAL RESISTANCE	5
6 PROPERTIES OF SET FOAM	5
7 COMBUSTION CHARACTERISTICS	5
8 MARKING	5
APPENDICES	
A DETERMINATION OF FOAM STABILITY AND APPEARANCE	8
B DETERMINATION OF THE DENSITY OF WET-SET FOAM	9
C UREA-FORMALDEHYDE FOAM SAMPLING AND DETERMINATION OF SHRINKAGE ON DRYING AND WATER DRAINAGE	11
D DETERMINATION OF DENSITY OF DRY-SET FOAM	13
E DETERMINATION OF WATER ABSORBENCY OF DRY-SET FOAM	14
F FREE FORMALDEHYDE CONTENT AND ACID VALUE OF WET-SET AND DRY-SET UREA-FORMALDEHYDE FOAM	15
G FORMALDEHYDE OFF-GASSING FROM DRY-SET FOAM	17
H SHRINKAGE OF DRY-SET FOAM AT ELEVATED TEMPERATURE AND HUMIDITY	21
I FUNGAL RESISTANCE OF DRY-SET FOAM	23

FOREWORD

Urea-formaldehyde foam thermal insulation is produced on site and installed directly into buildings in a wet state. It dries over the following weeks. This Standard specifies the properties which such foam must meet if it is correctly formulated and produced.

The foam generated in the gun shall be fully expanded before placement in the building and, while mobile at the time of placement, sets within a specified time and then dries by diffusion and evaporation.

The properties of the set foam can be determined by this Standard on samples specially produced during placement operations at the building site.

Currently in preview, click buy full version

STANDARDS AUSTRALIA

Australian Standard

Urea-formaldehyde foam thermal insulation—In situ set foam

1 SCOPE This Standard specifies the properties of set urea-formaldehyde foam (set foam) made by using phosphoric acid as catalyst, and produced for thermal insulation purposes.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- 1157 Methods of testing materials for resistance to fungal growth
- 1157.1 Part 1: General principles of testing
- 1157.10 Part 10: Resistance of adhesives and glues to fungal growth
- 1157.11 Part 11: Resistance of rubbers and plastics to surface fungal growth
- 1260 Unplasticized PVC (UPVC) pipes and fittings for sewerage applications
- 1530 Methods for fire tests on building materials, components and structures
- 1530.3 Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release
- 1886 Glossary of terms relating to plastics
- 2352 Glossary of terms for thermal insulation of buildings
- 2464 Methods of testing thermal insulation
- 2464.5 Part 5: Steady-state thermal transmission properties by means of the heat flow meter
- 2464.6 Part 6: Steady-state thermal transmission properties by means of the guarded hot plate
- 4074 Methods of testing raw materials for producing urea-formaldehyde foam thermal insulation
- 4075 Urea-formaldehyde foam thermal insulation—Installation requirements for in situ set foam

3 DEFINITIONS For the purpose of this Standard, the definitions given in AS 1886 and AS 2352 apply.

4 MATERIALS Raw materials used to produce the set foam shall be tested as described in AS 4074 and when combined and reacted shall produce set foam to meet the requirements of Clauses 5, 6 and 7 of this Standard.

5 THERMAL RESISTANCE When tested at a mean temperature of 25°C in accordance with either AS 2464.5 or AS 2464.6, thermal conductivity shall be not greater than 0.036 W/m.K. The test specimen shall be obtained in a plastic bag from a sample produced from the injection gun at the building site, transported to the laboratory, conditioned at 23 ± 2°C and a relative humidity of 50% for 4 h, then further dried at 40°C for 48 h and cut to the required size.

6 PROPERTIES OF SET FOAM Methods of determination and properties of the set foam shall meet the requirements in Table 1.

7 COMBUSTION CHARACTERISTICS When tested in accordance with AS 1530.3 the dry-set foam shall have the following indices:

- (a) Spread of flame: not greater than 7.
- (b) Smoke developed: not greater than 7.

The specimen for testing shall be 50 mm thick and shall be produced as in Clause 5.