

AS ISO 13007.1:2020

This Australian Standard® was prepared by BD-044, Fixing of Ceramic, Natural and Reconstituted Stone Tiles. It was approved on behalf of the Council of Standards Australia on 24 February 2020.

This Standard was published on 6 March 2020.

The following are represented on Committee BD-044:

- Association of Consultants in Access Australia
- Australian Ceramic Society
- Australian Industry Group
- Australian Institute of Waterproofing
- Australian Stone Advisory Association
- Australian Tile Council
- CSIRO
- Master Builders Australia
- Surface Coatings Association Australia
- Swimming Pool and Spa Association of Australia
- TAFE NSW
- Tiles and Tiling Industry Association Australia

This Standard was issued in draft form for comment as DR AS ISO 13007.1:2020.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

ISBN 978 1 76072 767 3



Ceramic tiles — Grouts and adhesives

Part 1: Terms, definitions and specifications for adhesives

Originated as AS 4992.1(Int)—2003.
Revised and redesignated as AS 4992.1—2006.
Revised and redesignated as AS ISO 13007.1—2013.
Second edition 2020.

COPYRIGHT

© ISO 2020 — All rights reserved
© Standards Australia Limited 2020

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Standards Australia Committee BD-044, Fixing of Ceramic, Natural and Reconstituted Stone Tiles to supersede AS ISO 13007.1—2013, *Ceramic tiles — Grouts and adhesives, Part 1: Terms, definitions and specifications for adhesives*.

The objective of this Standard is to give the terminology concerning the products, working methods, application properties, etc., for ceramic tile adhesives.

This Standard applies to ceramic tile adhesives for internal and external tile installations on walls and floors.

This Standard specifies the values of performance requirements for all ceramic tile adhesives [cementitious (C), dispersion (D) and reaction resin (R) adhesives].

This Standard does not contain criteria or recommendations for the design and installation of ceramic tiles.

NOTE Ceramic tile adhesives can also be used for other types of tiles (natural and agglomerated stones, etc.), where these do not adversely affect the materials.

This Standard is identical with, and has been reproduced from, ISO 13007-1:2014, *Ceramic tiles — Grouts and adhesives — Part 1: Terms, definitions and specifications for adhesives*.

As this document has been reproduced from an International Standard, the following applies:

- (a) In the source text “this part of ISO 13007” should read “this Australian Standard”.
- (b) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

Contents

Preface	ii
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Classification and designation	3
5 Requirements	4
5.1 Substrates	4
5.1.1 Exterior Glue Plywood	4
5.1.2 Other Substrates	5
5.2 Specifications for Cementitious Adhesives (C)	5
5.3 Specifications for Dispersion Adhesives (D)	6
5.4 Specifications for Reaction Resin Adhesives (R)	7
6 Marking, labelling and packaging	7

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 189, *Ceramic Tiles*.

This third edition cancels and replaces the first and second editions (ISO 13007-1:2004, ISO 13007-1:2010), which have been technically revised.

ISO 13007 consists of the following parts, under the general title *Ceramic Tiles — Grouts and Adhesives*:

- *Part 1: Terms, definitions and specifications for adhesives*
- *Part 2: Test methods for adhesives*
- *Part 3: Terms, definitions and specifications for grouts*
- *Part 4: Test methods for grouts*

Australian Standard®

Ceramic tiles — Grouts and adhesives

Part 1: Terms, definitions and specifications for adhesives

1 Scope

This part of ISO 13007 applies to ceramic tile adhesives for internal and external tile installations on walls and floors.

This part of ISO 13007 gives the terminology, concerning the products, working methods, application properties, etc., for ceramic tile adhesives

This part of ISO 13007 specifies the values of performance requirements for all ceramic tile adhesives [cementitious (C), dispersion (D) and reaction resin (R) adhesives].

This part of ISO 13007 does not contain criteria or recommendations for the design and installation of ceramic tiles.

NOTE Ceramic tile adhesives can also be used for other types of tiles (natural and agglomerated stones, etc.), where these do not adversely affect the materials.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13006, *Ceramic tiles — Definitions, classification, characteristics and marking*

ISO 13007-2, *Ceramic tiles — Grouts and adhesives — Part 2: Test methods for adhesives*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

substrate

fixing surface

surface on which the tile is installed or fixed

3.2

wall and floor tiles

tiles made out of ceramic tile or natural and agglomerated stones

Note 1 to entry: ISO 13006 should be used for definitions, classification, characteristics and marking of ceramic tile.

3.3

cementitious adhesive (C)

mixture of hydraulic binding agents, aggregates, and organic additives, to be mixed with water or liquid admix just before use

3.4

dispersion adhesive (D)

ready for use mixture of organic binding agent(s) that is in the form of an aqueous polymer dispersion, organic additives and mineral fillers

3.5**reaction resin adhesive (R)**

single or multi-component mixture of synthetic resin, mineral fillers and organic additives in which curing occurs by chemical reaction

3.6**notched trowel**

toothed tool, which makes it possible to apply the adhesive as a series of ribs of a uniform thickness onto the fixing surface and/or the reverse face of the tile

3.7**application to one surface only**

adhesive applied only to the fixing surface with a trowel to obtain a uniform layer and then combed with a notched trowel

3.8**application to both surfaces**

adhesive applied to the fixing surface and to the reverse surface of the tiles

3.9**shelf life**

time of storage under stated conditions during which an adhesive may be expected to maintain its working properties

3.10**maturing Time**

interval between the time when the cementitious adhesive is mixed and the time when it is ready for use

3.11**pot-life**

time interval during which the adhesive can be used after mixing

3.12**open time**

maximum time interval after application at which tiles can be embedded in the applied adhesive and meet the specified tensile adhesion strength requirement

3.13**slip**

downward movement of a tile applied to a combed adhesive layer on a vertical surface

3.14**adjustability**

maximum time interval after which the tile's position in the adhesive layer can be adjusted without significant loss of adhesion strength

3.15**adhesion strength**

maximum strength per unit surface area which can be measured by shear or tensile testing

3.16**deformability**

capacity of a hardened adhesive to be deformed by stresses between the tile and the fixing surface without damage to the installed surface

3.17**transverse deformation**

deflection recorded at the center when a beam of hardened adhesive is subjected to three point loading

3.18**fundamental characteristics**

characteristics that an adhesive absolutely must have

3.19**additional characteristics**

characteristics for specific service conditions where enhanced levels of performance are required

3.20**special characteristics**

characteristics of the adhesive which provide further information about its general performance

4 Classification and designation

Tile adhesives are defined in three types, according to the definitions reported in [3.2](#):

C Cementitious adhesive;

D Dispersion adhesive;

R Reaction resin adhesive.

For each type it is possible to have different classes, related to combinations of the different additional and special characteristics, in accordance with [Tables 1, 2, and 3](#). These classes are designated with the following abbreviations:

1 normal adhesive

2 improved adhesive

F fast setting cementitious adhesive

A accelerated drying dispersion adhesive

T slip resistant adhesive

E adhesive with extended open time

S special deformable characteristic for cementitious adhesives only

P adhesive with adhesion to exterior glue plywood

The designation of the adhesive is generated with the symbol of the type (C, D, or R), followed by the abbreviation of the class or classes to which it belongs. The following table describes the designation of current tile adhesives

Table 1 — Examples of Designation and Classification

Symbol type	Number	Class	Description
C	1		Normal cementitious adhesive
C	1	F	Fast setting cementitious adhesive
C	1	T	Normal cementitious adhesive with slip resistance
C	1	FT	Fast setting cementitious adhesive with slip resistance
C	2		Cementitious adhesive with improved characteristics
C	2	E	Cementitious adhesive with improved characteristics and extended open time
C	2	F	Fast setting cementitious adhesive with improved characteristics
C	2	T	Cementitious adhesive with improved characteristics and slip resistance
C	2	TE	Cementitious adhesive with improved characteristics, slip resistance and extended open time
C	2	FT	Fast setting cementitious adhesive with improved characteristics and slip resistance
D	1		Normal dispersion adhesive
D	1	T	Normal cementitious adhesive with slip resistance
D	2		Dispersion adhesive with improved characteristics
D	2	A	Accelerated drying dispersion adhesive with improved characteristics
D	2	T	Dispersion adhesive with improved characteristics with slip resistance
D	2	TE	Dispersion adhesive with improved characteristics, slip resistance and extended open time
R	1		Normal reaction resin adhesive
R	1	T	Normal reaction resin adhesive with slip resistance
R	2		Reaction resin adhesive with improved characteristics
R	2	T	Reaction resin adhesive with improved characteristics and slip resistance

NOTE Additional designations can be inserted according to the combination of the different symbols of the characteristics. For example: C2ES1P1 – Deformable, improved cementitious adhesive with extended open time and normal adhesion to exterior glue plywood.

5 Requirements

5.1 Substrates

The standard concrete substrate is mandatory. Other substrates may be used upon agreement if the substrate is recommended for the ceramic tile application by the adhesive manufacturer.

5.1.1 Exterior Glue Plywood

The exterior glue plywood substrate shall conform to the requirements for exterior plywood¹⁾. Test substrate must be at least 18,25 mm (23/32 of an inch) in thickness and must be selected from the Group 1 wood species with a wood veneer quality of “C-C plugged” or better and have no visible flaws in the “C-plugged” test area. Plywood with at least one C plugged side as the test surface is preferred²⁾.

1) Published requirements may be found in the US Voluntary Product Standard PS 1-09, Structural Plywood available online at: www.apawood.org.

2) Plywood meeting the requirements of 5.1.1 may be obtained through the Tile Council of North America

5.1.2 Other Substrates

To demonstrate compatibility with other optional substrates, the adhesive shall be applied to the selected substrate in accordance with the Tensile Adhesion Strength Method (ISO 13007-2:2010, 4.4.4.2). When the result of $>0,5 \text{ N/mm}^2$ is achieved or cohesive failure occurs in the substrate, the requirement is considered satisfied.

5.2 Specifications for Cementitious Adhesives (C)

Cementitious Adhesives shall comply with all of the C1 Fundamental Characteristics reported in Table 2. The amount of water and/or liquid admix required for preparing the cementitious adhesive must be the same for all tests. The additional characteristics for C2 (improved performance) products are also contained in Table 2. Table 3 reports the Special Characteristics that can be reported for cementitious adhesives.

Table 2 — Specifications for Cementitious Adhesives (C)

Classification	Property	Requirement	Test Method ISO 13007-2:2010
C1 - Normal cementitious adhesives (Fundamental characteristics)	Tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$	4.4.4.2
	Tensile adhesion strength after water immersion	$\geq 0,5 \text{ N/mm}^2$	4.4.4.3
	Tensile adhesion strength after heat aging	$\geq 0,5 \text{ N/mm}^2$	4.4.4.4
	Tensile adhesion strength after freeze-thaw cycle	$\geq 0,5 \text{ N/mm}^2$	4.4.4.5
	Open time: tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$ After not less than 20 min.	4.1
C2 - Improved cementitious adhesives (Additional characteristics)	Tensile adhesion strength	$\geq 1,0 \text{ N/mm}^2$	4.4.4.2
	Tensile adhesion strength after water immersion	$\geq 1,0 \text{ N/mm}^2$	4.4.4.3
	Tensile adhesion strength after heat aging	$\geq 1,0 \text{ N/mm}^2$	4.4.4.4
	Tensile adhesion strength after freeze-thaw cycle	$\geq 1,0 \text{ N/mm}^2$	4.4.4.5

(TCNA). Typically either Douglas Fir or Southern Yellow Pine plywood is supplied.

Table 3 — Specifications for Cementitious Adhesives (C) — Special Characteristics

Special Characteristic	Property	Requirement	Test Method ISO 13007-2:2010
T - Slip Resistance	Slip	$\leq 0,5$ mm	4.2
F - Fast Setting Adhesives	Tensile adhesion strength	$\geq 0,5$ N/mm ² after no more than 6h	4.4.4.2
	Open time: tensile adhesion strength	$\geq 0,5$ N/mm ² after not less than 10 min.	4.1
	All other requirements at least equal to or better than those listed for C1 adhesives as in Table 2	See Table 2 under C1 Adhesives	See Table 2 under C1 adhesives
S - Transverse Deformation	Deformable adhesive—S1	$\geq 2,5$ mm, < 5 mm	4.5
	Highly deformable adhesives—S2	≥ 5 mm	4.5
E - Extended Open Time	Extended open time: Tensile Adhesion Strength	$\geq 0,5$ N/mm ² after not less than 30 min.	4.1
P - Exterior Glue Plywood Adhesion (Optional Substrates)	Normal Exterior Glue Plywood Adhesion (P1)	$\geq 0,5$ N/mm ²	4.4.4.2
	Improved Exterior Glue Plywood Adhesion (P2)	≥ 1 N/mm ²	4.4.4.2

5.3 Specifications for Dispersion Adhesives (D)

All Dispersion Adhesives shall comply with the D1 Fundamental Characteristics reported in [Table 4](#). The Additional characteristics for D2 (improved performance) products are also contained in [Table 4](#). [Table 5](#) reports the Special Characteristics that can be reported for dispersion adhesives.

Table 4 — Specifications for Dispersion Adhesives (D)

Classification	Property	Requirement	Test Method ISO 13007-2:2010
D1 - Normal Adhesive (Fundamental Characteristics)	Shear adhesion strength	≥ 1 N/mm ²	4.3.4
	Shear Adhesion strength after heat aging	≥ 1 N/mm ²	4.3.6
	Open time: tensile adhesion strength	$\geq 0,5$ N/mm ² after not less than 20 min.	4.1
D2 - Improved Adhesive (Additional Characteristics)	Shear adhesion strength after 21 days air cure, 7 days water immersion	$\geq 0,5$ N/mm ²	4.3.5
	Shear adhesion strength at elevated temperature	≥ 1 N/mm ²	4.3.7

Table 5 — Specifications for Dispersion Adhesives (D) - Special Characteristics

Special Characteristic	Property	Requirement	Test Method ISO 13007-2:2010
T - Slip Resistance	Vertical slip resistance	$\leq 0,5$ mm	4.2
A - Accelerated Drying	Shear adhesion strength after 7 days air cure, 7 days water immersion	$\geq 0,5$ N/mm ²	4.3.5
	Shear adhesion strength at elevated temperature	≥ 1 N/mm ²	4.3.7
E - Extended Open Time	Extended open time: tensile adhesion strength	$\geq 0,5$ N/mm ² after not less than 30 min.	4.1

5.4 Specifications for Reaction Resin Adhesives (R)

All reaction resin adhesives shall comply with the R1 fundamental characteristics reported in [Table 6](#). The additional characteristics for R2 (improved performance) products are also contained in [Table 6](#). [Table 7](#) reports the Special Characteristics that can be reported for reaction resin adhesives.

Regarding the characteristic of chemical resistance, there is no indication of limit value or chemical agent. When specific chemical resistance data are required for a project, testing shall conform to (ISO 13007-2:2010, 4.6, Determination of Chemical Resistance) with chemical concentrations and immersion temperatures chosen to simulate exposure conditions. The test media shall consist of media to which the chemical resistant materials are to be exposed in service and the test conditions (temperature, etc.) shall simulate the anticipated service and exposure conditions as closely as possible.

Table 6 — Specifications for Reaction Resin Adhesives (R)

Classification	Property	Requirement	Test Method ISO 13007-2:2010
R1 - Normal Adhesive (Fundamental Characteristics)	Shear adhesion strength	≥ 2 N/mm ²	4.3.4
	Shear adhesion strength after water immersion	≥ 2 N/mm ²	4.3.5
	Open time: tensile adhesion strength	$\geq 0,5$ N/mm ² after not less than 20 min.	4.1
R2 - Improved Adhesives (Additional Characteristics)	Shear adhesion strength after thermal shock	≥ 2 N/mm ²	4.3.8

Table 7 — Specification for Reaction Resin Adhesives (R) -Special Characteristics

Special Characteristic	Property	Requirement	Test Method ISO 13007-2:2010
T - Slip Resistance	Vertical slip resistance	$\leq 0,5$ mm	4.2

6 Marking, labelling and packaging

Products complying with the requirements of this part of ISO 13007 shall be clearly marked with the following information:

- a) Name of the product
- b) Manufacturer's mark and place of origin

- c) Date or code of production, shelf life and conditions of storage
- d) Number of this part of ISO 13007 and date of issue
- e) Type of adhesive according to [Clause 4](#) (using symbols reported in [Table 1](#))
- f) Instructions for use:
 - Recommended areas for use
 - mix proportions (where applicable)
 - maturing time (where applicable)
 - pot life
 - mode of application
 - open time
 - delay for grouting and opening to traffic (where applicable)

NOTE *In the designation of an adhesive, information about special properties can be included when the product is intended for use in specific applications.*

This information shall be marked on the packaging and/or on the product's technical data sheet.

Standards Australia

Standards Australia develops Australian Standards® and other documents of public benefit and national interest. These Standards are developed through an open process of consultation and consensus, in which all interested parties are invited to participate. Through a Memorandum of Understanding with the Commonwealth Government, Standards Australia is recognized as Australia's peak non-government national standards body.

For further information visit www.standards.org.au

Australian Standards®

Committees of experts from industry, governments, consumers and other relevant sectors prepare Australian Standards. The requirements or recommendations contained in published Standards are a consensus of the views of representative interests and also take account of comments received from other sources. They reflect the latest scientific and industry experience. Australian Standards are kept under continuous review after publication and are updated regularly to take account of changing technology.

International Involvement

Standards Australia is responsible for ensuring the Australian viewpoint is considered in the formulation of International Standards and that the latest international experience is incorporated in national Standards. This role is vital in assisting local industry to compete in international markets. Standards Australia represents Australia at both the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

For information regarding the development of Standards contact:
Standards Australia Limited
GPO Box 476
Sydney NSW 2001
Phone: 02 9237 6000
Email: mail@standards.org.au
www.standards.org.au



ISBN 978 1 76072 767 3

This page has been left intentionally blank.