

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS A 5209 : 2020

(JCTMA)

Ceramic tiles

ICS 91.100.23

Reference number : JIS A 5209 : 2020 (E)

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A 5209 : 2020

Date of Establishment: 1957-03-29

Date of Revision: 2020-03-23

Date of Public Notice in Official Gazette: 2020-03-23

Investigated by: Japanese Industrial Standards Committee
Standards Board for ISO area
Technical Committee on Architecture

JIS A 5209 : 2020, First English edition published in 2020-12

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

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Printed in Japan

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Ceramic Tile Manufacturers' Association (JCTMA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS A 5209:2014**), which has been technically revised.

However, **JIS A 5209: 2014** may be applied in the **JIS** mark certification based on the relevant provisions of Article 30, paragraph (1), etc. of the Industrial Standardization Act until 22 March 2021.

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Ceramic tiles

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 13006** : 2018, Edition 3, with some modifications of the technical contents for reflecting the local needs and situations in Japan.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JA. The comparison table between previous and current editions of this Standard on technically significant revisions is given in Annex JB.

1 Scope

This Standard specifies requirements for the ceramic tiles (hereafter referred to as tiles) to be used for the tile post-faced method using cement mortar (hereafter referred to as mortar facing), the tile post-faced method using organic adhesives (hereafter referred to as adhesives facing) and the tile pre-faced precast concrete construction method.

NOTE The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 13006 : 2018 *Ceramic tiles — Definitions, classification, characteristics and marking* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS A 1509-1 *Test methods for ceramic tiles — Part 1 : Sampling*

NOTE Corresponding International Standard : ISO 10545-1 : 2014 *Ceramic tiles — Part 1 : Sampling and basis for acceptance* (MOD)

JIS A 1509-2 *Test methods for ceramic tiles — Part 2 : Determination of dimensions and the shape*

NOTE Corresponding International Standard : ISO 10545-2 : 1995 *Ceramic tiles — Part 2 : Determination of dimensions and surface quality* (MOD)

JIS A 1509-3 *Test methods for ceramic tiles — Part 3 : Determination of water absorption, apparent porosity and bulk density*

NOTE Corresponding International Standard : ISO 10545-3 : 1995 *Ceramic tiles — Part 3 : Determination of water absorption, apparent porosity, apparent relative density and bulk density* (MOD)

JIS A 1509-4 *Test methods for ceramic tiles — Part 4 : Determination of modulus of rupture and breaking strength*

NOTE Corresponding International Standard : ISO 10545-4 : 2004 *Ceramic tiles — Part 4 : Determination of modulus of rupture and breaking strength* (MOD)

JIS A 1509-5 *Test methods for ceramic tiles — Part 5 : Determination of resistance to body abrasion for floor tiles*

NOTE Corresponding International Standard : ISO 10545-6 : 2010 *Ceramic tiles — Part 6 : Determination of resistance to deep abrasion for unglazed tiles* (MOD)

JIS A 1509-6 *Test methods for ceramic tiles — Part 6 : Determination of resistance to surface abrasion for floor tiles*

NOTE Corresponding International Standard : ISO 10545-7 : 1996 *Ceramic tiles — Part 7 : Determination of resistance to surface abrasion for glazed tiles* (MOD)

JIS A 1509-7 *Test methods for ceramic tiles — Part 7 : Determination of resistance to thermal shock*

NOTE Corresponding International Standard : ISO 10545-9 : 2004 *Ceramic tiles — Part 9 : Determination of resistance to thermal shock* (MOD)

JIS A 1509-8 *Test methods for ceramic tiles — Part 8 : Determination of crazing resistance for glazed tiles*

NOTE Corresponding International Standard : ISO 10545-11 : 1994 *Ceramic tiles — Part 11 : Determination of crazing resistance for glazed tiles* (MOD)

JIS A 1509-9 *Test methods for ceramic tiles — Part 9 : Determination of frost resistance*

NOTE Corresponding International Standard : ISO 10545-12 : 1995 *Ceramic tiles — Part 12 : Determination of frost resistance* (MOD)

JIS A 1509-10 *Test methods for ceramic tiles — Part 10 : Determination of chemical resistance*

NOTE Corresponding International Standard : ISO 10545-13 : 2016 *Ceramic tiles — Part 13 : Determination of chemical resistance* (MOD)

JIS A 1509-11 *Test methods for ceramic tiles — Part 11 : Determination of lead and cadmium given off by glazed tiles*

NOTE Corresponding International Standard : ISO 10545-15 : 1995 *Ceramic tiles — Part 15 : Determination of lead and cadmium given off by glazed tiles* (MOD)

JIS A 1509-12 *Test methods for ceramic tiles — Part 12 : Determination of slip re-*

sistance

JIS A 1509-13 *Test methods for ceramic tiles — Part 13 : Test methods for unit-tiles of quality*

JIS A 5548 *Interior organic adhesives for ceramic tiles*

JIS A 5557 *Organic adhesives for exterior tile finishing*

JIS T 9251 *Guidelines for older persons and persons with disabilities — Shapes, dimensions and patterns of raised parts of tactile walking surface indicators for persons who are blind or with seeing impairment*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1

ceramic tile

thin slab less than 40 mm in thickness made from clays and/or other inorganic raw materials, generally used as covering for floors and walls, that are shaped and then dried and subsequently fired at high temperatures sufficient to develop the required properties

3.1.1

flat tiles

tiles that constitute the plane surface of the wall or floor of a building and are classified into regular tiles and irregular tiles (see Figure 1)

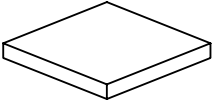
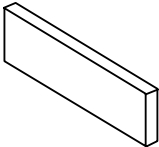
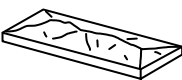
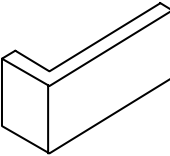
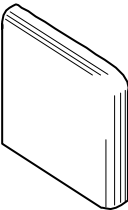
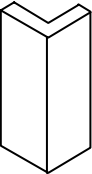
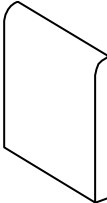
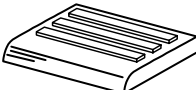
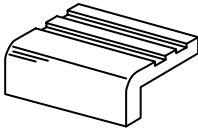
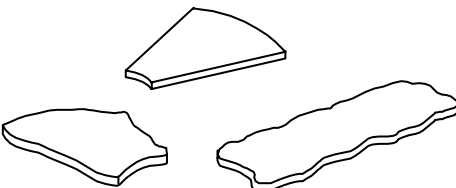
Shape	Flat tiles	Trim tiles
Regular tiles	 Square  Rectangular  Rectangular (convex face)  Rectangular (chiseled face)	 Bend  Double chamfered  Symmetric bend  Single chamfered  For stairs (without bend)  For stairs (with bend)
Irregular tiles	 Circle  Triangle  Other shapes	Trim tiles manufactured to fit the shape of a flat irregular tile.
NOTE The corners of a regular tile can be made arc-shaped. However, when the radius of an arc exceeds 5 mm, that tile is considered as an irregular tile.		

Figure 1 Designation of shapes of tile (example)

3.1.1.1

regular tiles

square or rectangular tiles (see Figure 1) excluding those of which the side face is made nonlinear for ornamental purpose

3.1.1.2

irregular tiles

tiles other than regular tiles (see Figure 1)

3.1.2

trim tiles

tiles which are used for an opening or a corner part, are classified into regular tiles and irregular tiles (see Figure 1) and are installed by themselves or assembled in line, excluding those bonded with organic adhesives

3.1.2.1

regular tiles

trim tiles used for installing the flat regular tiles (see Figure 1)

3.1.2.1.1

tiles consisting of one surface

square or rectangular tiles excluding those of which the side face is made nonlinear for ornamental purpose

3.1.2.1.2

tiles consisting of two or more surfaces

tiles which consist of one square and one rectangular surface, or of two square or rectangular surfaces, of which two adjoining surfaces are at right angles, excluding those of which the side face is made nonlinear for ornamental purpose

3.1.2.2

irregular tiles

trim tiles used for installing the flat irregular tiles (see Figure 1)

3.2

back feet

parallel ridges running across the back face of tiles which possess a geometry intended to facilitate an interlocking connection between tile and cement mortar

3.3

body

part comprising the main portion of a tile

NOTE..... In the case of glazed tiles, it is the portion excluding glaze.

3.4

unit tile

assembly of many tiles arranged and jointed in order to facilitate the tiling, excluding

those used for tile pre-faced precast concrete construction method

NOTE Unit tiles include face covering unit tiles, back joint unit tiles, flat unit tiles obtained by jointing flat tiles and trim unit tiles used for an opening or a corner part.

The surface area of the unit tile by modular size is 1 800 cm² or less.

3.4.1

face covering unit tile

unit tile of which the face is covered with face covering ground papers

NOTE The face covering ground paper is removed at the time of installation.

3.4.2

back joint unit tile

unit tile of which the back face and/or sides are jointed with back joint material

NOTE The back joint material includes a net, ground paper, resin, etc., and is embedded as it is at the time of installation.

3.5

back open area ratio

in the back joint unit tile, a ratio of the area devoid of back joint material to the whole back area

3.6

Shaping method

3.6.1

extrusion

a method wherein the body materials are extruded into predetermined shape and size by means of an extruder

3.6.2

dry pressing

a method wherein the body materials are formed into predetermined shape and size by means of a high-pressure pressing machine

3.7

Sizes

3.7.1

work size

basic product size used for manufacturing the tile or unit tile (see Figure 2)

NOTE The work size usually consists of dimensions indicating the size in appearance, such as length, width and thickness.

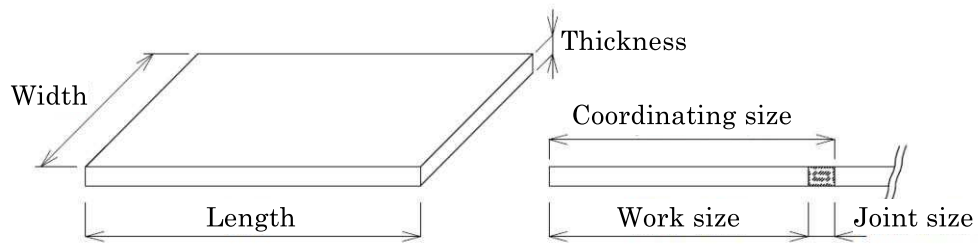


Figure 2 Work size and coordinating size

3.7.2

coordinating size

work size of a tile or a unit tile plus the joint size (see Figure 2)

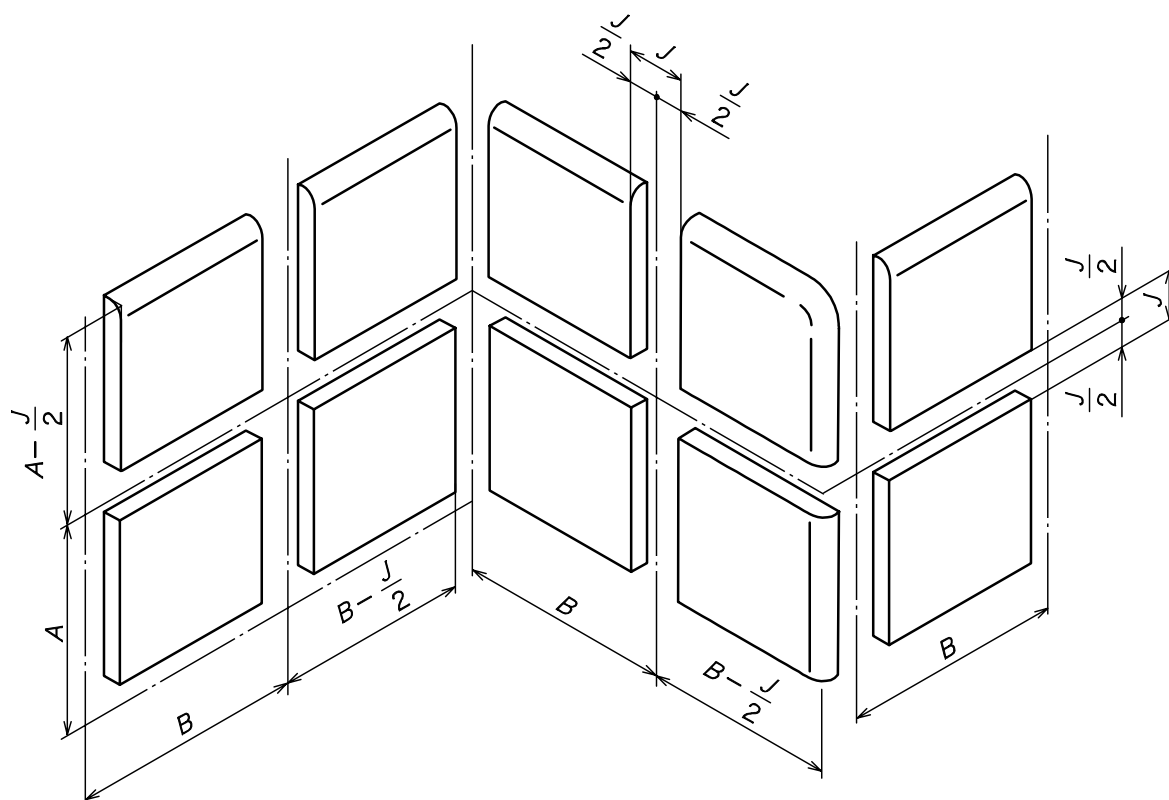
3.7.3

modular size

size used for planning layout of the tile and the unit tile

NOTE Figure 3 and Figure 4 show modular size as A and B and joint size as J .

Unit: mm

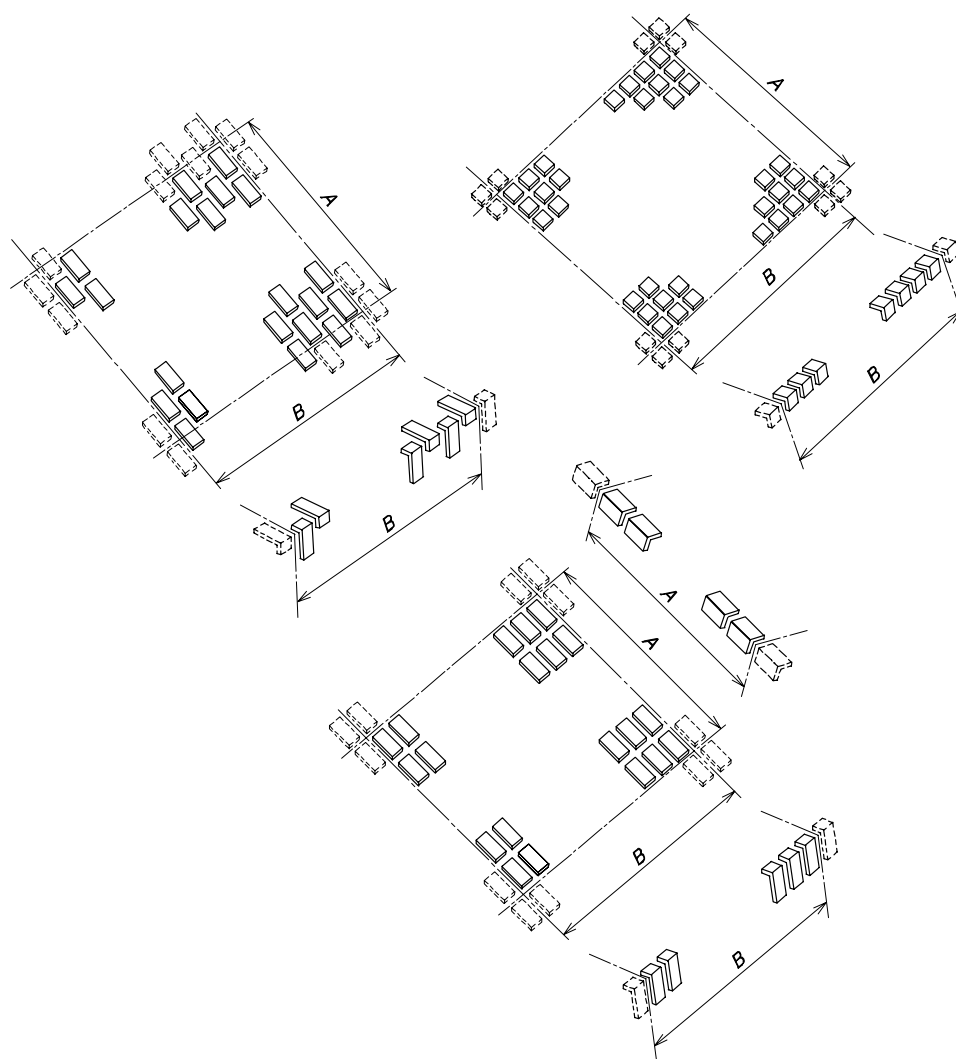


Example of modular size and joint size of tile

	Examples of size											
A, B	50	60	75	100	1 000/9	150	200	225	300	400	450	600
J	1 to 10											

Figure 3 Layout of tiles (example)

Unit: mm



Example of modular size of unit tile

	Flat unit tile			Trim unit tile		
	Example of modular size			Example of modular size		
<i>A, B</i>	300	400	303	300	400	303
NOTE The size of the trim unit tile shall be made equal to the size of the flat unit tile.						

Figure 4 Layout of unit tile (example)

3.8

glazed tiles

tiles whose surfaces are glazed, including tiles given slight glaze, engobed surface, spot glaze, body glaze, etc.

3.9

unglazed tiles

tiles with unglazed surfaces, with the bear surface of the body constituting the tile surface

3.10

tile post-faced method using cement mortar

tile post-faced method using cement mortar as pasting material

3.11

tile post-faced method using organic adhesives

tile post-faced method using organic adhesives specified in JIS A 5548 or JIS A 5557 as pasting material

3.12

tile pre-faced precast concrete construction method

construction method in which tiles are pre-faced in a framework in precast concrete works and unified after pouring concrete

3.13

application

part in a building structure, etc. for which a tile is applicable, given its material, performance and required function

3.14

standard sample

sample used as a reference for showing the required quality of the product

3.15

boundary sample

samples for defining the boundary level of a given quality, used for acceptance judgement of a product

3.16

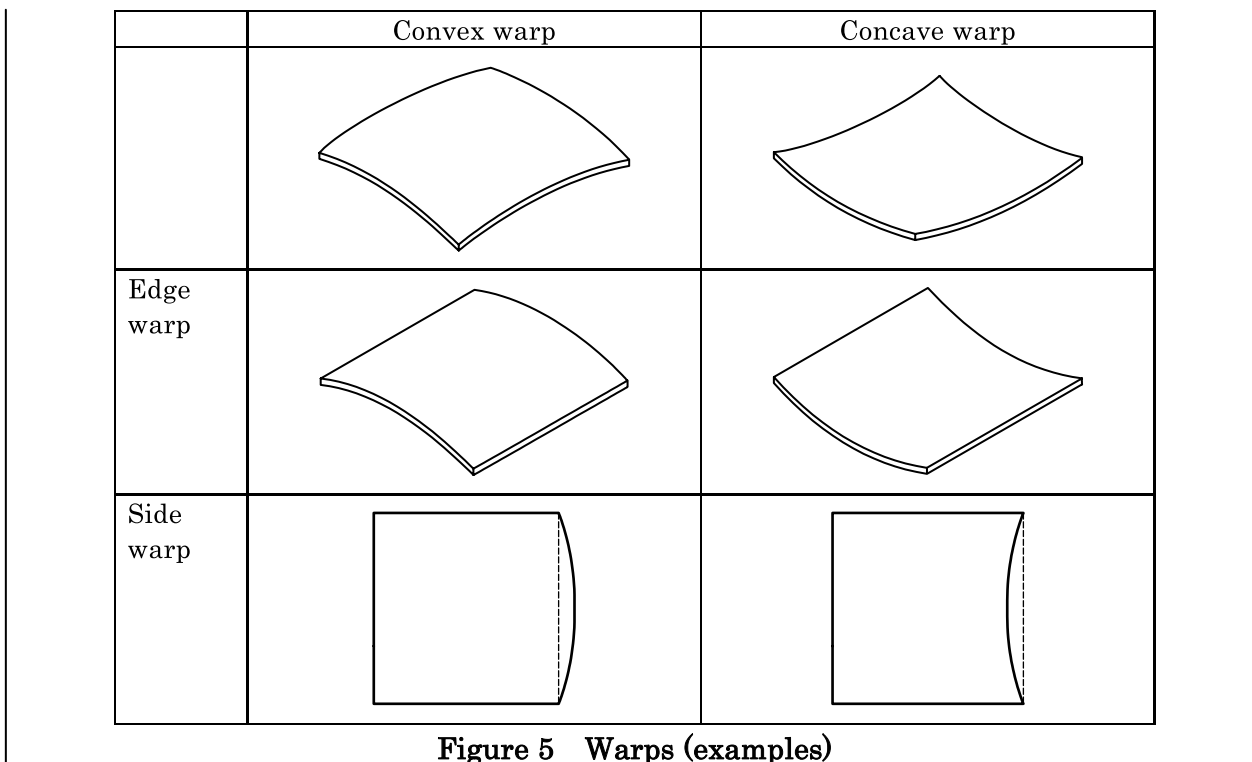
crook

irregularity of dimensions of four sides of a square tile or two opposing sides of a rectangular tile

3.17

warp

generic name for all types of curvatures of tiles (see Figure 5)



3.18

plane warp

curvature in the diagonal direction of a tile face (see Figure 5)

NOTE There are a convex warp that is curved convexly in the face direction and a concave warp that is curved in the opposite direction.

3.19

torsion

difference between curvatures in the directions of two diagonal lines of a tile face

3.20

edge warp

curvature in the edge of a tile face (see Figure 5)

NOTE There are a convex warp that is curved convexly in the face direction and a concave warp that is curved in the opposite direction.

3.21

side warp

curvature in the side of a tile (see Figure 5)

NOTE There are a convex warp that is curved convexly in the side direction and a concave warp that is curved in the opposite direction.

3.22