JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 0001 : 2019

(JSA)

Technical drawings for mechanical engineering

ICS 01.100.20

Reference number : **JIS B 0001** : **2019** (**E**)

Date of Establishment: 1958-10-07
Date of Revision: 2019-05-20
Date of Public Notice in Official Gazette: 2019-05-20
Investigated by: Japanese Industrial Standards Committee
Standards Board for ISO area

JIS B 0001:2019, First English edition published in 2020-08

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

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

Printed in Japan

AT

Contents

Page

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 Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS B 0001**:2010 is replaced with this Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

Blank

Technical drawings for mechanical engineering

1 Scope

This Japanese Industrial Standard specifies the technical drawings for mechanical engineering, mainly part drawings and assembly drawings based on **JIS Z 8310**.

The matters not stated in this Standard shall be in accordance with **JIS Z 8310** and other individual Japanese Industrial Standards related to technical drawings.

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 B 0021 *Geometrical product specifications (GPS)—Geometrical tolerancing—Tolerancing of form, orientation, location and run-out*

JIS B 0026 *Technical drawings—Dimensioning and tolerancing—Non-rigid parts*

JIS B 0028 *Geometrical product specifications (GPS)—Dimensioning and tolerancing—Cones*

JIS B 0031 *Geometrical Product Specifications (GPS)—Indication of surface texture in technical product documentation*

JIS B 0405 *General tolerances—Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

JIS B 0419 *General tolerances—Part 2: Geometrical tolerances for features without individual tolerance indications*

JIS B 0420-1 *Geometrical product specifications (GPS)—Dimensional tolerancing—Part 1: Linear sizes*

JIS B 0601 *Geometrical Product Specifications (GPS)—Surface texture: Profile method—Terms, definitions and surface texture parameters*

JIS B 0672-1 *Geometrical Product Specifications (GPS)—Geometrical features—Part 1: General terms and definitions*

JIS B 0681-2 *Geometrical product specifications (GPS)—Surface texture: Areal—Part 2: Terms, definitions and surface texture parameters*

JIS Z 3021 *Welding and allied processes—Symbolic representation*

JIS Z 8114 *Technical product documentation—Terms relating to technical drawings*

JIS Z 8310 *Technical drawings—General code of drafting practices*

JIS Z 8311 *Technical drawings—Sizes and layout of drawing sheets*

JIS Z 8312 *Technical drawings—General principles of presentation—Basic convention for lines*

JIS Z 8314 *Technical drawings—Scales*

JIS Z 8315-3 *Technical drawings—Projection method—Part 3: Axonometric representations*

JIS Z 8315-4 *Technical drawings—Projection method—Part 4: Central projection*

JIS Z 8317-1 *Technical drawings—Indications of dimensions and tolerances—Part 1: General principles*

JIS Z 8318 *Technical product documentation (TPD)—Indication method of tolerances for linear and angular dimensions*

JIS Z 8321 *Technical drawings—General principles of presentation—Preparation of lines by CAD system*

ISO 14405-2 *Geometrical product specifications (GPS)—Dimensional tolerancing—Part 2: Dimensions other than linear or angular sizes*

ISO 14405-3 *Geometrical product specifications (GPS)—Dimensional tolerancing—Part 3: Angular sizes*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS Z 8114**, and the following apply.

NOTE The term “linear size”, applying to linear dimension expressed in mm, is used to designate either a size or a distance; for the purpose of this Standard, the former refers to the feature of size such as the diameter of a circle or cylinder and width represented by two parallel opposite surfaces, that can be regulated by size tolerances, and the latter applies to, e.g. centre-to-centre distance of holes and distance of a step surface, that can be regulated by geometrical tolerances. See **JIS B 0401-1**, **JIS B 0420-1**, **ISO 14405-2** and **ISO 14405-3**.

3.1

least-squares size

size obtained by performing computational processing for least-squares method of many measurement points that have been obtained by measuring feature surfaces

NOTE For linear sizes, see **JIS B 0420-1**.

3.2

rough piece dimensions

dimensions which indicate the initial geometry of an object such as as-cast dimension, hot-rolled steel plate thickness and polished round bar diameter

3.3

tool size

dimension that indicates the size of a tool when parts are machined, such as drill diameter, reamer diameter, milling cutter diameter and cutter width (see Figure 1)

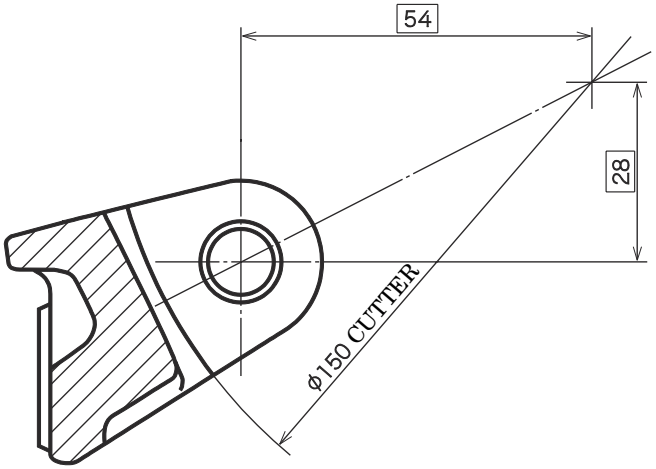


Figure 1 Example of designation of tool size used

3.4

angular size

angular dimension formed by two planes or straight lines of the feature substance

NOTE 1 This does not include an angle formed by two axis lines of obliquely-crossed holes.

NOTE 2 For angular sizes, see **ISO 14405-3**.

3.5

control radius, CR

radius controlled such that the junction between a straight section and a radial curved section is smoothly connected and there exists a radius between a maximum permissible radius and a minimum permissible radius (geometrical tolerance zone which is tangent to two curved surfaces) (see Figures 2 and 139)

NOTE CR is used as a symbol to designate control radius (see Table 7).

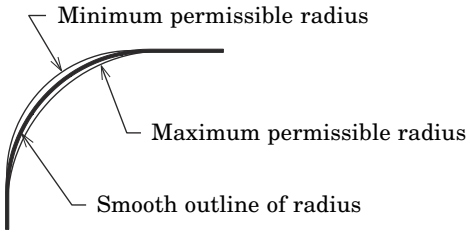


Figure 2 Control radius

4 General matters

General matters concerning technical drawing for mechanical engineering shall be as follows.

a) The technical drawing shall be so drawn that the correct proportional relation between the size of view and the size of object is maintained. However, for drawings with no room for possible misreading, this proportional relation does not have to be maintained on a part or all parts of view.

NOTE See **11.13**.

b) The centre of the line in thickness direction shall coincide with the line to be theoretically drawn (see Figure 3).

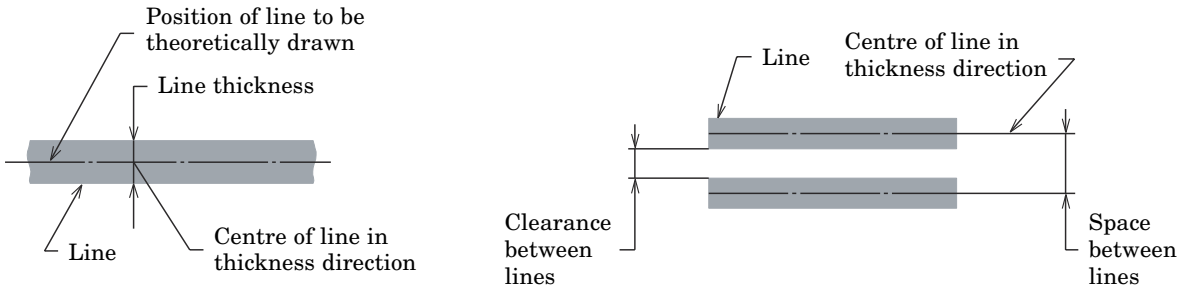
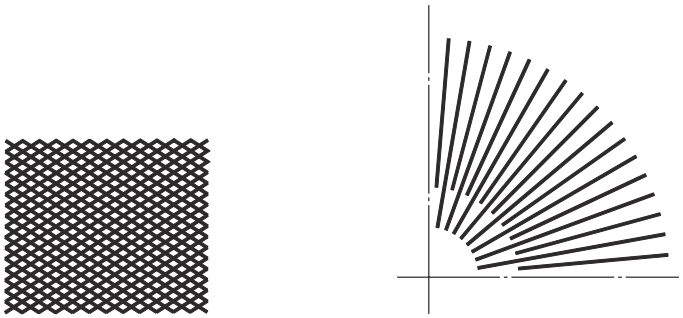


Figure 3 Centre position of line in thickness direction

c) The minimum clearance between parallel lines to be drawn adjacent to each other should be at least twice the thickness of the thickest line and not less than 0.7 mm [see Figure 3 b) and Figure 4 a)]. Further, the minimum clearance between densely aggregating crossing lines shall be at least three times the thickness of the thickest line.

d) In the case where many lines concentrate to a point, unless it is not confusing, the lines should stop at a position where the minimum clearance between lines is about twice the thickness of the thickest line, and the periphery of the point should be clear [see Figure 4 b)].



a) **b)**

Figure 4 Minimum clearance between lines

e) The objects or parts made of transparent material shall be all drawn in project view as being opaque.

f) For the dimensions indicating the size (linear size), unless otherwise specified [1)], the two point-measurement of the object shall be designated (see **JIS B 0420-1**). In this case, size tolerances (see **JIS B 0401-1**) are not to regulate the shape, unless otherwise specified.

Where a size (linear size) is a least-squares size [2)], it shall be indicated within or adjacent to a title block that **JIS B 0672-1** is applied.

Notes [1)] In the case where the application of envelope requirement (see **JIS B 0024** and **JIS B 0420-1**) is designated, and others.

[2)] In the case of a circular feature, the least-squares size is the diameter of the least-squares circle shown in Figure 5.

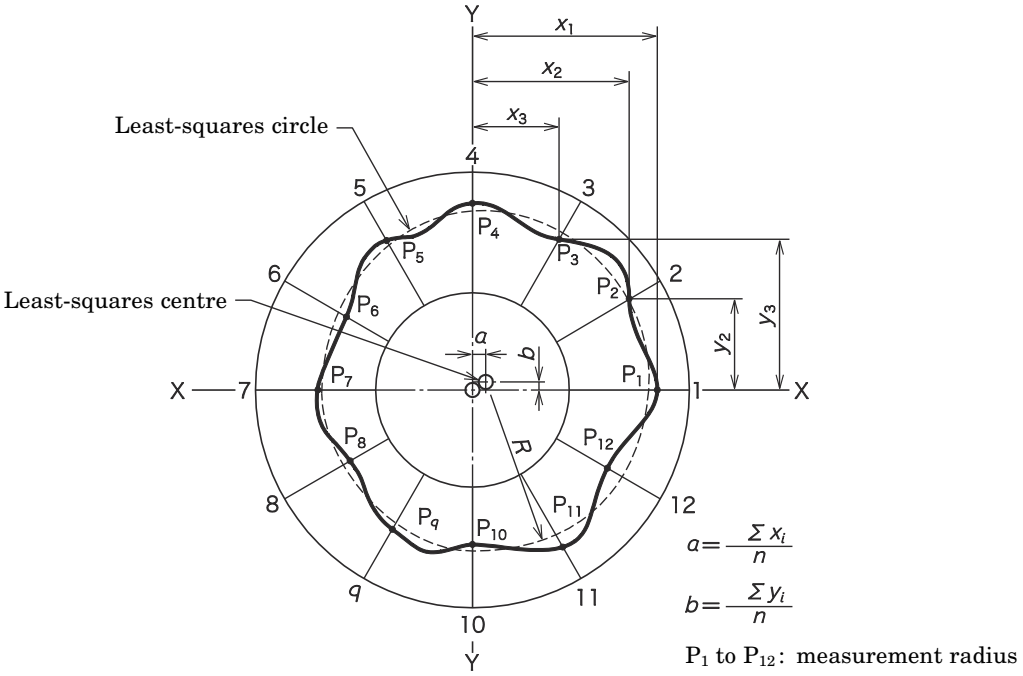


Figure 5 Least-squares circle

g) For the dimensions, except for special ones (reference dimensions, theoretically exact dimensions, etc.), the permissible limits shall be designated directly or collectively in accordance with **JIS B 0405**, **JIS B 0420-1**, **JIS Z 8317-1**, **JIS Z 8318**, **ISO 14405-2** and/or **ISO 14405-3**.

h) Only where they are indispensable depending on the functional requirement, interchangeability and technical level of manufacture, the geometrical tolerances shall be designated in accordance with **JIS B 0021** and/or **JIS B 0419**.

i) When the designation on surface texture is required, it shall be in accordance with **JIS B 0031** based on the definition given in **JIS B 0601** and **JIS B 0681-2**.

j) In the case where the designation of requirements concerning the welding is made by means of welding symbols, it shall be in accordance with **JIS Z 3021**.

k) The representation of special parts such as screws and springs shall be in accordance with separately specified individual **JIS** standards relating to technical drawings.

l) In the case where the symbols given in **JIS** that are specifically intended for technical drawings are used in strict accordance with the specifications, giving a note concerning the matter is not generally required. In the case where the symbols given in **JIS** that are not specifically designed for technical drawings, or symbols specified in other publicly known standards are used, the number of the applied standard shall be noted on a proper portion of the drawing.

Further, where symbols other than the above are used, their meanings shall be noted on a proper portion of the drawing.