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Technical drawings—
Dimensioning—
General principles, definitions,
methods of execution and special
indications

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS Z 8317 : 1984** is replaced with **JIS Z 8317 : 1999**.

This revision has been equivalent to **ISO 129 : 1985** *Technical drawings—Dimensioning—General principles, definitions, methods of execution and special indications* except for the provision of the symbol for 45° chamfering.

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

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Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 General principles	2
4 Method of dimensioning	4
5 Arrangement and indication of dimensions	10
6 Special indications	13
7 Indication of levels	18

Technical drawings— Dimensioning — General principles, definitions, methods of execution and special indications

Introduction This Japanese Industrial Standard has been prepared based on ISO 129, *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications* issued in 1985 without changing the technical contents, except for the symbol for 45° chamfering which has been formerly specified in JIS.

The description underlined with a dotted line in this Standard is not included in the original International Standard.

1 Scope This Standard establishes the general principles of dimensioning applicable in all fields (i.e., mechanical, electrical civil engineering, architecture, etc.). It is possible that in some specific technical areas, the general rules and conventions will not cover all the needs of specialized practices adequately. In such cases additional rules may be laid down in standards specific to these areas. However, the general principles of this Standard shall be followed to facilitate the international exchange of drawings and to ensure the coherence of drawings in a comprehensive system relating to several technical fields.

The figures, as shown in this Standard, merely illustrate the text and are not intended to reflect actual usage. The figures are consequently simplified to indicate only the relevant general principles applicable in any technical area.

Note: The International Standard corresponding to this Standard is as follows.
ISO 129 : 1985, *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications*

2 Normative references The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For these normative references, the most recent editions shall apply.

JIS Z 8316 Technical drawings — General principles of presentation

Note: The provisions cited from ISO 128 : 1985, *Technical drawings — General principles of presentation* are equivalent to the relevant provisions in this standard.

JIS Z 8318 *Technical drawings — Tolerancing of linear and angular dimensions*

Note: The provisions cited from ISO 406, *Technical drawings — Linear and angular tolerancing — Indications on drawings* are equivalent to the relevant provisions in this standard.

ISO 1660 *Technical drawings — Dimensioning and tolerancing of profiles*

ISO 3040 *Technical drawings — Dimensioning and tolerancing — Cones*

JIS Z 8313-1 *Technical drawings — Lettering — Part 1 : Currently used characters*

Note: The provisions cited from ISO 3098-1, *Technical drawings — Lettering — Part 1: Currently used characters* are equivalent to the relevant provisions in this standard.

JIS Z 8313-10 *Technical drawings — Lettering — Part 10: Japanese characters (Kana and kanji)*

ISO 6428 *Technical drawings — Requirements for microcopying*

3 General principles

3.1 Definitions For the purposes of this Standard, the following definitions apply.

3.1.1 **dimension:** A numerical value expressed in appropriate units of measurement and indicated graphically on technical drawings with lines, symbols and notes.

Dimensions are classified according to the following types:

3.1.1.1 **functional dimension:** A dimension that is essential to the function of the piece or space (See “*F*” in Fig. 1).

3.1.1.2 **non-functional dimension:** A dimension that is not essential to the function of the piece or space (See “*NF*” in Fig. 1).

3.1.1.3 **auxiliary dimension:** A dimension given for information purposes only. It does not govern production or inspection operations and is derived from other values shown on the drawing or in related documents. An auxiliary dimension is given in parentheses and no tolerance applies to it (See “*AUX*” in Fig. 1).

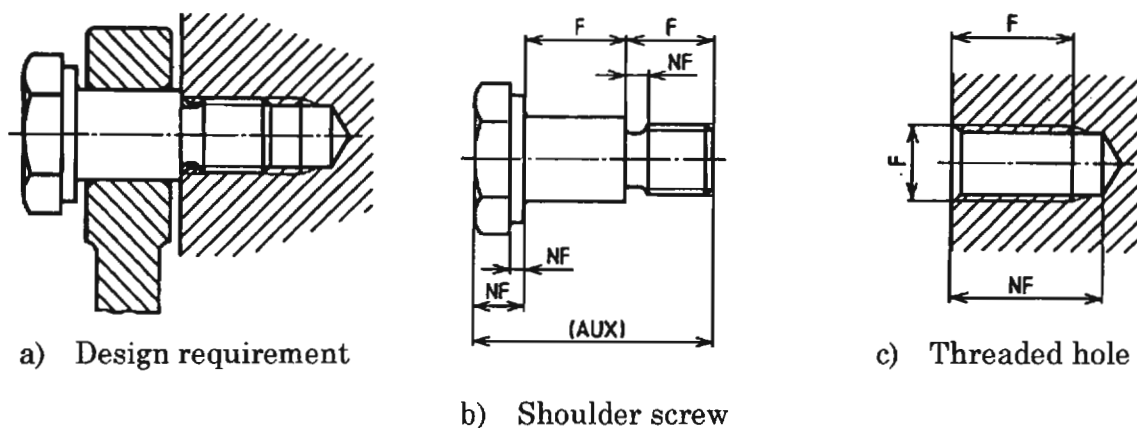


Fig. 1 Functional, not-functional and auxiliary dimensions

3.1.2 **feature:** An individual characteristic such as a flat surface, a cylindrical surface, two parallel surfaces, a shoulder, a screw thread, a slot, a profile, etc.

3.1.3 **end product:** The complete part ready for assembly or service or a configuration produced from a drawing specification. An end product may also be a part ready for

further processing (for example, the product of a foundry or forge) or a configuration needing further processing.

3.2 Application

3.2.1 All dimensional information necessary to define a part or component clearly and completely shall be shown directly on a drawing unless this information is specified in associated documentation.

3.2.2 Each feature shall be dimensioned once only on a drawing.

3.2.3 Dimensions shall be placed on the view or section that most clearly shows the corresponding features.

3.2.4 Each drawing shall use the same unit (for example, millimetres) for all dimensions but without showing the unit symbol. In order to avoid misinterpretation, the predominant unit symbol on a drawing may be specified in a note.

Where other units have to be shown as part of the drawing specification (for example, N·m for torque or kPa for pressure), the appropriate unit symbol shall be shown with the value.

3.2.5 No more dimensions than are necessary to define a part or an end product shall be shown on a drawing. No feature of a part or an end product shall be defined by more than one dimension in any one direction. Exception may, however, be made.

- a) where it is necessary to give additional dimensions at intermediate stages of production (for example, the size of a feature prior to carburizing and finishing);
- b) where the addition of an auxiliary dimension would be advantageous.

3.2.6 Production processes or inspection methods should not be specified unless they are essential to ensure satisfactory functioning or interchangeability.

3.2.7 Functional dimensions should be shown directly on the drawing wherever possible (see Fig. 2).

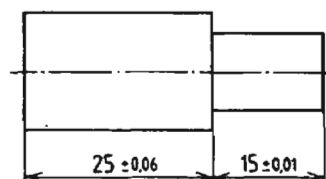


Fig. 2 Functional dimensioning

Occasionally indirect functional dimensioning is justified or necessary. In such cases, care shall be exercised so that the effect of directly shown functional dimensioning is maintained.

Fig. 3 shows the effect of acceptable indirect functional dimensioning that maintains the dimensional requirements established by Fig. 2.

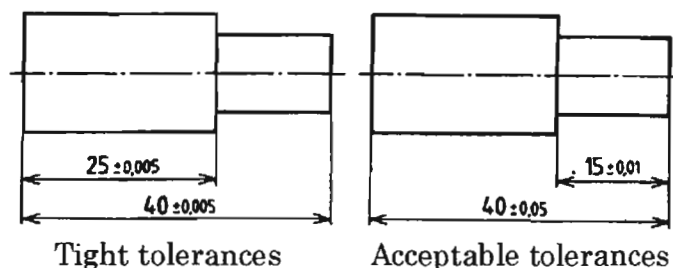


Fig. 3 Indirect functional dimensioning

3.2.8 The non-functional dimensions should be placed in a way which is most convenient for production and inspection.

4 Method of dimensioning

4.1 **Elements of dimensioning** The elements of dimensioning include the projection line, dimension line, leader line, dimension line termination, the origin indication, and the dimension itself. The various elements of dimensioning are illustrated in Fig. 4 and Fig. 5 (see ISO 128).

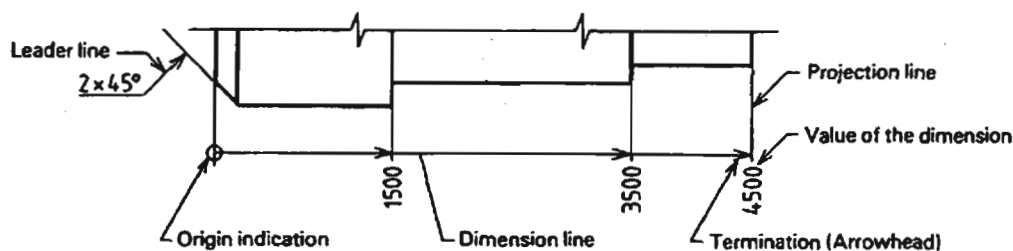


Fig. 4

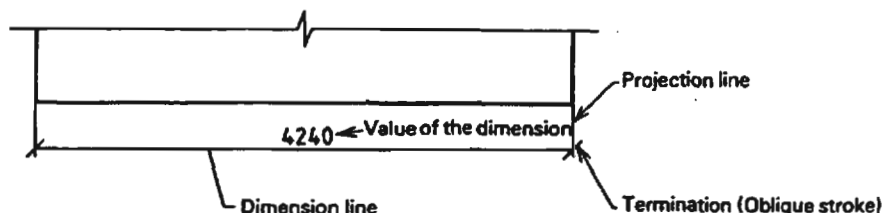


Fig. 5

4.2 **Projection lines, dimension lines and leader lines** Projection lines, dimension lines and leader lines are drawn as thin continuous lines as shown in ISO 128 and as illustrated in Fig. 4 and Fig. 5.

4.2.1 Projection lines shall extend slightly beyond the respective dimension line (see Fig. 4 and Fig. 5).

4.2.2 Projection lines should be drawn perpendicular to the feature being dimensioned. Where necessary, however, they may be drawn obliquely, but parallel to each other (see Fig. 6).

4.2.3 Intersecting construction and projection lines shall extend slightly beyond their point of intersection (see Fig. 7).

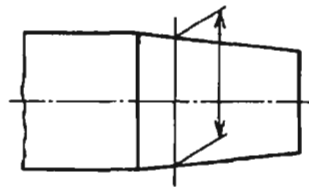


Fig. 6

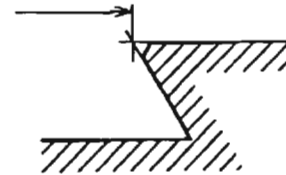


Fig. 7

4.2.4 In general, projection lines and dimension lines should not cross other lines unless this is unavoidable (see Fig. 8).

4.2.5 A dimension line shall be shown unbroken where the feature to which it refers is shown broken in order to omit the middle part (see Fig. 9), except as indicated in 4.4.1, method 2.

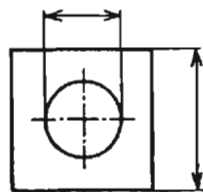


Fig. 8

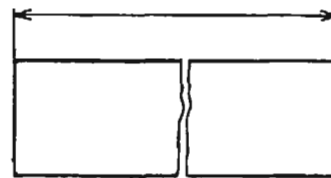


Fig. 9

4.2.6 Intersecting projection and dimension lines should be avoided. Where unavoidable, however, neither line shall be shown with a break (see Fig. 10).

4.2.7 A centreline or the outline of a part shall not be used as a dimension line but may be used in place of a projection line (see Fig. 10).

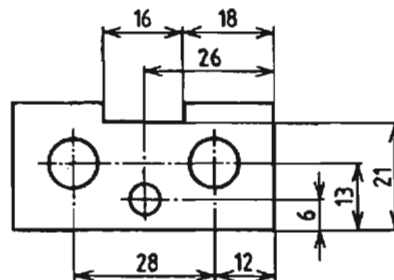


Fig. 10