

JIS

JAPANESE INDUSTRIAL STANDARD

**Technical drawings—
Geometrical tolerancing—
Maximum material requirement
and least material requirement**

JIS B 0023^{—1996}

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**In the event of any doubt arising,
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Errata will be provided upon request, please contact:

**Business Department,
Japanese Standards Association**
4-1-24, Akasaka, Minato-ku,
Tokyo, JAPAN 107
TEL. 03-3583-8002
FAX. 03-3583-0462

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Preface as Japanese Industrial Standard

This Japanese Industrial Standard has been described based on **ISO 2692** (Technical drawings — Geometrical tolerancing — Maximum material principle) published in 1988 as the first edition and **ISO 2692 Amendment 1** (Technical drawings — Geometrical tolerancing — Maximum material principle Amendment 1: Least material requirement) published in 1992, without alteration in the technical contents, organising the former as Part 1 and the latter as Part 2.

Portions marked with side lines (dotted lines) in this Standard are those of which specified contents in the original International Standard were altered or not specified in it.

Part 1 Maximum material requirement**0. Introduction**

0.1 The assembly of parts depends on the relationship between the actual size and actual geometrical deviation of the features being fitted together, such as the bolt holes in two flanges and the bolts securing them.

The minimum assembly clearance occurs when each of the mating features is at its maximum material size (e.g. largest bolt and smallest hole) and when their geometrical deviations (e.g. positional deviation) are also at their maximum.

Assembly clearance increases to a maximum when the actual sizes of the assembled features are furthest from their maximum material sizes (e.g. smallest shaft and largest hole) and when the geometrical deviations (e.g. positional deviations) are zero.

From the above, it follows that if the actual sizes of a mating part do not reach their maximum material size, the indicated geometrical tolerance may be increased without endangering the assembly of the other part.

This is called the "maximum material requirement" and is indicated on drawings by the symbol \textcircled{M} .

The figures in this Standard are intended only as illustrations to aid the understanding on the maximum material requirement, and numerical values of dimensions and tolerances have been given for illustrative purposes only.

For simplicity, the examples are limited to simple shapes.

0.2 For uniformity all figures in this Standard are in third angle projection.

Informative reference: In ISO 2692, all of the figures are indicated in first angle projection.

It should be understood that the first angle projection could equally well have been used without prejudice to the principles established.

For the definitive presentation (proportions and dimensions) of symbols for geometrical tolerancing, see ISO 7083.