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(JFRI/JSA)

**ISO metric trapezoidal screw
threads—Tolerances—Part 1:
Principles and basic data**

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In the event of any doubts arising as to the contents,
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Contents

	Page
Introduction.....	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols	2
5 Structure of tolerance system	2
6 Tolerance grades	3
7 Tolerance positions	3
8 Length of thread engagement	5
9 Tolerances for crest diameter and root diameter.....	5
9.1 Tolerance for minor diameter of internal thread T_{D1}	5
9.2 Tolerance for major diameter of external thread T_d	5
9.3 Tolerance for minor diameter of external thread T_{d3}	6
10 Tolerances for pitch diameter T_{D2} , T_{d2}	6
11 Recommended tolerance classes	12
12 Multiple-start threads	12
13 Formulae	13
13.1 Fundamental deviations	13
13.2 Length of thread engagement	13
13.3 Tolerances for crest diameter and root diameter.....	13
13.3.1 Tolerances for minor diameter of internal thread T_{D1}	13
13.3.2 Tolerances for major diameter of external thread T_d	13
13.3.3 Tolerances for minor diameter of external thread T_{d3}	13
13.4 Tolerances for pitch diameter	13
13.4.1 Tolerances for pitch diameter of internal thread T_{D2}	13
13.4.2 Tolerances for pitch diameter of external thread T_{d2}	14
13.5 Basis of rounding method of numerical values	14
14 Designation of screw thread.....	14
Annex JA (informative) Comparison table between JIS and corresponding International Standard	16

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal for establishment of Japanese Industrial Standard submitted by The Japan Research Institute for Screw Threads and Fasteners (JFRI)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

Consequently **JIS B 0217**: 1980 has been withdrawn and replaced with this Standard.

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JIS B 0217 series consists of the following 2 parts under the general title “*ISO metric trapezoidal screw threads—Tolerances*”:

Part 1: Principles and basic data

Part 2: Limits of sizes for external and internal screw thread

ISO metric trapezoidal screw threads— Tolerances—Part 1: Principles and basic data

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **ISO 2903** published in 1993 without any modifications of the technical contents.

The portions with dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies a tolerance system for ISO metric trapezoidal screw threads (Tr) according to **JIS B 0216-2**. This tolerance system refers to the basic profile and the maximum material profiles according to **JIS B 0216-1**, and the basic dimensions according to **JIS B 0216-3**; however, it does not apply to trapezoidal screw threads with special requirements on axial displacement, for example, lead screws.

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

ISO 2903:1993 *ISO metric trapezoidal screw threads—Tolerances* (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) listed below shall be applied.

JIS B 0101 *Screw threads and fasteners—Vocabulary*

NOTE : Corresponding International Standard: ISO 1891:2009 *Fasteners—Terminology* and ISO 5408:2009 *Screw threads—Vocabulary* (overall evaluation: MOD)

JIS B 0209-1 *ISO general purpose metric screw threads—Tolerances—Part 1: Principles and basic data*

NOTE : Corresponding International Standard: ISO 965-1:1980 *ISO general purpose metric screw threads—Tolerances—Part 1: Principles and basic data* (IDT)

JIS B 0216-1 *ISO metric trapezoidal screw threads—Part 1: Basic profiles and maximum material profiles*

NOTE : Corresponding International Standard: ISO 2901:1993 *ISO metric trapezoidal screw threads—Basic profile and maximum material profiles* (IDT)

JIS B 0216-2 *ISO metric trapezoidal screw threads—Part 2: General plan*

NOTE : Corresponding International Standard: ISO 2902:1977 *ISO metric trapezoidal screw threads—General plan* (IDT)

JIS B 0216-3 *ISO metric trapezoidal screw threads—Part 3: Basic dimensions*

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in **JIS B 0101** apply.

4 Symbols

Symbols used in this Standard are as follows (see figure 1 to figure 4).

D_4	basic major diameter of internal thread (mm)
D_1	basic minor diameter of internal thread (mm)
D_2	basic pitch diameter of internal thread (mm)
d	basic major diameter of external thread (mm)
d_3	basic minor diameter of external thread (mm)
d_2	basic pitch diameter of external thread (mm)
P	pitch (mm)
P_h	lead (mm)
N	designation for length of thread engagement “normal”
L	designation for length of thread engagement “long”
l_N	length of thread engagement (mm)
T	tolerance (μm)
T_{D1}	} tolerances for D_1 , D_2 , d , d_3 , and d_2 (tolerances for D_4 are not specified) (μm)
T_{D2}	
T_d	
T_{d3}	
T_{d2}	
ei, EI	lower deviations (zero for EI of internal threads) (μm)
es, ES	upper deviations (μm)

5 Structure of tolerance system

The structure of tolerance system is based on the selection from tolerance grades, tolerance positions and tolerance classes same as that in **JIS B 0209-1** for trapezoidal screw threads whose nominal diameter exceeds 6 mm. However, the recommended tolerance classes are not the same as those for ISO metric screw threads specified in **JIS B 0209-1**.

6 Tolerance grades

The tolerance grades are as follows.

	Tolerance grade
Minor diameter of internal thread D_1 :	4
Major diameter of external thread d :	4
Pitch diameter of internal thread D_2 :	7 8 9
Pitch diameter of external thread d_2 :	(6) 7 8 9
Minor diameter of external thread d_3 :	7 8 9

Tolerance grade 6 for the pitch diameter of external thread d_2 is used as a means to establish the tolerance for pitch diameter of tolerance grades 7, 8 and 9 (see **13.4.1** and **13.4.2**).

The tolerance grade for pitch diameter of external thread d_2 is always the same as that for the minor diameter of external thread d_3 . However, the values for T_{d_3} and T_{d_2} are not the same for a same grade because $T_{d_3} = 1.25 T_{d_2} + |es|$.

7 Tolerance positions

The tolerance positions for the pitch diameter are as follows.

- a) For internal threads: H with zero fundamental deviation EI (see figure 2 and table 1)
- b) For external threads: c and e with negative fundamental deviation es (see figure 3 and table 1)

The tolerance position for minor diameter D_1 and major diameter D_4 of internal threads shall always be such that the lower fundamental deviation EI is zero.

The tolerance position for major diameter d and minor diameter d_3 of the external threads shall be such that, in all cases, the upper fundamental deviation es is zero, and it is independent of the tolerance position of pitch diameter.

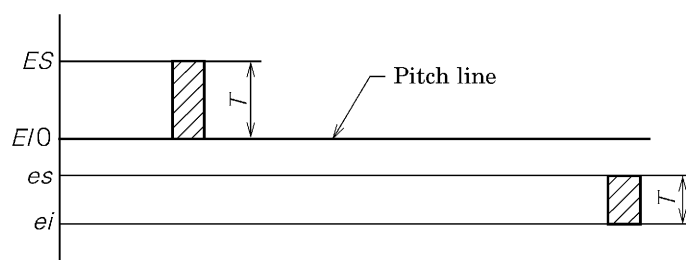


Figure 1 Tolerance positions with respect to basic line (basic dimensions)