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(ISO 286-2 : 1988)

**ISO system of limits and fits—
Part 2 : Tables of standard
tolerance grades and limit
deviations for holes and shafts**

ICS 17.040.10

Descriptors : tolerances (measurement), fits, dimensions, holes, axial, shafts (rotating), dimensional tolerances

Reference number : JIS B 0401-2 : 1998 (E)

B 0401-2 : 1998 (ISO 286-2 : 1988)

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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ISO system of limits and fits — Part 2 : Tables of standard tolerance grades and limit deviations for holes and shafts

Introduction This part of Japanese Industrial Standard has been prepared based on the first edition issued in 1988 of **ISO 286-2**, *ISO system of limits and fits — Part 2 : Tables of standard tolerance grades and limit deviations for holes and shafts* without changing the technical contents and the structural style of the ISO standard.

The "Informative reference" underlined with dots in this Standard is not included in the original International Standard.

The need for limits and fits for machined workpieces (hereinafter referred to as workpieces) was brought about mainly by the inherent inaccuracy of manufacturing methods, coupled with the fact that "exactness" of size was found to be unnecessary for most workpieces. In order that function could be satisfied, it was found sufficient to manufacture a given workpiece so that its size lay within two permissible limits, i.e. a tolerance, this being the variation in size acceptable in manufacture.

Similarly, where a specific fit condition is required between mating workpieces, it is necessary to ascribe an allowance, either positive or negative, to the basic size to achieve the required clearance or interference, i.e. a "deviation".

With developments in industry and international trade, it became necessary to develop formal systems of limits and fits, firstly at the industrial level, then at the national level and later at the international level.

This Standard therefore gives the internationally accepted system of limits and fits.

A general graphical representation of the relationship between the respective tolerance classes and their deviations is given in the Annex.

1 Scope This part of **JIS B 0401** gives values of the limit deviations for commonly used tolerance classes (zones) for holes and shafts calculated from the information given in **JIS B 0401-1**. This part of **JIS B 0401** covers values for the upper deviations ES (for holes) and es (for shafts), and the lower deviations EI (for holes) and ei (for shafts) (see Fig. 1).

Note: In the tables of limit deviations, the values for the upper deviation ES or es are shown above the values for the lower deviation EI or ei except for tolerance class JS and js which is symmetrical about the zero line.

2 Field of application The ISO system of limits and fits provides a system of tolerances and deviations suitable for plain workpieces.

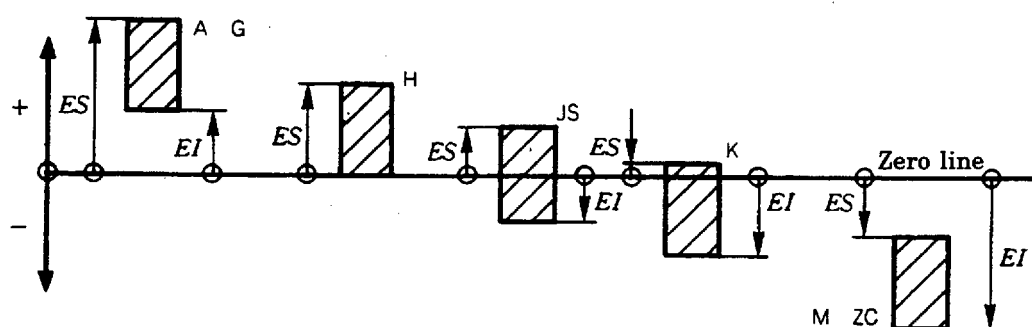
It should be noted that the general term "hole" or "shaft" used in this Standard can be taken as referring to the space contained by (or containing) the two parallel faces (or tangent planes) of any workpiece, such as the width of a slot or the thickness of a key (see also **JIS B 0401-1**). Similarly, the term "commonly used holes and shafts" shall be interpreted as providing a very wide choice of limit deviations suitable for

a wide variety of requirements.

For further information on terminology, symbols, bases of the system, etc., see **JIS B 0401-1**.

Notes on the presentation of Tables 2 to 32 are given on page 8.

a) Holes (internal features)



b) Shafts (external features)

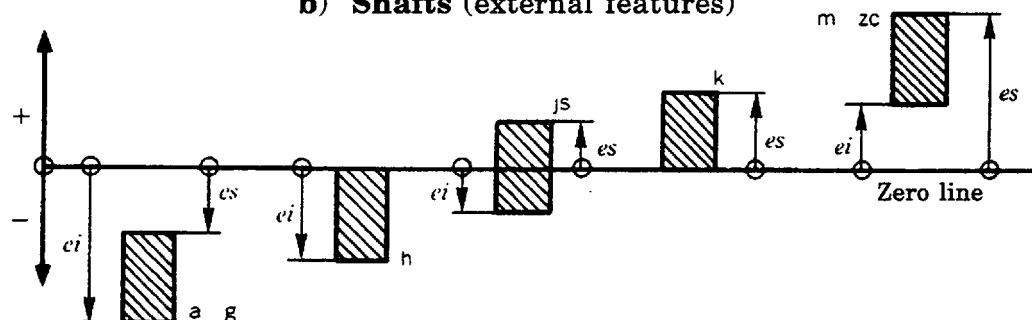


Fig. 1 Upper and lower deviations

3 Normative references

Note: See also 7.

The following standards contain provisions which, through reference in this text, constitute provisions of this part of **JIS B 0401**.

For dated references, out of these normative references, only the edition published in that year constitutes the provisions of this Standard, and subsequent amendments to or revisions are not applied. For undated references, the latest edition of the publication referred to applies.

JIS B 0401-1 *ISO system of limits and fits — Part 1: Bases of tolerances, deviations and fits*

Note: This Standard corresponds to **ISO 286-1**, *ISO systems of limits and fits — Part 1: Bases of tolerances, deviations and fits*.

ISO 1829:1975 *Selection of tolerance zones for general purposes*

Informative reference: For the selection of fits, see Annex 1, **JIS B 0401-1**.

4 Standard tolerances The values of standard tolerance grades IT1 to IT18 inclusive are given in Table 1.

For further information on the bases of the system and its application, see **JIS B 0401-1**; for values of standard tolerances IT0 and IT01, see **JIS B 0401-1**, Annex A, Table 5.

Table 1 Numerical values of standard tolerance grades IT for basic sizes up to 3 150 mm¹⁾

Note: This table, taken from **JIS B 0401-1**, has been included in this part of **JIS B 0401-1** to facilitate understanding and use of the system.

Basic size mm		Standard tolerance grades																	
		IT1 ²⁾	IT2 ²⁾	IT3 ²⁾	IT4 ²⁾	IT5 ²⁾	IT6	IT7	IT8	IT9	IT10	IT11	IT12	IT13	IT14 ³⁾	IT15 ³⁾	IT16 ³⁾	IT17 ³⁾	IT18 ³⁾
Above	Up to and incl.	Tolerances																	
		μm										mm							
—	3 ³⁾	0.8	1.2	2	3	4	6	10	14	25	40	60	0.1	0.14	0.25	0.4	0.6	1	1.4
3	6	1	1.5	2.5	4	5	8	12	18	30	48	75	0.12	0.18	0.3	0.48	0.75	1.2	1.8
6	10	1	1.5	2.5	4	6	9	15	22	36	58	90	0.15	0.22	0.36	0.58	0.9	1.5	2.2
10	18	1.2	2	3	5	8	11	18	27	43	70	110	0.18	0.27	0.43	0.7	1.1	1.8	2.7
18	30	1.5	2.5	4	6	9	13	21	33	52	84	130	0.21	0.33	0.52	0.84	1.3	2.1	3.3
30	50	1.5	2.5	4	7	11	16	25	39	62	100	160	0.25	0.39	0.62	1	1.6	2.5	3.9
50	80	2	3	5	8	13	19	30	46	74	120	190	0.3	0.46	0.74	1.2	1.9	3	4.6
80	120	2.5	4	6	10	15	22	35	54	87	140	220	0.35	0.54	0.87	1.4	2.2	3.5	5.4
120	180	3.5	5	8	12	18	25	40	63	100	160	250	0.4	0.63	1	1.6	2.5	4	6.3
180	250	4.5	7	10	14	20	29	46	72	115	185	290	0.46	0.72	1.15	1.85	2.9	4.6	7.2
250	315	6	8	12	16	23	32	52	81	130	210	320	0.52	0.81	1.3	2.1	3.2	5.2	8.1
315	400	7	9	13	18	25	36	57	89	140	230	360	0.57	0.89	1.4	2.3	3.6	5.7	8.9
400	500	8	10	15	20	27	40	63	97	155	250	400	0.63	0.97	1.55	2.5	4	6.3	9.7
500	630 ²⁾	9	11	16	22	32	44	70	110	175	280	440	0.7	1.1	1.75	2.8	4.4	7	11
630	800 ²⁾	10	13	18	25	36	50	80	125	200	320	500	0.8	1.25	2	3.2	5	8	12.5
800	1 000 ²⁾	11	15	21	28	40	56	90	140	230	360	560	0.9	1.4	2.3	3.6	5.6	9	14
1 000	1 250 ²⁾	13	18	24	33	47	66	105	165	260	420	660	1.05	1.65	2.6	4.2	6.6	10.5	16.5
1 250	1 600 ²⁾	15	21	29	39	55	78	125	195	310	500	780	1.25	1.95	3.1	5	7.8	12.5	19.5
1 600	2 000 ²⁾	18	25	35	46	65	92	150	230	370	600	920	1.5	2.3	3.7	6	9.2	15	23
2 000	2 500 ²⁾	22	30	41	55	78	110	175	280	440	700	1 100	1.75	2.8	4.4	7	11	17.5	28
2 500	3 150 ²⁾	26	36	50	68	96	135	210	330	540	860	1 350	2.1	3.3	5.4	8.6	13.5	21	33

- ¹⁾ Values for standard tolerance grades IT01 and IT0 for basic sizes less than or equal to 500 mm are given in **JIS B 0401-1**, Annex 1, Table 5.
- ²⁾ Values for standard tolerance grades IT1 to IT5 (incl.) for basic sizes over 500 mm are included for experimental use.
- ³⁾ Standard tolerance grades IT14 to IT18 (incl.) shall not be used for basic sizes less than or equal to 1 mm.

5 Limit deviations for holes A synoptic representation of the tolerance classes for holes, given in this part of **JIS B 0401**, is shown in Figs. 2 and 3.

Attention is drawn to the fact that the tolerance classes shown in Figs. 2 and 3, and their limit deviations, given in Tables 2 to 16, are not intended to give detailed directives on the selection of tolerance classes for any purpose.

Recommendations for the selection of tolerance classes are given in **ISO 1829**.

Note: Some tolerance classes are only provided for a restricted range of basic size steps. For further information, see Note 1 on page 8.

6 Limit deviations for shafts A synoptic representation of the tolerance classes for shafts, given in this part of **JIS B 0401**, is shown in Figs. 4 and 5.

Attention is drawn to the fact that the tolerance classes shown in Figs. 4 and 5, and their limit deviations, given in Tables 17 to 32, are not intended to give detailed directives on the selection of tolerance classes for any purpose. Recommendations for the selection of tolerance classes are given in **ISO 1829**.

Note: Some tolerance classes are only provided for a restricted range of basic size steps. For further information, see Note 1 on page 8.

7 Bibliography The following standards on tolerancing and tolerance systems will be useful with regard to the application of this part of **JIS B 0401**.

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

Informative reference: The provisions cited from **ISO 1101**, *Technical drawings — Geometrical tolerancing — Tolerances of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings* are equivalent to the relevant provisions in the said Standard.

JIS B 0023 *Technical drawings — Geometrical tolerancing — Maximum material requirement and least material requirement*

Informative reference: Part 1 of this Standard is identical to **ISO 2692**, *Technical drawings — Geometrical tolerancing — Maximum material principle*.

JIS B 0024 *Technical drawings — Fundamental tolerancing principle*

Informative reference: The said Standard is identical to **ISO 8015**, *Technical drawings — Fundamental tolerancing principle*.

JIS B 0403 *Castings — System of dimensional tolerances and machining allowances*

Informative reference: The provisions specified in this Standard correspond to **ISO 8062**, *Castings — System of dimensional tolerances and machining allowances*.

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

Informative reference: The said Standard is identical to **ISO 2768-1**, *General tolerances — Part 1: tolerances for linear and angular dimensions without individual tolerance indications*.

JIS B 0616 *System of cone fits*

Informative reference: The provisions specified in this Standard correspond to **ISO 5166**, *System of cone fits for cones from $C=1 : 3$ to $1 : 500$, lengths from 6 to 630 mm and diameters up to 500 mm.*

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

Informative reference: The said Standard is identical to **ISO 406**, *Technical drawings — Linear and angular tolerancing — Indications on drawings.*

ISO/R 1938 *ISO system of limits and fits — Inspection of plain workpieces*¹⁾

¹⁾ At present under revision.

Fig. 4 Synoptic representation of tolerance classes for shafts for basic sizes less than or equal to 500 mm

Note: The tolerance classes in the frame are given for experimental use.

Full document details: JIS B 0401-2-1998

Notes on the presentation of Tables 2 to 32

- 1 Values may be calculated, from the bases given in **JIS B 0401-1** for fundamental deviations used for tolerance classes, for which there is no entry in the tables, but for which the space has been left blank.
- 2 A small horizontal separation has been inserted in the tables, where appropriate, to distinguish between values for basic sizes less than or equal to 500 mm and those greater than 500 mm, which have been derived from different bases.

Table 2 Limit deviations for holes A, B and C¹⁾Upper limit deviation = *ES*Lower limit deviation = *EI*Unit: μm

Basic size mm		A ^{a)}					B ^{a)}						C					
Above	Up to and incl	9	10	11	12	13	8	9	10	11	12	13	8	9	10	11	12	13
—	3 ^{a)}	+ 295 + 270	+ 310 + 270	+ 330 + 270	+ 370 + 270	+ 410 + 270	+154 +140	+165 +140	+ 180 + 140	+ 200 + 140	+ 240 + 140	+ 280 + 140	+ 74 + 60	+ 85 + 60	+100 + 60	+120 + 60	+ 160 + 60	+ 200 + 60
3	6	+ 300 + 270	+ 318 + 270	+ 345 + 270	+ 390 + 270	+ 450 + 270	+158 +140	+170 +140	+ 188 + 140	+ 215 + 140	+ 260 + 140	+ 320 + 140	+ 88 + 70	+100 + 70	+118 + 70	+145 + 70	+ 190 + 70	+ 250 + 70
6	10	+ 316 + 280	+ 338 + 280	+ 370 + 280	+ 430 + 280	+ 500 + 280	+172 +150	+186 +150	+ 208 + 150	+ 240 + 150	+ 300 + 150	+ 370 + 150	+102 + 80	+116 + 80	+138 + 80	+170 + 80	+ 230 + 80	+ 300 + 80
10	18	+ 333 + 290	+ 360 + 290	+ 400 + 290	+ 470 + 290	+ 560 + 290	+177 +150	+193 +150	+ 220 + 150	+ 260 + 150	+ 330 + 150	+ 420 + 150	+122 + 95	+138 + 95	+165 + 95	+205 + 95	+ 275 + 95	+ 365 + 95
18	30	+ 352 + 300	+ 384 + 300	+ 430 + 300	+ 510 + 300	+ 630 + 300	+193 +160	+212 +160	+ 244 + 160	+ 290 + 160	+ 370 + 160	+ 490 + 160	+143 +110	+162 +110	+194 +110	+240 +110	+ 320 + 110	+ 440 + 110
30	40	+ 372 + 310	+ 410 + 310	+ 470 + 310	+ 560 + 310	+ 700 + 310	+209 +170	+232 +170	+ 270 + 170	+ 330 + 170	+ 420 + 170	+ 560 + 170	+159 +120	+182 +120	+220 +120	+280 +120	+ 370 + 120	+ 510 + 120
40	50	+ 382 + 320	+ 420 + 320	+ 480 + 320	+ 570 + 320	+ 710 + 320	+219 +180	+242 +180	+ 280 + 180	+ 340 + 180	+ 430 + 180	+ 570 + 180	+169 +130	+192 +130	+230 +130	+290 +130	+ 380 + 130	+ 520 + 130
50	65	+ 414 + 340	+ 460 + 340	+ 530 + 340	+ 640 + 340	+ 800 + 340	+236 +190	+264 +190	+ 310 + 190	+ 380 + 190	+ 490 + 190	+ 650 + 190	+186 +140	+214 +140	+260 +140	+330 +140	+ 440 + 140	+ 600 + 140
65	80	+ 434 + 360	+ 480 + 360	+ 550 + 360	+ 660 + 360	+ 820 + 360	+246 +200	+274 +200	+ 320 + 200	+ 390 + 200	+ 500 + 200	+ 660 + 200	+196 +150	+224 +150	+270 +150	+340 +150	+ 450 + 150	+ 610 + 150
80	100	+ 467 + 380	+ 520 + 380	+ 600 + 380	+ 730 + 380	+ 920 + 380	+274 +220	+307 +220	+ 360 + 220	+ 440 + 220	+ 570 + 220	+ 760 + 220	+224 +170	+257 +170	+310 +170	+390 +170	+ 520 + 170	+ 710 + 170
100	120	+ 497 + 410	+ 550 + 410	+ 630 + 410	+ 760 + 410	+ 950 + 410	+294 +240	+327 +240	+ 380 + 240	+ 460 + 240	+ 590 + 240	+ 780 + 240	+234 +180	+267 +180	+320 +180	+400 +180	+ 530 + 180	+ 720 + 180
120	140	+ 560 + 460	+ 620 + 460	+ 710 + 460	+ 860 + 460	+1 090 + 460	+323 +260	+360 +260	+ 420 + 260	+ 510 + 260	+ 660 + 260	+ 890 + 260	+263 +200	+300 +200	+360 +200	+450 +200	+ 600 + 200	+ 830 + 200
140	160	+ 620 + 520	+ 680 + 520	+ 770 + 520	+ 920 + 520	+1 150 + 520	+343 +280	+380 +280	+ 440 + 280	+ 530 + 280	+ 680 + 280	+ 910 + 280	+273 +210	+310 +210	+370 +210	+460 +210	+ 610 + 210	+ 840 + 210
160	180	+ 680 + 580	+ 740 + 580	+ 830 + 580	+ 980 + 580	+1 210 + 580	+373 +310	+410 +310	+ 470 + 310	+ 560 + 310	+ 710 + 310	+ 940 + 310	+293 +230	+330 +230	+390 +230	+480 +230	+ 630 + 230	+ 860 + 230
180	200	+ 775 + 660	+ 845 + 660	+ 950 + 660	+1 120 + 660	+1 380 + 660	+412 +340	+455 +340	+ 525 + 340	+ 630 + 340	+ 800 + 340	+1 060 + 340	+312 +240	+355 +240	+425 +240	+530 +240	+ 700 + 240	+ 960 + 240
200	225	+ 855 + 740	+ 925 + 740	+1 030 + 740	+1 200 + 740	+1 460 + 740	+452 +380	+495 +380	+ 565 + 380	+ 670 + 380	+ 840 + 380	+1 100 + 380	+332 +260	+375 +260	+445 +260	+550 +260	+ 720 + 260	+ 980 + 260
225	250	+ 935 + 820	+1 005 + 820	+1 110 + 820	+1 280 + 820	+1 540 + 820	+492 +420	+535 +420	+ 605 + 420	+ 710 + 420	+ 880 + 420	+1 140 + 420	+352 +280	+395 +280	+465 +280	+570 +280	+ 740 + 280	+1 000 + 280
250	280	+1 050 + 920	+1 130 + 920	+1 240 + 920	+1 440 + 920	+1 730 + 920	+561 +480	+610 +480	+ 690 + 480	+ 800 + 480	+1 000 + 480	+1 290 + 480	+381 +300	+430 +300	+510 +300	+620 +300	+ 820 + 300	+1 110 + 300
280	315	+1 180 +1 050	+1 260 +1 050	+1 370 +1 050	+1 570 +1 050	+1 860 +1 050	+621 +540	+670 +540	+ 750 + 540	+ 860 + 540	+1 060 + 540	+1 350 + 540	+411 +330	+460 +330	+540 +330	+650 +330	+ 850 + 330	+1 140 + 330
315	355	+1 340 +1 200	+1 430 +1 200	+1 560 +1 200	+1 770 +1 200	+2 000 +1 200	+689 +600	+740 +600	+ 830 + 600	+ 960 + 600	+1 170 + 600	+1 490 + 600	+449 +360	+500 +360	+590 +360	+720 +360	+ 930 + 360	+1 250 + 360
355	400	+1 490 +1 350	+1 580 +1 350	+1 710 +1 350	+1 920 +1 350	+2 240 +1 350	+769 +680	+820 +680	+ 910 + 680	+1 040 + 680	+1 250 + 680	+1 570 + 680	+489 +400	+540 +400	+630 +400	+760 +400	+ 970 + 400	+1 290 + 400
400	450	+1 655 +1 500	+1 750 +1 500	+1 900 +1 500	+2 130 +1 500	+2 470 +1 500	+857 +760	+915 +760	+1 010 + 760	+1 160 + 760	+1 390 + 760	+1 730 + 760	+537 +440	+595 +440	+690 +440	+840 +440	+1 070 + 440	+1 410 + 440
450	500	+1 805 +1 650	+1 900 +1 650	+2 050 +1 650	+2 280 +1 650	+2 620 +1 650	+937 +840	+995 +840	+1 090 + 840	+1 240 + 840	+1 470 + 840	+1 810 + 840	+577 +480	+635 +480	+730 +480	+880 +480	+1 110 + 480	+1 450 + 480

¹⁾ Fundamental deviations A, B and C are not provided for basic sizes greater than 500 mm.

²⁾ Fundamental deviations A and B shall not be used for any standard tolerance in basic sizes less than or equal to 1 mm.

Table 3 Limit deviations for holes CD, D and EUpper limit deviation = *ES*Lower limit deviation = *EI*Unit: μm

Basic size mm		CD ¹⁾					D								E					
Above	Up to and incl	6	7	8	9	10	6	7	8	9	10	11	12	13	5	6	7	8	9	10
—	3	+40 +34	+44 +34	+48 +34	+59 +34	+74 +34	+26 +20	+30 +20	+34 +20	+45 +20	+60 +20	+80 +20	+120 +20	+160 +20	+18 +14	+20 +14	+24 +14	+28 +14	+39 +14	+54 +14
3	6	+54 +46	+58 +46	+64 +46	+76 +46	+94 +46	+38 +30	+42 +30	+48 +30	+60 +30	+78 +30	+105 +30	+150 +30	+210 +30	+25 +20	+28 +20	+32 +20	+38 +20	+50 +20	+68 +20
6	10	+65 +56	+71 +56	+78 +56	+92 +56	+114 +56	+49 +40	+55 +40	+62 +40	+76 +40	+98 +40	+130 +40	+190 +40	+260 +40	+31 +25	+34 +25	+40 +25	+47 +25	+61 +25	+83 +25
10	18						+61 +50	+68 +50	+77 +50	+93 +50	+120 +50	+160 +50	+230 +50	+320 +50	+40 +32	+43 +32	+50 +32	+59 +32	+75 +32	+102 +32
18	30						+78 +65	+86 +65	+98 +65	+117 +65	+149 +65	+195 +65	+275 +65	+395 +65	+49 +40	+53 +40	+61 +40	+73 +40	+92 +40	+124 +40
30	50						+96 +80	+105 +80	+119 +80	+142 +80	+180 +80	+240 +80	+330 +80	+470 +80	+61 +50	+66 +50	+75 +50	+89 +50	+112 +50	+150 +50
50	80						+119 +100	+130 +100	+146 +100	+174 +100	+220 +100	+290 +100	+400 +100	+560 +100	+73 +60	+79 +60	+90 +60	+106 +60	+134 +60	+180 +60
80	120						+142 +120	+155 +120	+174 +120	+207 +120	+260 +120	+340 +120	+470 +120	+660 +120	+87 +72	+94 +72	+107 +72	+125 +72	+159 +72	+212 +72
120	180						+170 +145	+185 +145	+208 +145	+245 +145	+305 +145	+395 +145	+545 +145	+775 +145	+103 +85	+110 +85	+125 +85	+148 +85	+185 +85	+245 +85
180	250						+199 +170	+216 +170	+242 +170	+285 +170	+355 +170	+460 +170	+630 +170	+890 +170	+120 +100	+129 +100	+146 +100	+172 +100	+215 +100	+285 +100
250	315						+222 +190	+242 +190	+271 +190	+320 +190	+400 +190	+510 +190	+710 +190	+1 000 +190	+133 +110	+142 +110	+162 +110	+191 +110	+240 +110	+320 +110
315	400						+246 +210	+267 +210	+299 +210	+350 +210	+440 +210	+570 +210	+780 +210	+1 100 +210	+150 +125	+161 +125	+182 +125	+214 +125	+265 +125	+355 +125
400	500						+270 +230	+293 +230	+327 +230	+385 +230	+480 +230	+630 +230	+860 +230	+1 200 +230	+162 +135	+175 +135	+198 +135	+232 +135	+290 +135	+385 +135
500	630						+304 +260	+330 +260	+370 +260	+435 +260	+540 +260	+700 +260	+960 +260	+1 360 +260		+189 +145	+215 +145	+255 +145	+320 +145	+425 +145
630	800						+340 +290	+370 +290	+415 +290	+490 +290	+610 +290	+790 +290	+1 090 +290	+1 540 +290		+210 +160	+240 +160	+285 +160	+360 +160	+480 +160
800	1 000						+376 +320	+410 +320	+460 +320	+550 +320	+680 +320	+880 +320	+1 220 +320	+1 720 +320		+226 +170	+260 +170	+310 +170	+400 +170	+530 +170
1 000	1 250						+416 +350	+455 +350	+515 +350	+610 +350	+770 +350	+1 010 +350	+1 400 +350	+2 000 +350		+261 +195	+300 +195	+360 +195	+455 +195	+615 +195
1 250	1 600						+468 +390	+515 +390	+585 +390	+700 +390	+890 +390	+1 170 +390	+1 640 +390	+2 340 +390		+298 +220	+345 +220	+415 +220	+530 +220	+720 +220
1 600	2 000						+522 +430	+580 +430	+660 +430	+800 +430	+1 030 +430	+1 350 +430	+1 930 +430	+2 730 +430		+332 +240	+390 +240	+470 +240	+610 +240	+840 +240
2 000	2 500						+590 +480	+655 +480	+760 +480	+920 +480	+1 180 +480	+1 580 +480	+2 230 +480	+3 280 +480		+370 +260	+435 +260	+540 +260	+700 +260	+960 +260
2 500	3 150						+655 +520	+730 +520	+850 +520	+1 060 +520	+1 380 +520	+1 870 +520	+2 620 +520	+3 820 +520		+425 +290	+500 +290	+620 +290	+830 +290	+1 150 +290

- ¹⁾ The intermediate fundamental deviation CD is provided primarily for fine mechanisms and horology. If tolerance classes involving this fundamental deviation in other basic sizes are required, they may be calculated in accordance with JIS B 0401-1.

Table 4 Limit deviations for holes EF and FUpper limit deviation = *ES*Lower limit deviation = *EI*Unit: μm

Basic size mm		EF ¹⁾								F							
Above	Up to and incl.	3	4	5	6	7	8	9	10	3	4	5	6	7	8	9	10
—	3	+12 +10	+13 +10	+14 +10	+16 +10	+20 +10	+24 +10	+35 +10	+50 +10	+8 +6	+9 +6	+10 +6	+12 +6	+16 +6	+20 +6	+31 +6	+46 +6
3	6	+16.5 +14	+18 +14	+19 +14	+22 +14	+26 +14	+32 +14	+44 +14	+62 +14	+12.5 +10	+14 +10	+15 +10	+18 +10	+22 +10	+28 +10	+40 +10	+58 +10
6	10	+20.5 +18	+22 +18	+24 +18	+27 +18	+33 +18	+40 +18	+54 +18	+76 +18	+15.5 +13	+17 +13	+19 +13	+22 +13	+28 +13	+35 +13	+49 +13	+71 +13
10	18									+19 +16	+21 +16	+24 +16	+27 +16	+34 +16	+43 +16	+59 +16	+86 +16
18	30									+24 +20	+26 +20	+29 +20	+33 +20	+41 +20	+53 +20	+72 +20	+104 +20
30	50									+29 +25	+32 +25	+36 +25	+41 +25	+50 +25	+64 +25	+87 +25	+125 +25
50	80											+43 +30	+49 +30	+60 +30	+76 +30	+104 +30	
80	120											+51 +36	+58 +36	+71 +36	+90 +36	+123 +36	
120	180											+61 +43	+68 +43	+83 +43	+106 +43	+143 +43	
180	250											+70 +50	+79 +50	+96 +50	+122 +50	+165 +50	
250	315											+79 +56	+88 +56	+108 +56	+137 +56	+186 +56	
315	400											+87 +62	+98 +62	+119 +62	+151 +62	+202 +62	
400	500											+95 +68	+108 +68	+131 +68	+165 +68	+223 +68	
500	630												+120 +76	+146 +76	+186 +76	+251 +76	
630	800												+130 +80	+160 +80	+205 +80	+280 +80	
800	1000												+142 +86	+176 +86	+226 +86	+316 +86	
1000	1250												+164 +98	+203 +98	+263 +98	+358 +98	
1250	1600												+188 +110	+235 +110	+305 +110	+420 +110	
1600	2000												+212 +120	+270 +120	+350 +120	+490 +120	
2000	2500												+240 +130	+305 +130	+410 +130	+570 +130	
2500	3150												+280 +145	+355 +145	+475 +145	+685 +145	

- 1) The intermediate fundamental deviation EF is provided primarily for fine mechanisms and horology. If tolerance classes involving this fundamental deviation in other basic sizes are required, they may be calculated in accordance with JIS B 0401-1.

Table 5 Limit deviations for holes FG and GUpper limit deviation = *ES*Lower limit deviation = *EI*Unit: μm

Basic size mm		FG ¹⁾								G							
Above	Up to and incl.	3	4	5	6	7	8	9	10	3	4	5	6	7	8	9	10
—	3	+ 6 + 4	+ 7 + 4	+ 8 + 4	+10 + 4	+14 + 4	+18 + 4	+29 + 4	+44 + 4	+ 4 + 2	+ 5 + 2	+ 6 + 2	+ 8 + 2	+12 + 2	+16 + 2	+27 + 2	+42 + 2
3	6	+ 8.5 + 6	+10 + 6	+11 + 6	+14 + 6	+18 + 6	+24 + 6	+36 + 6	+54 + 6	+ 6.5 + 4	+ 8 + 4	+ 9 + 4	+12 + 4	+16 + 4	+22 + 4	+34 + 4	+52 + 4
6	10	+10.5 + 8	+12 + 8	+14 + 8	+17 + 8	+23 + 8	+30 + 8	+44 + 8	+66 + 8	+ 7.5 + 5	+ 9 + 5	+11 + 5	+14 + 5	+20 + 5	+27 + 5	+41 + 5	+63 + 5
10	18									+ 9 + 6	+11 + 6	+14 + 6	+17 + 6	+24 + 6	+33 + 6	+49 + 6	+76 + 6
18	30									+11 + 7	+13 + 7	+16 + 7	+20 + 7	+28 + 7	+40 + 7	+59 + 7	+91 + 7
30	50									+13 + 9	+16 + 9	+20 + 9	+25 + 9	+34 + 9	+48 + 9	+71 + 9	+109 + 9
50	80											+23 +10	+29 +10	+40 +10	+56 +10		
80	120											+27 +12	+34 +12	+47 +12	+66 +12		
120	180											+32 +14	+39 +14	+54 +14	+77 +14		
180	250											+35 +15	+44 +15	+61 +15	+87 +15		
250	315											+40 +17	+49 +17	+69 +17	+98 +17		
315	400											+43 +18	+54 +18	+75 +18	+107 +18		
400	500											+47 +20	+60 +20	+83 +20	+117 +20		
500	630											+ 66 + 22	+ 92 + 22	+132 + 22			
630	800											+ 74 + 24	+104 + 24	+149 + 24			
800	1 000											+ 82 + 26	+116 + 26	+166 + 26			
1 000	1 250											+ 94 + 28	+133 + 28	+193 + 28			
1 250	1 600											+108 + 30	+155 + 30	+225 + 30			
1 600	2 000											+124 + 32	+182 + 32	+262 + 32			
2 000	2 500											+144 + 34	+209 + 34	+314 + 34			
2 500	3 150											+173 + 38	+248 + 38	+368 + 38			

- ¹⁾ The intermediate fundamental deviation FG is provided primarily for fine mechanisms and horology. If tolerance classes involving this fundamental deviation in other basic sizes are required, they may be calculated in accordance with JIS B 0401-1.

Table 6 Limit deviations for holes HUpper limit deviation = *ES*Lower limit deviation = *EI*

Basic size mm		H																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14 ¹⁾	15 ¹⁾	16 ¹⁾	17 ¹⁾	18 ¹⁾
Above	Up to and incl.	Deviations																	
		μm										mm							
—	3 ¹⁾	+0.8 0	+1.2 0	+2 0	+3 0	+4 0	+6 0	+10 0	+14 0	+25 0	+40 0	+60 0	+0.1 0	+0.14 0	+0.25 0	+0.4 0	+0.6 0		
3	6	+1 0	+1.5 0	+2.5 0	+4 0	+5 0	+8 0	+12 0	+18 0	+30 0	+48 0	+75 0	+0.12 0	+0.18 0	+0.3 0	+0.48 0	+0.75 0	+1.2 0	+1.8 0
6	10	+1 0	+1.5 0	+2.5 0	+4 0	+6 0	+9 0	+15 0	+22 0	+36 0	+58 0	+90 0	+0.15 0	+0.22 0	+0.36 0	+0.58 0	+0.9 0	+1.5 0	+2.2 0
10	18	+1.2 0	+2 0	+3 0	+5 0	+8 0	+11 0	+18 0	+27 0	+43 0	+70 0	+110 0	+0.18 0	+0.27 0	+0.43 0	+0.7 0	+1.1 0	+1.8 0	+2.7 0
18	30	+1.5 0	+2.5 0	+4 0	+6 0	+9 0	+13 0	+21 0	+33 0	+52 0	+84 0	+130 0	+0.21 0	+0.33 0	+0.52 0	+0.84 0	+1.3 0	+2.1 0	+3.3 0
30	50	+1.5 0	+2.5 0	+4 0	+7 0	+11 0	+16 0	+25 0	+39 0	+62 0	+100 0	+160 0	+0.25 0	+0.39 0	+0.62 0	+1 0	+1.6 0	+2.5 0	+3.9 0
50	80	+2 0	+3 0	+5 0	+8 0	+13 0	+19 0	+30 0	+46 0	+74 0	+120 0	+190 0	+0.3 0	+0.46 0	+0.74 0	+1.2 0	+1.9 0	+3 0	+4.6 0
80	120	+2.5 0	+4 0	+6 0	+10 0	+15 0	+22 0	+35 0	+54 0	+87 0	+140 0	+220 0	+0.35 0	+0.54 0	+0.87 0	+1.4 0	+2.2 0	+3.5 0	+5.4 0
120	180	+3.5 0	+5 0	+8 0	+12 0	+18 0	+25 0	+40 0	+63 0	+100 0	+160 0	+250 0	+0.4 0	+0.63 0	+1 0	+1.6 0	+2.5 0	+4 0	+6.3 0
180	250	+4.5 0	+7 0	+10 0	+14 0	+20 0	+29 0	+46 0	+72 0	+115 0	+185 0	+290 0	+0.46 0	+0.72 0	+1.15 0	+1.85 0	+2.9 0	+4.6 0	+7.2 0
250	315	+6 0	+8 0	+12 0	+16 0	+23 0	+32 0	+52 0	+81 0	+130 0	+210 0	+320 0	+0.52 0	+0.81 0	+1.3 0	+2.1 0	+3.2 0	+5.2 0	+8.1 0
315	400	+7 0	+9 0	+13 0	+18 0	+25 0	+36 0	+57 0	+89 0	+140 0	+230 0	+360 0	+0.57 0	+0.89 0	+1.4 0	+2.3 0	+3.6 0	+5.7 0	+8.9 0
400	500	+8 0	+10 0	+15 0	+20 0	+27 0	+40 0	+63 0	+97 0	+155 0	+250 0	+400 0	+0.63 0	+0.97 0	+1.55 0	+2.5 0	+4 0	+6.3 0	+9.7 0
2)																			
500	630	+9 0	+11 0	+16 0	+22 0	+32 0	+44 0	+70 0	+110 0	+175 0	+280 0	+440 0	+0.7 0	+1.1 0	+1.75 0	+2.8 0	+4.4 0	+7 0	+11 0
630	800	+10 0	+13 0	+18 0	+25 0	+36 0	+50 0	+80 0	+125 0	+200 0	+320 0	+500 0	+0.8 0	+1.25 0	+2 0	+3.2 0	+5 0	+8 0	+12.5 0
800	1000	+11 0	+15 0	+21 0	+28 0	+40 0	+56 0	+90 0	+140 0	+230 0	+360 0	+560 0	+0.9 0	+1.4 0	+2.3 0	+3.6 0	+5.6 0	+9 0	+14 0
1000	1250	+13 0	+18 0	+24 0	+33 0	+47 0	+66 0	+105 0	+165 0	+260 0	+420 0	+660 0	+1.05 0	+1.65 0	+2.6 0	+4.2 0	+6.6 0	+10.5 0	+16.5 0
1250	1600	+15 0	+21 0	+29 0	+39 0	+55 0	+78 0	+125 0	+195 0	+310 0	+500 0	+780 0	+1.25 0	+1.95 0	+3.1 0	+5 0	+7.8 0	+12.5 0	+19.5 0
1600	2000	+18 0	+25 0	+35 0	+46 0	+65 0	+92 0	+150 0	+230 0	+370 0	+600 0	+920 0	+1.5 0	+2.3 0	+3.7 0	+6 0	+9.2 0	+15 0	+23 0
2000	2500	+22 0	+30 0	+41 0	+55 0	+78 0	+110 0	+175 0	+280 0	+440 0	+700 0	+1100 0	+1.75 0	+2.8 0	+4.4 0	+7 0	+11 0	+17.5 0	+28 0
2500	3150	+26 0	+36 0	+50 0	+68 0	+96 0	+135 0	+210 0	+330 0	+540 0	+860 0	+1350 0	+2.1 0	+3.3 0	+5.4 0	+8.6 0	+13.5 0	+21 0	+33 0

1) Tolerance grades IT14 to IT18 (incl.) shall not be used for basic sizes less than or equal to 1 mm.

2) The values given in the frame, for tolerance grades IT1 to IT5 (incl.), for basic sizes greater than 500 mm and less than or equal to 3 150 mm, are included for experimental use.