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मानक

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IS 919-2 (1993): ISO systems of limits and fits, Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts [PGD 20: Engineering Standards]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS 919 (Part 2) : 1993
ISO 286-2 : 1988

भारतीय मानक

सीमाओं और उपयुक्तताओं का आई एस ओ तंत्र

भाग 2 छेद और शैफ्टों के लिए मानक छूट ग्रेड और सीमा
विचलनों की सारणियाँ

(पहला पुनरीक्षण)

Indian Standard

ISO SYSTEM OF LIMITS AND FITS

PART 2 TABLES OF STANDARD TOLERANCE GRADES AND LIMIT
DEVIATIONS FOR HOLES AND SHAFTS

(First Revision)

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NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical with ISO 286-2 : 1988 'ISO system of limits and fits — Part 2 : Tables of standard tolerance grades and limit deviations for holes and shafts', issued by the International Organization for Standardization was adopted by the Bureau of Indian Standards on the recommendations of the Engineering Standards Sectional Committee (LM 01) and approval of the Light Mechanical Engineering Division Council.

The standard was originally published in 1979 taking assistance from ISO/R 286-1962 'ISO system of limits and fits general, tolerances and deviations'. Present revision has been taken up to harmonize with ISO 286-2 : 1988. The deviation requirement of the most common shafts and holes such as cd, CD, ef, FF, fg, FG for sizes up to 10 mm covered in the earlier version have now been included in IS 919 (Part 1) : 1993 'ISO system of limits and fits : Part 1 Bases of tolerances, deviations and fits (*second revision*)'

This standard is a necessary adjunct to IS 919 (Part 1) : 1993.

In the adopted standard certain terminology and conventions are not identical with those used in the Indian Standard, attention is especially drawn to the following:

- a) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use point (.) as the decimal marker.
- b) Wherever the words 'International Standard' appear, referring to this standard, they shall be read as 'Indian Standard'.

In the adopted standard reference appears to certain international standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 286-1 : 1988	IS 919 (Part 1) : 1992 ISO system of limits and fits : Part 1 Bases of tolerances, deviations and fits (<i>second revision</i>)	Identical
ISO 1829 : 1985	IS 2709 : 1982 Guide for selection of fits (<i>first revision</i>)	Technically equivalent

Indian Standard
ISO SYSTEM OF LIMITS AND FITS

**PART 2 TABLES OF STANDARD TOLERANCE GRADES AND LIMIT
DEVIATIONS FOR HOLES AND SHAFTS**

(First Revision)

0 Introduction

The need for limits and fits for machined 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 International 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 ISO 286 gives values of the limit deviations for commonly used tolerance classes (zones) for holes and shafts calculated from the information given in ISO 286-1. This part of

ISO 286 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 figure 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 International 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 ISO 286-1). 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 ISO 286-1.

Notes on the presentation of tables 2 to 32 are given on page 7.

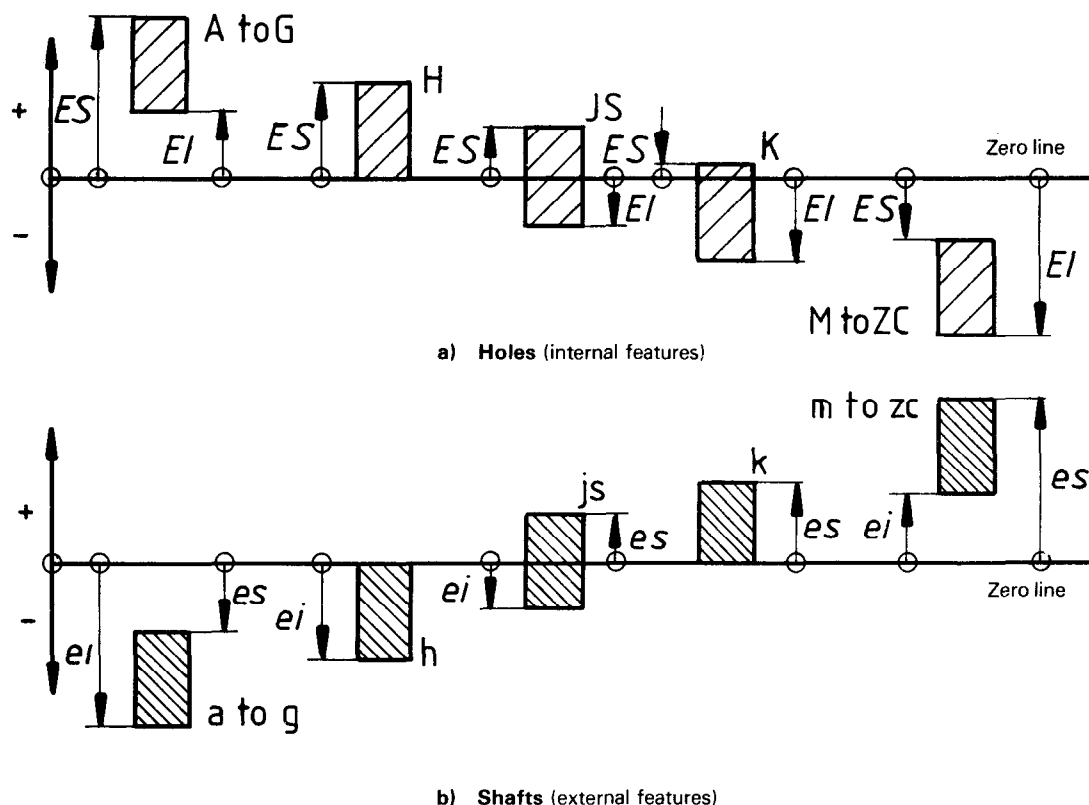


Figure 1 — Upper and lower deviations

3 References

NOTE — See also clause 7.

ISO 286-1, *ISO system of limits and fits — Part 1: Bases of tolerances, deviations and fits.*

ISO 1829, *Selection of tolerance zones for general purposes.*

4 Standard tolerances

The values of standard tolerance grades IT1 to IT18 inclusive are given in table 1.

For information on the bases of the system and its application, see ISO 286-1; for values of standard tolerances IT0 and IT01, see ISO 286-1, annex A, table 5.

5 Limit deviations for holes

A synoptic representation of the tolerance classes for holes, given in this part of ISO 286, is shown in figures 2 and 3.

Attention is drawn to the fact that the tolerance classes shown in figures 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 7.

6 Limit deviations for shafts

A synoptic representation of the tolerance classes for shafts, given in this part of ISO 286, is shown in figures 4 and 5.

Attention is drawn to the fact that the tolerance classes shown in figures 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 7.

7 Bibliography

The following International Standards on tolerancing and tolerance systems will be useful with regard to the application of this part of ISO 286:

ISO 406, *Technical drawings — Linear and angular tolerancing — Indications on drawings.*

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*

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

ISO 2692, *Technical drawings — Geometrical tolerancing — Maximum material principle.*

ISO 2768-1, *General tolerances for dimensions without tolerance indications — Part 1: Tolerances for linear and angular dimensions.*²⁾

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.*

ISO 8015, *Technical drawings — Fundamental tolerancing principle.*

ISO 8062, *Castings — System of dimensional tolerances.*

1) At present under revision.

2) At present at the stage of draft. (Revision, in part, of ISO 2768 : 1973.)

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

NOTE – This table, taken from ISO 286-1, has been included in this part of ISO 286 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 including	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	1000 ²⁾	11	15	21	28	40	56	90	140	230	360	560	0,9	1,4	2,3	3,6	5,6	9	14
1000	1250 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
1250	1600 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
1600	2000 ²⁾	18	25	35	46	65	92	150	230	370	600	920	1,5	2,3	3,7	6	9,2	15	23
2000	2500 ²⁾	22	30	41	55	78	110	175	280	440	700	1100	1,75	2,8	4,4	7	11	17,5	28
2500	3150 ²⁾	26	36	50	68	96	135	210	330	540	860	1350	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 ISO 286-1, annex A, 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.

				H1	JS1																		
					H2	JS2																	
			E5	EF3 F3	FG3 G3	H3	JS3	K3	M3 N3	P3	R3	S3											
				EF4 F4	FG4 G4	H4	JS4	K4	M4 N4	P4	R4	S4											
				EF5 F5	FG5 G5	H5	JS5	K5	M5 N5	P5	R5	S5	T5 U5	V5 X5									
				EF6 F6	FG6 G6	H6	JS6	J6 K6	M6 N6	P6	R6	S6	T6 U6	V6 X6 Y6	Z6	ZA6							
				EF7 F7	FG7 G7	H7	JS7	J7 K7	M7 N7	P7	R7	S7	T7 U7	V7 X7 Y7	Z7	ZA7	ZB7	ZC7					
	B8 C8			EF8 F8	FG8 G8	H8	JS8	J8 K8	M8 N8	P8	R8	S8	T8 U8	V8 X8 Y8	Z8	ZA8	ZB8	ZC8					
A9	B9 C9			EF9 F9	FG9 G9	H9	JS9	K9	M9 N9	P9	R9	S9	U9	X9 Y9	Z9	ZA9	ZB9	ZC9					
A10	B10 C10			EF10 F10	FG10 G10	H10	JS10	K10	M10 N10	P10	R10	S10	U10	X10 Y10	Z10	ZA10	ZB10	ZC10					
A11	B11 C11					H11	JS11		N11						Z11	ZA11	ZB11	ZC11					
A12	B12 C12			D11		H12	JS12																
A13	B13 C13			D12		H13	JS13																
				D13		H14	JS14																
						H15	JS15																
						H16	JS16																
						H17	JS17																
						H18	JS18																
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16									
Tables																							

Figure 2 — Synoptic representation of tolerance classes for holes for basic sizes less than or equal to 500 mm

				H1	JS1																	
				H2	JS2																	
				H3	JS3																	
				H4	JS4																	
				H5	JS5																	
	D6 E6		F6	G6	H6	JS6	K6	M6 N6	P6	R6	S6	T6 U6										
	D7 E7		F7	G7	H7	JS7	K7	M7 N7	P7	R7	S7	T7 U7										
	D8 E8		F8	G8	H8	JS8	K8	M8 N8	P8	R8	S8	T8 U8										
	D9 E9		F9		H9	JS9		N9	P9													
	D10 E10				H10	JS10																
	D11				H11	JS11																
	D12				H12	JS12																
	D13				H13	JS13																
					H14	JS14																
					H15	JS15																
					H16	JS16																
					H17	JS17																
					H18	JS18																
3	4	5	6	7	8	9	10	11	12	13												
Tables																						

NOTE — The tolerance classes in the frame are given for experimental use.

Figure 3 — Synoptic representation of tolerance classes for holes for basic sizes greater than 500 mm and less than or equal to 3 150 mm

Notes on the presentation of tables 2 to 32

- 1 Values may be calculated, from the bases given in ISO 286-1, 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*

Deviations in micrometres

Basic size mm		A ²⁾					B ²⁾						C					
Above	Up to and including	9	10	11	12	13	8	9	10	11	12	13	8	9	10	11	12	13
—	3 ²⁾	+ 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	+ 960 + 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 E

Upper limit deviation = *ES*

Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		CD 1)					D							E						
Above	Up to and including	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	+20 +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 ISO 286-1.

Table 4 — Limit deviations for holes EF and F

Upper limit deviation = *ES*
Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		EF ¹⁾								F							
Above	Up to and in- cluding	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	1 000												+142 +86	+176 +86	+226 +86	+316 +86	
1 000	1 250												+164 +98	+203 +98	+263 +98	+358 +98	
1 250	1 600												+188 +110	+235 +110	+305 +110	+420 +110	
1 600	2 000												+212 +120	+270 +120	+350 +120	+490 +120	
2 000	2 500												+240 +130	+305 +130	+410 +130	+570 +130	
2 500	3 150												+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 ISO 286-1.

Table 5 — Limit deviations for holes FG and G

Upper limit deviation = *ES*

Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		FG ¹⁾								G							
Above	Up to and in- cluding	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	+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 ISO 286-1.

Table 6 — Limit deviations for holes H

Upper limit deviation = *ES*

Lower limit deviation = *EI*

Basic size mm		H																	
Above	Up to and including	1	2	3	4	5	6	7	8	9	10	11	12	13	14 ¹⁾	15 ¹⁾	16 ¹⁾	17 ¹⁾	18 ¹⁾
		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	1 000	+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
1 000	1 250	+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
1 250	1 600	+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
1 600	2 000	+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
2 000	2 500	+22 0	+30 0	+41 0	+55 0	+78 0	+110 0	+175 0	+280 0	+440 0	+700 0	+1 100 0	+1,75 0	+2,8 0	+4,4 0	+7 0	+11 0	+17,5 0	+28 0
2 500	3 150	+26 0	+36 0	+50 0	+68 0	+96 0	+135 0	+210 0	+330 0	+540 0	+860 0	+1 350 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.

Table 7 — Limit deviations¹⁾ for holes JS

Upper limit deviation = *ES*

Lower limit deviation = *EI*

Basic size		JS																	
mm		1	2	3	4	5	6	7	8	9	10	11	12	13	14 ²⁾	15 ²⁾	16 ²⁾	17	18
Above	Up to and including	Deviations																	
		μm												mm					
—	3 ²⁾	±0,4	±0,6	±1	±1,5	±2	±3	±5	±7	±12,5	±20	±30	±0,05	±0,07	±0,125	±0,2	±0,3		
3	6	±0,5	±0,75	±1,25	±2	±2,5	±4	±6	±9	±15	±24	±37,5	±0,06	±0,09	±0,15	±0,24	±0,375	±0,6	±0,9
6	10	±0,5	±0,75	±1,25	±2	±3	±4,5	±7,5	±11	±18	±29	±45	±0,075	±0,11	±0,18	±0,29	±0,45	±0,75	±1,1
10	18	±0,6	±1	±1,5	±2,5	±4	±5,5	±9	±13,5	±21,5	±35	±55	±0,09	±0,135	±0,215	±0,35	±0,55	±0,9	±1,35
18	30	±0,75	±1,25	±2	±3	±4,5	±6,5	±10,5	±16,5	±26	±42	±65	±0,105	±0,165	±0,26	±0,42	±0,65	±1,05	±1,65
30	50	±0,75	±1,25	±2	±3,5	±5,5	±8	±12,5	±19,5	±31	±50	±80	±0,125	±0,195	±0,31	±0,5	±0,8	±1,25	±1,95
50	80	±1	±1,5	±2,5	±4	±6,5	±9,5	±15	±23	±37	±60	±95	±0,15	±0,23	±0,37	±0,6	±0,95	±1,5	±2,3
80	120	±1,25	±2	±3	±5	±7,5	±11	±17,5	±27	±43,5	±70	±110	±0,175	±0,27	±0,435	±0,7	±1,1	±1,75	±2,7
120	180	±1,75	±2,5	±4	±6	±9	±12,5	±20	±31,5	±50	±80	±125	±0,2	±0,315	±0,5	±0,8	±1,25	±2	±3,15
180	250	±2,25	±3,5	±5	±7	±10	±14,5	±23	±36	±57,5	±92,5	±145	±0,23	±0,36	±0,575	±0,925	±1,45	±2,3	±3,6
250	315	±3	±4	±6	±8	±11,5	±16	±26	±40,5	±65	±105	±160	±0,26	±0,405	±0,65	±1,05	±1,6	±2,6	±4,05
315	400	±3,5	±4,5	±6,5	±9	±12,5	±18	±28,5	±44,5	±70	±115	±180	±0,285	±0,445	±0,7	±1,15	±1,8	±2,85	±4,45
400	500	±4	±5	±7,5	±10	±13,5	±20	±31,5	±48,5	±77,5	±125	±200	±0,315	±0,485	±0,775	±1,25	±2	±3,15	±4,85
		3)																	
500	630	±4,5	±5,5	±8	±11	±16	±22	±35	±55	±87,5	±140	±220	±0,35	±0,55	±0,875	±1,4	±2,2	±3,5	±5,5
630	800	±5	±6,5	±9	±12,5	±18	±25	±40	±62,5	±100	±160	±250	±0,4	±0,625	±1	±1,6	±2,5	±4	±6,25
800	1 000	±5,5	±7,5	±10,5	±14	±20	±28	±45	±70	±115	±180	±280	±0,45	±0,7	±1,15	±1,8	±2,8	±4,5	±7
1 000	1 250	±6,5	±9	±12	±16,5	±23,5	±33	±52,5	±82,5	±130	±210	±330	±0,525	±0,825	±1,3	±2,1	±3,3	±5,25	±8,25
1 250	1 600	±7,5	±10,5	±14,5	±19,5	±27,5	±39	±62,5	±97,5	±155	±250	±390	±0,625	±0,975	±1,55	±2,5	±3,9	±6,25	±9,75
1 600	2 000	±9	±12,5	±17,5	±23	±32,5	±46	±75	±115	±185	±300	±460	±0,75	±1,15	±1,85	±3	±4,6	±7,5	±11,5
2 000	2 500	±11	±15	±20,5	±27,5	±39	±55	±87,5	±140	±220	±350	±550	±0,875	±1,4	±2,2	±3,5	±5,5	±8,75	±14
2 500	3 150	±13	±18	±25	±34	±48	±67,5	±105	±165	±270	±430	±675	±1,05	±1,65	±2,7	±4,3	±6,75	±10,5	±16,5

- 1) In order to avoid repetition of equal values, the table lists the values as "±x"; this is to be interpreted as *ES* = +x and *EI* = -x, e.g. $\begin{matrix} +0,23 \\ -0,23 \end{matrix}$ μm.
- 2) Tolerance grades IT14 to IT16 (incl.) shall not be used for basic sizes less than or equal to 1 mm.
- 3) The values 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.

Table 8 – Limit deviations for holes J and K

Upper limit deviation = *ES*
Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		J				K							
Above	Up to and in- cluding	6	7	8	9 ¹⁾	3	4	5	6	7	8	9 ²⁾	10 ²⁾
—	3	+ 2 - 4	+ 4 - 6	+ 6 - 8		0 - 2	0 - 3	0 - 4	0 - 6	0 - 10	0 - 14	0 - 25	0 - 40
3	6	+ 5 - 3	± 6 ³⁾	+ 10 - 8		0 - 2,5	+ 0,5 - 3,5	0 - 5	+ 2 - 6	+ 3 - 9	+ 5 - 13		
6	10	+ 5 - 4	+ 8 - 7	+ 12 - 10		0 - 2,5	+ 0,5 - 3,5	+ 1 - 5	+ 2 - 7	+ 5 - 10	+ 6 - 16		
10	18	+ 6 - 5	+ 10 - 8	+ 15 - 12		0 - 3	+ 1 - 4	+ 2 - 6	+ 2 - 9	+ 6 - 12	+ 8 - 19		
18	30	+ 8 - 5	+ 12 - 9	+ 20 - 13		- 0,5 - 4,5	0 - 6	+ 1 - 8	+ 2 - 11	+ 6 - 15	+ 10 - 23		
30	50	+ 10 - 6	+ 14 - 11	+ 24 - 15		- 0,5 - 4,5	+ 1 - 6	+ 2 - 9	+ 3 - 13	+ 7 - 18	+ 12 - 27		
50	80	+ 13 - 6	+ 18 - 12	+ 28 - 18				+ 3 - 10	+ 4 - 15	+ 9 - 21	+ 14 - 32		
80	120	+ 16 - 6	+ 22 - 13	+ 34 - 20				+ 2 - 13	+ 4 - 18	+ 10 - 25	+ 16 - 38		
120	180	+ 18 - 7	+ 26 - 14	+ 41 - 22				+ 3 - 15	+ 4 - 21	+ 12 - 28	+ 20 - 43		
180	250	+ 22 - 7	+ 30 - 16	+ 47 - 25				+ 2 - 18	+ 5 - 24	+ 13 - 33	+ 22 - 50		
250	315	+ 25 - 7	+ 36 - 16	+ 55 - 26				+ 3 - 20	+ 5 - 27	+ 16 - 36	+ 25 - 56		
315	400	+ 29 - 7	+ 39 - 18	+ 60 - 29				+ 3 - 22	+ 7 - 29	+ 17 - 40	+ 28 - 61		
400	500	+ 33 - 7	+ 43 - 20	+ 66 - 31				+ 2 - 25	+ 8 - 32	+ 18 - 45	+ 29 - 68		
500	630								0 - 44	0 - 70	0 - 110		
630	800								0 - 50	0 - 80	0 - 125		
800	1 000								0 - 56	0 - 90	0 - 140		
1 000	1 250								0 - 66	0 - 105	0 - 165		
1 250	1 600								0 - 78	0 - 125	0 - 195		
1 600	2 000								0 - 92	0 - 150	0 - 230		
2 000	2 500								0 - 110	0 - 175	0 - 280		
2 500	3 150								0 - 135	0 - 210	0 - 330		

1) Tolerance classes J9, J10, etc. are symmetrical about the zero line. For these values, see JS9, JS10, etc.

2) Deviations for K in tolerance grades above IT8 are not defined for basic sizes greater than 3 mm.

3) Identical with JS7.

Table 9 — Limit deviations for holes M and N

Upper limit deviation = *ES*

Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		M								N								
Above	Up to and including	3	4	5	6	7	8	9	10	3	4	5	6	7	8	9 ¹⁾	10 ¹⁾	11 ¹⁾
—	3 ¹⁾	-2 -4	-2 -5	-2 -6	-2 -8	-2 -12	-2 -16	-2 -27	-2 -42	-4 -6	-4 -7	-4 -8	-4 -10	-4 -14	-4 -18	-4 -29	-4 -44	-4 -64
3	6	-3 -5,5	-2,5 -6,5	-3 -8	-1 -9	0 -12	+2 -16	-4 -34	-4 -52	-7 -9,5	-6,5 -10,5	-7 -12	-5 -13	-4 -16	-2 -20	0 -30	0 -48	0 -75
6	10	-5 -7,5	-4,5 -8,5	-4 -10	-3 -12	0 -15	+1 -21	-6 -42	-6 -64	-9 -11,5	-8,5 -12,5	-8 -14	-7 -16	-4 -19	-3 -25	0 -36	0 -58	0 -90
10	18	-6 -9	-5 -10	-4 -12	-4 -15	0 -18	+2 -25	-7 -50	-7 -77	-11 -14	-10 -15	-9 -17	-9 -20	-5 -23	-3 -30	0 -43	0 -70	0 -110
18	30	-6,5 -10,5	-6 -12	-5 -14	-4 -17	0 -21	+4 -29	-8 -60	-8 -92	-13,5 -17,5	-13 -19	-12 -21	-11 -24	-7 -28	-3 -36	0 -52	0 -84	0 -130
30	50	-7,5 -11,5	-6 -13	-5 -16	-4 -20	0 -25	+5 -34	-9 -71	-9 -109	-15,5 -19,5	-14 -21	-13 -24	-12 -28	-8 -33	-3 -42	0 -62	0 -100	0 -160
50	80			-6 -19	-5 -24	0 -30	+5 -41					-15 -28	-14 -33	-9 -39	-4 -50	0 -74	0 -120	0 -190
80	120			-8 -23	-6 -28	0 -35	+6 -48					-18 -33	-16 -38	-10 -45	-4 -58	0 -87	0 -140	0 -220
120	180			-9 -27	-8 -33	0 -40	+8 -55					-21 -39	-20 -45	-12 -52	-4 -67	0 -100	0 -160	0 -250
180	250			-11 -31	-8 -37	0 -46	+9 -63					-25 -45	-22 -51	-14 -60	-5 -77	0 -115	0 -185	0 -290
250	315			-13 -36	-9 -41	0 -52	+9 -72					-27 -50	-25 -57	-14 -66	-5 -86	0 -130	0 -210	0 -320
315	400			-14 -39	-10 -46	0 -57	+11 -78					-30 -55	-26 -62	-16 -73	-5 -94	0 -140	0 -230	0 -360
400	500			-16 -43	-10 -50	0 -63	+11 -86					-33 -60	-27 -67	-17 -80	-6 -103	0 -155	0 -250	0 -400
500	630				-26 -70	-26 -96	-26 -136							-44 -88	-44 -114	-44 -154	-44 -219	
630	800				-30 -80	-30 -110	-30 -155							-50 -100	-50 -130	-50 -175	-50 -250	
800	1 000				-34 -90	-34 -124	-34 -174							-56 -112	-56 -146	-56 -196	-56 -286	
1 000	1 250				-40 -106	-40 -145	-40 -205							-66 -132	-66 -171	-66 -231	-66 -326	
1 250	1 600				-48 -126	-48 -173	-48 -243							-78 -156	-78 -203	-78 -273	-78 -388	
1 600	2 000				-58 -150	-58 -208	-58 -288							-92 -184	-92 -242	-92 -322	-92 -462	
2 000	2 500				-68 -178	-68 -243	-68 -348							-110 -220	-110 -285	-110 -390	-110 -550	
2 500	3 150				-76 -211	-76 -286	-76 -406							-135 -270	-135 -345	-135 -465	-135 -675	

1) Tolerance classes N9, N10 and N11 shall not be used for basic sizes less than or equal to 1 mm.

Table 10 — Limit deviations for holes P

Upper limit deviation = *ES*
 Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		P							
Above	Up to and in- cluding	3	4	5	6	7	8	9	10
—	3	- 6 - 8	- 6 - 9	- 6 - 10	- 6 - 12	- 6 - 16	- 6 - 20	- 6 - 31	- 6 - 46
3	6	- 11 - 13,5	- 10,5 - 14,5	- 11 - 16	- 9 - 17	- 8 - 20	- 12 - 30	- 12 - 42	- 12 - 60
6	10	- 14 - 16,5	- 13,5 - 17,5	- 13 - 19	- 12 - 21	- 9 - 24	- 15 - 37	- 15 - 51	- 15 - 73
10	18	- 17 - 20	- 16 - 21	- 15 - 23	- 15 - 26	- 11 - 29	- 18 - 45	- 18 - 61	- 18 - 88
18	30	- 20,5 - 24,5	- 20 - 26	- 19 - 28	- 18 - 31	- 14 - 35	- 22 - 55	- 22 - 74	- 22 - 106
30	50	- 24,5 - 28,5	- 23 - 30	- 22 - 33	- 21 - 37	- 17 - 42	- 26 - 65	- 26 - 88	- 26 - 126
50	80			- 27 - 40	- 26 - 45	- 21 - 51	- 32 - 78	- 32 - 106	
80	120			- 32 - 47	- 30 - 52	- 24 - 59	- 37 - 91	- 37 - 124	
120	180			- 37 - 55	- 36 - 61	- 28 - 68	- 43 - 106	- 43 - 143	
180	250			- 44 - 64	- 41 - 70	- 33 - 79	- 50 - 122	- 50 - 165	
250	315			- 49 - 72	- 47 - 79	- 36 - 88	- 56 - 137	- 56 - 186	
315	400			- 55 - 80	- 51 - 87	- 41 - 98	- 62 - 151	- 62 - 202	
400	500			- 61 - 88	- 55 - 95	- 45 - 108	- 68 - 165	- 68 - 223	
500	630				- 78 - 122	- 78 - 148	- 78 - 188	- 78 - 253	
630	800				- 88 - 138	- 88 - 168	- 88 - 213	- 88 - 288	
800	1 000				- 100 - 156	- 100 - 190	- 100 - 240	- 100 - 330	
1 000	1 250				- 120 - 186	- 120 - 225	- 120 - 285	- 120 - 380	
1 250	1 600				- 140 - 218	- 140 - 265	- 140 - 335	- 140 - 450	
1 600	2 000				- 170 - 262	- 170 - 320	- 170 - 400	- 170 - 540	
2 000	2 500				- 195 - 305	- 195 - 370	- 195 - 475	- 195 - 635	
2 500	3 150				- 240 - 375	- 240 - 450	- 240 - 570	- 240 - 780	

Table 11 — Limit deviations for holes R

Upper limit deviation = *ES*
Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		R							
Above	Up to and including	3	4	5	6	7	8	9	10
—	3	-10 -12	-10 -13	-10 -14	-10 -16	-10 -20	-10 -24	-10 -35	-10 -50
3	6	-14 -16,5	-13,5 -17,5	-14 -19	-12 -20	-11 -23	-15 -33	-15 -45	-15 -63
6	10	-18 -20,5	-17,5 -21,5	-17 -23	-16 -25	-13 -28	-19 -41	-19 -55	-19 -77
10	18	-22 -25	-21 -26	-20 -28	-20 -31	-16 -34	-23 -50	-23 -66	-23 -93
18	30	-26,5 -30,5	-26 -32	-25 -34	-24 -37	-20 -41	-28 -61	-28 -80	-10 -112
30	50	-32,5 -36,5	-31 -38	-30 -41	-29 -45	-25 -50	-34 -73	-34 -96	-34 -134
50	65			-36 -49	-35 -54	-30 -60	-41 -87		
65	80			-38 -51	-37 -56	-32 -62	-43 -89		
80	100			-46 -61	-44 -66	-38 -73	-51 -105		
100	120			-49 -64	-47 -69	-41 -76	-54 -108		
120	140			-57 -75	-56 -81	-48 -88	-63 -126		
140	160			-59 -77	-58 -83	-50 -90	-65 -128		
160	180			-62 -80	-61 -86	-53 -93	-68 -131		
180	200			-71 -91	-68 -97	-60 -106	-77 -149		
200	225			-74 -94	-71 -100	-63 -109	-80 -152		
225	250			-78 -98	-75 -104	-67 -113	-84 -156		
250	280			-87 -110	-85 -117	-74 -126	-94 -175		
280	315			-91 -114	-89 -121	-78 -130	-98 -179		
315	355			-101 -126	-97 -133	-87 -144	-108 -197		
355	400			-107 -132	-103 -139	-93 -150	-114 -203		
400	450			-119 -146	-113 -153	-103 -166	-126 -223		
450	500			-125 -152	-119 -159	-109 -172	-132 -229		

Basic size mm		R		
Above	Up to and including	6	7	8
500	560	-150 -194	-150 -220	-150 -260
560	630	-155 -199	-155 -225	-155 -265
630	710	-175 -225	-175 -255	-175 -300
710	800	-185 -235	-185 -265	-185 -310
800	900	-210 -266	-210 -300	-210 -350
900	1 000	-220 -276	-220 -310	-220 -360
1 000	1 120	-250 -316	-250 -355	-250 -415
1 120	1 250	-260 -326	-260 -365	-260 -425
1 250	1 400	-300 -378	-300 -425	-300 -495
1 400	1 600	-330 -408	-330 -455	-330 -525
1 600	1 800	-370 -462	-370 -520	-370 -600
1 800	2 000	-400 -492	-400 -550	-400 -630
2 000	2 240	-440 -550	-440 -615	-440 -720
2 240	2 500	-460 -570	-460 -635	-460 -740
2 500	2 800	-550 -685	-550 -760	-550 -880
2 800	3 150	-580 -715	-580 -790	-580 -910

Table 12 — Limit deviations for holes S

Upper limit deviation = *ES*

Lower limit deviation = *EI*

Basic size mm		S							
Above	Up to and in- cluding	3	4	5	6	7	8	9	10
—	3	-14 -16	-14 -17	-14 -18	-14 -20	-14 -24	-14 -28	-14 -39	-14 -54
3	6	-18 -20,5	-17,5 -21,5	-18 -23	-16 -24	-15 -27	-19 -37	-19 -49	-19 -67
6	10	-22 -24,5	-21,5 -25,5	-21 -27	-20 -29	-17 -32	-23 -45	-23 -59	-23 -81
10	18	-27 -30	-26 -31	-25 -33	-25 -36	-21 -39	-28 -55	-28 -71	-28 -98
18	30	-33,5 -37,5	-33 -39	-32 -41	-31 -44	-27 -48	-35 -68	-35 -87	-35 -119
30	50	-41,5 -45,5	-40 -47	-39 -50	-38 -54	-34 -59	-43 -82	-43 -105	-43 -143
50	65			-48 -61	-47 -66	-42 -72	-53 -99	-53 -127	
65	80			-54 -67	-53 -72	-48 -78	-59 -105	-59 -133	
80	100			-66 -81	-64 -86	-58 -93	-71 -125	-71 -158	
100	120			-74 -89	-72 -94	-66 -101	-79 -133	-79 -166	
120	140			-86 -104	-85 -110	-77 -117	-92 -155	-92 -192	
140	160			-94 -112	-93 -118	-85 -125	-100 -163	-100 -200	
160	180			-102 -120	-101 -126	-93 -133	-108 -171	-108 -208	
180	200			-116 -136	-113 -142	-105 -151	-122 -194	-122 -237	
200	225			-124 -144	-121 -150	-113 -159	-130 -202	-130 -245	
225	250			-134 -154	-131 -160	-123 -169	-140 -212	-140 -255	
250	280			-151 -174	-149 -181	-138 -190	-158 -239	-158 -288	
280	315			-163 -186	-161 -193	-150 -202	-170 -251	-170 -300	
315	355			-183 -208	-179 -215	-169 -226	-190 -279	-190 -330	
355	400			-201 -226	-197 -233	-187 -244	-208 -297	-208 -348	
400	450			-225 -252	-219 -259	-209 -272	-232 -329	-232 -387	
450	500			-245 -272	-239 -279	-229 -292	-252 -349	-252 -407	

Deviations in micrometres

Basic size mm		S		
Above	Up to and in- cluding	6	7	8
500	560	-280 -324	-280 -350	-280 -390
560	630	-310 -354	-310 -380	-310 -420
630	710	-340 -390	-340 -420	-340 -465
710	800	-380 -430	-380 -460	-380 -505
800	900	-430 -486	-430 -520	-430 -570
900	1 000	-470 -526	-470 -560	-470 -610
1 000	1 120	-520 -586	-520 -625	-520 -685
1 120	1 250	-580 -646	-580 -685	-580 -745
1 250	1 400	-640 -718	-640 -765	-640 -835
1 400	1 600	-720 -798	-720 -845	-720 -915
1 600	1 800	-820 -912	-820 -970	-820 -1 050
1 800	2 000	-920 -1 012	-920 -1 070	-920 -1 150
2 000	2 240	-1 000 -1 110	-1 000 -1 175	-1 000 -1 280
2 240	2 500	-1 100 -1 210	-1 100 -1 275	-1 100 -1 380
2 500	2 800	-1 250 -1 385	-1 250 -1 460	-1 250 -1 580
2 800	3 150	-1 400 -1 535	-1 400 -1 610	-1 400 -1 730

Table 13 – Limit deviations for holes T and U

Upper limit deviation = *ES*
Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		T ¹⁾				U					
Above	Up to and in- cluding	5	6	7	8	5	6	7	8	9	10
—	3					-18 -22	-18 -24	-18 -28	-18 -32	-18 -43	-18 -58
3	6					-22 -27	-20 -28	-19 -31	-23 -41	-23 -53	-23 -71
6	10					-26 -32	-25 -34	-22 -37	-28 -50	-28 -64	-28 -86
10	18					-30 -38	-30 -41	-26 -44	-33 -60	-33 -76	-33 -103
18	24					-38 -47	-37 -50	-33 -54	-41 -74	-41 -93	-41 -125
24	30	-38 -47	-37 -50	-33 -54	-41 -74	-45 -54	-44 -57	-40 -61	-48 -81	-48 -100	-48 -132
30	40	-44 -55	-43 -59	-39 -64	-48 -87	-56 -67	-55 -71	-51 -76	-60 -99	-60 -122	-60 -160
40	50	-50 -61	-49 -65	-45 -70	-54 -93	-66 -77	-65 -81	-61 -86	-70 -109	-70 -132	-70 -170
50	65		-60 -79	-55 -85	-66 -112		-81 -100	-76 -106	-87 -133	-87 -161	-87 -207
65	80		-69 -88	-64 -94	-75 -121		-96 -115	-91 -121	-102 -148	-102 -176	-102 -222
80	100		-84 -106	-78 -113	-91 -145		-117 -139	-111 -146	-124 -178	-124 -211	-124 -264
100	120		-97 -119	-91 -126	-104 -158		-137 -159	-131 -166	-144 -198	-144 -231	-144 -284
120	140		-115 -140	-107 -147	-122 -185		-163 -188	-155 -195	-170 -233	-170 -270	-170 -330
140	160		-127 -152	-119 -159	-134 -197		-183 -208	-175 -215	-190 -253	-190 -290	-190 -350
160	180		-139 -164	-131 -171	-146 -209		-203 -228	-195 -235	-210 -273	-210 -310	-210 -370
180	200		-157 -186	-149 -195	-166 -238		-227 -256	-219 -265	-236 -308	-236 -351	-236 -421
200	225		-171 -200	-163 -209	-180 -252		-249 -278	-241 -287	-258 -330	-258 -373	-258 -443
225	250		-187 -216	-179 -225	-196 -268		-275 -304	-267 -313	-284 -356	-284 -399	-284 -469
250	280		-209 -241	-198 -250	-218 -299		-306 -338	-295 -347	-315 -396	-315 -445	-315 -525
280	315		-231 -263	-220 -272	-240 -321		-341 -373	-330 -382	-350 -431	-350 -480	-350 -560
315	355		-257 -293	-247 -304	-268 -357		-379 -415	-369 -426	-390 -479	-390 -530	-390 -620
355	400		-283 -319	-273 -330	-294 -383		-424 -460	-414 -471	-435 -524	-435 -575	-435 -665
400	450		-317 -357	-307 -370	-330 -427		-477 -517	-467 -530	-490 -587	-490 -645	-490 -740
450	500		-347 -387	-337 -400	-360 -457		-527 -567	-517 -580	-540 -637	-540 -695	-540 -790

Basic size mm		T			U		
Above	Up to and in- cluding	6	7	8	6	7	8
500	560	-400 -444	-400 -470	-400 -510	-600 -644	-600 -670	-600 -710
560	630	-450 -494	-450 -520	-450 -560	-660 -704	-660 -730	-660 -770
630	710	-500 -550	-500 -580	-500 -625	-740 -790	-740 -820	-740 -865
710	800	-560 -610	-560 -640	-560 -685	-840 -890	-840 -920	-840 -965
800	900	-620 -676	-620 -710	-620 -760	-940 -996	-940 -1 030	-940 -1 080
900	1 000	-680 -736	-680 -770	-680 -820	-1 050 -1 106	-1 050 -1 140	-1 050 -1 190
1 000	1 120	-780 -846	-780 -885	-780 -945	-1 150 -1 216	-1 150 -1 255	-1 150 -1 315
1 120	1 250	-840 -906	-840 -945	-840 -1 005	-1 300 -1 366	-1 300 -1 405	-1 300 -1 465
1 250	1 400	-960 -1 038	-960 -1 085	-960 -1 155	-1 450 -1 528	-1 450 -1 575	-1 450 -1 645
1 400	1 600	-1 050 -1 128	-1 050 -1 175	-1 050 -1 245	-1 600 -1 678	-1 600 -1 725	-1 600 -1 795
1 600	1 800	-1 200 -1 292	-1 200 -1 350	-1 200 -1 430	-1 850 -1 942	-1 850 -2 000	-1 850 -2 080
1 800	2 000	-1 350 -1 442	-1 350 -1 500	-1 350 -1 580	-2 000 -2 092	-2 000 -2 150	-2 000 -2 230
2 000	2 240	-1 500 -1 610	-1 500 -1 675	-1 500 -1 780	-2 300 -2 410	-2 300 -2 475	-2 300 -2 580
2 240	2 500	-1 650 -1 760	-1 650 -1 825	-1 650 -1 930	-2 500 -2 610	-2 500 -2 675	-2 500 -2 780
2 500	2 800	-1 900 -2 035	-1 900 -2 110	-1 900 -2 230	-2 900 -3 035	-2 900 -3 110	-2 900 -3 230
2 800	3 150	-2 100 -2 235	-2 100 -2 310	-2 100 -2 430	-3 200 -3 335	-3 200 -3 410	-3 200 -3 530

1) Tolerance classes T5 to T8 (incl.) have not been tabulated for basic sizes less than or equal to 24 mm. It is recommended that tolerance classes U5 to U8 (incl.) be used instead. However, if tolerance classes T5 to T8 (incl.) are especially required, they may be calculated from the bases given in ISO 286-1.

Table 14 – Limit deviations for holes V, X and Y¹⁾

Upper limit deviation = *ES*
Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		V ²⁾				X						Y ³⁾				
Above	Up to and in- cluding	5	6	7	8	5	6	7	8	9	10	6	7	8	9	10
—	3					-20	-20	-20	-20	-20	-20					
						-24	-26	-30	-34	-45	-60					
3	6					-27	-25	-24	-28	-28	-28					
						-32	-33	-36	-46	-58	-76					
6	10					-32	-31	-28	-34	-34	-34					
						-38	-40	-43	-56	-70	-92					
10	14					-37	-37	-33	-40	-40	-40					
						-45	-48	-51	-67	-83	-110					
14	18	-36	-36	-32	-39	-42	-42	-38	-45	-45	-45					
		-44	-47	-50	-66	-50	-53	-56	-72	-88	-115					
18	24	-44	-43	-39	-47	-51	-50	-46	-54	-54	-54	-59	-55	-63	-63	-63
		-53	-56	-60	-80	-60	-63	-67	-87	-106	-138	-72	-76	-96	-115	-147
24	30	-52	-51	-47	-55	-61	-60	-56	-64	-64	-64	-71	-67	-75	-75	-75
		-61	-64	-68	-88	-70	-73	-77	-97	-116	-148	-84	-88	-108	-127	-159
30	40	-64	-63	-59	-68	-76	-75	-71	-80	-80	-80	-89	-85	-94	-94	-94
		-75	-79	-84	-107	-87	-91	-96	-119	-142	-180	-105	-110	-133	-156	-194
40	50	-77	-76	-72	-81	-93	-92	-88	-97	-97	-97	-109	-105	-114	-114	-114
		-88	-92	-97	-120	-104	-108	-113	-136	-159	-197	-125	-130	-153	-176	-214
50	65		-96	-91	-102		-116	-111	-122	-122		-138	-133	-144		
			-115	-121	-148		135	-141	-168	-196		-157	-163	-190		
65	80		-114	-109	-120		-140	-135	-146	-146		-168	-163	-174		
			-133	-139	-166		-159	-165	-192	-220		-187	-193	-220		
80	100		-139	-133	-146		-171	-165	-178	-178		-207	-201	-214		
			-161	-168	-200		-193	-200	-232	-265		-229	-236	-268		
100	120		-165	-159	-172		-203	-197	-210	-210		-247	-241	-254		
			-187	-194	-226		-225	-232	-264	-297		-269	-276	-308		
120	140		-195	-187	-202		-241	-233	-248	-248		-293	-285	-300		
			-220	-227	-265		-266	-273	-311	-348		-318	-325	-363		
140	160		-221	-213	-228		-273	-265	-280	-280		-333	-325	-340		
			-246	-253	-291		-298	-305	-343	-380		-358	-365	-403		
160	180		-245	-237	-252		-303	-295	-310	-310		-373	-365	-380		
			-270	-277	-315		-328	-335	-373	-410		-398	-405	-443		
180	200		-275	-267	-284		-341	-333	-350	-350		-416	-408	-425		
			-304	-313	-356		-370	-379	-422	-465		-445	-454	-497		
200	225		-301	-293	-310		-376	-368	-385	-385		-461	-453	-470		
			-330	-339	-382		-405	-414	-457	-500		-490	-499	-542		
225	250		-331	-323	-340		-416	-408	-425	-425		-511	-503	-520		
			-360	-369	-412		-445	-454	-497	-540		-540	-549	-592		
250	280		-376	-365	-385		-466	-455	-475	-475		-571	-560	-580		
			-408	-417	-466		-498	-507	-556	-605		-603	-612	-661		
280	315		-416	-405	-425		-516	-505	-525	-525		-641	-630	-650		
			-448	-457	-506		-548	-557	-606	-655		-673	-682	-731		
315	355		-464	-454	-475		-579	-569	-590	-590		-719	-709	-730		
			-500	-511	-564		-615	-626	-679	-730		-755	-766	-819		
355	400		-519	-509	-530		-649	-639	-660	-660		-809	-799	-820		
			-555	-566	-619		-685	-696	-749	-800		-845	-856	-909		
400	450		-582	-572	-595		-727	-717	-740	-740		-907	-897	-920		
			-622	-635	-692		-767	-780	-837	-895		-947	-960	-1 017		
450	500		-647	-637	-660		-807	-797	-820	-820		-987	-977	-1 000		
			-687	-700	-757		-847	-860	-917	-975		-1 027	-1 040	-1 097		

1) Fundamental deviations V, X and Y are not provided for basic sizes greater than 500 mm.

2) Tolerance classes V5 to V8 (incl.) have not been tabulated for basic sizes less than or equal to 14 mm. It is recommended that tolerance classes X5 to X8 (incl.) be used instead. However, if tolerance classes V5 to V8 (incl.) are especially required, they may be calculated from the bases given in ISO 286-1.

3) Tolerance classes Y6 to Y10 (incl.) have not been tabulated for basic sizes less than or equal to 18 mm. It is recommended that tolerance classes Z6 to Z10 (incl.) be used instead. However, if tolerance classes Y6 to Y10 (incl.) are especially required, they may be calculated from the bases given in ISO 286-1.

Table 15 — Limit deviations for holes Z and ZA ¹⁾

Upper limit deviation = *ES*
Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		Z						ZA					
Above	Up to and including	6	7	8	9	10	11	6	7	8	9	10	11
—	3	- 26 - 32	- 26 - 36	- 26 - 40	- 26 - 51	- 26 - 66	- 26 - 86	- 32 - 38	- 32 - 42	- 32 - 46	- 32 - 57	- 32 - 72	- 32 - 92
3	6	- 32 - 40	- 31 - 43	- 35 - 53	- 35 - 65	- 35 - 83	- 35 - 110	- 39 - 47	- 38 - 50	- 42 - 60	- 42 - 72	- 42 - 90	- 42 - 117
6	10	- 39 - 48	- 36 - 51	- 42 - 64	- 42 - 78	- 42 - 100	- 42 - 132	- 49 - 58	- 46 - 61	- 52 - 74	- 52 - 88	- 52 - 110	- 52 - 142
10	14	- 47 - 58	- 43 - 61	- 50 - 77	- 50 - 93	- 50 - 120	- 50 - 160	- 61 - 72	- 57 - 75	- 64 - 91	- 64 - 107	- 64 - 134	- 64 - 174
14	18	- 57 - 68	- 53 - 71	- 60 - 87	- 60 - 103	- 60 - 130	- 60 - 170	- 74 - 85	- 70 - 88	- 77 - 104	- 77 - 120	- 77 - 147	- 77 - 187
18	24	- 69 - 82	- 65 - 86	- 73 - 106	- 73 - 125	- 73 - 157	- 73 - 203	- 94 - 107	- 90 - 111	- 98 - 131	- 98 - 150	- 98 - 182	- 98 - 228
24	30	- 84 - 97	- 80 - 101	- 88 - 121	- 88 - 140	- 88 - 172	- 88 - 218	- 114 - 127	- 110 - 131	- 118 - 151	- 118 - 170	- 118 - 202	- 118 - 248
30	40	- 107 - 123	- 103 - 128	- 112 - 151	- 112 - 174	- 112 - 212	- 112 - 272	- 143 - 159	- 139 - 164	- 148 - 187	- 148 - 210	- 148 - 248	- 148 - 308
40	50	- 131 - 147	- 127 - 152	- 136 - 175	- 136 - 198	- 136 - 236	- 136 - 296	- 175 - 191	- 171 - 196	- 180 - 219	- 180 - 242	- 180 - 280	- 180 - 340
50	65		- 161 - 191	- 172 - 218	- 172 - 246	- 172 - 292	- 172 - 362		- 215 - 245	- 226 - 272	- 226 - 300	- 226 - 346	- 226 - 416
65	80		- 199 - 229	- 210 - 256	- 210 - 284	- 210 - 330	- 210 - 400		- 263 - 293	- 274 - 320	- 274 - 348	- 274 - 394	- 274 - 464
80	100		- 245 - 280	- 258 - 312	- 258 - 345	- 258 - 398	- 258 - 478		- 322 - 357	- 335 - 389	- 335 - 422	- 335 - 475	- 335 - 555
100	120		- 297 - 332	- 310 - 364	- 310 - 397	- 310 - 450	- 310 - 530		- 387 - 422	- 400 - 454	- 400 - 487	- 400 - 540	- 400 - 620
120	140		- 350 - 390	- 365 - 428	- 365 - 465	- 365 - 525	- 365 - 615		- 455 - 495	- 470 - 533	- 470 - 570	- 470 - 630	- 470 - 720
140	160		- 400 - 440	- 415 - 478	- 415 - 515	- 415 - 575	- 415 - 665		- 520 - 560	- 535 - 598	- 535 - 635	- 535 - 695	- 535 - 785
160	180		- 450 - 490	- 465 - 528	- 465 - 565	- 465 - 625	- 465 - 715		- 585 - 625	- 600 - 663	- 600 - 700	- 600 - 760	- 600 - 850
180	200		- 503 - 549	- 520 - 592	- 520 - 635	- 520 - 705	- 520 - 810		- 653 - 699	- 670 - 742	- 670 - 785	- 670 - 855	- 670 - 960
200	225		- 558 - 604	- 575 - 647	- 575 - 690	- 575 - 760	- 575 - 865		- 723 - 769	- 740 - 812	- 740 - 855	- 740 - 925	- 740 - 1 030
225	250		- 623 - 669	- 640 - 712	- 640 - 755	- 640 - 825	- 640 - 930		- 803 - 849	- 820 - 892	- 820 - 935	- 820 - 1 005	- 820 - 1 110
250	280		- 690 - 742	- 710 - 791	- 710 - 840	- 710 - 920	- 710 - 1 030		- 900 - 952	- 920 - 1 001	- 920 - 1 050	- 920 - 1 130	- 920 - 1 240
280	315		- 770 - 822	- 790 - 871	- 790 - 920	- 790 - 1 000	- 790 - 1 110		- 980 - 1 032	- 1 000 - 1 081	- 1 000 - 1 130	- 1 000 - 1 210	- 1 000 - 1 320
315	355		- 879 - 936	- 900 - 989	- 900 - 1 040	- 900 - 1 130	- 900 - 1 260		- 1 129 - 1 186	- 1 150 - 1 239	- 1 150 - 1 290	- 1 150 - 1 380	- 1 150 - 1 510
355	400		- 979 - 1 036	- 1 000 - 1 089	- 1 000 - 1 140	- 1 000 - 1 230	- 1 000 - 1 360		- 1 279 - 1 336	- 1 300 - 1 389	- 1 300 - 1 440	- 1 300 - 1 530	- 1 300 - 1 660
400	450		- 1 077 - 1 140	- 1 100 - 1 197	- 1 100 - 1 255	- 1 100 - 1 350	- 1 100 - 1 500		- 1 427 - 1 490	- 1 450 - 1 547	- 1 450 - 1 605	- 1 450 - 1 700	- 1 450 - 1 850
450	500		- 1 227 - 1 290	- 1 250 - 1 347	- 1 250 - 1 405	- 1 250 - 1 500	- 1 250 - 1 650		- 1 577 - 1 640	- 1 600 - 1 697	- 1 600 - 1 755	- 1 600 - 1 850	- 1 600 - 2 000

¹⁾ Fundamental deviations Z and ZA are not provided for basic sizes greater than 500 mm.

Table 16 — Limit deviations for holes ZB and ZC¹⁾

Upper limit deviation = *ES*

Lower limit deviation = *EI*

Deviations in micrometres

Basic size mm		ZB					ZC				
Above	Up to and in- cluding	7	8	9	10	11	7	8	9	10	11
—	3	— 40 — 50	— 40 — 54	— 40 — 65	— 40 — 80	— 40 — 100	— 60 — 70	— 60 — 74	— 60 — 85	— 60 — 100	— 60 — 120
3	6	— 46 — 58	— 50 — 68	— 50 — 80	— 50 — 98	— 50 — 125	— 76 — 88	— 80 — 98	— 80 — 110	— 80 — 128	— 80 — 155
6	10	— 61 — 76	— 67 — 89	— 67 — 103	— 67 — 125	— 67 — 157	— 91 — 106	— 97 — 119	— 97 — 133	— 97 — 155	— 97 — 187
10	14	— 83 — 101	— 90 — 117	— 90 — 133	— 90 — 160	— 90 — 200	— 123 — 141	— 130 — 157	— 130 — 173	— 130 — 200	— 130 — 240
14	18	— 101 — 119	— 108 — 135	— 108 — 151	— 108 — 178	— 108 — 218	— 143 — 161	— 150 — 177	— 150 — 193	— 150 — 220	— 150 — 260
18	24	— 128 — 149	— 136 — 169	— 136 — 188	— 136 — 220	— 136 — 266	— 180 — 201	— 188 — 221	— 188 — 240	— 188 — 272	— 188 — 318
24	30	— 152 — 173	— 160 — 193	— 160 — 212	— 160 — 244	— 160 — 290	— 210 — 231	— 218 — 251	— 218 — 270	— 218 — 302	— 218 — 348
30	40	— 191 — 216	— 200 — 239	— 200 — 262	— 200 — 300	— 200 — 360	— 265 — 290	— 274 — 313	— 274 — 336	— 274 — 374	— 274 — 434
40	50	— 233 — 258	— 242 — 281	— 242 — 304	— 242 — 342	— 242 — 402	— 316 — 341	— 325 — 364	— 325 — 387	— 325 — 425	— 325 — 485
50	65	— 289 — 319	— 300 — 346	— 300 — 374	— 300 — 420	— 300 — 490	— 394 — 424	— 405 — 451	— 405 — 479	— 405 — 525	— 405 — 595
65	80	— 349 — 379	— 360 — 406	— 360 — 434	— 360 — 480	— 360 — 550	— 469 — 499	— 480 — 526	— 480 — 554	— 480 — 600	— 480 — 670
80	100	— 432 — 467	— 445 — 499	— 445 — 532	— 445 — 585	— 445 — 665	— 572 — 607	— 585 — 639	— 585 — 672	— 585 — 725	— 585 — 805
100	120	— 512 — 547	— 525 — 579	— 525 — 612	— 525 — 665	— 525 — 745	— 677 — 712	— 690 — 744	— 690 — 777	— 690 — 830	— 690 — 910
120	140	— 605 — 645	— 620 — 683	— 620 — 720	— 620 — 780	— 620 — 870	— 785 — 825	— 800 — 863	— 800 — 900	— 800 — 960	— 800 — 1 050
140	160	— 685 — 725	— 700 — 763	— 700 — 800	— 700 — 860	— 700 — 950	— 885 — 925	— 900 — 963	— 900 — 1 000	— 900 — 1 060	— 900 — 1 150
160	180	— 765 — 805	— 780 — 843	— 780 — 880	— 780 — 940	— 780 — 1 030	— 985 — 1 025	— 1 000 — 1 063	— 1 000 — 1 100	— 1 000 — 1 160	— 1 000 — 1 250
180	200	— 863 — 909	— 880 — 952	— 880 — 995	— 880 — 1 065	— 880 — 1 170	— 1 133 — 1 179	— 1 150 — 1 222	— 1 150 — 1 265	— 1 150 — 1 335	— 1 150 — 1 440
200	225	— 943 — 989	— 960 — 1 032	— 960 — 1 075	— 960 — 1 145	— 960 — 1 250	— 1 233 — 1 279	— 1 250 — 1 322	— 1 250 — 1 365	— 1 250 — 1 435	— 1 250 — 1 540
225	250	— 1 033 — 1 079	— 1 050 — 1 122	— 1 050 — 1 165	— 1 050 — 1 235	— 1 050 — 1 340	— 1 333 — 1 379	— 1 350 — 1 422	— 1 350 — 1 465	— 1 350 — 1 535	— 1 350 — 1 640
250	280	— 1 180 — 1 232	— 1 200 — 1 281	— 1 200 — 1 330	— 1 200 — 1 410	— 1 200 — 1 520	— 1 530 — 1 582	— 1 550 — 1 631	— 1 550 — 1 680	— 1 550 — 1 760	— 1 550 — 1 870
280	315	— 1 280 — 1 332	— 1 300 — 1 381	— 1 300 — 1 430	— 1 300 — 1 510	— 1 300 — 1 620	— 1 680 — 1 732	— 1 700 — 1 781	— 1 700 — 1 830	— 1 700 — 1 910	— 1 700 — 2 020
315	355	— 1 479 — 1 536	— 1 500 — 1 589	— 1 500 — 1 640	— 1 500 — 1 730	— 1 500 — 1 860	— 1 879 — 1 936	— 1 900 — 1 989	— 1 900 — 2 040	— 1 900 — 2 130	— 1 900 — 2 260
355	400	— 1 629 — 1 686	— 1 650 — 1 739	— 1 650 — 1 790	— 1 650 — 1 880	— 1 650 — 2 010	— 2 079 — 2 136	— 2 100 — 2 189	— 2 100 — 2 240	— 2 100 — 2 330	— 2 100 — 2 460
400	450	— 1 827 — 1 890	— 1 850 — 1 947	— 1 850 — 2 005	— 1 850 — 2 100	— 1 850 — 2 250	— 2 377 — 2 440	— 2 400 — 2 497	— 2 400 — 2 555	— 2 400 — 2 650	— 2 400 — 2 800
450	500	— 2 077 — 2 140	— 2 100 — 2 197	— 2 100 — 2 255	— 2 100 — 2 350	— 2 100 — 2 500	— 2 577 — 2 640	— 2 600 — 2 697	— 2 600 — 2 755	— 2 600 — 2 850	— 2 600 — 3 000

1) Fundamental deviations ZB and ZC are not provided for basic sizes greater than 500 mm.

Table 17 — Limit deviations for shafts a, b and c¹⁾

Upper limit deviation = *es*
Lower limit deviation = *ei*

Deviations in micrometres

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

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 grades in basic sizes less than or equal to 1 mm.

Table 18 – Limit deviations for shafts *cd* and *d*

Upper limit deviation = *es*
Lower limit deviation = *ei*

Deviations in micrometres

Basic size mm		<i>cd</i> ¹⁾						<i>d</i>									
Above	Up to and including	5	6	7	8	9	10	5	6	7	8	9	10	11	12	13	
—	3	-34 -38	-34 -40	-34 -44	-34 -48	-34 -59	-34 -74	-20 -24	-20 -26	-20 -30	-20 -34	-20 -45	-20 -60	-20 -80	-20 -120	-20 -160	
3	6	-46 -51	-46 -54	-46 -58	-46 -64	-46 -76	-46 -94	-30 -35	-30 -38	-30 -42	-30 -48	-30 -60	-30 -78	-30 -105	-30 -150	-30 -210	
6	10	-56 -62	-56 -65	-56 -71	-56 -78	-56 -92	-56 -114	-40 -46	-40 -49	-40 -55	-40 -62	-40 -76	-40 -98	-40 -130	-40 -190	-40 -260	
10	18							-50 -58	-50 -61	-50 -68	-50 -77	-50 -93	-50 -120	-50 -160	-50 -230	-50 -320	
18	30							-65 -74	-65 -78	-65 -86	-65 -98	-65 -117	-65 -149	-65 -195	-65 -275	-65 -395	
30	50							-80 -91	-80 -96	-80 -105	-80 -119	-80 -142	-80 -180	-80 -240	-80 -330	-80 -470	
50	80							-100 -113	-100 -119	-100 -130	-100 -146	-100 -174	-100 -220	-100 -290	-100 -400	-100 -560	
80	120							-120 -135	-120 -142	-120 -155	-120 -174	-120 -207	-120 -260	-120 -340	-120 -470	-120 -660	
120	180							-145 -163	-145 -170	-145 -185	-145 -208	-145 -245	-145 -305	-145 -395	-145 -545	-145 -775	
180	250							-170 -190	-170 -199	-170 -216	-170 -242	-170 -285	-170 -355	-170 -460	-170 -630	-170 -890	
250	315							-190 -213	-190 -222	-190 -242	-190 -271	-190 -320	-190 -400	-190 -510	-190 -710	-190 -1 000	
315	400							-210 -235	-210 -246	-210 -267	-210 -299	-210 -350	-210 -440	-210 -570	-210 -780	-210 -1 100	
400	500							-230 -257	-230 -270	-230 -293	-230 -327	-230 -385	-230 -480	-230 -630	-230 -860	-230 -1 200	
500	630									-260 -330	-260 -370	-260 -435	-260 -540	-260 -700			
630	800									-290 -370	-290 -415	-290 -490	-290 -610	-290 -790			
800	1 000									-320 -410	-320 -460	-320 -550	-320 -680	-320 -880			
1 000	1 250									-350 -455	-350 -515	-350 -610	-350 -770	-350 -1 010			
1 250	1 600									-390 -515	-390 -585	-390 -700	-390 -890	-390 -1 170			
1 600	2 000									-430 -580	-430 -660	-430 -800	-430 -1 030	-430 -1 350			
2 000	2 500									-480 -655	-480 -760	-480 -920	-480 -1 180	-480 -1 580			
2 500	3 150									-520 -730	-520 -850	-520 -1 060	-520 -1 380	-520 -1 870			

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 ISO 286-1.

Table 19 — Limit deviations for shafts e and ef

Upper limit deviation = es
Lower limit deviation = ei

Deviations in micrometres

Basic size mm		e						ef ¹⁾							
Above	Up to and in- cluding	5	6	7	8	9	10	3	4	5	6	7	8	9	10
—	3	-14 -18	-14 -20	-14 -24	-14 -28	-14 -39	-14 -54	-10 -12	-10 -13	-10 -14	-10 -16	-10 -20	-10 -24	-10 -35	-10 -50
3	6	-20 -25	-20 -28	-20 -32	-20 -38	-20 -50	-20 -68	-14 -16,5	-14 -18	-14 -19	-14 -22	-14 -26	-14 -32	-14 -44	-14 -62
6	10	-25 -31	-25 -34	-25 -40	-25 -47	-25 -61	-25 -83	-18 -20,5	-18 -22	-18 -24	-18 -27	-18 -33	-18 -40	-18 -54	-18 -76
10	18	-32 -40	-32 -43	-32 -50	-32 -59	-32 -75	-32 -102								
18	30	-40 -49	-40 -53	-40 -61	-40 -73	-40 -92	-40 -124								
30	50	-50 -61	-50 -66	-50 -75	-50 -89	-50 -112	-50 -150								
50	80	-60 -73	-60 -79	-60 -90	-60 -106	-60 -134	-60 -180								
80	120	-72 -87	-72 -94	-72 -107	-72 -126	-72 -159	-72 -212								
120	180	-85 -103	-85 -110	-85 -125	-85 -148	-85 -185	-85 -245								
180	250	-100 -120	-100 -129	-100 -146	-100 -172	-100 -215	-100 -285								
250	315	-110 -133	-110 -142	-110 -162	-110 -191	-110 -240	-110 -320								
315	400	-125 -150	-125 -161	-125 -182	-125 -214	-125 -265	-125 -355								
400	500	-135 -162	-135 -175	-135 -198	-135 -232	-135 -290	-135 -385								
500	630		-145 -189	-145 -215	-145 -255	-145 -320	-145 -425								
630	800		-160 -210	-160 -240	-160 -285	-160 -360	-160 -480								
800	1 000		-170 -226	-170 -260	-170 -310	-170 -400	-170 -530								
1 000	1 250		-195 -261	-195 -300	-195 -360	-195 -455	-195 -615								
1 250	1 600		-220 -298	-220 -345	-220 -415	-220 -530	-220 -720								
1 600	2 000		-240 -332	-240 -390	-240 -470	-240 -610	-240 -840								
2 000	2 500		-260 -370	-260 -435	-260 -540	-260 -700	-260 -960								
2 500	3 150		-290 -425	-290 -500	-290 -620	-290 -830	-290 -1 150								

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 ISO 286-1.

Table 20 — Limit deviations for shafts f and fg

Upper limit deviation = *es*
Lower limit deviation = *ei*

Deviations in micrometres

Basic size mm		f								fg ¹⁾							
Above	Up to and in- cluding	3	4	5	6	7	8	9	10	3	4	5	6	7	8	9	10
—	3	-6 -8	-6 -9	-6 -10	-6 -12	-6 -16	-6 -20	-6 -31	-6 -46	-4 -6	-4 -7	-4 -8	-4 -10	-4 -14	-4 -18	-4 -29	-4 -44
3	6	-10 -12,5	-10 -14	-10 -15	-10 -18	-10 -22	-10 -28	-10 -40	-10 -58	-6 -8,5	-6 -10	-6 -11	-6 -14	-6 -18	-6 -24	-6 -36	-6 -54
6	10	-13 -15,5	-13 -17	-13 -19	-13 -22	-13 -28	-13 -35	-13 -49	-13 -71	-8 -10,5	-8 -12	-8 -14	-8 -17	-8 -23	-8 -30	-8 -44	-8 -66
10	18	-16 -19	-16 -21	-16 -24	-16 -27	-16 -34	-16 -43	-16 -59	-16 -86								
18	30	-20 -24	-20 -26	-20 -29	-20 -33	-20 -41	-20 -53	-20 -72	-20 -104								
30	50	-25 -29	-25 -32	-25 -36	-25 -41	-25 -50	-25 -64	-25 -87	-25 -125								
50	80		-30 -38	-30 -43	-30 -49	-30 -60	-30 -76	-30 -104									
80	120		-36 -46	-36 -51	-36 -58	-36 -71	-36 -90	-36 -123									
120	180		-43 -55	-43 -61	-43 -68	-43 -83	-43 -106	-43 -143									
180	250		-50 -64	-50 -70	-50 -79	-50 -96	-50 -122	-50 -165									
250	315		-56 -72	-56 -79	-56 -88	-56 -108	-56 -137	-56 -185									
315	400		-62 -80	-62 -87	-62 -98	-62 -119	-62 -151	-62 -202									
400	500		-68 -88	-68 -95	-68 -108	-68 -131	-68 -165	-68 -223									
500	630				-76 -120	-76 -146	-76 -186	-76 -251									
630	800				-80 -130	-80 -160	-80 -205	-80 -280									
800	1 000				-86 -142	-86 -176	-86 -226	-86 -316									
1 000	1 250				-98 -164	-98 -203	-98 -263	-98 -358									
1 250	1 600				-110 -188	-110 -235	-110 -305	-110 -420									
1 600	2 000				-120 -212	-120 -270	-120 -350	-120 -490									
2 000	2 500				-130 -240	-130 -305	-130 -410	-130 -570									
2 500	3 150				-145 -280	-145 -355	-145 -475	-145 -685									

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 ISO 286-1.

Table 21 – Limit deviations for shafts g

Upper limit deviation = es

Lower limit deviation = ei

Deviations in micrometres

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

Table 22 – Limit deviations for shafts h

Upper limit deviation = *es*
Lower limit deviation = *ei*

Basic size		h																	
mm		1	2	3	4	5	6	7	8	9	10	11	12	13	14 ¹⁾	15 ¹⁾	16 ¹⁾	17	18
Above	Up to and including	Deviations																	
		µm									mm								
—	3 ¹⁾	0 -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		
3	6	0 -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
6	10	0 -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
10	18	0 -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
18	30	0 -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
30	50	0 -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
50	80	0 -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
80	120	0 -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
120	180	0 -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
180	250	0 -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
250	315	0 -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
315	400	0 -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
400	500	0 -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
2)																			
500	630	0 -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
630	800	0 -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
800	1 000	0 -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
1 000	1 250	0 -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
1 250	1 600	0 -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
1 600	2 000	0 -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
2 000	2 500	0 -22	0 -30	0 -41	0 -55	0 -78	0 -110	0 -175	0 -280	0 -440	0 -700	0 -1 100	0 -1,75	0 -2,8	0 -4,4	0 -7	0 -11	0 -17,5	0 -28
2 500	3 150	0 -26	0 -36	0 -50	0 -68	0 -96	0 -135	0 -210	0 -330	0 -540	0 -860	0 -1 350	0 -2,1	0 -3,3	0 -5,4	0 -8,6	0 -13,5	0 -21	0 -33

1) Tolerance grades IT14 to IT16 (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.

Table 23 — Limit deviations¹⁾ for shafts js

Upper limit deviation = *es*

Lower limit deviation = *ei*

Basic size mm		js ²⁾																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14 ³⁾	15 ³⁾	16 ³⁾	17	18
Above	Up to and including	Deviations																	
		µm												mm					
—	3 ³⁾	±0,4	±0,6	±1	±1,5	±2	±3	±5	±7	±12,5	±20	±30	±0,05	±0,07	±0,125	±0,2	±0,3		
3	6	±0,5	±0,75	±1,25	±2	±2,5	±4	±6	±9	±15	±24	±37,5	±0,06	±0,09	±0,15	±0,24	±0,375	±0,6	±0,9
6	10	±0,5	±0,75	±1,25	±2	±3	±4,5	±7,5	±11	±18	±29	±45	±0,075	±0,11	±0,18	±0,29	±0,45	±0,75	±1,1
10	18	±0,6	±1	±1,5	±2,5	±4	±5,5	±9	±13,5	±21,5	±35	±55	±0,09	±0,135	±0,215	±0,35	±0,55	±0,9	±1,35
18	30	±0,75	±1,25	±2	±3	±4,5	±6,5	±10,5	±16,5	±26	±42	±65	±0,105	±0,165	±0,26	±0,42	±0,65	±1,05	±1,65
30	50	±0,75	±1,25	±2	±3,5	±5,5	±8	±12,5	±19,5	±31	±50	±80	±0,125	±0,195	±0,31	±0,5	±0,8	±1,25	±1,95
50	80	±1	±1,5	±2,5	±4	±6,5	±9,5	±15	±23	±37	±60	±95	±0,15	±0,23	±0,37	±0,6	±0,95	±1,5	±2,3
80	120	±1,25	±2	±3	±5	±7,5	±11	±17,5	±27	±43,5	±70	±110	±0,175	±0,27	±0,435	±0,7	±1,1	±1,75	±2,7
120	180	±1,75	±2,5	±4	±6	±9	±12,5	±20	±31,5	±50	±80	±125	±0,2	±0,315	±0,5	±0,8	±1,25	±2	±3,15
180	250	±2,25	±3,5	±5	±7	±10	±14,5	±23	±36	±57,5	±92,5	±145	±0,23	±0,36	±0,575	±0,925	±1,45	±2,3	±3,6
250	315	±3	±4	±6	±8	±11,5	±16	±26	±40,5	±65	±105	±160	±0,26	±0,405	±0,65	±1,05	±1,6	±2,6	±4,05
315	400	±3,5	±4,5	±6,5	±9	±12,5	±18	±28,5	±44,5	±70	±115	±180	±0,285	±0,445	±0,7	±1,15	±1,8	±2,85	±4,45
400	500	±4	±5	±7,5	±10	±13,5	±20	±31,5	±48,5	±77,5	±125	±200	±0,315	±0,485	±0,775	±1,25	±2	±3,15	±4,85
		4)																	
500	630	±4,5	±5,5	±8	±11	±16	±22	±35	±55	±87,5	±140	±220	±0,35	±0,55	±0,875	±1,4	±2,2	±3,5	±5,5
630	800	±5	±6,5	±9	±12,5	±18	±25	±40	±62,5	±100	±160	±250	±0,4	±0,625	±1	±1,6	±2,5	±4	±6,25
800	1 000	±5,5	±7,5	±10,5	±14	±20	±28	±45	±70	±115	±180	±280	±0,45	±0,7	±1,15	±1,8	±2,8	±4,5	±7
1 000	1 250	±6,5	±9	±12	±16,5	±23,5	±33	±52,5	±82,5	±130	±210	±330	±0,525	±0,825	±1,3	±2,1	±3,3	±5,25	±8,25
1 250	1 600	±7,5	±10,5	±14,5	±19,5	±27,5	±39	±62,5	±97,5	±155	±250	±390	±0,625	±0,975	±1,55	±2,5	±3,9	±6,25	±9,75
1 600	2 000	±9	±12,5	±17,5	±23	±32,5	±46	±75	±115	±185	±300	±460	±0,75	±1,15	±1,85	±3	±4,6	±7,5	±11,5
2 000	2 500	±11	±15	±20,5	±27,5	±39	±55	±87,5	±140	±220	±350	±550	±0,875	±1,4	±2,2	±3,5	±5,5	±8,75	±14
2 500	3 150	±13	±18	±25	±34	±48	±67,5	±105	±165	±270	±430	±675	±1,05	±1,65	±2,7	±4,3	±6,75	±10,5	±16,5

1) In order to avoid repetition of equal values, the table lists the values as "±x"; this is to be interpreted as *es* = +x and *ei* = -x, e.g. $\begin{matrix} +0,23 \\ -0,23 \end{matrix}$ µm.

2) The table gives the exact values derived from $\pm \frac{IT}{2}$, either in micrometres or millimetres. For tolerance classes js7 to js11 (incl.), the values with decimal fractions of 0,5 µm may possibly be rounded in national standards by replacing the exact value by the integer immediately below, e.g. ±19,5 µm may be rounded to ±19 µm.

3) Tolerance grades IT14 to IT16 (incl.) shall not be used for basic sizes less than or equal to 1 mm.

4) The values 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.

Table 24 — Limit deviations for shafts j and k

Upper limit deviation = *es*
Lower limit deviation = *ei*

Deviations in micrometres

Basic size mm		j				k											
Above	Up to and including	5 ¹⁾	6 ¹⁾	7 ¹⁾	8	3	4	5	6	7	8	9	10	11	12	13	
—	3	± 2	+ 4 - 2	+ 6 - 4	+ 8 - 6	+ 2 0	+ 3 0	+ 4 0	+ 6 0	+ 10 0	+ 14 0	+ 25 0	+ 40 0	+ 60 0	+ 100 0	+ 140 0	
3	6	+ 3 - 2	+ 6 - 2	+ 8 - 4		+ 2,5 0	+ 5 + 1	+ 6 + 1	+ 9 + 1	+ 13 + 1	+ 18 0	+ 30 0	+ 48 0	+ 75 0	+ 120 0	+ 180 0	
6	10	+ 4 - 2	+ 7 - 2	+ 10 - 5		+ 2,5 0	+ 5 + 1	+ 7 + 1	+ 10 + 1	+ 16 + 1	+ 22 0	+ 36 0	+ 58 0	+ 90 0	+ 150 0	+ 220 0	
10	18	+ 5 - 3	+ 8 - 3	+ 12 - 6		+ 3 0	+ 6 + 1	+ 9 + 1	+ 12 + 1	+ 19 + 1	+ 27 0	+ 43 0	+ 70 0	+ 110 0	+ 180 0	+ 270 0	
18	30	+ 5 - 4	+ 9 - 4	+ 13 - 8		+ 4 0	+ 8 + 2	+ 11 + 2	+ 15 + 2	+ 23 + 2	+ 33 0	+ 52 0	+ 84 0	+ 130 0	+ 210 0	+ 300 0	
30	50	+ 6 - 5	+ 11 - 5	+ 15 - 10		+ 4 0	+ 9 + 2	+ 13 + 2	+ 18 + 2	+ 27 + 2	+ 39 0	+ 62 0	+ 100 0	+ 160 0	+ 250 0	+ 390 0	
50	80	+ 6 - 7	+ 12 - 7	+ 18 - 12			+ 10 + 2	+ 15 + 2	+ 21 + 2	+ 32 + 2	+ 46 0	+ 74 0	+ 120 0	+ 190 0	+ 300 0	+ 460 0	
80	120	+ 6 - 9	+ 13 - 9	+ 20 - 15			+ 13 + 3	+ 18 + 3	+ 25 + 3	+ 38 + 3	+ 54 0	+ 87 0	+ 140 0	+ 220 0	+ 350 0	+ 540 0	
120	180	+ 7 - 11	+ 14 - 11	+ 22 - 18			+ 15 + 3	+ 21 + 3	+ 28 + 3	+ 43 + 3	+ 63 0	+ 100 0	+ 160 0	+ 250 0	+ 400 0	+ 630 0	
180	250	+ 7 - 13	+ 16 - 13	+ 25 - 21			+ 18 + 4	+ 24 + 4	+ 33 + 4	+ 50 + 4	+ 72 0	+ 115 0	+ 185 0	+ 290 0	+ 460 0	+ 720 0	
250	315	+ 7 - 16	± 16	± 26			+ 20 + 4	+ 27 + 4	+ 36 + 4	+ 56 + 4	+ 81 0	+ 130 0	+ 210 0	+ 320 0	+ 520 0	+ 810 0	
315	400	+ 7 - 18	± 18	+ 29 - 28			+ 22 + 4	+ 29 + 4	+ 40 + 4	+ 61 + 4	+ 89 0	+ 140 0	+ 230 0	+ 360 0	+ 570 0	+ 890 0	
400	500	+ 7 - 20	± 20	+ 31 - 32			+ 25 + 5	+ 32 + 5	+ 45 + 5	+ 68 + 5	+ 97 0	+ 155 0	+ 250 0	+ 400 0	+ 630 0	+ 970 0	
500	630								+ 44 0	+ 70 0	+ 110 0	+ 175 0	+ 280 0	+ 440 0	+ 700 0	+ 1 100 0	
630	800								+ 50 0	+ 80 0	+ 125 0	+ 200 0	+ 320 0	+ 500 0	+ 800 0	+ 1 250 0	
800	1 000								+ 56 0	+ 90 0	+ 140 0	+ 230 0	+ 360 0	+ 560 0	+ 900 0	+ 1 400 0	
1 000	1 250								+ 66 0	+ 105 0	+ 165 0	+ 260 0	+ 420 0	+ 660 0	+ 1 050 0	+ 1 650 0	
1 250	1 600								+ 78 0	+ 125 0	+ 195 0	+ 310 0	+ 500 0	+ 780 0	+ 1 250 0	+ 1 950 0	
1 600	2 000								+ 92 0	+ 150 0	+ 230 0	+ 370 0	+ 600 0	+ 920 0	+ 1 500 0	+ 2 300 0	
2 000	2 500								+ 110 0	+ 175 0	+ 280 0	+ 440 0	+ 700 0	+ 1 100 0	+ 1 750 0	+ 2 800 0	
2 500	3 150								+ 135 0	+ 210 0	+ 330 0	+ 540 0	+ 880 0	+ 1 350 0	+ 2 100 0	+ 3 300 0	

1) Where values for j5, j6 and j7 are shown as "±x", they are identical with the tolerance class js5, js6 or js7 for that basic size step.

Table 25 — Limit deviations for shafts m and n

Upper limit deviation = es

Lower limit deviation = ei

Deviations in micrometres

Basic size mm		m							n						
Above	Up to and including	3	4	5	6	7	8	9	3	4	5	6	7	8	9
—	3	+ 4 + 2	+ 5 + 2	+ 6 + 2	+ 8 + 2	+ 12 + 2	+16 + 2	+27 + 2	+ 6 + 4	+ 7 + 4	+ 8 + 4	+ 10 + 4	+ 14 + 4	+18 + 4	+29 + 4
3	6	+ 6,5 + 4	+ 8 + 4	+ 9 + 4	+ 12 + 4	+ 16 + 4	+22 + 4	+34 + 4	+10,5 + 8	+12 + 8	+13 + 8	+ 16 + 8	+ 20 + 8	+26 + 8	+38 + 8
6	10	+ 8,5 + 6	+10 + 6	+12 + 6	+ 15 + 6	+ 21 + 6	+28 + 6	+42 + 6	+12,5 +10	+14 +10	+16 +10	+ 19 + 10	+ 25 + 10	+32 +10	+46 +10
10	18	+10 + 7	+12 + 7	+15 + 7	+ 18 + 7	+ 25 + 7	+34 + 7	+50 + 7	+15 +12	+17 +12	+20 +12	+ 23 + 12	+ 30 + 12	+39 +12	+55 +12
18	30	+12 + 8	+14 + 8	+17 + 8	+ 21 + 8	+ 29 + 8	+41 + 8	+60 + 8	+19 +15	+21 +15	+24 +15	+ 28 + 15	+ 36 + 15	+48 +15	+67 +15
30	50	+13 + 9	+16 + 9	+20 + 9	+ 25 + 9	+ 34 + 9	+48 + 9	+71 + 9	+21 +17	+24 +17	+28 +17	+ 33 + 17	+ 42 + 17	+56 +17	+79 +17
50	80		+19 +11	+24 +11	+ 30 + 11	+ 41 + 11				+28 +20	+33 +20	+ 39 + 20	+ 50 + 20		
80	120		+23 +13	+28 +13	+ 35 + 13	+ 48 + 13				+33 +23	+38 +23	+ 45 + 23	+ 58 + 23		
120	180		+27 +15	+33 +15	+ 40 + 15	+ 55 + 15				+39 +27	+45 +27	+ 52 + 27	+ 67 + 27		
180	250		+31 +17	+37 +17	+ 46 + 17	+ 63 + 17				+45 +31	+51 +31	+ 60 + 31	+ 77 + 31		
250	315		+36 +20	+43 +20	+ 52 + 20	+ 72 + 20				+50 +34	+57 +34	+ 66 + 34	+ 86 + 34		
315	400		+39 +21	+46 +21	+ 57 + 21	+ 78 + 21				+55 +37	+62 +37	+ 73 + 37	+ 94 + 37		
400	500		+43 +23	+50 +23	+ 63 + 23	+ 86 + 23				+60 +40	+67 +40	+ 80 + 40	+103 + 40		
500	630				+ 70 + 26	+ 96 + 26						+ 88 + 44	+114 + 44		
630	800				+ 80 + 30	+110 + 30						+100 + 50	+130 + 50		
800	1 000				+ 90 + 34	+124 + 34						+112 + 56	+146 + 56		
1 000	1 250				+106 + 40	+145 + 40						+132 + 66	+171 + 66		
1 250	1 600				+126 + 48	+173 + 48						+156 + 78	+203 + 78		
1 600	2 000				+150 + 58	+208 + 58						+184 + 92	+242 + 92		
2 000	2 500				+178 + 68	+243 + 68						+220 +110	+285 +110		
2 500	3 150				+211 + 76	+286 + 76						+270 +135	+345 +135		

Table 26 — Limit deviations for shafts p

Upper limit deviation = *es*

Lower limit deviation = *ei*

Deviations in micrometres

Basic size mm		p							
Above	Up to and including	3	4	5	6	7	8	9	10
—	3	+ 8 + 6	+ 9 + 6	+10 + 6	+ 12 + 6	+ 16 + 6	+ 20 + 6	+31 + 6	+ 46 + 6
3	6	+14,5 +12	+16 +12	+17 +12	+ 20 + 12	+ 24 + 12	+ 30 + 12	+42 +12	+ 60 + 12
6	10	+17,5 +15	+19 +15	+21 +15	+ 24 + 15	+ 30 + 15	+ 37 + 15	+51 +15	+ 73 + 15
10	18	+21 +18	+23 +18	+26 +18	+ 29 + 18	+ 36 + 18	+ 45 + 18	+61 +18	+ 88 + 18
18	30	+26 +22	+28 +22	+31 +22	+ 35 + 22	+ 43 + 22	+ 55 + 22	+74 +22	+106 + 22
30	50	+30 +26	+33 +26	+37 +26	+ 42 + 26	+ 51 + 26	+ 65 + 26	+88 +26	+126 + 26
50	80		+40 +32	+45 +32	+ 51 + 32	+ 62 + 32	+ 78 + 32		
80	120		+47 +37	+52 +37	+ 59 + 37	+ 72 + 37	+ 91 + 37		
120	180		+55 +43	+61 +43	+ 68 + 43	+ 83 + 43	+106 + 43		
180	250		+64 +50	+70 +50	+ 79 + 50	+ 96 + 50	+122 + 50		
250	315		+72 +56	+79 +56	+ 88 + 56	+108 + 56	+137 + 56		
315	400		+80 +62	+87 +62	+ 98 + 62	+119 + 62	+151 + 62		
400	500		+88 +68	+95 +68	+108 + 68	+131 + 68	+165 + 68		
500	630				+122 + 78	+148 + 78	+188 + 78		
630	800				+138 + 98	+168 + 88	+213 + 88		
800	1 000				+156 +100	+190 +100	+240 +100		
1 000	1 250				+186 +120	+225 +120	+285 +120		
1 250	1 600				+218 +140	+265 +140	+335 +140		
1 600	2 000				+262 +170	+320 +170	+400 +170		
2 000	2 500				+305 +195	+370 +195	+475 +195		
2 500	3 150				+375 +240	+450 +240	+570 +240		

Table 27 — Limit deviations for shafts r

Upper limit deviation = *es*
Lower limit deviation = *ei*

Basic size mm		r							
Above	Up to and in- cluding	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
3	6	+17,5 +15	+19 +15	+20 +15	+23 +15	+27 +15	+33 +15	+45 +15	+63 +15
6	10	+21,5 +19	+23 +19	+25 +19	+28 +19	+34 +19	+41 +19	+55 +19	+77 +19
10	18	+26 +23	+28 +23	+31 +23	+34 +23	+41 +23	+50 +23	+66 +23	+93 +23
18	30	+32 +28	+34 +28	+37 +28	+41 +28	+49 +28	+61 +28	+80 +28	+112 +28
30	50	+38 +34	+41 +34	+45 +34	+50 +34	+59 +34	+73 +34	+96 +34	+134 +34
50	65		+49 +41	+54 +41	+60 +41	+71 +41	+87 +41		
65	80		+51 +43	+56 +43	+62 +43	+73 +43	+89 +43		
80	100		+61 +51	+66 +51	+73 +51	+86 +51	+105 +51		
100	120		+64 +54	+69 +54	+76 +54	+89 +54	+108 +54		
120	140		+75 +63	+81 +63	+88 +63	+103 +63	+126 +63		
140	160		+77 +65	+83 +65	+90 +65	+105 +65	+128 +65		
160	180		+80 +68	+86 +68	+93 +68	+108 +68	+131 +68		
180	200		+91 +77	+97 +77	+106 +77	+123 +77	+149 +77		
200	225		+94 +80	+100 +80	+109 +80	+126 +80	+152 +80		
225	250		+98 +84	+104 +84	+113 +84	+130 +84	+156 +84		
250	280		+110 +94	+117 +94	+126 +94	+146 +94	+175 +94		
280	315		+114 +98	+121 +98	+130 +98	+150 +98	+179 +98		
315	355		+126 +108	+133 +108	+144 +108	+165 +108	+197 +108		
355	400		+132 +114	+139 +114	+150 +114	+171 +114	+203 +114		
400	450		+146 +126	+153 +126	+166 +126	+189 +126	+223 +126		
450	500		+152 +132	+159 +132	+172 +132	+195 +132	+229 +132		

Deviations in micrometres

Basic size mm		r		
Above	Up to and in- cluding	6	7	8
500	560	+194 +150	+220 +150	+260 +150
560	630	+199 +155	+225 +155	+265 +155
630	710	+225 +175	+255 +175	+300 +175
710	800	+235 +185	+265 +185	+310 +185
800	900	+266 +210	+300 +210	+350 +210
900	1 000	+276 +220	+310 +220	+360 +220
1 000	1 120	+316 +250	+355 +250	+415 +250
1 120	1 250	+326 +260	+365 +260	+425 +260
1 250	1 400	+378 +300	+425 +300	+495 +300
1 400	1 600	+408 +330	+455 +330	+525 +330
1 600	1 800	+462 +370	+520 +370	+600 +370
1 800	2 000	+492 +400	+550 +400	+630 +400
2 000	2 240	+550 +440	+615 +440	+720 +440
2 240	2 500	+570 +460	+635 +460	+740 +460
2 500	2 800	+685 +550	+760 +550	+880 +550
2 800	3 150	+715 +580	+790 +580	+910 +580

Table 28 — Limit deviations for shafts *s*

Upper limit deviation = *es*
Lower limit deviation = *ei*

Basic size mm		<i>s</i>							
Above	Up to and in- cluding	3	4	5	6	7	8	9	10
—	3	+16 +14	+17 +14	+18 +14	+20 +14	+24 +14	+28 +14	+39 +14	+54 +14
3	6	+21,5 +19	+23 +19	+24 +19	+27 +19	+31 +19	+37 +19	+49 +19	+67 +19
6	10	+25,5 +23	+27 +23	+29 +23	+32 +23	+38 +23	+45 +23	+59 +23	+81 +23
10	18	+31 +28	+33 +28	+36 +28	+39 +28	+46 +28	+55 +28	+71 +28	+98 +28
18	30	+39 +35	+41 +35	+44 +35	+48 +35	+56 +35	+68 +35	+87 +35	+119 +35
30	50	+47 +43	+50 +43	+54 +43	+59 +43	+68 +43	+82 +43	+105 +43	+143 +43
50	65		+61 +53	+66 +53	+72 +53	+83 +53	+99 +53	+127 +53	
65	80		+67 +59	+72 +59	+78 +59	+89 +59	+105 +59	+133 +59	
80	100		+81 +71	+86 +71	+93 +71	+106 +71	+125 +71	+158 +71	
100	120		+89 +79	+94 +79	+101 +79	+114 +79	+133 +79	+166 +79	
120	140		+104 +92	+110 +92	+117 +92	+132 +92	+155 +92	+192 +92	
140	160		+112 +100	+118 +100	+125 +100	+140 +100	+163 +100	+200 +100	
160	180		+120 +108	+126 +108	+133 +108	+148 +108	+171 +108	+208 +108	
180	200		+136 +122	+142 +122	+151 +122	+168 +122	+194 +122	+237 +122	
200	225		+144 +130	+150 +130	+159 +130	+176 +130	+202 +130	+245 +130	
225	250		+154 +140	+160 +140	+169 +140	+186 +140	+212 +140	+255 +140	
250	280		+174 +158	+181 +158	+190 +158	+210 +158	+239 +158	+288 +158	
280	315		+186 +170	+193 +170	+202 +170	+222 +170	+251 +170	+300 +170	
315	355		+208 +190	+215 +190	+226 +190	+247 +190	+279 +190	+330 +190	
355	400		+226 +208	+233 +208	+244 +208	+265 +208	+297 +208	+348 +208	
400	450		+252 +232	+259 +232	+272 +232	+295 +232	+329 +232	+387 +232	
450	500		+272 +252	+279 +252	+292 +252	+315 +252	+349 +252	+407 +252	

Deviations in micrometres

Basic size mm		<i>s</i>		
Above	Up to and in- cluding	6	7	8
500	560	+324 +280	+350 +280	+390 +280
560	630	+354 +310	+380 +310	+420 +310
630	710	+390 +340	+420 +340	+465 +340
710	800	+430 +380	+460 +380	+505 +380
800	900	+486 +430	+520 +430	+570 +430
900	1 000	+526 +470	+560 +470	+610 +470
1 000	1 120	+586 +520	+625 +520	+685 +520
1 120	1 250	+646 +580	+685 +580	+745 +580
1 250	1 400	+718 +640	+765 +640	+835 +640
1 400	1 600	+798 +720	+845 +720	+915 +720
1 600	1 800	+912 +820	+970 +820	+1 050 +820
1 800	2 000	+1 012 +920	+1 070 +920	+1 150 +920
2 000	2 240	+1 110 +1 000	+1 175 +1 000	+1 280 +1 000
2 240	2 500	+1 210 +1 100	+1 275 +1 100	+1 380 +1 100
2 500	2 800	+1 385 +1 250	+1 460 +1 250	+1 580 +1 250
2 800	3 150	+1 535 +1 400	+1 610 +1 400	+1 730 +1 400

Table 29 — Limit deviations for shafts t and u

Upper limit deviation = *es*
Lower limit deviation = *ei*

Deviations in micrometres

Basic size mm		t 1)				u				
Above	Up to and in- cluding	5	6	7	8	5	6	7	8	9
—	3					+ 22 + 18	+ 24 + 18	+ 28 + 18	+ 32 + 18	+ 43 + 18
3	6					+ 28 + 23	+ 31 + 23	+ 35 + 23	+ 41 + 23	+ 53 + 23
6	10					+ 34 + 28	+ 37 + 28	+ 43 + 28	+ 50 + 28	+ 64 + 28
10	18					+ 41 + 33	+ 44 + 33	+ 51 + 33	+ 60 + 33	+ 76 + 33
18	24					+ 50 + 41	+ 54 + 41	+ 62 + 41	+ 74 + 41	+ 93 + 41
24	30	+ 50 + 41	+ 54 + 41	+ 62 + 41	+ 74 + 41	+ 57 + 48	+ 61 + 48	+ 69 + 48	+ 81 + 48	+ 100 + 48
30	40	+ 59 + 48	+ 64 + 48	+ 73 + 48	+ 87 + 48	+ 71 + 60	+ 76 + 60	+ 85 + 60	+ 99 + 60	+ 122 + 60
40	50	+ 65 + 54	+ 70 + 54	+ 79 + 54	+ 93 + 54	+ 81 + 70	+ 86 + 70	+ 95 + 70	+ 109 + 70	+ 132 + 70
50	65	+ 79 + 66	+ 85 + 66	+ 96 + 66	+ 112 + 66	+ 100 + 87	+ 106 + 87	+ 117 + 87	+ 133 + 87	+ 161 + 87
65	80	+ 88 + 75	+ 94 + 75	+ 105 + 75	+ 121 + 75	+ 115 + 102	+ 121 + 102	+ 132 + 102	+ 148 + 102	+ 176 + 102
80	100	+ 106 + 91	+ 113 + 91	+ 126 + 91	+ 145 + 91	+ 139 + 124	+ 146 + 124	+ 159 + 124	+ 178 + 124	+ 211 + 124
100	120	+ 119 + 104	+ 126 + 104	+ 139 + 104	+ 158 + 104	+ 159 + 144	+ 166 + 144	+ 179 + 144	+ 198 + 144	+ 231 + 144
120	140	+ 140 + 122	+ 147 + 122	+ 162 + 122	+ 185 + 122	+ 188 + 170	+ 195 + 170	+ 210 + 170	+ 233 + 170	+ 270 + 170
140	160	+ 152 + 134	+ 159 + 134	+ 174 + 134	+ 197 + 134	+ 208 + 190	+ 215 + 190	+ 230 + 190	+ 253 + 190	+ 290 + 190
160	180	+ 164 + 146	+ 171 + 146	+ 186 + 146	+ 209 + 146	+ 228 + 210	+ 235 + 210	+ 250 + 210	+ 273 + 210	+ 310 + 210
180	200	+ 186 + 166	+ 195 + 166	+ 212 + 166	+ 238 + 166	+ 256 + 236	+ 265 + 236	+ 282 + 236	+ 308 + 236	+ 351 + 236
200	225	+ 200 + 180	+ 209 + 180	+ 226 + 180	+ 252 + 180	+ 278 + 258	+ 287 + 258	+ 304 + 258	+ 330 + 258	+ 373 + 258
225	250	+ 216 + 196	+ 225 + 196	+ 242 + 196	+ 268 + 196	+ 304 + 284	+ 313 + 284	+ 330 + 284	+ 356 + 284	+ 399 + 284
250	280	+ 241 + 218	+ 250 + 218	+ 270 + 218	+ 299 + 218	+ 338 + 315	+ 347 + 315	+ 367 + 315	+ 396 + 315	+ 445 + 315
280	315	+ 263 + 240	+ 272 + 240	+ 292 + 240	+ 321 + 240	+ 373 + 350	+ 382 + 350	+ 402 + 350	+ 431 + 350	+ 480 + 350
315	355	+ 293 + 268	+ 304 + 268	+ 325 + 268	+ 357 + 268	+ 415 + 390	+ 426 + 390	+ 447 + 390	+ 479 + 390	+ 530 + 390
355	400	+ 319 + 294	+ 330 + 294	+ 351 + 294	+ 383 + 294	+ 460 + 435	+ 471 + 435	+ 492 + 435	+ 524 + 435	+ 575 + 435
400	450	+ 357 + 330	+ 370 + 330	+ 393 + 330	+ 427 + 330	+ 517 + 490	+ 530 + 490	+ 553 + 490	+ 587 + 490	+ 645 + 490
450	500	+ 387 + 360	+ 400 + 360	+ 423 + 360	+ 457 + 360	+ 567 + 540	+ 580 + 540	+ 603 + 540	+ 637 + 540	+ 695 + 540

Basic size mm		t		u		
Above	Up to and in- cluding	6	7	6	7	8
500	560	+ 444 + 400	+ 470 + 400	+ 644 + 600	+ 670 + 600	+ 710 + 600
560	630	+ 494 + 450	+ 520 + 450	+ 704 + 660	+ 730 + 660	+ 770 + 660
630	710	+ 550 + 500	+ 580 + 500	+ 790 + 740	+ 820 + 740	+ 865 + 740
710	800	+ 610 + 560	+ 640 + 560	+ 890 + 840	+ 920 + 840	+ 965 + 840
800	900	+ 676 + 620	+ 710 + 620	+ 996 + 940	+ 1 030 + 940	+ 1 080 + 940
900	1 000	+ 736 + 680	+ 770 + 680	+ 1 106 + 1 050	+ 1 140 + 1 050	+ 1 190 + 1 050
1 000	1 120	+ 846 + 780	+ 885 + 780	+ 1 216 + 1 150	+ 1 255 + 1 150	+ 1 315 + 1 150
1 120	1 250	+ 906 + 840	+ 945 + 840	+ 1 366 + 1 300	+ 1 405 + 1 300	+ 1 465 + 1 300
1 250	1 400	+ 1 038 + 960	+ 1 085 + 960	+ 1 528 + 1 450	+ 1 575 + 1 450	+ 1 645 + 1 450
1 400	1 600	+ 1 128 + 1 050	+ 1 175 + 1 050	+ 1 678 + 1 600	+ 1 725 + 1 600	+ 1 795 + 1 600
1 600	1 800	+ 1 292 + 1 200	+ 1 350 + 1 200	+ 1 942 + 1 850	+ 2 000 + 1 850	+ 2 080 + 1 850
1 800	2 000	+ 1 442 + 1 350	+ 1 500 + 1 350	+ 2 092 + 2 000	+ 2 150 + 2 000	+ 2 230 + 2 000
2 000	2 240	+ 1 610 + 1 500	+ 1 675 + 1 500	+ 2 410 + 2 300	+ 2 475 + 2 300	+ 2 580 + 2 300
2 240	2 500	+ 1 760 + 1 650	+ 1 825 + 1 650	+ 2 610 + 2 500	+ 2 675 + 2 500	+ 2 780 + 2 500
2 500	2 800	+ 2 035 + 1 900	+ 2 110 + 1 900	+ 3 035 + 2 900	+ 3 110 + 2 900	+ 3 230 + 2 900
2 800	3 150	+ 2 235 + 2 100	+ 2 310 + 2 100	+ 3 335 + 3 200	+ 3 410 + 3 200	+ 3 530 + 3 200

1) Tolerance classes t5 to t8 (incl.) have not been tabulated for basic sizes less than or equal to 24 mm. It is recommended that tolerance classes u5 to u8 (incl.) be used instead. However, if tolerance classes t5 to t8 (incl.) are especially required, they may be calculated from the bases given in ISO 286-1

Table 30 — Limit deviations for shafts v, x and y¹⁾

Upper limit deviation = *es*
Lower limit deviation = *ei*

Deviations in micrometres

Basic size mm		v ²⁾				x						y ³⁾				
Above	Up to and including	5	6	7	8	5	6	7	8	9	10	6	7	8	9	10
—	3					+ 24 + 20	+ 26 + 20	+ 30 + 20	+ 34 + 20	+ 45 + 20	+ 60 + 20					
3	6					+ 33 + 28	+ 36 + 28	+ 40 + 28	+ 46 + 28	+ 58 + 28	+ 76 + 28					
6	10					+ 40 + 34	+ 43 + 34	+ 49 + 34	+ 56 + 34	+ 70 + 34	+ 92 + 34					
10	14					+ 48 + 40	+ 51 + 40	+ 58 + 40	+ 67 + 40	+ 83 + 40	+ 110 + 40					
14	18	+ 47 + 39	+ 50 + 39	+ 57 + 39	+ 66 + 39	+ 53 + 45	+ 56 + 45	+ 63 + 45	+ 72 + 45	+ 88 + 45	+ 115 + 45					
18	24	+ 56 + 47	+ 60 + 47	+ 68 + 47	+ 80 + 47	+ 63 + 54	+ 67 + 54	+ 75 + 54	+ 87 + 54	+ 106 + 54	+ 138 + 54	+ 76 + 63	+ 84 + 63	+ 96 + 63	+ 115 + 63	+ 147 + 63
24	30	+ 64 + 55	+ 68 + 55	+ 76 + 55	+ 88 + 55	+ 73 + 64	+ 77 + 64	+ 85 + 64	+ 97 + 64	+ 116 + 64	+ 148 + 64	+ 88 + 75	+ 96 + 75	+ 108 + 75	+ 127 + 75	+ 159 + 75
30	40	+ 79 + 68	+ 84 + 68	+ 93 + 68	+ 107 + 68	+ 91 + 80	+ 96 + 80	+ 105 + 80	+ 119 + 80	+ 142 + 80	+ 180 + 80	+ 110 + 94	+ 119 + 94	+ 133 + 94	+ 156 + 94	+ 194 + 94
40	50	+ 92 + 81	+ 97 + 81	+ 106 + 81	+ 120 + 81	+ 108 + 97	+ 113 + 97	+ 122 + 97	+ 136 + 97	+ 159 + 97	+ 197 + 97	+ 130 + 114	+ 139 + 114	+ 153 + 114	+ 176 + 114	+ 214 + 114
50	65	+ 115 + 102	+ 121 + 102	+ 132 + 102	+ 148 + 102	+ 135 + 122	+ 141 + 122	+ 152 + 122	+ 168 + 122	+ 196 + 122	+ 242 + 122	+ 163 + 144	+ 174 + 144	+ 190 + 144		
65	80	+ 133 + 120	+ 139 + 120	+ 150 + 120	+ 166 + 120	+ 159 + 146	+ 165 + 146	+ 176 + 146	+ 192 + 146	+ 220 + 146	+ 266 + 146	+ 193 + 174	+ 204 + 174	+ 220 + 174		
80	100	+ 161 + 146	+ 168 + 146	+ 181 + 146	+ 200 + 146	+ 193 + 178	+ 200 + 178	+ 213 + 178	+ 232 + 178	+ 265 + 178	+ 318 + 178	+ 236 + 214	+ 249 + 214	+ 268 + 214		
100	120	+ 187 + 172	+ 194 + 172	+ 207 + 172	+ 226 + 172	+ 225 + 210	+ 232 + 210	+ 245 + 210	+ 264 + 210	+ 297 + 210	+ 350 + 210	+ 276 + 254	+ 289 + 254	+ 308 + 254		
120	140	+ 220 + 202	+ 227 + 202	+ 242 + 202	+ 265 + 202	+ 266 + 248	+ 273 + 248	+ 288 + 248	+ 311 + 248	+ 348 + 248	+ 408 + 248	+ 325 + 300	+ 340 + 300	+ 363 + 300		
140	160	+ 246 + 228	+ 253 + 228	+ 268 + 228	+ 291 + 228	+ 298 + 280	+ 305 + 280	+ 320 + 280	+ 343 + 280	+ 380 + 280	+ 440 + 280	+ 365 + 340	+ 380 + 340	+ 403 + 340		
160	180	+ 270 + 252	+ 277 + 252	+ 292 + 252	+ 315 + 252	+ 328 + 310	+ 335 + 310	+ 350 + 310	+ 373 + 310	+ 410 + 310	+ 470 + 310	+ 405 + 380	+ 420 + 380	+ 443 + 380		
180	200	+ 304 + 284	+ 313 + 284	+ 330 + 284	+ 356 + 284	+ 370 + 350	+ 379 + 350	+ 396 + 350	+ 422 + 350	+ 465 + 350	+ 535 + 350	+ 454 + 425	+ 471 + 425	+ 497 + 425		
200	225	+ 330 + 310	+ 339 + 310	+ 356 + 310	+ 382 + 310	+ 405 + 385	+ 414 + 385	+ 431 + 385	+ 457 + 385	+ 500 + 385	+ 570 + 385	+ 499 + 470	+ 516 + 470	+ 542 + 470		
225	250	+ 360 + 340	+ 369 + 340	+ 386 + 340	+ 412 + 340	+ 445 + 425	+ 454 + 425	+ 471 + 425	+ 497 + 425	+ 540 + 425	+ 610 + 425	+ 549 + 520	+ 566 + 520	+ 592 + 520		
250	280	+ 408 + 385	+ 417 + 385	+ 437 + 385	+ 466 + 385	+ 498 + 475	+ 507 + 475	+ 527 + 475	+ 556 + 475	+ 605 + 475	+ 685 + 475	+ 612 + 580	+ 632 + 580	+ 661 + 580		
280	315	+ 448 + 425	+ 457 + 425	+ 477 + 425	+ 506 + 425	+ 548 + 525	+ 557 + 525	+ 577 + 525	+ 606 + 525	+ 655 + 525	+ 735 + 525	+ 682 + 650	+ 702 + 650	+ 731 + 650		
315	355	+ 500 + 475	+ 511 + 475	+ 532 + 475	+ 564 + 475	+ 615 + 590	+ 626 + 590	+ 647 + 590	+ 679 + 590	+ 730 + 590	+ 820 + 590	+ 766 + 730	+ 787 + 730	+ 819 + 730		
355	400	+ 555 + 530	+ 566 + 530	+ 587 + 530	+ 619 + 530	+ 685 + 660	+ 696 + 660	+ 717 + 660	+ 749 + 660	+ 800 + 660	+ 890 + 660	+ 856 + 820	+ 877 + 820	+ 909 + 820		
400	450	+ 622 + 595	+ 635 + 595	+ 658 + 595	+ 692 + 595	+ 767 + 740	+ 780 + 740	+ 803 + 740	+ 837 + 740	+ 895 + 740	+ 990 + 740	+ 960 + 920	+ 983 + 920	+ 1 017 + 920		
450	500	+ 687 + 660	+ 700 + 660	+ 723 + 660	+ 757 + 660	+ 847 + 820	+ 860 + 820	+ 883 + 820	+ 917 + 820	+ 975 + 820	+ 1 070 + 820	+ 1 040 + 1 000	+ 1 063 + 1 000	+ 1 097 + 1 000		

- 1) Fundamental deviations v, x and y are not provided for basic sizes greater than 500 mm.
- 2) Tolerance classes v₅ to v₈ (incl.) have not been tabulated for basic sizes less than or equal to 14 mm. It is recommended that tolerance classes x₅ to x₈ (incl.) be used instead. However, if tolerance classes v₅ to v₈ (incl.) are especially required, they may be calculated from the bases given in ISO 286-1.
- 3) Tolerance classes y₆ to y₁₀ (incl.) have not been tabulated for basic sizes less than or equal to 18 mm. It is recommended that tolerance classes z₆ to z₁₀ (incl.) be used instead. However, if tolerance classes y₆ to y₁₀ (incl.) are especially required, they may be calculated from the bases given in ISO 286-1.

Table 31 – Limit deviations for shafts z and za¹⁾

Upper limit deviation = *es*
Lower limit deviation = *ei*

Deviations in micrometres

Basic size mm		z						za					
Above	Up to and in- cluding	6	7	8	9	10	11	6	7	8	9	10	11
—	3	+ 32 + 26	+ 36 + 26	+ 40 + 26	+ 51 + 26	+ 66 + 26	+ 86 + 26	+ 38 + 32	+ 42 + 32	+ 46 + 32	+ 57 + 32	+ 72 + 32	+ 92 + 32
3	6	+ 43 + 35	+ 47 + 35	+ 53 + 35	+ 65 + 35	+ 83 + 35	+ 110 + 35	+ 50 + 42	+ 54 + 42	+ 60 + 42	+ 72 + 42	+ 90 + 42	+ 117 + 42
6	10	+ 51 + 42	+ 57 + 42	+ 64 + 42	+ 78 + 42	+ 100 + 42	+ 132 + 42	+ 61 + 52	+ 67 + 52	+ 74 + 52	+ 88 + 52	+ 110 + 52	+ 142 + 52
10	14	+ 61 + 50	+ 68 + 50	+ 77 + 50	+ 93 + 50	+ 120 + 50	+ 160 + 50	+ 75 + 64	+ 82 + 64	+ 91 + 64	+ 107 + 64	+ 134 + 64	+ 174 + 64
14	18	+ 71 + 60	+ 78 + 60	+ 87 + 60	+ 103 + 60	+ 130 + 60	+ 170 + 60	+ 88 + 77	+ 95 + 77	+ 104 + 77	+ 120 + 77	+ 147 + 77	+ 187 + 77
18	24	+ 86 + 73	+ 94 + 73	+ 106 + 73	+ 125 + 73	+ 157 + 73	+ 203 + 73	+ 111 + 98	+ 119 + 98	+ 131 + 98	+ 150 + 98	+ 182 + 98	+ 228 + 98
24	30	+ 101 + 88	+ 109 + 88	+ 121 + 88	+ 140 + 88	+ 172 + 88	+ 218 + 88	+ 131 + 118	+ 139 + 118	+ 151 + 118	+ 170 + 118	+ 202 + 118	+ 248 + 118
30	40	+ 128 + 112	+ 137 + 112	+ 151 + 112	+ 174 + 112	+ 212 + 112	+ 272 + 112	+ 164 + 148	+ 173 + 148	+ 187 + 148	+ 210 + 148	+ 248 + 148	+ 308 + 148
40	50	+ 152 + 136	+ 161 + 136	+ 175 + 136	+ 198 + 136	+ 236 + 136	+ 296 + 136	+ 196 + 180	+ 205 + 180	+ 219 + 180	+ 242 + 180	+ 280 + 180	+ 340 + 180
50	65	+ 191 + 172	+ 202 + 172	+ 218 + 172	+ 246 + 172	+ 292 + 172	+ 362 + 172	+ 245 + 226	+ 256 + 226	+ 272 + 226	+ 300 + 226	+ 346 + 226	+ 416 + 226
65	80	+ 229 + 210	+ 240 + 210	+ 256 + 210	+ 284 + 210	+ 330 + 210	+ 400 + 210	+ 293 + 274	+ 304 + 274	+ 320 + 274	+ 348 + 274	+ 394 + 274	+ 464 + 274
80	100	+ 280 + 258	+ 293 + 258	+ 312 + 258	+ 345 + 258	+ 398 + 258	+ 478 + 258	+ 357 + 335	+ 370 + 335	+ 389 + 335	+ 422 + 335	+ 475 + 335	+ 555 + 335
100	120	+ 332 + 310	+ 345 + 310	+ 364 + 310	+ 397 + 310	+ 450 + 310	+ 530 + 310	+ 422 + 400	+ 435 + 400	+ 454 + 400	+ 487 + 400	+ 540 + 400	+ 620 + 400
120	140	+ 390 + 365	+ 405 + 365	+ 428 + 365	+ 465 + 365	+ 525 + 365	+ 615 + 365	+ 495 + 470	+ 510 + 470	+ 533 + 470	+ 570 + 470	+ 630 + 470	+ 720 + 470
140	160	+ 440 + 415	+ 455 + 415	+ 478 + 415	+ 515 + 415	+ 575 + 415	+ 665 + 415	+ 560 + 535	+ 575 + 535	+ 598 + 535	+ 635 + 535	+ 695 + 535	+ 785 + 535
160	180	+ 490 + 465	+ 505 + 465	+ 528 + 465	+ 565 + 465	+ 625 + 465	+ 715 + 465	+ 625 + 600	+ 640 + 600	+ 663 + 600	+ 700 + 600	+ 760 + 600	+ 850 + 600
180	200	+ 549 + 520	+ 566 + 520	+ 592 + 520	+ 635 + 520	+ 705 + 520	+ 810 + 520	+ 699 + 670	+ 716 + 670	+ 742 + 670	+ 785 + 670	+ 855 + 670	+ 960 + 670
200	225	+ 604 + 575	+ 621 + 575	+ 647 + 575	+ 690 + 575	+ 760 + 575	+ 865 + 575	+ 769 + 740	+ 786 + 740	+ 812 + 740	+ 855 + 740	+ 925 + 740	+ 1 030 + 740
225	250	+ 669 + 640	+ 686 + 640	+ 712 + 640	+ 755 + 640	+ 825 + 640	+ 930 + 640	+ 849 + 820	+ 866 + 820	+ 892 + 820	+ 935 + 820	+ 1 005 + 820	+ 1 110 + 820
250	280	+ 742 + 710	+ 762 + 710	+ 791 + 710	+ 840 + 710	+ 920 + 710	+ 1 030 + 710	+ 952 + 920	+ 972 + 920	+ 1 001 + 920	+ 1 050 + 920	+ 1 130 + 920	+ 1 240 + 920
280	315	+ 822 + 790	+ 842 + 790	+ 871 + 790	+ 920 + 790	+ 1 000 + 790	+ 1 110 + 790	+ 1 032 + 1 000	+ 1 052 + 1 000	+ 1 081 + 1 000	+ 1 130 + 1 000	+ 1 210 + 1 000	+ 1 320 + 1 000
315	355	+ 936 + 900	+ 957 + 900	+ 989 + 900	+ 1 040 + 900	+ 1 130 + 900	+ 1 260 + 900	+ 1 186 + 1 150	+ 1 207 + 1 150	+ 1 239 + 1 150	+ 1 290 + 1 150	+ 1 380 + 1 150	+ 1 510 + 1 150
355	400	+ 1 036 + 1 000	+ 1 057 + 1 000	+ 1 089 + 1 000	+ 1 140 + 1 000	+ 1 230 + 1 000	+ 1 360 + 1 000	+ 1 336 + 1 300	+ 1 357 + 1 300	+ 1 389 + 1 300	+ 1 440 + 1 300	+ 1 530 + 1 300	+ 1 660 + 1 300
400	450	+ 1 140 + 1 100	+ 1 163 + 1 100	+ 1 197 + 1 100	+ 1 255 + 1 100	+ 1 350 + 1 100	+ 1 500 + 1 100	+ 1 490 + 1 450	+ 1 513 + 1 450	+ 1 547 + 1 450	+ 1 605 + 1 450	+ 1 700 + 1 450	+ 1 850 + 1 450
450	500	+ 1 290 + 1 250	+ 1 313 + 1 250	+ 1 347 + 1 250	+ 1 405 + 1 250	+ 1 500 + 1 250	+ 1 650 + 1 250	+ 1 640 + 1 600	+ 1 663 + 1 600	+ 1 697 + 1 600	+ 1 755 + 1 600	+ 1 850 + 1 600	+ 2 000 + 1 600

1) Fundamental deviations z and za are not provided for basic sizes greater than 500 mm.

Table 32 – Limit deviations for shafts zb and zc¹⁾

Upper limit deviation = *es*
Lower limit deviation = *ei*

Deviations in micrometres

Basic size mm		zb					zc				
Above	Up to and in- cluding	7	8	9	10	11	7	8	9	10	11
—	3	+ 50 + 40	+ 54 + 40	+ 65 + 40	+ 80 + 40	+ 100 + 40	+ 70 + 60	+ 74 + 60	+ 85 + 60	+ 100 + 60	+ 120 + 60
3	6	+ 62 + 50	+ 68 + 50	+ 80 + 50	+ 98 + 50	+ 125 + 50	+ 92 + 80	+ 98 + 80	+ 110 + 80	+ 128 + 80	+ 155 + 80
6	10	+ 82 + 67	+ 89 + 67	+ 103 + 67	+ 125 + 67	+ 157 + 67	+ 112 + 97	+ 119 + 97	+ 133 + 97	+ 155 + 97	+ 187 + 97
10	14	+ 108 + 90	+ 117 + 90	+ 133 + 90	+ 160 + 90	+ 200 + 90	+ 148 + 130	+ 157 + 130	+ 173 + 130	+ 200 + 130	+ 240 + 130
14	18	+ 126 + 108	+ 135 + 108	+ 151 + 108	+ 178 + 108	+ 218 + 108	+ 168 + 150	+ 177 + 150	+ 193 + 150	+ 220 + 150	+ 260 + 150
18	24	+ 157 + 136	+ 169 + 136	+ 188 + 136	+ 220 + 136	+ 266 + 136	+ 209 + 188	+ 221 + 188	+ 240 + 188	+ 272 + 188	+ 318 + 188
24	30	+ 181 + 160	+ 193 + 160	+ 212 + 160	+ 244 + 160	+ 290 + 160	+ 239 + 218	+ 251 + 218	+ 270 + 218	+ 302 + 218	+ 348 + 218
30	40	+ 225 + 200	+ 239 + 200	+ 262 + 200	+ 300 + 200	+ 360 + 200	+ 299 + 274	+ 313 + 274	+ 336 + 274	+ 374 + 274	+ 434 + 274
40	50	+ 267 + 242	+ 281 + 242	+ 304 + 242	+ 342 + 242	+ 402 + 242	+ 350 + 325	+ 364 + 325	+ 387 + 325	+ 425 + 325	+ 485 + 325
50	65	+ 330 + 300	+ 346 + 300	+ 374 + 300	+ 420 + 300	+ 490 + 300	+ 435 + 405	+ 451 + 405	+ 479 + 405	+ 525 + 405	+ 595 + 405
65	80	+ 390 + 360	+ 406 + 360	+ 434 + 360	+ 480 + 360	+ 550 + 360	+ 510 + 480	+ 526 + 480	+ 554 + 480	+ 600 + 480	+ 670 + 480
80	100	+ 480 + 445	+ 499 + 445	+ 532 + 445	+ 585 + 445	+ 665 + 445	+ 620 + 585	+ 639 + 585	+ 672 + 585	+ 725 + 585	+ 805 + 585
100	120	+ 560 + 525	+ 579 + 525	+ 612 + 525	+ 665 + 525	+ 745 + 525	+ 725 + 690	+ 744 + 690	+ 777 + 690	+ 830 + 690	+ 910 + 690
120	140	+ 660 + 620	+ 683 + 620	+ 720 + 620	+ 780 + 620	+ 870 + 620	+ 840 + 800	+ 863 + 800	+ 900 + 800	+ 960 + 800	+ 1 050 + 800
140	160	+ 740 + 700	+ 763 + 700	+ 800 + 700	+ 860 + 700	+ 950 + 700	+ 940 + 900	+ 963 + 900	+ 1 000 + 900	+ 1 060 + 900	+ 1 150 + 900
160	180	+ 820 + 780	+ 843 + 780	+ 880 + 780	+ 940 + 780	+ 1 030 + 780	+ 1 040 + 1 000	+ 1 063 + 1 000	+ 1 100 + 1 000	+ 1 160 + 1 000	+ 1 250 + 1 000
180	200	+ 926 + 880	+ 952 + 880	+ 995 + 880	+ 1 065 + 880	+ 1 170 + 880	+ 1 196 + 1 150	+ 1 222 + 1 150	+ 1 265 + 1 150	+ 1 335 + 1 150	+ 1 440 + 1 150
200	225	+ 1 006 + 960	+ 1 032 + 960	+ 1 075 + 960	+ 1 145 + 960	+ 1 250 + 960	+ 1 296 + 1 250	+ 1 322 + 1 250	+ 1 365 + 1 250	+ 1 435 + 1 250	+ 1 540 + 1 250
225	250	+ 1 096 + 1 050	+ 1 122 + 1 050	+ 1 165 + 1 050	+ 1 235 + 1 050	+ 1 340 + 1 050	+ 1 396 + 1 350	+ 1 422 + 1 350	+ 1 465 + 1 350	+ 1 535 + 1 350	+ 1 640 + 1 350
250	280	+ 1 252 + 1 200	+ 1 281 + 1 200	+ 1 330 + 1 200	+ 1 410 + 1 200	+ 1 520 + 1 200	+ 1 602 + 1 550	+ 1 631 + 1 550	+ 1 680 + 1 550	+ 1 760 + 1 550	+ 1 870 + 1 550
280	315	+ 1 352 + 1 300	+ 1 381 + 1 300	+ 1 430 + 1 300	+ 1 510 + 1 300	+ 1 620 + 1 300	+ 1 752 + 1 700	+ 1 781 + 1 700	+ 1 830 + 1 700	+ 1 910 + 1 700	+ 2 020 + 1 700
315	355	+ 1 557 + 1 500	+ 1 589 + 1 500	+ 1 640 + 1 500	+ 1 730 + 1 500	+ 1 860 + 1 500	+ 1 957 + 1 900	+ 1 989 + 1 900	+ 2 040 + 1 900	+ 2 130 + 1 900	+ 2 260 + 1 900
355	400	+ 1 707 + 1 650	+ 1 739 + 1 650	+ 1 790 + 1 650	+ 1 880 + 1 650	+ 2 010 + 1 650	+ 2 157 + 2 100	+ 2 189 + 2 100	+ 2 240 + 2 100	+ 2 330 + 2 100	+ 2 460 + 2 100
400	450	+ 1 913 + 1 850	+ 1 947 + 1 850	+ 2 005 + 1 850	+ 2 100 + 1 850	+ 2 250 + 1 850	+ 2 463 + 2 400	+ 2 497 + 2 400	+ 2 555 + 2 400	+ 2 650 + 2 400	+ 2 800 + 2 400
450	500	+ 2 163 + 2 100	+ 2 197 + 2 100	+ 2 255 + 2 100	+ 2 350 + 2 100	+ 2 500 + 2 100	+ 2 663 + 2 600	+ 2 697 + 2 600	+ 2 755 + 2 600	+ 2 850 + 2 600	+ 3 000 + 2 600

1) Fundamental deviations zb and zc are not provided for basic sizes greater than 500 mm.

Annex

Graphical review of tolerance zones of holes and shafts

(This annex does not form an integral part of the standard.)

A.1 Representation of tolerance zones for holes

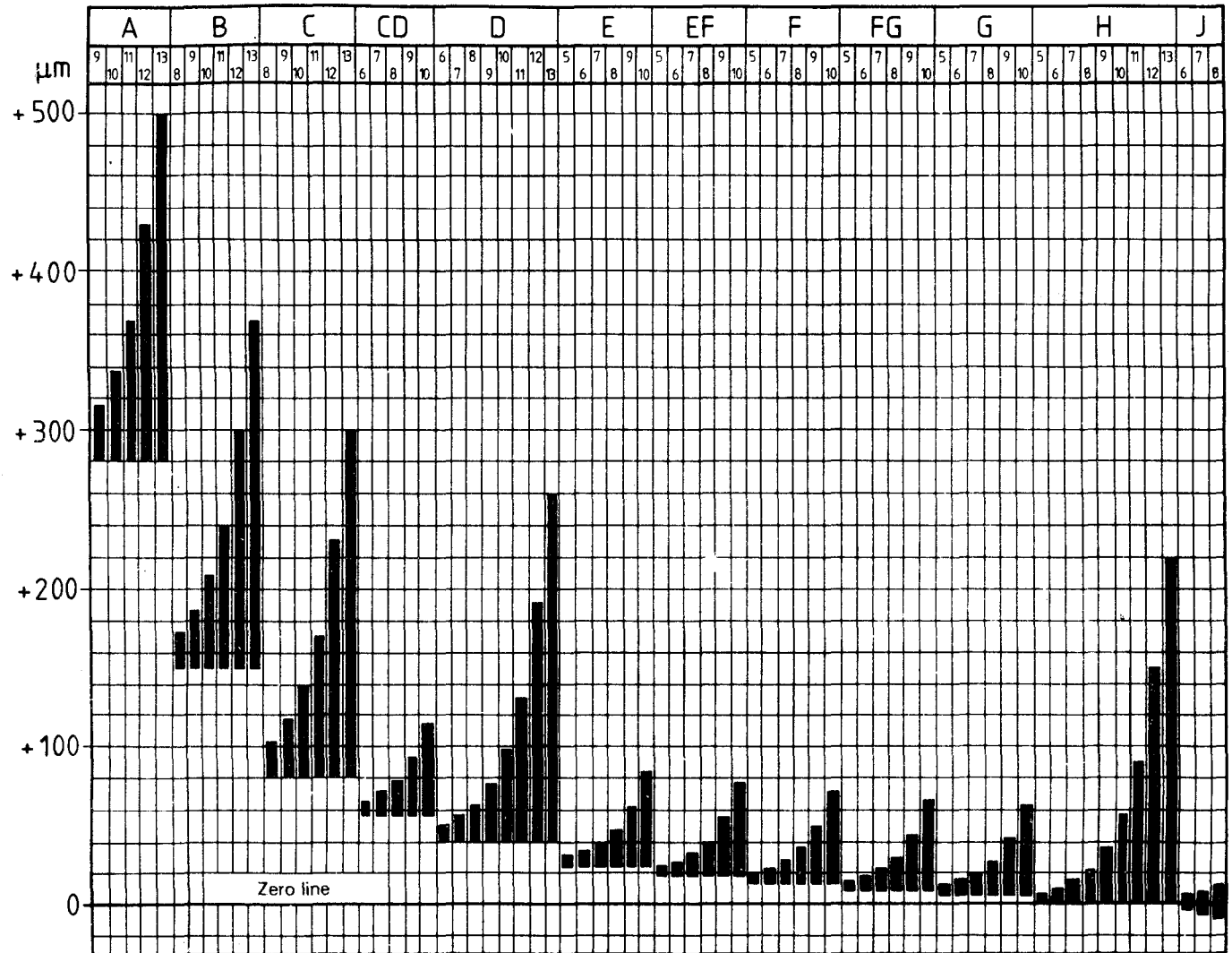
A graphical review of a broad selection of tolerance classes for holes is given in figures 6 and 7. Figure 6 shows the tolerance classes in terms of the fundamental deviation (A to ZC), whereas figure 7 gives the same information in terms of the standard tolerance grade (IT5 to IT11). Figures 6 and 7 do not include all the tolerance classes given in this part of ISO 286 and reference should be made to the tables for specific details.

For comparative purposes, the tolerance classes given in figures 6 and 7 illustrate the values for *ES*, *EI* and IT given for the basic size step from 6 to 10 mm. Where there are no tabulated values for this basic size step, i.e. those tolerance classes involving fundamental deviations T, V and Y, the values have been given, again for comparative purposes, for the basic size step from 24 to 30 mm.

A.2 Representation of tolerance zones for shafts

A graphical review of a broad selection of tolerance classes for shafts is given in figures 8 and 9. Figure 8 shows the tolerance classes in terms of the fundamental deviation (a to zc), whereas figure 9 gives the same information in terms of the standard tolerance grade (IT5 to IT11). Figures 8 and 9 do not include all the tolerance classes given in this part of ISO 286 and reference should be made to the tables for specific details.

For comparative purposes, the tolerance classes given in figures 8 and 9 illustrate the values for *es*, *ei* and IT given for the basic size step from 6 to 10 mm. Where there are no tabulated values for this basic size step, i.e. those tolerance classes involving fundamental deviations t, v and y, the values have been given, again for comparative purposes, for the basic size step from 24 to 30 mm.



(concluded)

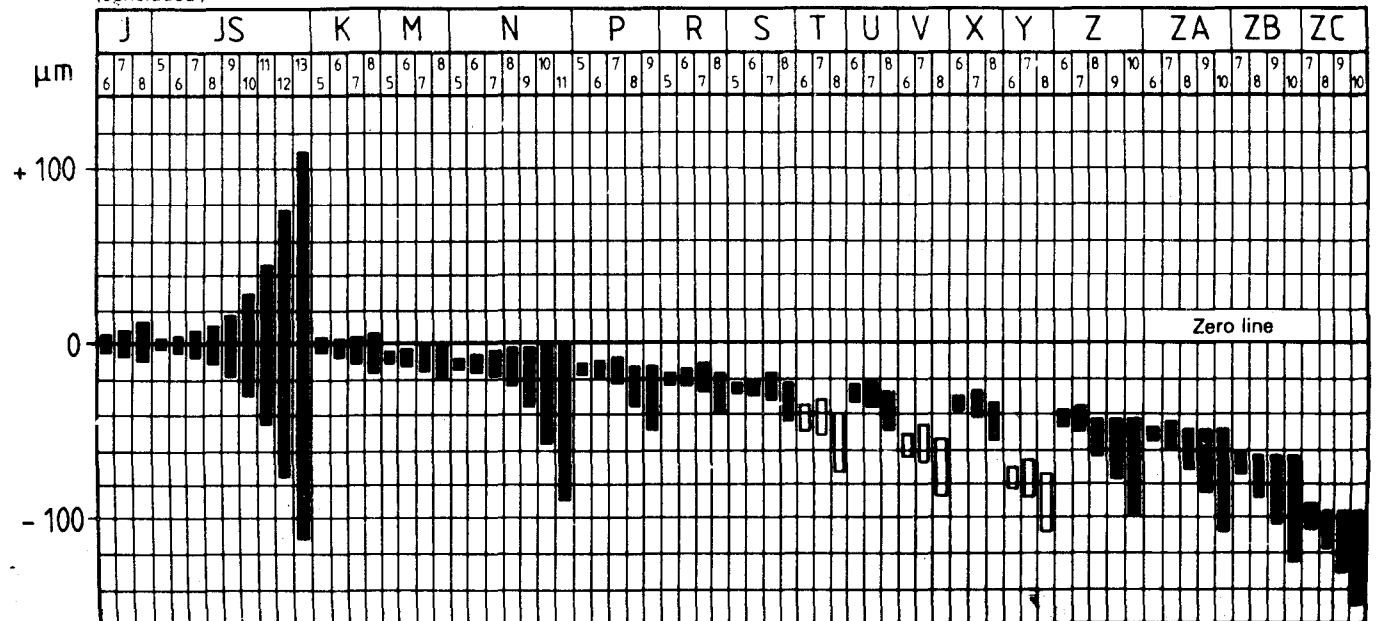
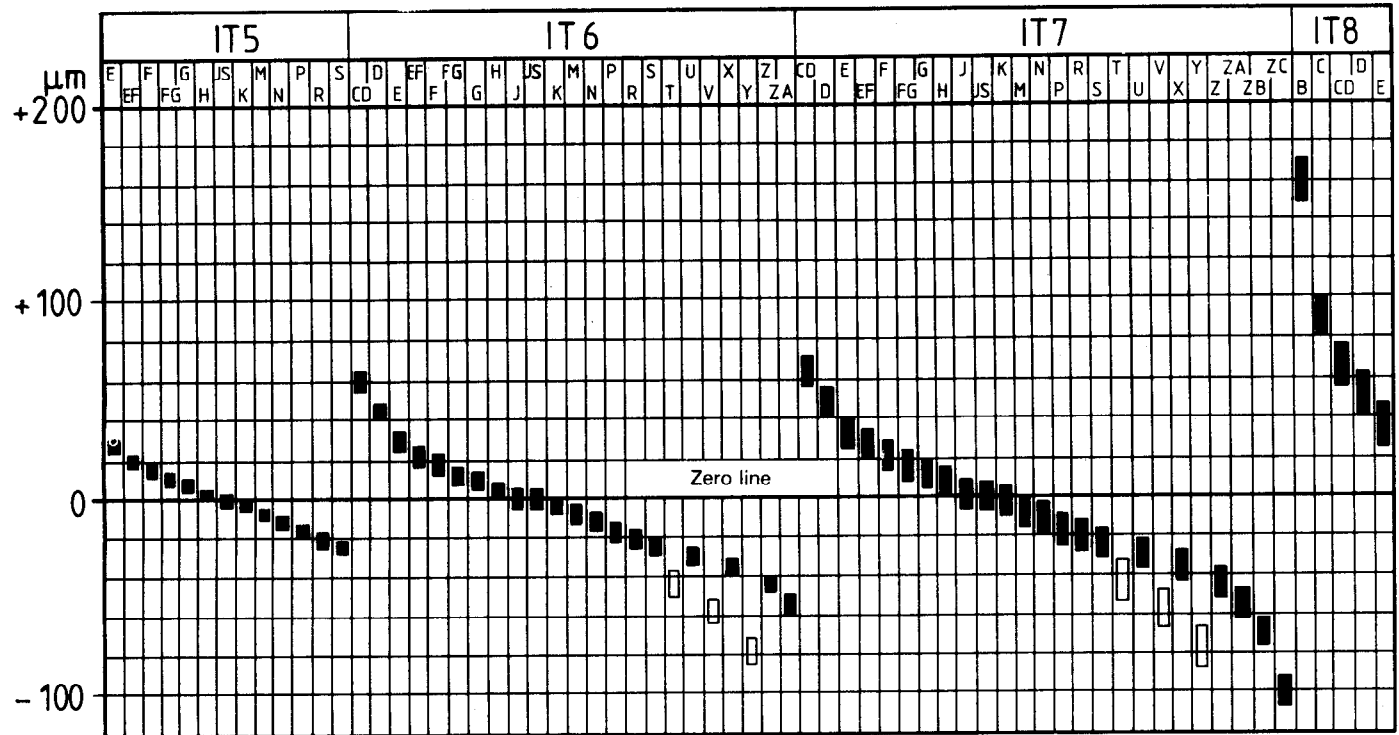


Figure 6 — Graphical review of tolerance classes for holes in terms of fundamental deviations



(concluded)

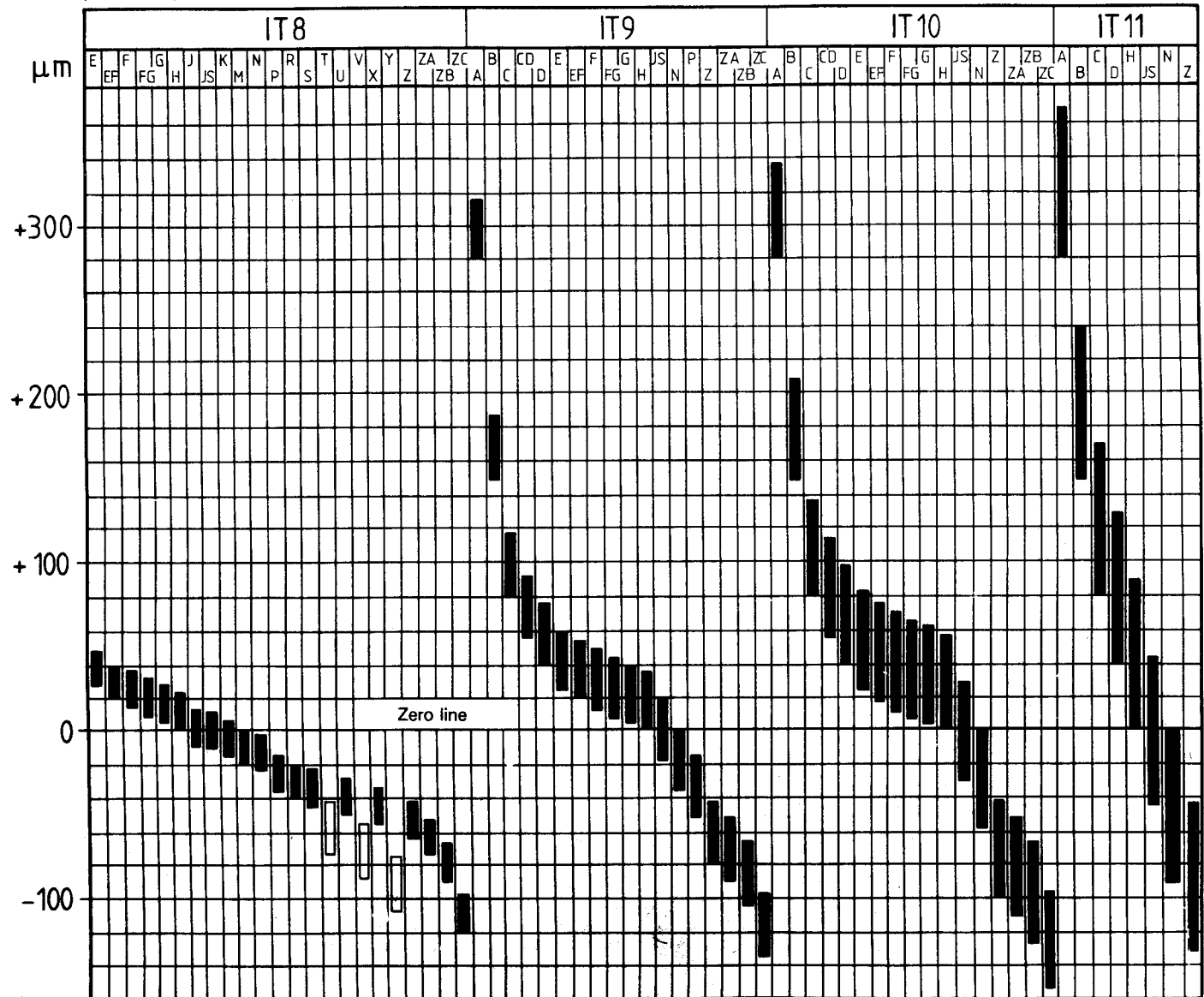
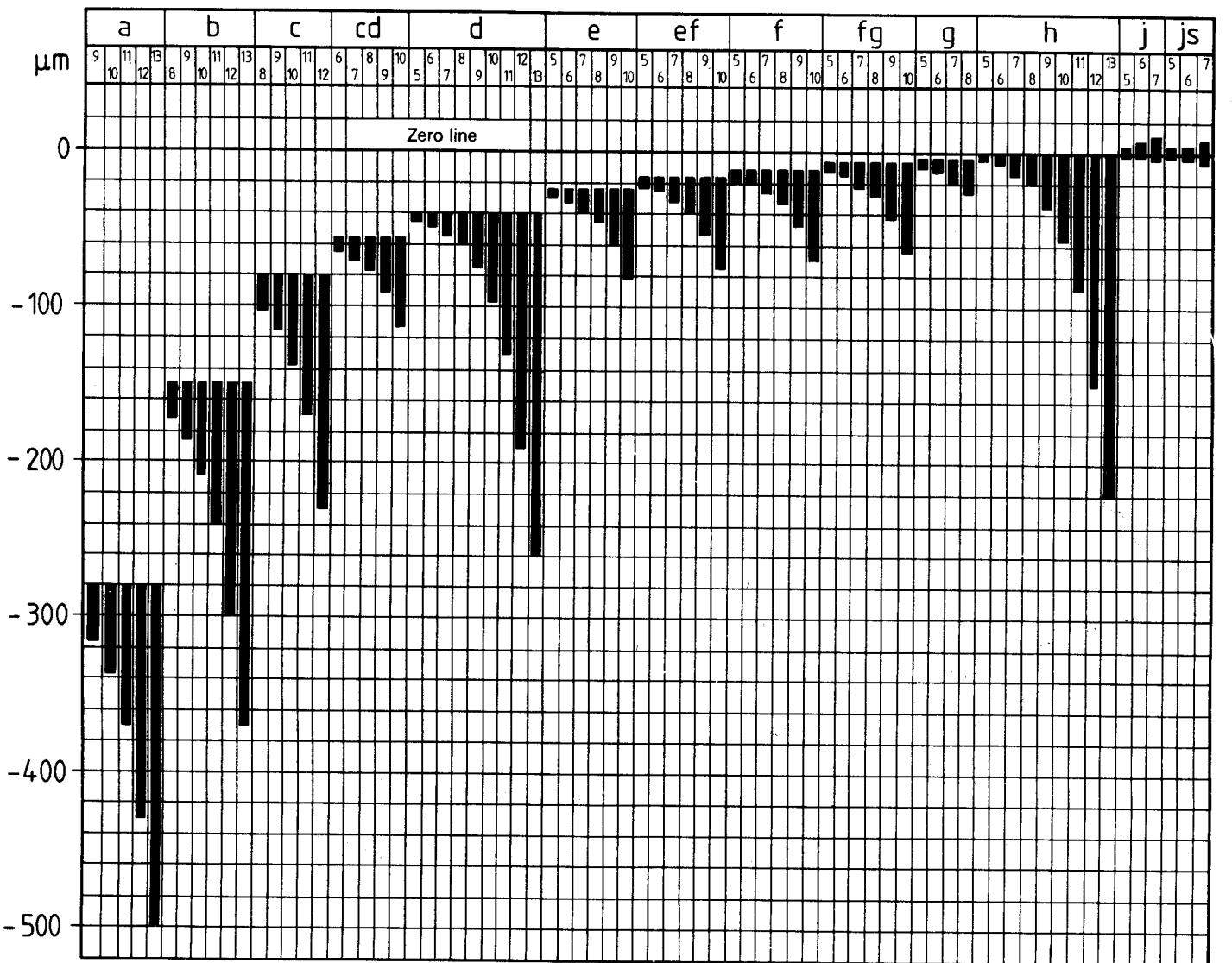


Figure 7 — Graphical review of tolerance classes for holes in terms of standard tolerance grades



(concluded)

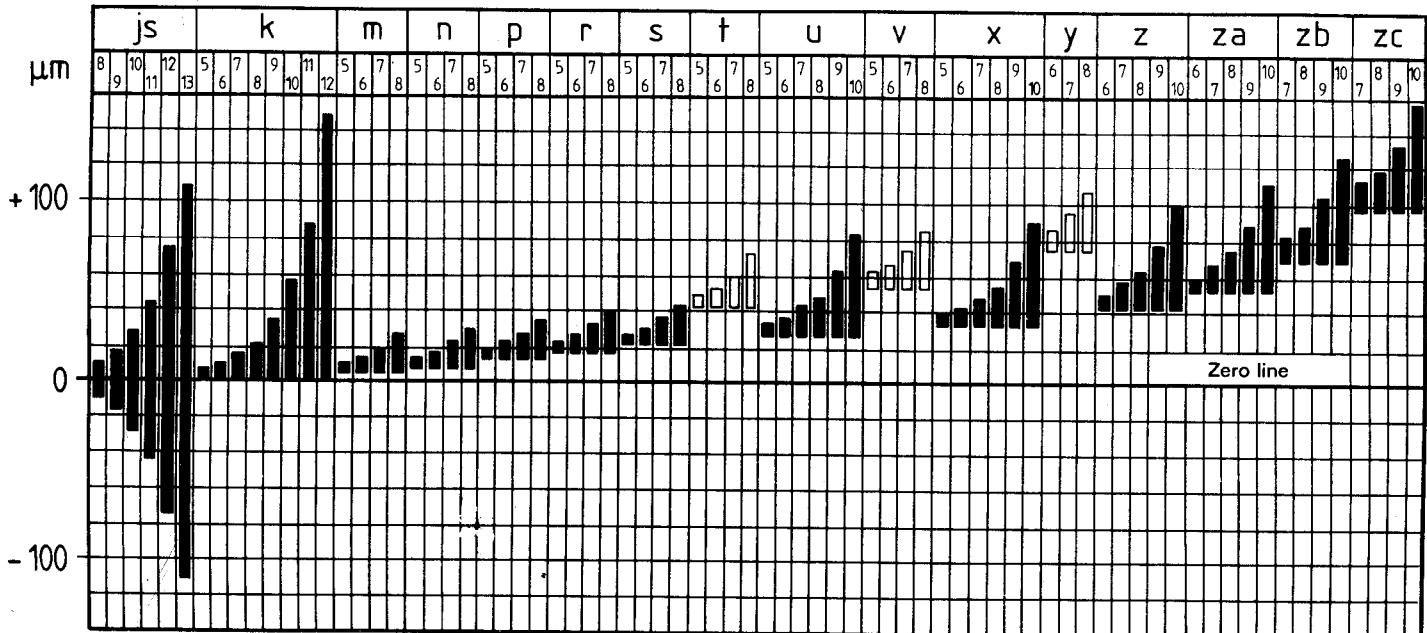
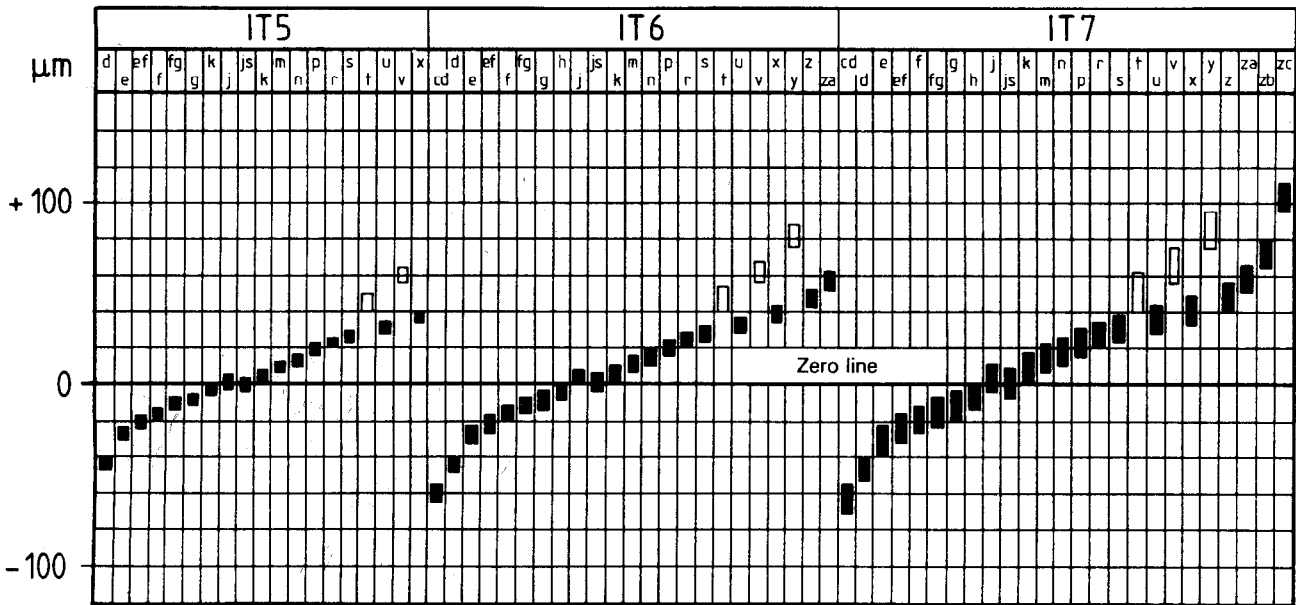


Figure 8 — Graphical review of tolerance classes for shafts in terms of fundamental deviations



(concluded)

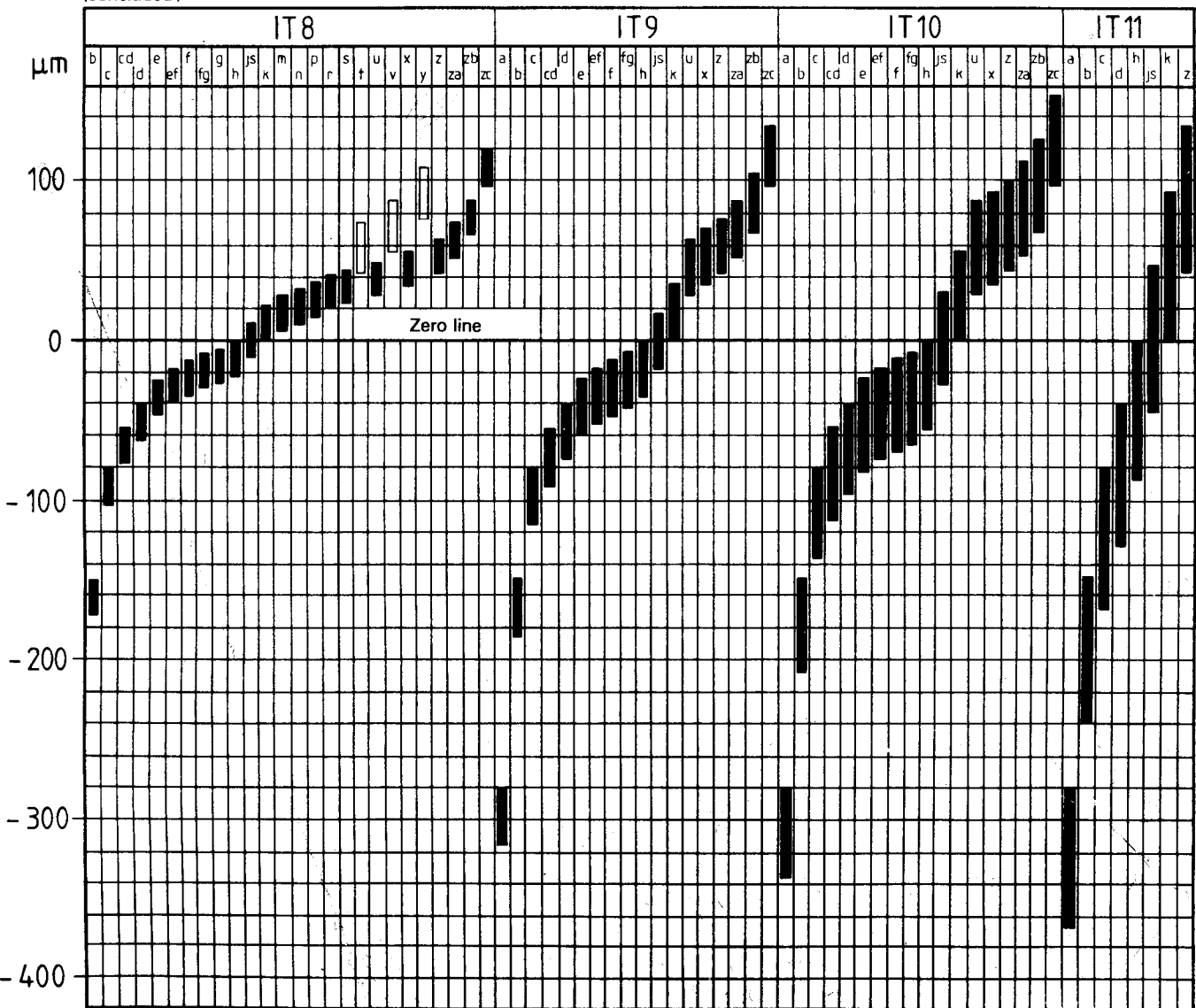


Figure 9 — Graphical review of tolerance classes for shafts in terms of standard tolerance grades

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