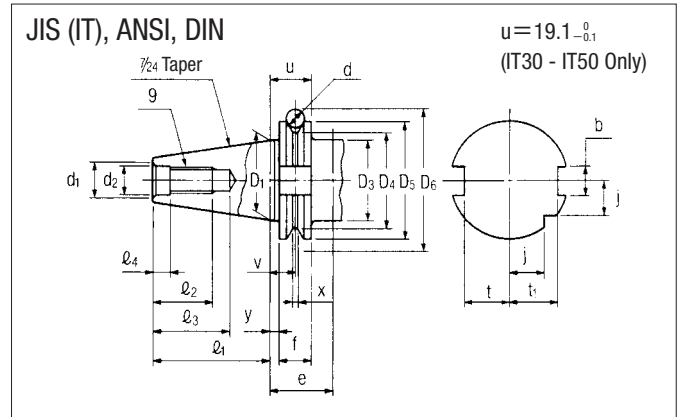
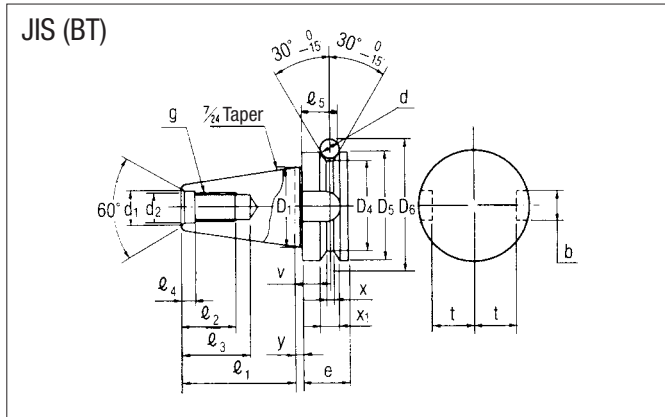


# Reference Data

## Shank Standard JIS B6339-1992 for Machining Center



(Unit: mm)

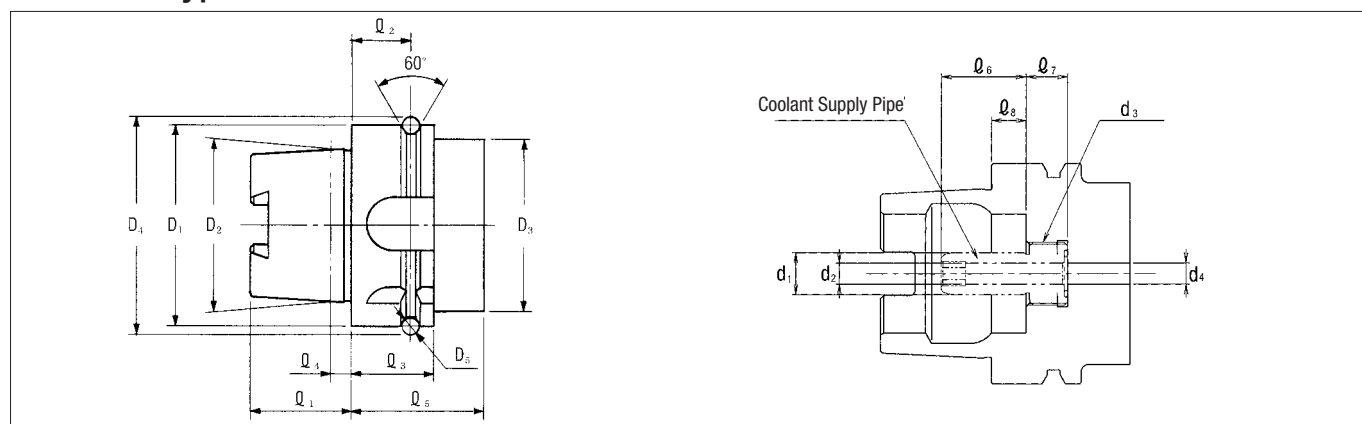
Standard	Shank				Screw Portion				Tenon Portion					
	D <sub>1</sub>	l <sub>1</sub>	d <sub>1</sub>	d <sub>2</sub>	g	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	b	l <sub>5</sub>	t	t <sub>1</sub>	j	
No.30	JIS(BT)	31.75	48.4 <sup>±0.15</sup>	14	12.5 <sup>H8</sup>	M12	24min	34 min	7.0 <sup>+0.5</sup> <sub>0</sub>	16.1 <sup>H12</sup>	17min	16.3 <sup>0</sup> <sub>-0.2</sub>	—	—
	JIS(IT)	31.75	47.8 <sup>0</sup> <sub>-0.3</sub>	14max	13.0 <sup>H7</sup>	M12	24min	34 min	5.5 <sup>+0.5</sup> <sub>0</sub>	16.1 <sup>H12</sup>	—	16.4 <sup>0</sup> <sub>-0.4</sub>	19 <sup>0</sup> <sub>-0.4</sub>	—
	ANSI	31.75	47.8 <sup>0</sup> <sub>-0.3</sub>	14.5 max	12.4 <sup>+0.4</sup> <sub>0</sub>	M12	25min	—	(4.65)	16.1 <sup>+0.2</sup> <sub>0</sub>	—	16.4 <sup>0</sup> <sub>-0.4</sub>	19.7 <sup>0</sup> <sub>-0.4</sub>	—
	DIN	31.75	47.8 <sup>0</sup> <sub>-0.3</sub>	14	13	M12	24min	33.5min	5.5 <sup>+0.5</sup> <sub>0</sub>	16.1 <sup>H12</sup>	—	16.4 <sup>0</sup> <sub>-0.4</sub>	19 <sup>0</sup> <sub>-0.4</sub>	15 <sup>0</sup> <sub>-0.3</sub>
No.35	JIS(BT)	38.10	56.4 <sup>±0.15</sup>	14	12.5 <sup>H8</sup>	M12	24min	34 min	7.0 <sup>+0.5</sup> <sub>0</sub>	16.1 <sup>H12</sup>	20min	19.6 <sup>0</sup> <sub>-0.2</sub>	—	—
	JIS(BT)	44.45	65.4 <sup>±0.15</sup>	19	17 <sup>H8</sup>	M16	30min	43 min	9.0 <sup>+0.5</sup> <sub>0</sub>	16.1 <sup>H12</sup>	21min	22.6 <sup>0</sup> <sub>-0.2</sub>	—	—
	JIS(IT)	44.45	68.4 <sup>0</sup> <sub>-0.3</sub>	19.0 max	17 <sup>H7</sup>	M16	32min	42.5min	9.2 <sup>+0.5</sup> <sub>0</sub>	16.1 <sup>H12</sup>	—	22.8 <sup>0</sup> <sub>-0.4</sub>	25 <sup>0</sup> <sub>-0.4</sub>	18.50 <sup>0</sup> <sub>-0.3</sub>
	ANSI	44.45	68.4 <sup>0</sup> <sub>-0.3</sub>	18.5	16.4 <sup>+0.4</sup> <sub>0</sub>	M16	30min	—	4.75 <sup>+0.5</sup> <sub>0</sub>	16.1 <sup>+0.2</sup> <sub>0</sub>	—	22.8 <sup>0</sup> <sub>-0.4</sub>	26 <sup>0</sup> <sub>-0.4</sub>	—
No.40	DIN	44.45	68.4 <sup>0</sup> <sub>-0.3</sub>	19.0 max	17 <sup>H7</sup>	M16	32min	42.5min	8.2 <sup>+0.5</sup> <sub>0</sub>	16.1 <sup>H12</sup>	—	16.4 <sup>0</sup> <sub>-0.4</sub>	25 <sup>0</sup> <sub>-0.4</sub>	18.5 <sup>0</sup> <sub>-0.3</sub>
	JIS(BT)	57.15	82.8 <sup>±0.15</sup>	23	21 <sup>H8</sup>	M20	35min	50 min	11.0 <sup>+0.5</sup> <sub>0</sub>	19.3 <sup>H12</sup>	26min	29.1 <sup>0</sup> <sub>-0.2</sub>	—	—
	JIS(IT)	57.15	82.70 <sup>0</sup> <sub>-0.3</sub>	23.4 max	21 <sup>H7</sup>	M20	40min	52.5min	10.0 <sup>+0.5</sup> <sub>0</sub>	19.3 <sup>H12</sup>	—	29.1 <sup>0</sup> <sub>-0.4</sub>	31.3 <sup>0</sup> <sub>-0.4</sub>	24.00 <sup>0</sup> <sub>-0.3</sub>
	ANSI	57.15	82.7 <sup>0</sup> <sub>-0.3</sub>	22.5	20.4 <sup>+0.4</sup> <sub>0</sub>	M20	38min	—	5.25 <sup>+0.5</sup> <sub>0</sub>	19.3 <sup>+0.2</sup> <sub>0</sub>	—	29.1 <sup>0</sup> <sub>-0.4</sub>	32.5 <sup>0</sup> <sub>-0.4</sub>	—
No.45	DIN	57.15	82.70 <sup>0</sup> <sub>-0.3</sub>	23.4 max	21 <sup>H7</sup>	M20	40min	52.5min	10.0 <sup>+0.5</sup> <sub>0</sub>	19.3 <sup>H12</sup>	—	29max	—	24 <sup>0</sup> <sub>-0.3</sub>
	JIS(BT)	69.85	101.8 <sup>±0.15</sup>	27	25 <sup>H8</sup>	M24	45min	62 min	13.0 <sup>+0.5</sup> <sub>0</sub>	25.7 <sup>H12</sup>	31min	35.4 <sup>0</sup> <sub>-0.2</sub>	—	—
	JIS(IT)	69.85	101.75 <sup>0</sup> <sub>-0.3</sub>	28.0 max	25 <sup>H8</sup>	M24	47min	61.5min	11.5 <sup>+0.5</sup> <sub>0</sub>	25.7 <sup>H12</sup>	—	35.5 <sup>0</sup> <sub>-0.4</sub>	37.7 <sup>0</sup> <sub>-0.4</sub>	30.00 <sup>0</sup> <sub>-0.3</sub>
	ANSI	69.85	101.75 <sup>0</sup> <sub>-0.3</sub>	26.5	24.8 <sup>+0.4</sup> <sub>0</sub>	M24	45min	—	5.75 <sup>+0.5</sup> <sub>0</sub>	25.7 <sup>+0.2</sup> <sub>0</sub>	—	35.5 <sup>0</sup> <sub>-0.4</sub>	40.4 <sup>0</sup> <sub>-0.4</sub>	—
No.50	DIN	69.85	101.75 <sup>0</sup> <sub>-0.3</sub>	28.0 max	25 <sup>H7</sup>	M24	47min	61.5min	11.5 <sup>+0.5</sup> <sub>0</sub>	25.7 <sup>H12</sup>	—	35.5 <sup>0</sup> <sub>-0.4</sub>	37.7 <sup>0</sup> <sub>-0.4</sub>	30 <sup>0</sup> <sub>-0.3</sub>

Standard	Flange Portion									Reference			
	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	e	f	v	x	x <sub>1</sub>	y	Small End Diameter	d	D <sub>6</sub>	
No.30	JIS(BT)	—	38	46 <sup>H8</sup>	20	—	13.6 <sup>±0.1</sup>	4	8 <sup>+0.1</sup> <sub>0</sub>	2 <sup>±0.4</sup>	17.633	8	56.144
	JIS(IT)	39 <sup>0</sup> <sub>-0.5</sub>	39.25 <sup>0</sup> <sub>-0.5</sub>	46.05 <sup>0</sup> <sub>-0.1</sub>	35min	15.90	11.1 <sup>±0.1</sup>	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.2 <sup>±0.1</sup>	—	—	54.85 <sup>±0.05</sup>
	ANSI	32 <sup>0</sup> <sub>-0.5</sub>	39.25 <sup>0</sup> <sub>-0.5</sub>	46.05 <sup>0</sup> <sub>-0.1</sub>	35min	—	(11.1)	3.75 <sup>+0.15</sup> <sub>0</sub>	—	(3.18)	—	7	54.85 <sup>±0.05</sup>
	DIN	45max	44.3 <sup>0</sup> <sub>-0.5</sub>	50 <sup>0</sup> <sub>-0.1</sub>	35min	15.90	11.1 <sup>±0.1</sup>	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.2 <sup>±0.1</sup>	17.808	7	59.3
No.35	JIS(BT)	—	43	53 <sup>H8</sup>	22	—	14.6 <sup>±0.1</sup>	5	10 <sup>+0.1</sup> <sub>0</sub>	2 <sup>±0.4</sup>	21.650	10	65.680
	JIS(BT)	—	53	63 <sup>H8</sup>	25	—	16.6 <sup>±0.1</sup>	5	10 <sup>+0.1</sup> <sub>0</sub>	2 <sup>±0.4</sup>	25.375	10	75.679
	JIS(IT)	44.7 <sup>0</sup> <sub>-0.5</sub>	56.25 <sup>0</sup> <sub>-0.5</sub>	63.55 <sup>0</sup> <sub>-0.1</sub>	35min	15.90	11.1 <sup>±0.1</sup>	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.2 <sup>±0.1</sup>	24.500	7	72.30 <sup>±0.05</sup>
	ANSI	44.7 <sup>0</sup> <sub>-0.5</sub>	56.25 <sup>0</sup> <sub>-0.5</sub>	63.55 <sup>0</sup> <sub>-0.1</sub>	35min	15.90 <sup>+0.1</sup>	11.1	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.18	24.500	7	72.30 <sup>±0.05</sup>
No.40	DIN	50max	56.25 <sup>0</sup> <sub>-0.5</sub>	63.55 <sup>0</sup> <sub>-0.1</sub>	35min	15.90	11.1 <sup>±0.1</sup>	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.2 <sup>±0.2</sup>	24.500	7	72.30 <sup>±0.05</sup>
	JIS(BT)	—	73	85 <sup>H8</sup>	30	—	21.2 <sup>±0.1</sup>	6	12 <sup>+0.1</sup> <sub>0</sub>	3 <sup>±0.4</sup>	33.000	12	100.216
	JIS(IT)	57.4 <sup>0</sup> <sub>-0.5</sub>	75.25 <sup>0</sup> <sub>-0.5</sub>	82.55 <sup>0</sup> <sub>-0.1</sub>	35min	15.90	11.1 <sup>±0.1</sup>	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.2 <sup>±0.1</sup>	33.029	7	91.35 <sup>±0.05</sup>
	ANSI	57.4 <sup>0</sup> <sub>-0.5</sub>	75.25 <sup>0</sup> <sub>-0.5</sub>	82.55 <sup>0</sup> <sub>-0.1</sub>	35min	15.82 <sup>+0.1</sup> <sub>0</sub>	11.1	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.18	33.029	7	91.35 <sup>±0.05</sup>
No.45	DIN	63max	75.25 <sup>0</sup> <sub>-0.5</sub>	82.55 <sup>0</sup> <sub>-0.1</sub>	35min	15.90	11.1 <sup>±0.1</sup>	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.2 <sup>±0.1</sup>	33.029	7	91.35 <sup>±0.05</sup>
	JIS(BT)	—	85	100 <sup>H8</sup>	35	—	23.2 <sup>±0.1</sup>	7	15 <sup>+0.1</sup> <sub>0</sub>	3 <sup>±0.4</sup>	40.158	15	119.020
	JIS(IT)	70.1 <sup>0</sup> <sub>-0.5</sub>	91.25 <sup>0</sup> <sub>-0.5</sub>	97.50 <sup>0</sup> <sub>-0.1</sub>	35min	15.90	11.1 <sup>±0.1</sup>	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.2 <sup>±0.1</sup>	40.173	7	107.25 <sup>±0.05</sup>
	ANSI	70.1 <sup>0</sup> <sub>-0.5</sub>	91.25 <sup>0</sup> <sub>-0.5</sub>	98.45 <sup>0</sup> <sub>-0.1</sub>	35min	15.82 <sup>+0.1</sup> <sub>0</sub>	11.1	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.18	40.173	7	107.25 <sup>±0.05</sup>
No.50	DIN	80max	91.25 <sup>0</sup> <sub>-0.5</sub>	97.50 <sup>0</sup> <sub>-0.1</sub>	35min	15.90	11.1 <sup>±0.1</sup>	3.75 <sup>+0.15</sup> <sub>0</sub>	—	3.2 <sup>±0.1</sup>	40.173	7	107.25 <sup>±0.05</sup>

• There is an exclusive machine tool manufacturer's standard for BT35.

## HSK Shank Standard DIN69893

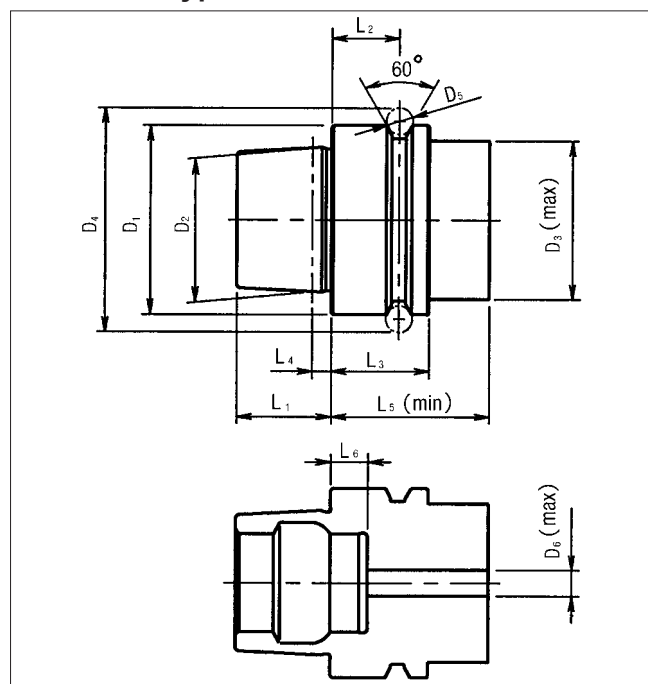
### ● HSK A Type



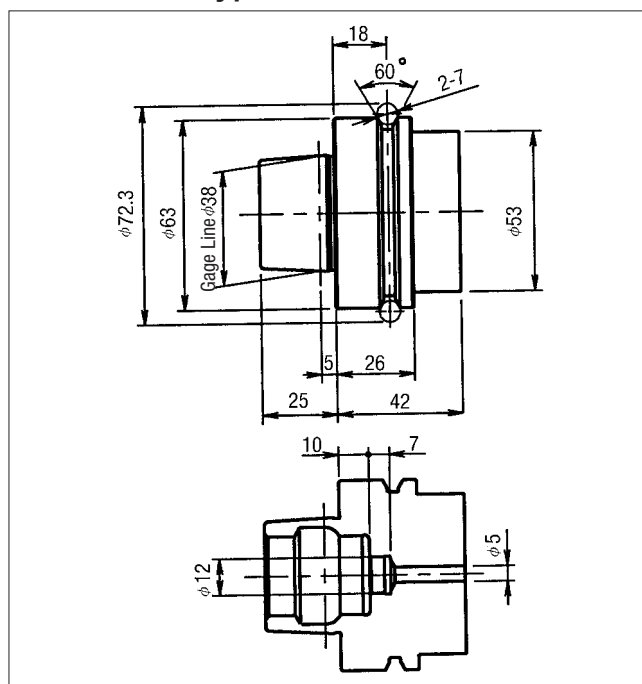
(Unit: mm)

No.	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	ℓ <sub>1</sub>	ℓ <sub>2</sub>	ℓ <sub>3</sub>	ℓ <sub>4</sub>	ℓ <sub>5</sub>	ℓ <sub>6</sub>	ℓ <sub>7</sub>	ℓ <sub>8</sub>
HSK A 40	40	30	34	45.00	4	8	5	M12×1	5	20	16	20	4	35	21.5	8	8
HSK A 50	50	38	42	59.30	7	10	6.4	M16×1	6.8	25	18	26	5	42	23	10	10
HSK A 63	63	48	53	72.30	7	12	8	M18×1	8.4	32	18	26	6.3	42	24.5	12	10
HSK A100	100	75	85	109.75	7	16	10	M24×1	12	50	20	29	10	45	28	16	12.5

### ● HSK E Type



### ● HSK F63 Type



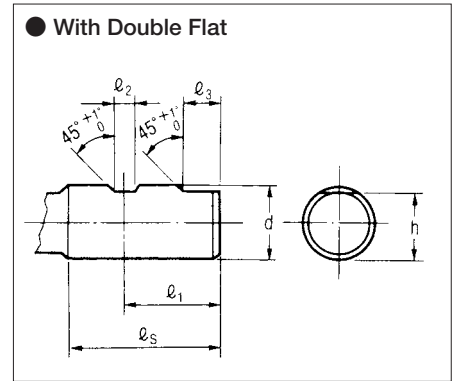
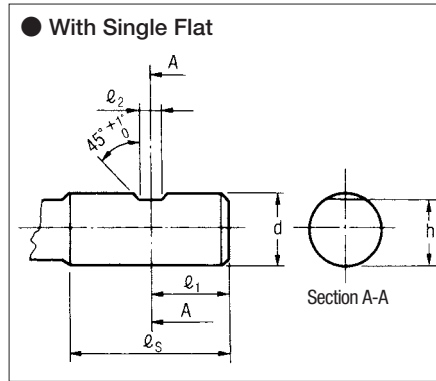
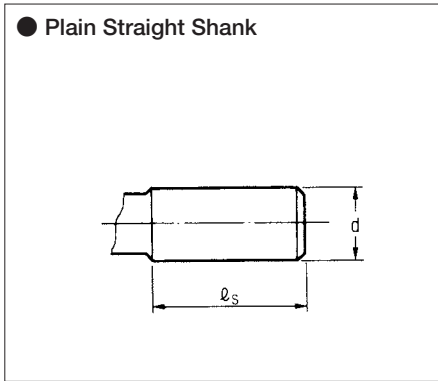
(Unit: mm)

No.	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	ℓ <sub>1</sub>	ℓ <sub>2</sub>	ℓ <sub>3</sub>	ℓ <sub>4</sub>	ℓ <sub>5</sub>	ℓ <sub>6</sub>
HSK E32	32	24	26	37	4	4.2	16	16	20	3.2	35	8
HSK E40	40	30	34	45	4	5	20	16	20	4	35	8
HSK E50	50	38	42	59.3	7	6.8	25	18	26	5	42	10
HSK E63	63	48	53	72.3	7	8.4	32	18	26	6.3	42	10

KURODA Standard Design is without hole for manual clamping, and with hole Design is option.

# Reference Data

## Straight Shank Standard JIS B4005-1996 for Milling



(Unit: mm)

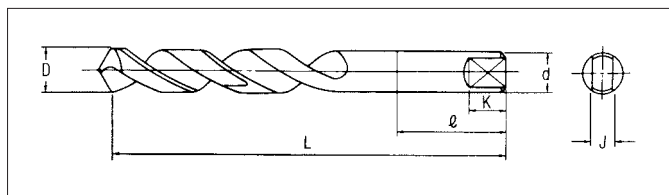
Standard Dimension	Shank Diameter d		Shank Length $l_s$ $\left( \begin{smallmatrix} +2 \\ 0 \end{smallmatrix} \right)$	$l_1$ $\left( \begin{smallmatrix} 0 \\ -1 \end{smallmatrix} \right)$	$l_2$ $\left( \begin{smallmatrix} +0.2 \\ 0 \end{smallmatrix} \right)$	$l_3$ $\left( \begin{smallmatrix} +1 \\ 0 \end{smallmatrix} \right)$	h $\left( \begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix} \right)$
	Tolerance						
	Plain Straight Shank R Type (h8)	Straight Shank with Flat (h6)					
8	0	0	36	18	5.5	—	6.6
10	-0.022	-0.009	40	20	7		8.4
12	0	0	45	22.5	8		10.4
16	-0.027	-0.011	48	24	10		14.2
20	0	0	50	25	11		18.2
25	-0.033	-0.013	56	32	12	17	23
32	0	0	60	36	14	19	30
40(42)	-0.039	-0.016	70	40			38
50	0	0	80	45			47.8
63	-0.046	-0.019	90	50	18	23	60.8

Note: Items that have a value for the shank diameter d in brackets are only applicable for use with plain straight shanks, and should not be used if possible.

## Straight Shank Drill with Tang TAS1102-1970 Type 2

(The Japan Small Tool Makers Association Standard)

(Unit: mm)



Nominal Size D	L	ℓ	d	J	K
3.2	74±2	22	$(D-0.025)_{-0.018}^0$	$2.4_{-0.1}^0$	7
3.3					
3.4					
3.5					
3.6					
3.7					
3.8	80±2				
3.9					
4.0					
4.1					
4.2					
4.3	87±2				
4.4					
4.5					
4.6					
4.7					
4.8	95±2				
4.9					
5.0					
5.1					
5.2					
5.3	100±2				
5.4					
5.5					
5.6					
5.7					
5.8	103±2				
5.9					
6.0					
6.1					
6.2					
6.3	107±2				
6.4					
6.5					
6.6					
6.7					
6.8	110±2				
6.9					
7.0					
7.1					
7.2					
7.3	113±2				
7.4					
7.5					
7.6					
7.7					
7.8	116±2				
7.9					
8.0					
8.1					
8.2					
8.0	124±2	25	$(D-0.038)_{-0.018}^0$	$3.1_{-0.1}^0$	8
8.1					
8.2					
8.3					
8.4					
8.5					
8.6	130±2				
8.7					
8.8					
8.9					
9.0					
9.1	134±2				
9.2					
9.3					
9.4					
9.5					
9.6	137±2				
9.7					
9.8					
9.9					
10.0					
10.1	142±2				
10.2					
10.3					
10.4					
10.5					
10.6	146±2				
10.7					
10.8					
10.9					
11.0					
11.1	149±2				
11.2					
11.3					
11.4					
11.5					
11.6	152±2				
11.7					
11.8					
11.9					
12.0					
12.1	156±2				
12.2					
12.3					
12.4					
12.5					
12.6	157±2				
12.7					
12.8					
12.9					
13.0					
13.1	160±3				
13.2					
13.3					
13.4					
13.5					
13.6	163±3				
13.7					
13.8					
13.9					
14.0					
14.0	167±3				
14.0					
14.0					
14.0					
14.0					
14.0	170±3				
14.0					
14.0					
14.0					
14.0					

Nominal Size D	L	ℓ	d	J	K
8.3	130±2	32	$(D-0.05)_{-0.022}^0$	$5.2_{-0.1}^0$	10
8.4					
8.5					
8.6					
8.7					
8.8	134±2				
8.9					
9.0					
9.1					
9.2					
9.3	137±2				
9.4					
9.5					
9.6					
9.7					
9.8	142±2				
9.9					
10.0					
10.1					
10.2					
10.3	146±2				
10.4					
10.5					
10.6					
10.7					
10.8	149±2				
10.9					
11.0					
11.1					
11.2					
11.3	152±2				
11.4					
11.5					
11.6					
11.7					
11.8	156±2				
11.9					
12.0					
12.1					
12.2					
12.3	157±2				
12.4					
12.5					
12.6					
12.7					
12.8	160±3				
12.9					
13.0					
13.1					
13.2					
13.3	163±3				
13.4					
13.5					
13.6					
13.7					
13.8	167±3				
13.9					
14.0					
14.0					
14.0					
14.0	170±3				
14.0					
14.0					
14.0					
14.0					

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