

JIS

JAPANESE INDUSTRIAL STANDARD

Single point tools with
cemented carbide tips

☞ JIS B 4105—1991

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.



1. Scope

This Japanese Industrial Standard specifies the single point tools with cemented carbide tips (hereafter referred to as the "tools").

Remarks 1. Applicable Standards to this Standard are the following:

JIS B 0107-Single Point Tools - Vocabulary

JIS B 0659-Roughness Comparison Specimens

JIS B 4053-Hard Tool Materials and Classification of Applicability

JIS B 4104-Hard Tool Material Tips

JIS B 7507-Vernier Callipers

JIS B 7513-Precision Surface Plates

JIS B 7514-Steel Straightedges

JIS B 7517-Height Gauges

JIS G 4401-Carbon Tool Steels

2. Corresponding International Standards to this Standard are the following:

ISO 243-1975 Turning tools with carbide tips - External tools

ISO 504-1975 Turning tools with carbide tips - Designation and marking

ISO 514-1975 Turning tools with carbide tips - Internal tools

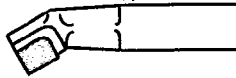
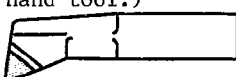
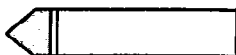
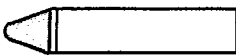
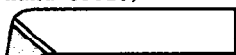
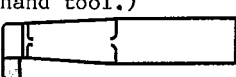
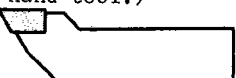
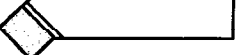
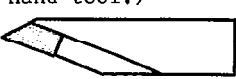
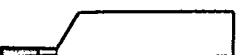
2. Definitions

For the purposes of this Standard main definitions are in accordance with JIS B 0107.

3. Classification

The tools shall be classified into 26 types according to their shapes as given in Table 1.

Table 1. Classification

Classification		Shape	Classification		Shape
Type No.	Hand		Type No.	Hand	
31	Right hand	(Diagram shows right hand tool.)	45	Right hand	(Diagram shows right hand tool.)
32	Left hand		46	Left hand	
33	Right hand	(Diagram shows right hand tool.)	47	Right hand	(Diagram shows right hand tool.)
34	Left hand		48	Left hand	
35	No hand		49	Right hand	(Diagram shows right hand tool.)
36	No hand		50	Left hand	
37	Right hand	(Diagram shows right hand tool.)	51	Right hand	(Diagram shows right hand tool.)
38	Left hand		52	Left hand	
39	Right hand	(Diagram shows right hand tool.)	91	Right hand	(Diagram shows left hand tool.)
40	Left hand		92	Left hand	
41	Right hand	(Diagram shows right hand tool.)	93	Right hand	(Diagram shows right hand tool.)
42	Left hand		94	Left hand	
43	Right hand		95	Right hand	

4. Shapes and dimensions

The shapes and dimensions of the tools shall be in accordance with Attached Tables 1 to 15 and the tolerances thereof shall be as follows.

- (1) Dimensional tolerances of tip ⁽¹⁾ The dimensional tolerances of the tip ⁽¹⁾ conform to Table 2.

Table 2. Dimensional tolerances of tips Unit: mm

Length of one side of tip ⁽¹⁾	Tolerances
5 or under	+ 0.1 - 0.5
Over 5 up to and including 10	+ 0.1 - 0.7
Over 10 up to and including 25	+ 0.2 - 0.9
Over 25 up to and including 50	+ 0.3 - 1.1

Note ⁽¹⁾ The grinding finished tips after having been brazed to the shank part.

- (2) Angular tolerances of cutting part The angular tolerances of the cutting part conform to Table 3.

Table 3. Angular tolerances of cutting parts

Measuring place	Tolerances
Rake angle	$\pm 1^\circ$
Clearance angle	$\pm 1^\circ$
Other angles	$\pm 2^\circ$

Remarks 1. The angular tolerances on side clearance angle and back tapers of Type 43 tools shall be taken as $\begin{smallmatrix} + \\ - \end{smallmatrix} 1^\circ_{30'}$.

2. The tolerances on nose angle of 60 degrees of Types 49 to 52 tools shall be taken as $\pm 30'$.

- (3) Tolerances on nose height of cutting part The tolerances on the nose height of the cutting conform to Table 4.

Table 4. Tolerances on nose heights of cutting parts

Unit: mm

Classification	Reference plane in measuring nose height	Basic dimension of nose height	Nominal No. of tool	Tolerance
Types 31 to 43 Types 45 to 52	Upper face of shank	0	0, 1	0 - 0.5
			2, 3, 4	0 - 1
			5, 6	0 - 1.5
Types 91, 92, 95	Base of shank	<i>h</i> as given in Attached Table		0 - 1
Types 93, 94				0 - 1.5

- (4) Dimensional tolerances for shank The dimensional tolerances of the shank conform to Table 5.

Table 5. Dimensional tolerances for shank

Unit: mm

Width (<i>W</i>) and height (<i>H</i>)	Tolerances
16 or under	+ 0.5 - 1
Over 16 up to and including 25	± 1
Over 25 up to and including 35	± 1.2
Over 35 up to and including 50	± 1.5
Length (<i>L</i>)	± 2 %

Remarks: Width (*W*) and height (*H*) are measured at a portion within three times the height (*H*) from end face of shank.

5. Appearance

The appearance of the tools shall conform to Table 6.

Table 6. Appearance

Division	Quality item	Conditions
Tips	Flaws and cracks	No such defect shall be found.
	Finish of cutting edge	Cutting part of a tip should be grinding-finished as flat as possible. The surface roughness shall be 0.4 μ (1.6 S) and no harmful broken edge of the cutting edge be found.
	Conditions of brazed portion	Harmful defects in use such as cracks and voids shall not be found.
Shanks	Flaws, burrs, deformation and cracks	No harmful defect in use shall be found.
	Finish	The shank faces shall be finished as flat as possible. The base, particularly, shall provide the flatness produced by machine finishing or a flatness equal to or better than that.

6. Materials

The materials of the tools shall be in accordance with Table 7.

Table 7. Materials

Division	Materials
Tips	Tips for the tools specified in JIS B 4104 shall be used.
Shanks	SK 5 to 7 of JIS G 4401 or the material providing equal performances in use or better than that shall be used.

7. Testing methods

7.1 Shapes and dimensions The shapes and dimensions shall be measured in accordance with Table 8.

Table 8. Testing methods of shapes and dimensions

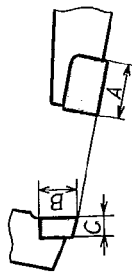
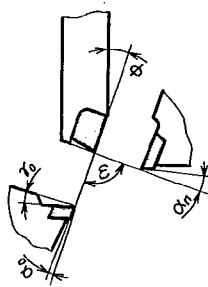
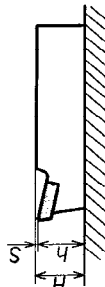
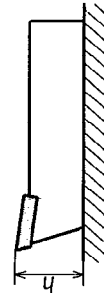
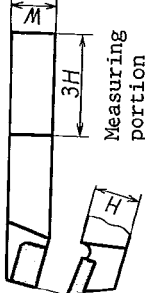
No.	Item	Measuring method	Illustrations for measuring method	Measurement instrument
1	Dimensions of tip	Measure the dimensions with a vernier caliper and obtain the differences between those and the basic dimensions.		Vernier calipers of Grade 1 of JIS B 7507
2	Angles of cutting part	Measure the angles by a fan-shaped protractor with handle or measure those with a bevel protractor, placing the tool on a precise surface plate, and then obtain the differences between those and the basic angles.		Precise surface plate of Grade 1 of JIS B 7513. Fan-shaped protractor with handle bevel protractor
3	Nose height of cutting part	Place the tool on a precise surface plate and measure the height (h) up to the cutting edge and the height (H) up to upper surface of shank by a height gauge, and then obtain the difference S of those. $S = h - H$		Precise surface plate of Grade 1 of JIS B 7513. Height gauges specified in JIS B 7517
		Place the tool on a precise surface plate and measure the height (h) up to the cutting edge by a height gauge, and obtain the difference between the basic dimension and that.		

Table 8 (Cont'd)

No.	Item		Measuring method	Illustrations for measuring method	Measurement instrument
	Di- mensions of shank	Width (W) and height (H)	Measure those by a vernier calipers and obtain the differences between the basic dimensions and those. In measuring width (W) and height (H), measure those at a part not more than three times the height (H) from the end face of shank.		Vernier calipers of Grade 1 specified in JIS B 7507
		Length (L)	Measure L by a vernier calipers and obtain the difference between the basic dimension and that.		