

JIS

JAPANESE INDUSTRIAL STANDARD

Inspection Method for Taper Screw Gauges

JIS B 0262—1989

Translated and Published

by

Japanese Standards Association

Printed in Japan

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

JAPANESE INDUSTRIAL STANDARD

J I S

Inspection Method for
Taper Screw Gauges

B 0262-1989

1. Scope

This Japanese Industrial Standard specifies the inspection method of taper screw gauges for pipes specified in JIS B 0253 (hereafter referred to as the "taper screw gauges").

Furthermore, the inspection method for the taper screw gauges specified in Appendix of JIS B 0253 is specified in Appendix.

Remark: The units and numerical values given in { } in this Standard are based on the traditional units and are appended for informative reference.

2. Temperature Conditions of Measuring Site

The temperature of the site where the measurement of the taper screw gauge is carried out shall be $20 \pm 2^{\circ}\text{C}$ ⁽¹⁾.

Note ⁽¹⁾ The tolerances on temperature shall be the temperature grade 2 of JIS Z 8703.

3. Measuring Items, Measuring Positions, Outline of Measurement and Measuring Instruments and Tools

The measuring items, measuring positions, outline of measurement and measuring instruments and tools are given in Table 1.

Applicable Standards: See page 21.

Table 1. Measuring items, Measuring Positions, Outline of Measurement, and Measuring Instruments and Tools

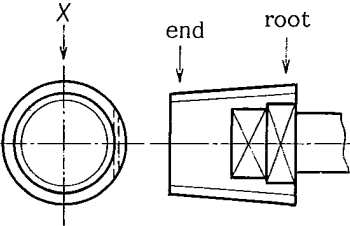
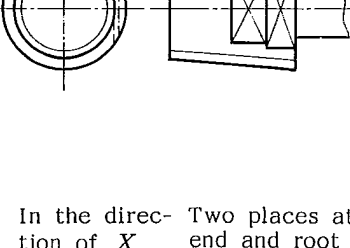
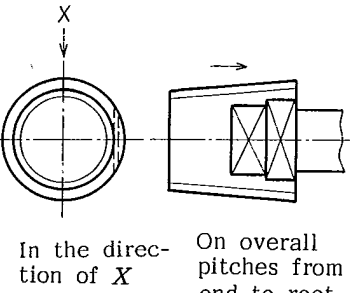
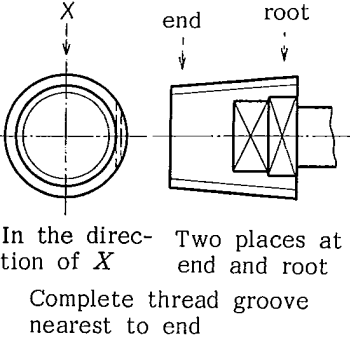
Classi- fication of mea- surement	Taper screw gauge to be mea- sured	Measuring item	Measuring positions (2)	Outline of measurement	Measuring instruments and tools (3)
Inspection on dimensions or shape	Taper screw plug gauge or inspection plug	Major diameter and taper of major diameter		Refer to 4.	Indicating micrometer specified in JIS B 7520, grade 1 block gauge specified in JIS B 7506, and rollers and auxiliary plates for measuring taper screw threads given in Table 2.
		Pitch diameter and taper of pitch diameter	 In the direc- Two places at tion of X end and root	Refer to 5.	Indicating micrometer specified in JIS B 7520, grade 1 block gauge specified in JIS B 7506, and rollers and auxiliary plates for measuring taper screw threads given in Table 2 and four wires (4) for measuring taper screw threads.
		Pitch	 In the direc- On overall tion of X pitches from end to root	Refer to 6.	
		Half angle of thread	 In the direc- Two places at tion of X end and root Complete thread groove nearest to end	Refer to 7.	Tool makers' micro- meter specified in JIS B 7153
		Root diameter and shape of root		The root diameter is not measured. Only the shape is comparison observed by screw shaped template. For inspection plug, width of under- cut is measured.	

Table 1 (Continued)

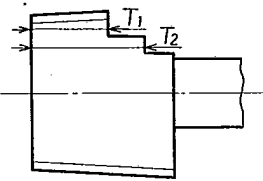
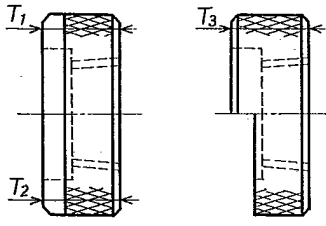
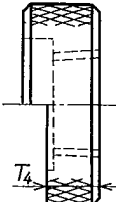
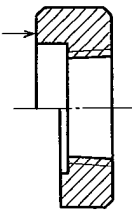
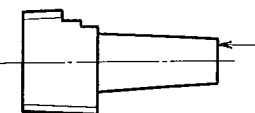
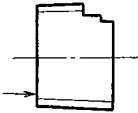
Classi- fication of mea- surement	Taper screw gauge to be mea- sured	Measuring item	Measuring positions (2)	Outline of measurement	Measuring instruments and tools (3)
Inspection on dimensions or shape	Taper screw plug gauge or inspection plug	Length of notch		Measure T_1 and T_2 and calculate $T_2 - T_1$.	Lever type dial gauge specified in JIS B 7533, grade 1 block gauge specified in JIS B 7506, or outside micrometer specified in JIS B 7502.
	Taper screw ring gauge	Pitch diameter		Tightly engage inspection plug with hand, and measure the gap between the end face of the major diameter of the taper screw ring gauge and the end face of the notch of inspection plug (see 8. of JIS B 0253).	Inspection plug specified in JIS B 0253, lever type dial gauge specified in JIS B 7533, grade 1 block gauge specified in JIS B 7506, or depth micrometer specified in JIS B 7544.
		Pitch			
		Half angle of thread			
		Taper of pitch diameter			
		Inside diameter		Refer to 9.	Taper plug gauge for measuring taper screw ring gauge inside diameter defined in Table 4, lever type dial gauge specified in JIS B 7533, grade 1 block gauge specified in JIS B 7506 or depth micrometer specified in JIS B 7544.
		Root diameter and shape of root		Root diameter is not measured. For that is capable of being moulded, only its shape is comparison observed by screw shaped template.	Sulfur (mixed with graphite), gypsum or Zimmerman amalgam, and tool makers' microscope specified in JIS B 7153.
		Gauge length	 Three places of T_1 , T_2 and T_3		Outside micrometer specified in JIS B 7502

Table 1 (Continued)

Classi- fication of mea- surement	Taper screw gauge to be mea- sured	Measuring item	Measuring positions (2)	Outline of measurement	Measuring instruments and tools (3)
Inspection on dimensions or shape	Taper screw ring gauge	Length of notch		Measure the maxi- mum value and minimum value of T_4 , and calculate the value of $\frac{T_1 + T_2 + T_3}{3} - T_4$ for respective values.	Outside micrometer specified in JIS B 7502.
Other inspections	Taper screw ring gauge, taper screw plug gauge and inspection plug	Surface roughness	Gauge surface	By comparison observation with the surface rough- ness comparison specimen	Surface roughness comparison specimen
		Hardness	Taper screw ring gauge  Taper screw plug gauge (Taper lock type)  (Tri-lock type)  Near the arrow mark (→) in Figure	Load 294.2 N (30 kgf) or over	Vicker's hardness tester (5) specified in JIS B 7725.

Notes (2) In the case where the measuring positions given herein are unable to be taken, proper positions, instead of these, shall be selected.

(3) It is not necessarily limited to the measuring instruments and tools given herein, however, it shall be those equal or superior to these.

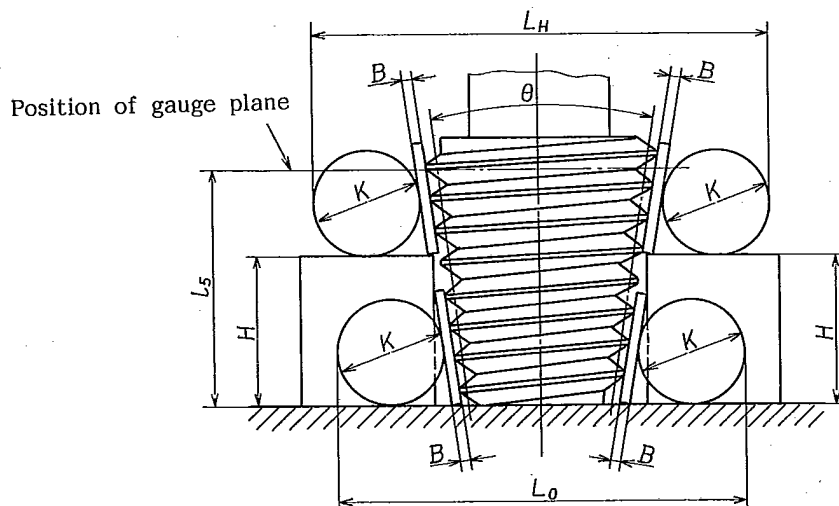
(4) It shall be that which has been assembled into a set of 4 wires specified in JIS B 0271. However, when no wire corresponding to the number of threads of the taper screw gauge has been specified, the wire of the nearest dimension to this shall be taken.

(5) The rockwell hardness tester specified in JIS B 7726 may be used instead.

4. Measuring Method of Major Diameters for Taper Screw Plug Gauge and Inspection Plug

The measurements of the major diameters of the taper screw plug gauge and inspection plug shall generally be carried out by the method using rollers and auxiliary plates (see Fig. 1). The dimensions and tolerances of rollers and auxiliary plates shall be in accordance with Table 2.

Fig. 1. Measuring Method of Major Diameter of Taper Screw Plug Gauge by Using Rollers and Auxiliary Plates



At first, after confirming well that no unevenness of major diameter dimensions could exist by the gap observation with a straight edge, tool makers' microscope, etc., stand the taper screw plug gauge or inspection plug to be measured on a surface plate with its end face of minor diameter facing downward as given in Fig. 1, apply auxiliary plates and rollers from both sides, and measure the outside distance L_o of rollers. Next, put the auxiliary plates and rollers on the block gauge of which height H makes the upper faces of rollers to coincide approximately with the end face of the major diameter of the taper screw plug gauge or inspection plug, and measure the outside distance L_H of the rollers in this case.

The taper ratio of major diameter shall be obtained by $\frac{L_H - L_o}{H}$.

In addition, the acceptability of the taper angle shall be determined whether the $(L_H - L_o) - (H \times \frac{1}{16})$ comes within the tolerance of taper angle or not.

Major diameter dimension D at the position of gauge plane shall be obtained from the following formula:

$$D = L_H - K - (2B + K) \sec \frac{\theta}{2} + (2L_s - 2H - K) \frac{L_H - L_o}{2H}$$

where B : mean value of thickness of both side auxiliary plates

K : mean value of diameters of both side rollers

l_s : $\frac{1}{2}$ the sum of measured value of length from the maximum notch to the minor diameter end face, and the measured value of length from the minimum notch to the minor diameter end face.

θ : basic size of taper angle

In the case where the taper ratio is 1 : 16, namely, $\frac{\theta}{2}$ is $1^\circ 47' 24''$, it shall be calculated as follows:

$$D = L_H - K - 1.000\,488 (2B + K) + (2l_s - 2H - K) \frac{L_H - L_o}{2H}.$$

Table 2. Dimensions and Tolerances of Rollers and Auxiliary Plates for Taper Screw Measurement

Unit: mm

Threads per inch to be applied (per 25.4 mm)	Diameter of roller	Auxiliary plate		
		Width of plate	Thickness of plate	Dimensional deviation on thickness of plate
28	4	9	1	± 0.1
19	6			
14	8			
11	10		2	

- Remarks
1. The accuracy of rollers shall be of precision grade specified in JIS B 1506.
 2. The parallelism, flatness and surface roughness of auxiliary plates shall be of grade 1 specified in JIS B 7506.
 3. The lengths of the roller and auxiliary plate are not specified.

5. Measuring Method of Pitch Diameters of Taper Screw Plug Gauge and Inspection Plug

The measurement of the pitch diameters of the taper screw plug gauge and inspection plug shall generally be in accordance with 4-wire method.