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Test mandrels

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Precision Measuring Instruments Manufacturers Association (JMA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS B 7545:1982** is replaced with this Standard.

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Test mandrels

1 Scope

This Japanese Industrial Standard specifies the cylindrical test mandrels with taper shank and those with centre holes used mainly for the geometric accuracy tests of machine tools and measuring instruments.

NOTE 1 The term “test mandrels” is used when the test mandrels with taper shank and the test mandrels with centre holes are collectively called.

NOTE 2 When using the test mandrel horizontally, its deflection is taken into consideration (see Annex A).

NOTE 3 Precautions when using test mandrels are shown in Annex B as a reference.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS B 0106 *Machine tools — Parts and working methods — Vocabulary*
- JIS B 0154 *Vocabulary of cones*
- JIS B 0182 *Machine tools — Test codes — Vocabulary*
- JIS B 0651 *Geometrical Product Specifications (GPS) — Surface texture : Profile method — Nominal characteristics of contact (stylus) instruments*
- JIS B 0659-1 *Geometrical Product Specifications (GPS) — Surface texture : Profile method; Measurement standards — Part 1 : Material measures*
- JIS B 0680 *Geometrical Product Specifications (GPS) — Standard reference temperature for geometrical product specification and verification*
- JIS B 1011 *Centre holes*
- JIS B 3301 *Taper gauges — Morse tapers and metric tapers*
- JIS B 4003 *Machine tools — Self-holding tapers for tool shanks*
- JIS B 6064-1 *Hollow taper interface with flange contact surface — Part 1 : Shanks — Dimensions*
- JIS B 6101 *7/24 tapers for tool shanks for manual changing*
- JIS B 6339-1 *Tool shanks with 7/24 taper for automatic tool changers — Part 1 : Dimensions and designation of shanks of forms A, AD, AF, U, UD and UF*
- JIS B 6339-2 *Tool shanks with 7/24 taper for automatic tool changers — Part 2 :*

Dimensions and designation of shanks of forms J, JD and JF

JIS B 7451	<i>Instruments for the assessment of departure from roundness — Measurement of variations in radius</i>
JIS B 7503	<i>Mechanical dial gauges</i>
JIS B 7506	<i>Gauge blocks</i>
JIS B 7513	<i>Precision surface plates</i>
JIS B 7519	<i>Microindicators</i>
JIS B 7533	<i>Dial test indicators (lever type)</i>
JIS B 7536	<i>Electrical comparators</i>
JIS B 7540	<i>Vee blocks</i>
JIS B 7725	<i>Vickers hardness test — Verification and calibration of testing machines</i>
JIS B 7726	<i>Rockwell hardness test — Verification and calibration of testing machines</i>
JIS Z 2244	<i>Vickers hardness test — Test method</i>
JIS Z 2245	<i>Rockwell hardness test — Test method</i>

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in JIS B 0106, JIS B 0154 and JIS B 0182, and the following apply.

3.1 centre-hole cover

cover-like portion on which a centre hole is machined

4 Types

The test mandrels are divided into the test mandrels with taper shank and the test mandrels with centre holes, and their types are as given in Table 1.

Table 1 Division and type of test mandrels

Division	Type	Typical nominal number	Grade
Test mandrel with taper shank	Test mandrel with Morse taper shank	MT0	—
		MT1	
		MT2	
		MT3	
		MT4	
		MT5	
		MT6	
	Test mandrel with metric taper shank	MET80	—
		MET100	
	Test mandrel with 7/24 taper shank (for manual tool changer)	NT30	—
		NT40	
		NT45	
		NT50	
	Test mandrel with 7/24 taper shank (for automatic tool changer)	BT30	—
		BT40	
		BT45	
		BT50	
	Test mandrel with hollow taper interface with flange contact surface	HSK – A40	—
		HSK – A50	
		HSK – A63	
		HSK – A100	
Test mandrel with centre holes	Test mandrel with centre holes	—	Grade 1 ^{a)}
		—	Grade 2
Note ^{a)} Grade 1 applies to the test mandrels with centre holes having the cylindrical part of a diameter (<i>D</i>) of 40 mm or under and a length (<i>L</i>) of 250 mm or under as given in Table 3.			

5 Standard reference temperature

Each dimension specified in this Standard shall be the value at 20 °C which is the standard reference temperature specified in JIS B 0680.

6 Shape and dimensions

6.1 Test mandrel with taper shank

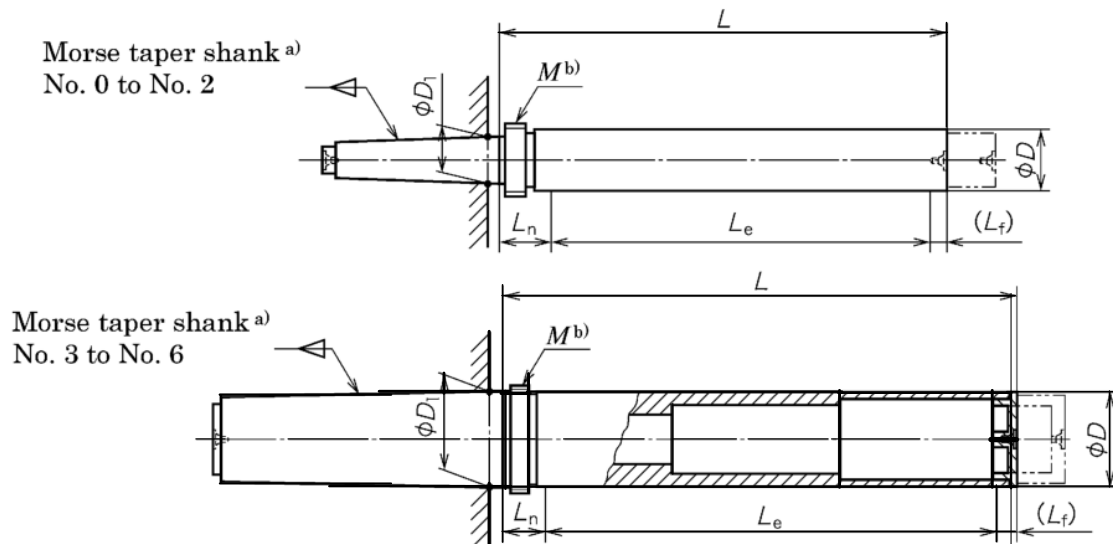
The shapes of the test mandrels with taper shank corresponding to the typical nominal numbers shall be as given in Figure 1 to Figure 5, and the dimensions shall be as given in Table 2. Other shapes and dimensions than those of typical nominal numbers shall be as agreed between the parties concerned with delivery.

The centre hole shall conform to Type B or Type C of 60° centre hole specified in JIS B 1011.

NOTE 1 If necessary for machining, the portion to fix a lathe-dog (part enclosed by a long-dashed double-dotted line in Figure 1 to Figure 5) may be added.

NOTE 2 To reduce the weight or the deflection, a hollow shape may be adopted and the centre-hole cover may be strongly fixed on the end face of both sides or one side as a dead-end hole.

NOTE 3 An air hole may be made on the centre-hole cover.



Notes ^{a)} Shapes and dimensions of taper shank part shall be as specified in **JIS B 4003**.

^{b)} Instead of the screw (M) to draw out the test mandrel with taper shank, flats for spanner jaw (W) may be made as shown in the following diagram.

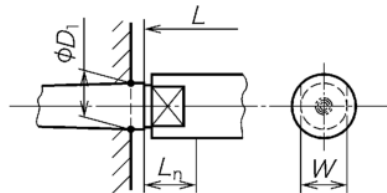
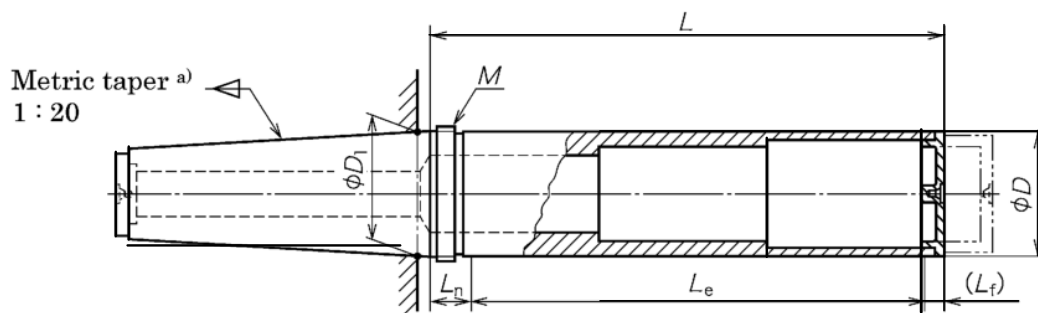


Figure 1 Shape of test mandrel with Morse taper shank (MT)



Note ^{a)} Shapes and dimensions of taper shank part shall be as specified in **JIS B 4003**.

Figure 2 Shape of test mandrel with metric taper shank (MET)