

JIS

JAPANESE INDUSTRIAL STANDARD

Measuring microscopes

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Measuring microscopes

B 7153-1995

1. Scope This Japanese Industrial Standard specifies the measuring microscopes to measure lengths, angles, profiles, etc. (see Attached Fig. 1).

Remarks 1. The standards cited in this Standard are given in the following:

JIS B 7184 Measuring projectors

JIS B 7432 Optical polygons for angle standards

JIS B 7526 Squares

JIS B 7536 Electrical comparators

JIS B 7538 Autocollimators

JIS B 7541 Standard scales

2. In this Standard, units and numerical values given in { } are in accordance with the conventional units, and are appended for informative reference.

2. Definitions The definitions used in this Standard are in accordance with the following:

(1) observing microscope A microscope having a reticle, and having function to make up an image produced through an objective lens to a projected image or pictorial image.

(2) X-axis An axis in left and right directions of the table perpendicular to the optical axis of the objective lens.

(3) Y-axis An axis in front and rear directions of the table perpendicular to the optical axis of the objective lens.

(4) objective lens for profile measurement An objective lens, being combined with the template eyepiece, for measuring the profile of shape or the like.

(5) measuring accuracy In the practical measuring conditions, the accuracy being obtained when a length standard has been measured by the measuring microscope.

3. Grades The grades of the measuring microscopes shall be two grades of grade 0 and grade 1 according to the performance.

4. Performances The performances shall be in accordance with Table 1. The permissible values shall be those of at 20°C.

Table 1. Performances

No.	Item	Measuring method	Explanatory Figure	Measuring instruments	Permissible values
1	Parallelism or run out of upper face in respect to table travelling	X-axis direction	Attached Fig. 2	Electrical comparator (that has been specified in JIS B 7536) or that having performances in accordance with this, as appropriate.	Respective directions of upper face of object glass Grade 0 ($7.5 + 0.025 L$) μm or under Grade 1 ($15.0 + 0.050 L$) μm or under L is the displacement of table (mm) and is applicable to the overall measuring range.
		Y-axis direction			
		Rotational direction			
2	Straightness in the horizontal plane of table travelling	X-axis direction	Attached Fig. 3	Precision straightedge (that has been calibrated by the accuracy of $1/5$ or under the permissible value), and electrical comparator (that is more precise than $0.2 \mu\text{m}$ specified in JIS B 7536) or that having performances in accordance with this, as appropriate.	In both directions Grade 0 ($0.5 + 0.01 L$) μm or under Grade 1 ($1.0 + 0.02 L$) μm or under L is the displacement of table (mm) and is applicable to the overall measuring range.
		Y-axis direction			
3	Perpendicularity of travelling direction in X-axis to travelling direction in Y-axis of table	Place the working surface of precision straightedge in parallel to the travelling direction in X-axis on the table upper surface, apply the electrical comparator or the like being attached on the objective lens attaching part to the working surface of another side, and obtain the maximum value of run out of indication, when the table has been allowed to travel in Y-axis direction.	Attached Fig. 4	Precision square (that has been calibrated its squareness to the accuracy of $1/5$ or under of permissible value), and electrical comparator (that is more precise than $0.2 \mu\text{m}$ specified in JIS B 7536) or that having performances in accordance with this, as appropriate.	Grade 0 ($1.5 + 0.02 L$) μm or under Grade 1 ($3.0 + 0.04 L$) μm or under L is the displacement of table (mm) and is applicable to the overall measuring range.