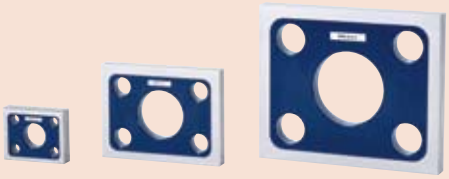
New Products

Ultra Low Expansion Ceramic Gauge Blocks (ZERO CERA Block)

Refer to page E-6 for details.

Gauge Block Comparator GBCD-100A

Refer to page E-31 for details.



Digital Height Master

Refer to page E-35 for details.

High Precision Square

Refer to page E-42 for details.

E

Small Tool Instruments and Reference Gages

Gauge Blocks

Gauge Block

Height Master & Reference Gages

Height Master

Granite Surface Plates

INDEX

Mitutoyo

Gauge Blocks

Length Standards Brought to You by Mitutoyo

Features and Accuracies

Features of Mitutoyo Gauge Blocks

Mitutoyo offers 3 types of gauge block for use as length standards: rectangular steel, rectangular ceramic (CERA Blocks) and square steel gauge blocks. In addition, rectangular and square protection blocks (1mm and 2mm for each) are available in tungsten carbide. Mitutoyo gauge blocks are recognized to be of the highest quality both here in Japan and abroad, and are available in various grades to meet every need in respect of working conditions, environment and application.

Accuracy

As a world-leading precision measuring equipment manufacturer, Mitutoyo is certified by the Japanese government as an accredited calibration laboratory, which means that the accuracy of its gauge blocks is guaranteed through traceability to the Metrology Management Center of the National Institute of Advanced Industrial Science and Technology (AIST).

Wringing

Lapping measuring surfaces is one of Mitutoyo's specialties. Our advanced technique, developed over more than half a century, enables us to achieve the optimum flatness and surface finish needed for gauge blocks and thus maximize the wringing force.

Abrasion Resistance and Dimensional Stability of Steel Blocks

High-carbon high-chrome steel is employed to satisfy a variety of the material characteristics required for gauge blocks. Our advanced heat treatment technology for steel blocks, which involves repeated temperature cycling, simultaneously achieves excellent abrasion resistance and minimizes any change in length over time.

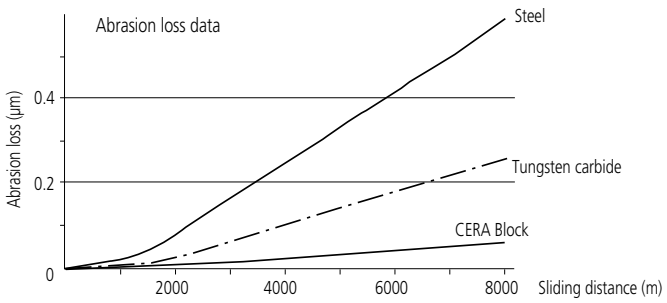
CERA Blocks

CERA blocks are made of a ceramic material with a superior surface finish, created by Mitutoyo's ultra-precision machining techniques, that provides a premium quality block with significant advantages:

1. Corrosion Resistant
Anti-corrosion treatment is not required when handled normally (i.e. with fingers), resulting in simple maintenance and storage.

2. No Burrs Caused by Accidental Mishandling
Since the CERA Block is very hard, it will not scratch easily and is highly resistant to burrs. If a burr is formed, it can easily be removed with a ceramic deburring stone (Ceraston).

3. Abrasion Resistant
CERA Blocks have 10 times the abrasion resistance of steel gauge blocks.



4. Dimensionally Stable
CERA Blocks are free from dimensional change over time.

5. Clearly Marked Sizes
Black characters, indicating the nominal length, are inscribed by laser and are clearly visible against the white surface of the block.

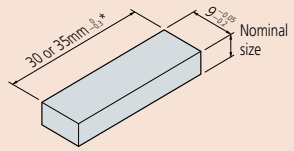
6. Non-magnetic Nature Prevents Steel Swarf Contamination

7. High Wringing Force
Superior flatness and surface finish provides maximum wringing force.

Classification of Gauge Blocks by Shape

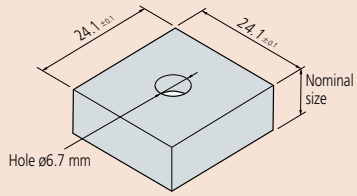
Mitutoyo broadly divides gauge blocks into two categories according to the block shape.

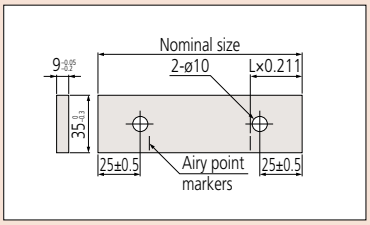
Rectangular gauge blocks



* Depends on the nominal size.
More than 10mm
10mm or less

Square gauge blocks





Coupling holes in long rectangular gauge blocks

Selecting Gauge Blocks

- Select gauge blocks in accordance with the combination range required.
  If a large length is required, add a long block set.
- Select gauge blocks in accordance with the minimum length step required. Add wear block sets if necessary.
- If a set containing a large number of gauge blocks is selected, the number of combination gauge blocks required for a length is reduced and the number of combinations is increased. The accuracy will be retained and damage will be reduced.
- The specific gauge block set for micrometer inspection and caliper inspection is available (refer to page E-11 for details).
- If using only one length repeatedly, it is a good idea to purchase discrete gauge blocks (refer to page E-13, E-14, E-15, E-16, and E24 for details) .
- The 2mm-based gauge blocks, which take the base of the minimum length step as 2mm, are easy to handle and will not warp, as compared to the 1mm-based gauge blocks.

Mitutoyo Gauge Blocks and Inspection Certificates

A Certificate of Inspection is furnished with all Mitutoyo gauge blocks with a serial number on the box (in the case of sets) and an identification number on each block. The deviation of each block from nominal length, at the time of inspection, is stated. For this inspection, each gauge block is measured relative to the upper level master using a gauge block comparator. Grade K gauge blocks are measured by a primary measurement method using an interferometer.

Grade and Application

The following table can be used to select the gauge block grade according to usage (specified by DIN861, BS4311, and JIS B 7506).

	Applications	Grade
Workshop use	• Mounting tools and cutters	2
	• Manufacturing gages • Calibrating instruments	1 or 2
Inspection use	• Inspecting mechanical parts, tools, etc.	1 or 2
	• Checking the accuracy of gages • Calibrating instruments	0 or 1
Calibration use	• Checking the accuracy of gauge blocks for workshop • Checking the accuracy of gauge blocks for inspection • Checking the accuracy of instruments	K or 0
Reference use	• Checking the accuracy of gauge blocks for calibration • For academic research	K

Constructing a Gauge Block Stack

The following points should be noted when constructing a gauge block stack:

1. Use as few gauge blocks as possible to obtain the required length by selecting thick blocks wherever possible.
2. Select the block for the least significant digit first, then work back through the more significant digits until the required length is attained.
3. There are multiple combinations for the integer part of a length. To prevent wear as much as possible, do not always use the same gauge blocks.

Example: Required length = 45.6785mm

• For a 1mm-based gauge block set (112 pcs.)

```
      1.0005
      1.008
      1.17
     17.5
+ )  25
     45.6785mm
```

• For a 2mm-based gauge block set (112 pcs.)

```
      2.0005
      2.008
      2.17
     14.5
+ )  25
     45.6785mm
```

* Regarding the method for wringing, refer to "Quick Guide to Precision Measuring Instruments" on page E-33.

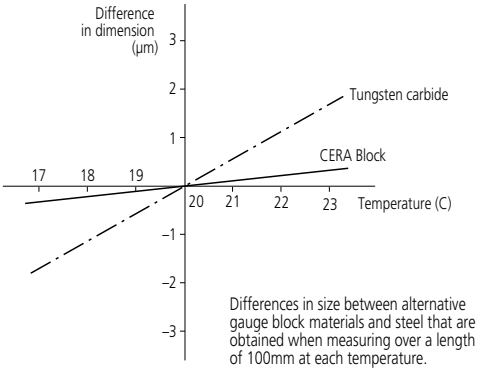
8. Superior Material Characteristics of CERA Block

Property \ Material	CERA Block (ZrO_2)	Steel (Fe)	Tungsten Carbide (WC-Co)
Hardness (HV)	**1350**	800	1650
Coefficient of thermal expansion (10^{-6}/K)	**9.3±0.5**	10.8±0.5	5.5±1.0
Flexural strength by 3-point bending (MPa)	**1270**	1960	1960
Fracture toughness K_{1C} (MPa•$m^{1/2}$)	**7**	120	12
Young's modulus x10^4 (MPa)	**20.6**	20.6	61.8
Poisson's ratio	**0.3**	0.3	0.2
Specific gravity (Kg/dm^3)	**6.0**	7.8	14.8
Thermal conductivity (W/m•k)	**2.9**	54.4	79.5

* Ceramics have the advantage of a slow response to temperature changes due to the low thermal conductivity. However, caution is required when using CERA blocks in the environment of severe temperature change.

9. Closest Expansion Coefficient to Steel

The thermal expansion coefficient of a CERA Block is quite similar to that of a steel gauge block.



10. Highly Resistant to Dropping and Impact Damage

The CERA Block material is one of the toughest ceramics. It is extremely difficult to crack a CERA block in normal use.

Features of Square Gauge Blocks

1. Gauge blocks in a stack can be clamped together

After wringing square gauge blocks, a tie rod can be inserted through the center hole to clamp the blocks together for extra security.

2. A height reference standard can easily be made

A precision height reference standard can be made easily and inexpensively using accessories such as the plain jaw and block base.

3. A dedicated inspection jig can easily be made

A dedicated inspection jig for periodic inspection of instruments can be made easily and inexpensively.

4. A wide measuring surface with cross-sectional dimensions of 24.1 x 24.1mm is available.

A square gauge block retains stable orientation both longitudinally and laterally. A wide range of applications is covered, including cutting tool positioning, angle measurement with a sine bar, taper measurement with a roller, and inspection of depth micrometers.

Long and Ultra-Thin Gauge Blocks

Mitutoyo offers extra-thin gauge blocks from 0.10 mm to 0.99 mm (increments of 0.01 mm) as well as long gauge blocks up to 1,000 mm as standard products.

Gauge Blocks

Length Standards Brought to You by Mitutoyo

ACCURACY SPECIFICATIONS: JIS B 7506-2004 (JAPAN)

(at 20°C)

Nominal length (mm)		Grade K		Grade 0	
		Limit deviation of length at any point	Tolerance for the variation in length	Limit deviation of length at any point	Tolerance for the variation in length
from 0.5	up to 10	±0.20μm	0.05μm	±0.12μm	0.10μm
over 10	up to 25	±0.30μm	0.05μm	±0.14μm	0.10μm
over 25	up to 50	±0.40μm	0.06μm	±0.20μm	0.10μm
over 50	up to 75	±0.50μm	0.06μm	±0.25μm	0.12μm
over 75	up to 100	±0.60μm	0.07μm	±0.30μm	0.12μm
over 100	up to 150	±0.80μm	0.08μm	±0.40μm	0.14μm
over 150	up to 200	±1.00μm	0.09μm	±0.50μm	0.16μm
over 200	up to 250	±1.20μm	0.10μm	±0.60μm	0.16μm
over 250	up to 300	±1.40μm	0.10μm	±0.70μm	0.18μm
over 300	up to 400	±1.80μm	0.12μm	±0.90μm	0.20μm
over 400	up to 500	±2.20μm	0.14μm	±1.10μm	0.25μm
over 500	up to 600	±2.60μm	0.16μm	±1.30μm	0.25μm
over 600	up to 700	±3.00μm	0.18μm	±1.50μm	0.30μm
over 700	up to 800	±3.40μm	0.20μm	±1.70μm	0.30μm
over 800	up to 900	±3.80μm	0.20μm	±1.90μm	0.35μm
over 900	up to 1000	±4.20μm	0.25μm	±2.00μm	0.40μm

Nominal length (mm)		Grade 1		Grade 2	
		Limit deviation of length at any point	Tolerance for the variation in length	Limit deviation of length at any point	Tolerance for the variation in length
from 0.5	up to 10	±0.20μm	0.16μm	±0.45μm	0.30μm
over 10	up to 25	±0.30μm	0.16μm	±0.60μm	0.30μm
over 25	up to 50	±0.40μm	0.18μm	±0.80μm	0.30μm
over 50	up to 75	±0.50μm	0.18μm	±1.00μm	0.35μm
over 75	up to 100	±0.60μm	0.20μm	±1.20μm	0.35μm
over 100	up to 150	±0.80μm	0.20μm	±1.60μm	0.40μm
over 150	up to 200	±1.00μm	0.25μm	±2.00μm	0.40μm
over 200	up to 250	±1.20μm	0.25μm	±2.40μm	0.45μm
over 250	up to 300	±1.40μm	0.25μm	±2.80μm	0.50μm
over 300	up to 400	±1.80μm	0.30μm	±3.60μm	0.50μm
over 400	up to 500	±2.20μm	0.35μm	±4.40μm	0.60μm
over 500	up to 600	±2.60μm	0.40μm	±5.00μm	0.70μm
over 600	up to 700	±3.00μm	0.45μm	±6.00μm	0.70μm
over 700	up to 800	±3.40μm	0.50μm	±6.50μm	0.80μm
over 800	up to 900	±3.80μm	0.50μm	±7.50μm	0.90μm
over 900	up to 1000	±4.20μm	0.60μm	±8.00μm	1.00μm

ACCURACY SPECIFICATIONS: BS 4311: Part 1: 1993 (UK)

(at 20°C)

Nominal length (inch)		Grade K			Grade 0		
		Tolerance on deviation of measured central length	Parallelism	Flatness	Tolerance on deviation of measured central length	Parallelism	Flatness
over 0	up to 0.4	±5μin	2μin	2μin	±5μin	4μin	4μin
over 0.4	up to 1	±6μin	2μin	2μin	±6μin	4μin	4μin
over 1	up to 2	±8μin	3μin	2μin	±8μin	4μin	4μin
over 2	up to 3	±10μin	3μin	2μin	±10μin	5μin	4μin
over 3	up to 4	±12μin	3μin	2μin	±12μin	5μin	4μin

Nominal length (inch)		Grade 1			Grade 2		
		Tolerance on deviation of measured central length	Parallelism	Flatness	Tolerance on deviation of measured central length	Parallelism	Flatness
over 0	up to 0.4	±10μin	6μin	6μin	±20μin	12μin	10μin
over 0.4	up to 1	±12μin	6μin	6μin	±25μin	12μin	10μin
over 1	up to 2	±15μin	7μin	6μin	±30μin	12μin	10μin
over 2	up to 3	±20μin	7μin	6μin	±40μin	14μin	10μin
over 3	up to 4	±25μin	8μin	6μin	±50μin	14μin	10μin

ACCURACY SPECIFICATIONS: BS 4311: Part 1: 1993 (UK)

(at 20°C)

Nominal length (mm)		Grade K			Grade 0		
		Tolerance on deviation of measured central length	Parallelism	Flatness	Tolerance on deviation of measured central length	Parallelism	Flatness
over 0	up to 10	±0.12μm	0.05μm	0.05μm	±0.12μm	0.10μm	0.10μm
over 10	up to 25	±0.15μm	0.05μm	0.05μm	±0.15μm	0.10μm	0.10μm
over 25	up to 50	±0.20μm	0.06μm	0.05μm	±0.20μm	0.10μm	0.10μm
over 50	up to 75	±0.25μm	0.06μm	0.05μm	±0.25μm	0.12μm	0.10μm
over 75	up to 100	±0.30μm	0.07μm	0.05μm	±0.30μm	0.12μm	0.10μm

Nominal length (mm)		Grade 1			Grade 2		
		Tolerance on deviation of measured central length	Parallelism	Flatness	Tolerance on deviation of measured central length	Parallelism	Flatness
over 0	up to 10	±0.25μm	0.16μm	0.15μm	±0.50μm	0.30μm	0.25μm
over 10	up to 25	±0.30μm	0.16μm	0.15μm	±0.60μm	0.30μm	0.25μm
over 25	up to 50	±0.40μm	0.18μm	0.15μm	±0.80μm	0.30μm	0.25μm
over 50	up to 75	±0.50μm	0.18μm	0.15μm	±1.00μm	0.35μm	0.25μm
over 75	up to 100	±0.60μm	0.20μm	0.15μm	±1.20μm	0.35μm	0.25μm

ACCURACY SPECIFICATIONS: ASME B89.1.9-2002 (USA)

(at 20°C)

Nominal length (inch)		Grade K		Grade 00		Grade 0		Grade 1		Grade 2	
		Limit deviations of length at any point	Tolerance for the variation in length	Limit deviations of length at any point	Tolerance for the variation in length	Limit deviations of length at any point	Tolerance for the variation in length	Limit deviations of length at any point	Tolerance for the variation in length	Limit deviations of length at any point	Tolerance for the variation in length
	up to .05	±12μin	2μin	±4μin	2μin	±6μin	4μin	±12μin	6μin	±24μin	12μin
over .05	up to .4	±10μin	2μin	±3μin	2μin	±5μin	4μin	±8μin	6μin	±18μin	12μin
over .45	up to 1	±12μin	2μin	±3μin	2μin	±6μin	4μin	±12μin	6μin	±24μin	12μin
over 1	up to 2	±16μin	2μin	±4μin	2μin	±8μin	4μin	±16μin	6μin	±32μin	12μin
over 2	up to 3	±20μin	2μin	±5μin	3μin	±10μin	4μin	±20μin	6μin	±40μin	14μin
over 3	up to 4	±24μin	3μin	±6μin	3μin	±12μin	5μin	±24μin	8μin	±48μin	14μin
over 4	up to 5	±32μin	3μin	±8μin	3μin	±16μin	5μin	±32μin	8μin	±64μin	16μin
over 5	up to 6	±32μin	3μin	±8μin	3μin	±16μin	5μin	±32μin	8μin	±64μin	16μin
over 6	up to 7	±40μin	4μin	±10μin	4μin	±20μin	6μin	±40μin	10μin	±80μin	16μin
over 7	up to 8	±40μin	4μin	±10μin	4μin	±20μin	6μin	±40μin	10μin	±80μin	16μin
over 8	up to 10	±48μin	4μin	±12μin	4μin	±24μin	6μin	±48μin	10μin	±104μin	18μin
over 10	up to 12	±56μin	4μin	±14μin	4μin	±28μin	7μin	±56μin	10μin	±112μin	20μin
over 12	up to 16	±72μin	5μin	±18μin	5μin	±36μin	8μin	±72μin	12μin	±144μin	20μin
over 16	up to 20	±88μin	6μin	±20μin	6μin	±44μin	10μin	±88μin	14μin	±176μin	24μin
over 20	up to 24	±104μin	6μin	±25μin	6μin	±52μin	10μin	±104μin	16μin	±200μin	28μin
over 24	up to 28	±120μin	7μin	±30μin	7μin	±60μin	12μin	±120μin	18μin	±240μin	28μin
over 28	up to 32	±136μin	8μin	±34μin	8μin	±68μin	12μin	±136μin	20μin	±260μin	32μin
over 32	up to 36	±152μin	8μin	±38μin	8μin	±76μin	14μin	±152μin	20μin	±300μin	36μin
over 36	up to 40	±160μin	10μin	±40μin	10μin	±80μin	16μin	±168μin	24μin	±320μin	40μin

Nominal length (mm)		Grade K		Grade 00		Grade 0		Grade 1		Grade 2	
		Limit deviations of length at any point	Tolerance for the variation in length	Limit deviations of length at any point	Tolerance for the variation in length	Limit deviations of length at any point	Tolerance for the variation in length	Limit deviations of length at any point	Tolerance for the variation in length	Limit deviations of length at any point	Tolerance for the variation in length
	up to 0.5	±0.30μm	0.05μm	±0.10μm	0.05μm	±0.14μm	0.10μm	±0.30μm	0.16μm	±0.60μm	0.30μm
over 0.5	up to 10	±0.20μm	0.05μm	±0.07μm	0.05μm	±0.12μm	0.10μm	±0.20μm	0.16μm	±0.45μm	0.30μm
over 10	up to 25	±0.30μm	0.05μm	±0.07μm	0.05μm	±0.14μm	0.10μm	±0.30μm	0.16μm	±0.60μm	0.30μm
over 25	up to 50	±0.40μm	0.06μm	±0.10μm	0.06μm	±0.20μm	0.10μm	±0.40μm	0.18μm	±0.80μm	0.30μm
over 50	up to 75	±0.50μm	0.06μm	±0.12μm	0.06μm	±0.25μm	0.12μm	±0.50μm	0.18μm	±1.00μm	0.35μm
over 75	up to 100	±0.60μm	0.07μm	±0.15μm	0.07μm	±0.30μm	0.12μm	±0.60μm	0.20μm	±1.20μm	0.35μm
over 100	up to 150	±0.80μm	0.08μm	±0.20μm	0.08μm	±0.40μm	0.14μm	±0.80μm	0.20μm	±1.60μm	0.40μm
over 150	up to 200	±1.00μm	0.09μm	±0.25μm	0.09μm	±0.50μm	0.16μm	±1.00μm	0.25μm	±2.00μm	0.40μm
over 200	up to 250	±1.20μm	0.10μm	±0.30μm	0.10μm	±0.60μm	0.16μm	±1.20μm	0.25μm	±2.40μm	0.45μm
over 250	up to 300	±1.40μm	0.10μm	±0.35μm	0.10μm	±0.70μm	0.18μm	±1.40μm	0.25μm	±2.80μm	0.50μm
over 300	up to 400	±1.80μm	0.12μm	±0.45μm	0.12μm	±0.90μm	0.20μm	±1.80μm	0.30μm	±3.60μm	0.50μm
over 400	up to 500	±2.20μm	0.14μm	±0.50μm	0.14μm	±1.10μm	0.25μm	±2.20μm	0.35μm	±4.40μm	0.60μm
over 500	up to 600	±2.60μm	0.16μm	±0.65μm	0.16μm	±1.30μm	0.25μm	±2.60μm	0.40μm	±5.00μm	0.70μm
over 600	up to 700	±3.00μm	0.18μm	±0.75μm	0.18μm	±1.50μm	0.30μm	±3.00μm	0.45μm	±6.00μm	0.70μm
over 700	up to 800	±3.40μm	0.20μm	±0.85μm	0.20μm	±1.70μm	0.30μm	±3.40μm	0.50μm	±6.50μm	0.80μm
over 800	up to 900	±3.80μm	0.20μm	±0.95μm	0.20μm	±1.90μm	0.35μm	±3.80μm	0.50μm	±7.50μm	0.90μm
over 900	up to 1000	±4.20μm	0.25μm	±1.00μm	0.25μm	±2.00μm	0.40μm	±4.20μm	0.60μm	±8.00μm	1.00μm

An inspection certificate is supplied as standard.
Refer to page X for details.

*Suffix Number (-■■■) for Selecting Standard Required

ISO/DIN/JIS

Suffix No.	Grade	Inspection Certificate	Calibration Certificate JCSS
-01B	K	O	O

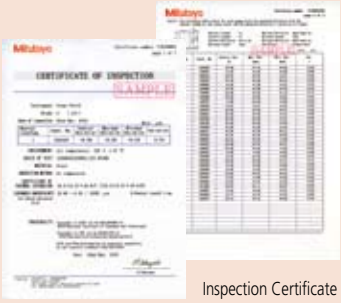
ASME

Suffix No.	Grade	Inspection Certificate	Calibration Certificate JCSS
-51B	K	O	O

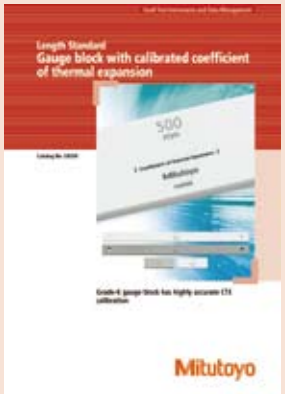
BS

Suffix No.	Grade	Inspection Certificate	Calibration Certificate JCSS
-11B	K	O	O

* Only for 100mm type



Inspection Certificate



For details, please refer to Leaflet No. E4334 "Gauge Block with calibrated coefficient of thermal expansion".

An inspection certificate is supplied as standard.
Refer to page X for details.

For details, please refer to Leaflet No. E4331 "ZERO CERA BLOCK"

Gauge Blocks with a Calibrated Coefficient of Thermal Expansion

- Mitutoyo offers top-quality gauge blocks (steel and ceramic), superior to K class blocks due to their advanced manufacturing technologies.

- Features an accurately calibrated thermal expansion coefficient measured with a proprietary double-faced interferometer (DFI).
- Each gauge block is calibrated for length on a highly accurate gauge block interferometer (GBI) system.
- Available as rectangular gauge blocks in the range 100 to 500mm.

SPECIFICATIONS

Metric Blocks with CTE

Order No. (steel)*	Order No. (CERA)*	Length (mm)
611681	613681	100
611802	613802	125
611803	613803	150
611804	613804	175
611682	613682	200
611805	613805	250
611683	613683	300
611684	613684	400
611685	613685	500

Inch Blocks with CTE

Order No. (steel)*	Order No. (CERA)*	Length (inch)
611204	613204	4
611205	613205	5
611206	613206	6
611207	613207	7
611208	613208	8
611222	613222	10
611223	613223	12
611224	613224	16
611225	613225	20

Grade	K class in JIS/ASME/ISO
Uncertainty of thermal expansion coefficient	0.035×10^{-6}/K (k = 2)
Uncertainty of length measurement	30nm (k = 2), for 100mm block

* An inspection certificate and a JCSS calibration certificate are supplied as standard.
A calibration report and a calibration certificate for the thermal expansion coefficient are also supplied as standard.

E

ZERO CERA Blocks

- Thermal expansion in the temperature range 20±1°C less than 1/500 that of steel ($0\pm0.02\times10^{-6}$/K(20°C))
- Almost no secular change both in dimension and coefficient of thermal expansion

- Complementary ultra-low thermal expansion and high specific rigidity (Young's modulus/ specific gravity)

SPECIFICATIONS

Metric Blocks

Order No. JIS/ISO/DIN	Order No. BS	Order No. ASME	Length (mm)
617673-016	617673-116	617673-516	30
617675-016	617675-116	617675-516	50
617681-016	617681-116	617681-516	100
617682-016	617682-116	617682-516	200
617683-016	617683-116	617683-516	300
617684-016	617684-116	617684-516	400
617685-016	617685-116	617685-516	500
617840-016	617840-116	617840-516	600
617841-016	617841-116	617841-516	700
617843-016	617843-116	617843-516	800
617844-016	617844-116	617844-516	900
617845-016	617845-116	617845-516	1000
516-771-60	516-771-61	516-771-66	Above set

Mitutoyo

Gauge Blocks

Length Standards Brought to You by Mitutoyo

An inspection certificate is supplied as standard.
Refer to page X for details.

Metric/Inch Rectangular Gauge Block Sets
SERIES 516

- Mitutoyo provides a wide selection of boxed sets of gauge blocks to meet the various needs of industry. Selecting the best set, or sets, to acquire usually depends on the accuracy required by the target applications, the level of convenience desired (larger sets offer more combination possibilities) and the environmental conditions in which they will be used.

Steel 1mm Base Block Sets


Steel 112-block set


Steel 103-block set


Steel 76-block set


Steel 56-block set


Steel 47-block set


Steel 46-block set


Steel 34-block set


Steel 32-block set

Steel 0.001mm Step Block Sets


Steel 9-block set


Steel 9-block set


Steel 18-block set

Steel Long Block Sets


Steel 8-block set

Steel Wear Block Sets


Steel 2-block set

Steel Thin Block Sets


Steel 9-block set

Note: Details of the contents of any particular set are given on page E-9.

An inspection certificate is supplied as standard.
Refer to page X for details.

CERA 1mm Base Block Sets


CERA 112-block set


CERA 103-block set


CERA 76-block set


CERA 56-block set


CERA 47-block set


CERA 46-block set


CERA 34-block set


CERA 32-block set

CERA 0.001mm Step Block Sets

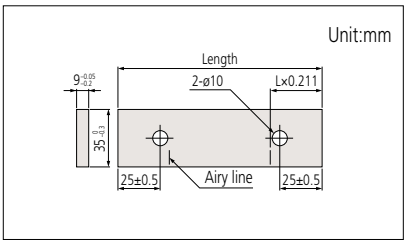

CERA 9-block set


CERA 9-block set


CERA 18-block set

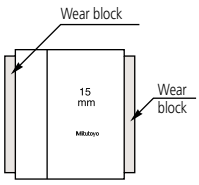
CERA Long Block Sets


CERA 8-block set



CERA Wear Block Sets


CERA 2-block set



Note: Details of the contents of any particular set are given on page E-10.

Gauge Blocks

Length Standards Brought to You by Mitutoyo

An inspection certificate is supplied as standard.
Refer to page X for details.

SPECIFICATIONS

1mm Base Block Sets

* Details of the overall sizes for forms of block are given on page E-3 and the accuracy standards to which they are manufactured are given on page E-5.

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Steel	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
122	—	—	—	—	—	1.0005		1
	516-596	—	K: -■0	—	—	1.001 - 1.009	0.001	9
	516-597	—	0: -■0	—	—	1.01 - 1.49	0.01	49
	516-598	—	1: -■0	—	—	1.6 - 1.9	0.1	4
	516-599	—	2: -■0	—	—	0.5 - 24.5	0.5	49
						30 - 100	10	8
						25, 75		2
112	**516-531**	**516-541**	—	K: -■6	—	1.0005		1
	516-937	**516-337**	K: -■0	00: -■6	K: -■1	1.001 - 1.009	0.001	9
	516-938	**516-338**	0: -■0	0: -■6	0: -■1	1.01 - 1.49	0.01	49
	516-939	**516-339**	1: -■0	1: -■6	1: -■1	0.5 - 24.5	0.5	49
	516-940	**516-340**	2: -■0	2: -■6	2: -■1	25 - 100	25	4
103	**516-533**	**516-542**	—	K: -■6	—	1.005		1
	516-941	**516-341**	K: -■0	00: -■6	K: -■1	1.01 - 1.49	0.01	49
	516-942	**516-342**	0: -■0	0: -■6	0: -■1	0.5 - 24.5	0.5	49
	516-943	**516-343**	1: -■0	1: -■6	1: -■1	25 - 100	25	4
	516-944	**516-344**	2: -■0	2: -■6	2: -■1			
88	—	—	—	—	—	1.0005		1
	516-969	**516-369**	—	—	K: -■1	1.001 - 1.009	0.001	9
	516-970	**516-370**	0: -■0	—	0: -■1	1.01 - 1.49	0.01	49
	516-971	**516-371**	1: -■0	—	1: -■1	0.5 - 9.5	0.5	19
	516-972	**516-372**	2: -■0	—	2: -■1	10 - 100	10	10
87	**516-535**	**515-543**	—	K: -■6	—	1.001 - 1.009	0.001	9
	516-945	**516-345**	K: -■0	00: -■6	K: -■1	1.01 - 1.49	0.01	49
	516-946	**516-346**	0: -■0	0: -■6	0: -■1	0.5 - 9.5	0.5	19
	516-947	**516-347**	1: -■0	1: -■6	1: -■1	10 - 100	10	10
	516-948	**516-348**	2: -■0	2: -■6	2: -■1			
76	—	—	—	—	—	1.005		1
	516-949	**516-349**	K: -■0	—	—	1.01 - 1.49	0.01	49
	516-950	**516-350**	0: -■0	—	—	0.5 - 9.5	0.5	19
	516-951	**516-351**	1: -■0	—	—	10 - 40	10	4
	516-952	**516-352**	2: -■0	—	—	50 - 100	25	3
56	**516-536**	**516-544**	—	K: -■6	—	0.5		1
	516-953	**516-353**	K: -■0	00: -■6	—	1.001 - 1.009	0.001	9
	516-954	**516-354**	0: -■0	0: -■6	—	1.01 - 1.09	0.01	9
	516-955	**516-355**	1: -■0	1: -■6	—	1.1 - 1.9	0.1	9
	516-956	**516-356**	2: -■0	2: -■6	—	1 - 24	1	24
						25 - 100	25	4
47	**516-537**	**516-545**	—	K: -■6	—	1.005		1
	516-957	**516-357**	K: -■0	00: -■6	—	1.01 - 1.09	0.01	9
	516-958	**516-358**	0: -■0	0: -■6	—	1.1 - 1.9	0.1	9
	516-959	**516-359**	1: -■0	1: -■6	—	1 - 24	1	24
	516-960	**516-360**	2: -■0	2: -■6	—	25 - 100	25	4
47	—	—	—	—	—	1.005		1
	516-961	**516-361**	K: -■0	—	K: -■1	1.01 - 1.19	0.01	19
	516-962	**516-362**	0: -■0	—	0: -■1	1.2 - 1.9	0.1	8
	516-963	**516-363**	1: -■0	—	1: -■1	1 - 9	1	9
	516-964	**516-364**	2: -■0	—	2: -■1	10 - 100	10	10
46	—	—	—	—	—	1.001 - 1.009	0.001	9
	516-994	**516-394**	K: -■0	—	—	1.01 - 1.09	0.01	9
	516-995	**516-395**	0: -■0	—	—	1.1 - 1.9	0.1	9
	516-996	**516-396**	1: -■0	—	—	1 - 9	1	9
	516-997	**516-397**	2: -■0	—	—	10 - 100	10	10
34	—	—	—	—	—	1.0005		1
	516-128	**516-178**	K: -■0	—	K: -■1	1.001 - 1.009	0.001	9
	516-129	**516-179**	0: -■0	—	0: -■1	1.01 - 1.09	0.01	9
	516-130	**516-180**	1: -■0	—	1: -■1	1.1 - 1.9	0.1	9
	516-131	**516-181**	2: -■0	—	2: -■1	1 - 5	1	5
						10		1
32	—	—	—	—	—	1.005		1
	516-965	**516-365**	K: -■0	—	K: -■1	1.01 - 1.09	0.01	9
	516-966	**516-366**	0: -■0	—	0: -■1	1.1 - 1.9	0.1	9
	516-967	**516-367**	1: -■0	—	1: -■1	1 - 9	1	9
	516-968	**516-368**	2: -■0	—	2: -■1	10 - 30	10	3
						60		1

Thin Block Sets

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Steel	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
9	**516-990**	—	0: -■0	—	—	0.10 - 0.50	0.05	9
	516-991	—	1: -■0	—	—			
	516-992	—	2: -■0	—	—			

* Suffix Number (■) for Selecting Standard and Certificate Provided

ISO/DIN/JIS

Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	O	—
6	O	O

Suffix No. 1: Not available for Grade K sets.

ASME

Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	O	—
6	O	O

Suffix No. 1: Not available for Grade K sets.
Suffix No. 6: Only for Grade K sets.

BS

Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	O	—
6	O	O

Suffix No. 1: Not available for Grade K sets.
Suffix No. 6: Only for Grade K sets.

Inspection Certificate

An inspection certificate is supplied as standard.
Refer to page X for details.

SPECIFICATIONS

0.001mm Step Block Set

* Details of the overall sizes for forms of block are given on page E-3 and the accuracy standards to which they are manufactured are given on page E-5.

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Steel	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
18	**516-973** **516-974** **516-975** **516-976**	**516-373** **516-374** **516-375** **516-376**	K: **-■0** 0: **-■0** 1: **-■0** 2: **-■0**	— — — —	— — — —	0.991 - 0.999 1.001 - 1.009	0.001 0.001	9 9
9	**516-981** **516-982** **516-983** **516-984**	**516-381** **516-382** **516-383** **516-384**	K: **-■0** 0: **-■0** 1: **-■0** 2: **-■0**	— — — —	K: **-■1** 0: **-■1** 1: **-■1** 2: **-■1**	1.001 - 1.009	0.001	9
9	**516-985** **516-986** **516-987** **516-988**	**516-385** **516-386** **516-387** **516-388**	K: **-■0** 0: **-■0** 1: **-■0** 2: **-■0**	— — — —	— — — —	0.991 - 0.999	0.001	9

Long Block Sets

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Steel	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
8	**516-540** **516-701** **516-702** **516-703** **516-704**	**516-546** **516-731** **516-732** **516-733** **516-734**	— K: **-■0** 0: **-■0** 1: **-■0** 2: **-■0**	K: **-■6** 00: **-■6** 0: **-■6** 1: **-■6** 2: **-■6**	— — — — —	125 - 175 200 - 250 300 - 500	25 50 100	3 2 3

Wear Block Sets

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Carbide	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
2	**516-807** **516-806**	**516-832** **516-833**	0: **-■0** 1: **-■0**	0:**-■6** 1:**-■6**	— —	1		2
2	**516-803** **516-802**	**516-830** **516-831**	0: **-■0** 1: **-■0**	0:**-■6** 1:**-■6**	— —	2		2

Inch Block Sets

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Steel	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
82	**516-548** **516-905** **516-906** **516-907** **516-908**	**516-556** **516-305** **516-306** **516-307** **516-308**	— — — — —	K: **-■6** 00: **-■6** 0: **-■6** 1: **-■6** 2: **-■6**	— — 0: **-■1** 1: **-■1** 2: **-■1**	.10005 .1001 – .1009 .101 – .149 .05 – .95 1 - 4	 .0001 .001 .05 1	1 9 49 19 4
81	**516-549** **516-901** **516-902** **516-903** **516-904**	**516-557** **516-301** **516-302** **516-303** **516-304**	— — — — —	K: **-■6** 00: **-■6** 0: **-■6** 1: **-■6** 2: **-■6**	— — 0: **-■1** 1: **-■1** 2: **-■1**	.1001 – .1009 .101 – .149 .05 – .95 1 - 4	.0001 .001 .05 1	9 49 19 4
49	— — **516-910** **516-911** **516-912**	— — — — —	— — — — —	— — — — —	— — 0: **-■1** 1: **-■1** 2: **-■1**	.1001 – .1009 .101 – .109 .01 – .19 .2 - .9 1 - 4	.0001 .001 .01 .1 1	9 9 19 8 4
35	**516-550** **516-913** **516-914** **516-915** **516-916**	**516-558** **516-313** **516-314** **516-315** **516-316**	— — — — —	K: **-■6** 00: **-■6** 0: **-■6** 1: **-■6** 2: **-■6**	— — 0: **-■1** 1: **-■1** 2: **-■1**	.10005 .1001 – .1009 .101 – .109 .11 – .19 .1 - .3 .5, 1, 2, 4	 .0001 .001 .01 .1	1 9 9 9 3 4

Thin Block Sets

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Steel	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
28	**516-551** **516-917** **516-918** **516-919** **516-920**	— — — — —	— — — — —	K: **-■6** 00: **-■6** 0: **-■6** 1: **-■6** 2: **-■6**	— — — — —	.02005 .0201 – .0209 .021 – .029 .01 – .09	 .0001 .001 .01	1 9 9 9
10	**516-926** **516-927** **516-928**	— — —	— — —	0: **-■6** 1: **-■6** —	0: **-■1** 1: **-■1** 2: **-■1**	.005 - .050	.005	10

Long Block Sets

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Steel	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
8	— — **516-712** **516-713**	**516-564** **516-741** **516-742** **516-743**	— — — —	K: **-■6** 00: **-■6** 0: **-■6** 1: **-■6**	— — — —	5 - 7 8, 10, 12 16, 20	1 2 4	3 3 2

Wear Block Sets

Blocks per set	Order No.		Standard / grade available and **Suffix No.***			Blocks included in set		
	Carbide	CERA	ISO/DIN/JIS	ASME	BS	Size	Step	Qty.
2	**516-809** **516-808**	**516-836** **516-837**	— —	0: **-■6** 1: **-■6**	— —	.05		2
2	**516-805** **516-804**	**516-834** **516-835**	— —	0: **-■6** 1: **-■6**	— —	.1		2

E

Mitutoyo

Gauge Blocks

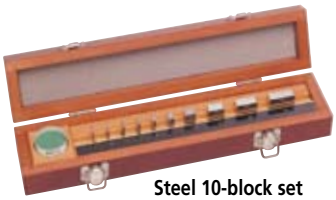
Length Standards Brought to You by Mitutoyo

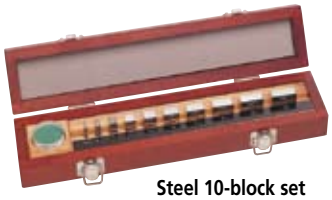
An inspection certificate is supplied as standard.
Refer to page X for details.

Micrometer Inspection Gauge Block Sets SERIES 516

- Dedicated gauge block sets for micrometer inspection.
  Sets **516-106/7/8** and **516-322/3** are recommended for checking instrumental errors in micrometers due to the choice of block sizes ensuring that the instrument is checked through a full rotation of the spindle over the range 0-25 mm (or 0-1″).
  Sets **516-115/6/7**, **516-165/6** and **516-177** contain blocks in 25 mm (or 1″) steps for aiding inspection of large micrometers in conjunction with one of the abovementioned sets.
  Sets **516-580/1/2**, **516-390/1/2** are dedicated to the QuantuMike with its 2mm/rev spindle feed.

Steel


Steel 10-block set

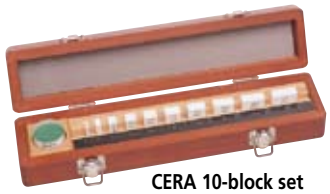

Steel 10-block set


Steel 8-block set


Steel 10-block set

CERA


CERA 10-block set


CERA 10-block set


CERA 8-block set


CERA 10-block set

Micro Checker

Can clamp a stack of gauge blocks to be used for micrometer inspection.

516-607
(The gauge blocks are optional.)

Gauge Block Sets for Micrometer Inspection

A set consisting of a Micro Checker and gauge blocks for micrometer inspection.

(516-132/3/4/5/6/7)

SPECIFICATIONS

Metric Micro Checker (holder only)

Order No.	516-607
Applicable gauge block set	**516-106, 516-107, 516-108, 516-156, 516-157, 516-158**
Applicable gauge block size (mm)	2.5, 5.1, 7.7, 10.3, 12.9, 15, 17.6, 20.2, 22.8, 25

Inch Micro Checker (holder only)

Order No.	516-608
Applicable gauge block set	**516-921, 516-922, 516-923, 516-321, 516-322, 516-323**
Applicable gauge block size (inch)	.105, .210, .315, .420, .5, .605, .710, .815, .920, 1

E

An inspection certificate is supplied as standard.
Refer to page X for details.

*Suffix Number (■) for Selecting Standard and Certificate Provided

ISO/DIN/JIS

Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	O	—
6	O	O

Suffix No. 1: Not available for Grade K sets.

ASME

Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	O	—
6	O	O

Suffix No. 1: Not available for Grade K sets.
Suffix No. 6: Only for Grade K sets.

BS

Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	O	—

Inspection Certificate

SPECIFICATIONS

Metric Block Sets

Blocks per set	Order No. Steel	Order No. CERA	Standard / grade available and Suffix No.* ISO/DIN/JIS	ASME	BS	Blocks included in set
16	516-111 516-112 516-113	516-161 516-162 516-163	0: -■0 1: -■0 2: -■0	— — —	— — —	1.00, 1.25, 1.5, 2, 3, 5, 10, 15, 20, 25, 25.25, 30, 35, 40, 45, 50mm, Cerastone, Optical parallels (t = 12mm, 25mm)
10	516-977 516-978 516-979 516-980	— 516-378 516-379 516-380	K: -■0 0: -■0 1: -■0 2: -■0	— — — —	— — — —	1.00, 1.25, 1.50, 2, 3, 5, 10, 15, 20, 25mm, Optical parallel (t = 12mm)
10	516-103 516-101 —	516-152 516-153 516-154	0: -■0 1: -■0 2: -■0	0: -■6 1: -■6 —	— — —	1.00, 1.25, 1.50, 2, 3, 5, 10, 15, 20, 25mm
10	516-580 516-581 516-582	516-390 516-391 516-392	0: -■0 1: -■0 2: -■0	— — —	— — —	2.2, 4.8, 7.8, 10.4, 12, 15.2, 17.4, 19.6, 22.6, 25mm
10	516-106 516-107 516-108	516-156 516-157 516-158	0: -■0 1: -■0 2: -■0	— — —	— — —	2.5, 5.1, 7.7, 10.3, 12.9, 15, 17.6, 20.2, 22.8, 25mm, Optical parallel (t = 12mm)
10	516-132 516-133 516-134	516-182 516-183 516-184	0: -■0 1: -■0 2: -■0	— — —	— — —	1.25, 1.50, 1, 2, 3, 5, 10, 15, 20, 25mm, Micro Checker, Optical parallel (t = 12mm)
10	516-135 516-136 516-137	516-185 516-186 516-187	0: -■0 1: -■0 2: -■0	— — —	— — —	2.5, 5.1, 7.7, 10.3, 12.9, 15, 17.6, 20.2, 22.8, 25mm, Micro Checker, Optical parallel (t = 12mm)
8	— — 516-115 516-116 516-117	516-547 516-164 516-165 516-166 516-167	— K: -■0 0: -■0 1: -■0 2: -■0	K: -■6 00: -■6 0: -■6 1: -■6 2: -■6	— — — — —	25, 50, 75, 100, 125, 150, 175, 200mm

Inch Block Sets

Blocks per set	Order No. Steel	Order No. CERA	Standard / grade available and Suffix No.* ISO/DIN/JIS	ASME	BS	Blocks included in set
10	516-528 516-529 516-530	516-318 516-319 516-320	— — —	00: -■6 0: -■6 1: -■6	0: -■1 1: -■1 2: -■1	.087, .189, .307, .409, .472, .598, .669, .772, .890, 1"
10	516-552 516-921 516-922 516-923	516-559 516-321 516-322 516-323	— — — —	K: -■6 00: -■6 0: -■6 1: -■6	— 0: -■1 1: -■1 2: -■1	.105, .210, .315, .420, .500, .605, .710, .815, .920, 1", Optical parallel (t = .5")
10	516-553 516-138 516-139 516-140	516-560 516-188 516-189 516-190	— — — —	K: -■6 00: -■6 0: -■6 1: -■6	— 0: -■1 1: -■1 2: -■1	.105, .210, .315, .420, .500, .605, .710, .815, .920, 1", Micro checker, Optical parallel (t = .5")
9	516-554 516-929 516-930 516-931 516-932	516-561 516-333 516-334 516-335 516-336	— — — — —	K: -■6 00: -■6 0: -■6 1: -■6 2: -■6	— — — — —	.0625, .100, .125, .200, .250, .300, .500, 1, 2", Optical parallel (t = .5")
9	516-555 516-141 516-142 516-143 516-144	516-562 516-191 516-192 516-193 516-194	— — — — —	K: -■6 00: -■6 0: -■6 1: -■6 2: -■6	— — — — —	.0625, .100, .125, .200, .250, .300, .500, 1, 2", Micro Checker, Optical parallel (t = .5")
9	— — 516-934 516-935 516-936	516-563 516-329 516-330 516-331 516-332	— — — — —	K: -■6 00: -■6 0: -■6 1: -■6 2: -■6	— — — — —	.0625, .100, .125, .200, .250, .300, .500, 1, 2"
8	516-126 516-127	516-176 516-177	— —	0: -■6 1: -■6	— —	1, 2, 3, 4, 5, 6, 7, 8"

SERIES 516 – Caliper Inspection Gauge Block Sets

SPECIFICATIONS

Metric Block Sets

Blocks per set	Order No. Steel	Order No. CERA	Standard / grade available and Suffix No. ISO/DIN/JIS	ASME	BS	Blocks included in set
5	— —	— 516-174	— 2: -10	— —	— —	5 pcs.: 10.3, 24.5, 50, 75, 100mm, Ceramic plain jaws, Holder (250mm), Glove
4	516-526 516-527	516-566 516-567	1: -10 2: -10	— —	— —	4 pcs.: 10, 30, 50, 125mm, Setting ring (ø4mm, ø10mm), Pin gage (ø10mm), Glove
3	516-124 516-125	516-150 516-151	1: -10 2: -10	— —	— —	3 pcs.: 30, 41.3, 131.4mm, Setting ring (ø4mm, ø25mm), Glove
2	516-122 516-123	516-172 516-173	1: -10 2: -10	— —	— —	2 pcs.: 41.3, 131.4mm, Setting ring (ø20mm), Glove

E

Mitutoyo

Gauge Blocks

Length Standards Brought to You by Mitutoyo

Individual Metric Rectangular Gauge Blocks

- If using only one length repeatedly, it is a good idea to purchase individual gauge blocks.
- Nominal sizes which are not included in the chart below can be supplied custom-made on request.
- Each Grade K gauge block to ISO/DIN/JIS, BS or ASME standard is supplied with a Certificate of Calibration which certifies that the gauge block was calibrated by interferometry.

SPECIFICATIONS

Metric Blocks

* Details of the overall sizes for forms of block are given on page E-3 and the accuracy standards to which they are manufactured are given on page E-5.

Length (mm)	Order No.*	
	Steel	CERA
0.1	**611821**	—
0.11	**611860**	—
0.12	**611861**	—
0.13	**611862**	—
0.14	**611863**	—
0.15	**611822**	—
0.16	**611864**	—
0.17	**611865**	—
0.18	**611866**	—
0.19	**611867**	—
0.2	**611823**	—
0.21	**611868**	—
0.22	**611869**	—
0.23	**611870**	—
0.24	**611871**	—
0.25	**611824**	—
0.26	**611872**	—
0.27	**611873**	—
0.28	**611874**	—
0.29	**611875**	—
0.3	**611825**	—
0.31	**611876**	—
0.32	**611877**	—
0.33	**611878**	—
0.34	**611879**	—
0.35	**611826**	—
0.36	**611880**	—
0.37	**611881**	—
0.38	**611882**	—
0.39	**611883**	—
0.4	**611827**	—
0.41	**611884**	—
0.42	**611885**	—
0.43	**611886**	—
0.44	**611887**	—
0.45	**611828**	—
0.46	**611888**	—
0.47	**611889**	—
0.48	**611890**	—
0.49	**611891**	—
0.5	**611506**	**613506**
0.51	**611892**	—
0.52	**611893**	—

Length (mm)	Order No.*	
	Steel	CERA
0.53	**611894**	—
0.54	**611895**	—
0.55	**611896**	—
0.56	**611897**	—
0.57	**611898**	—
0.58	**611899**	—
0.59	**611900**	—
0.6	**611901**	—
0.61	**611902**	—
0.62	**611903**	—
0.63	**611904**	—
0.64	**611905**	—
0.65	**611906**	—
0.66	**611907**	—
0.67	**611908**	—
0.68	**611909**	—
0.69	**611910**	—
0.7	**611911**	—
0.71	**611912**	—
0.72	**611913**	—
0.73	**611914**	—
0.74	**611915**	—
0.75	**611916**	—
0.76	**611917**	—
0.77	**611918**	—
0.78	**611919**	—
0.79	**611920**	—
0.8	**611921**	—
0.81	**611922**	—
0.82	**611923**	—
0.83	**611924**	—
0.84	**611925**	—
0.85	**611926**	—
0.86	**611927**	—
0.87	**611928**	—
0.88	**611929**	—
0.89	**611930**	—
0.9	**611931**	—
0.91	**611932**	—
0.92	**611933**	—
0.93	**611934**	—
0.94	**611935**	—
0.95	**611936**	—

Length (mm)	Order No.*	
	Steel	CERA
0.96	**611937**	—
0.97	**611938**	—
0.98	**611939**	—
0.99	**611940**	—
0.991	**611551**	**613551**
0.992	**611552**	**613552**
0.993	**611553**	**613553**
0.994	**611554**	**613554**
0.995	**611555**	**613555**
0.996	**611556**	**613556**
0.997	**611557**	**613557**
0.998	**611558**	**613558**
0.999	**611559**	**613559**
1	**611611**	**613611**
1.0005	**611520**	**613520**
1.001	**611521**	**613521**
1.002	**611522**	**613522**
1.003	**611523**	**613523**
1.004	**611524**	**613524**
1.005	**611525**	**613525**
1.006	**611526**	**613526**
1.007	**611527**	**613527**
1.008	**611528**	**613528**
1.009	**611529**	**613529**
1.01	**611561**	**613561**
1.02	**611562**	**613562**
1.03	**611563**	**613563**
1.04	**611564**	**613564**
1.05	**611565**	**613565**
1.06	**611566**	**613566**
1.07	**611567**	**613567**
1.08	**611568**	**613568**
1.09	**611569**	**613569**
1.1	**611570**	**613570**
1.11	**611571**	**613571**
1.12	**611572**	**613572**
1.13	**611573**	**613573**
1.14	**611574**	**613574**
1.15	**611575**	**613575**
1.16	**611576**	**613576**
1.17	**611577**	**613577**
1.18	**611578**	**613578**
1.19	**611579**	**613579**

An inspection certificate is supplied as standard. Refer to page X for details.

*Suffix Number (-■■■) for Selecting Standard and Certificate Provided

ISO/DIN/JIS

Suffix No.	Grade	Inspection Certificate	Calibration Certificate	
			JCSS	RvA
-016	K	O	O	—
-021	0	O	—	—
-026	0	O	O	—
-031	1	O	—	—
-036	1	O	O	—
-041	2	O	—	—
-046	2	O	O	—

ASME

Suffix No.	Grade	Inspection Certificate	Calibration Certificate
			JCSS
-516	K	O	O
-521	00	O	—
-531	0	O	—
-541	1	O	—
-551	2	O	—

BS

Suffix No.	Grade	Inspection Certificate	Calibration Certificate
			JCSS
-116	K	O	O
-121	0	O	—
-126	0	O	O
-131	1	O	—
-136	1	O	O
-141	2	O	—
-146	2	O	O

Inspection Certificate

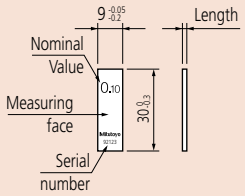
E

An inspection certificate is supplied as standard.
Refer to page X for details.

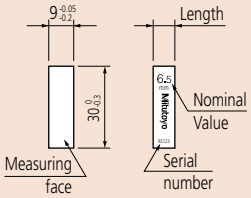
Dimensions

Unit: mm

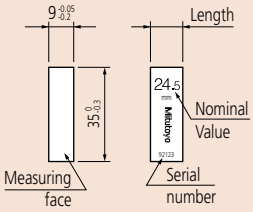
Nominal length:
0.1mm - 5.5mm
(.004" - .25")



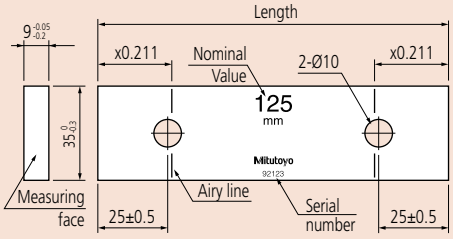
Nominal length:
6mm - 10mm
(.3" - .4")



Nominal length:
10.3mm - 100mm
(.45" - 4")



Nominal length 125mm - 1000mm (5" - 20")



* Details of the overall sizes for forms of block are given on page E-3 and the accuracy standards to which they are manufactured are given on page E-5.

Length (mm)	Order No.* Steel	Order No.* CERA
1.2	611580	613580
1.21	611581	613581
1.22	611582	613582
1.23	611583	613583
1.24	611584	613584
1.25	611585	613585
1.26	611586	613586
1.27	611587	613587
1.28	611588	613588
1.29	611589	613589
1.3	611590	613590
1.31	611591	613591
1.32	611592	613592
1.33	611593	613593
1.34	611594	613594
1.35	611595	613595
1.36	611596	613596
1.37	611597	613597
1.38	611598	613598
1.39	611599	613599
1.4	611600	613600
1.41	611601	613601
1.42	611602	613602
1.43	611603	613603
1.44	611604	613604
1.45	611605	613605
1.46	611606	613606
1.47	611607	613607
1.48	611608	613608
1.49	611609	613609
1.5	611641	613641
1.6	611516	613516
1.7	611517	613517
1.8	611518	613518
1.9	611519	613519
2	611612	613612
2.0005	611690	—
2.001	611691	—
2.002	611692	—
2.003	611693	—
2.004	611694	—
2.005	611695	—
2.006	611696	—
2.007	611697	—
2.008	611698	—
2.009	611699	—
2.01	611701	—
2.02	611702	—
2.03	611703	—
2.04	611704	—
2.05	611705	—
2.06	611706	—
2.07	611707	—
2.08	611708	—
2.09	611709	—
2.1	611710	—
2.11	611711	—
2.12	611712	—
2.13	611713	—
2.14	611714	—
2.15	611715	—
2.16	611716	—

Length (mm)	Order No.* Steel	Order No.* CERA
2.17	611717	—
2.18	611718	—
2.19	611719	—
2.2	611720	—
2.21	611721	—
2.22	611722	—
2.23	611723	—
2.24	611724	—
2.25	611725	—
2.26	611726	—
2.27	611727	—
2.28	611728	—
2.29	611729	—
2.3	611730	—
2.31	611731	—
2.32	611732	—
2.33	611733	—
2.34	611734	—
2.35	611735	—
2.36	611736	—
2.37	611737	—
2.38	611738	—
2.39	611739	—
2.4	611740	—
2.41	611741	—
2.42	611742	—
2.43	611743	—
2.44	611744	—
2.45	611745	—
2.46	611746	—
2.47	611747	—
2.48	611748	—
2.49	611749	—
2.5	611642	613642
2.6	611750	—
2.7	611751	—
2.8	611752	—
2.9	611753	—
3	611613	613613
3.5	611643	613643
4	611614	613614
4.5	611644	613644
5	611615	613615
5.1	611850	613850
5.5	611645	613645
6	611616	613616
6.5	611646	613646
7	611617	613617
7.5	611647	613647
7.7	611851	613851
8	611618	613618
8.5	611648	613648
9	611619	613619
9.5	611649	613649
10	611671	613671
10.3	611852	613852
10.5	611650	613650
11	611621	613621
11.5	611651	613651
12	611622	613622
12.5	611652	613652
12.9	611853	613853

Length (mm)	Order No.* Steel	Order No.* CERA
13	611623	613623
13.5	611653	613653
14	611624	613624
14.5	611654	613654
15	611625	613625
15.5	611655	613655
16	611626	613626
16.5	611656	613656
17	611627	613627
17.5	611657	613657
17.6	611854	613854
18	611628	613628
18.5	611658	613658
19	611629	613629
19.5	611659	613659
20	611672	613672
20.2	611855	613855
20.5	611660	613660
21	611631	613631
21.5	611661	613661
22	611632	613632
22.5	611662	613662
22.8	611856	613856
23	611633	613633
23.5	611663	613663
24	611634	613634
24.5	611664	613664
25	611635	613635
25.25	611754	613754
30	611673	613673
35	611755	613755
40	611674	613674
41.3	611857	613857
45	611756	613756
50	611675	613675
60	611676	613676
70	611677	613677
75	611801	613801
80	611678	613678
90	611679	613679
100	611681	613681
125	611802	613802
131.4	611858	613858
150	611803	613803
175	611804	613804
200	611682	613682
250	611805	613805
300	611683	613683
400	611684	613684
500	611685	613685
600	611840	—
700	611841	—
750	611842	—
800	611843	—
900	611844	—
1000	611845	—

Metric Wear Blocks

Length (mm)	Order No.* Tungsten carbide
1	612611
2	612612

E

Gauge Blocks

Length Standards Brought to You by Mitutoyo

Individual Inch Rectangular Gauge Blocks

SPECIFICATIONS

Inch Block

* Details of the overall sizes for forms of block are given on page E-3 and the accuracy standards to which they are manufactured are given on page E-5.

Length (inch)	Order No.*	
	Steel	CERA
.004	**611304**	—
.005	**611305**	—
.006	**611306**	—
.007	**611307**	—
.008	**611308**	—
.009	**611309**	—
.01	**611310**	—
.011	**611311**	—
.012	**611312**	—
.013	**611313**	—
.014	**611314**	—
.015	**611315**	—
.016	**611316**	—
.017	**611317**	—
.018	**611318**	—
.019	**611319**	—
.02	**611320**	—
.02005	**611240**	—
.0201	**611231**	—
.0202	**611232**	—
.0203	**611233**	—
.0204	**611234**	—
.0205	**611235**	—
.0206	**611236**	—
.0207	**611237**	—
.0208	**611238**	—
.0209	**611239**	—
.021	**611321**	—
.022	**611322**	—
.023	**611323**	—

Length (inch)	Order No.*	
	Steel	CERA
.024	**611324**	—
.025	**611325**	—
.026	**611326**	—
.027	**611327**	—
.028	**611328**	—
.029	**611329**	—
.03	**611330**	—
.031	**611331**	—
.03125 (1/32)	**611101**	**613103**
.032	**611332**	—
.033	**611333**	—
.034	**611334**	—
.035	**611335**	—
.036	**611336**	—
.037	**611337**	—
.038	**611338**	—
.039	**611339**	—
.04	**611340**	—
.041	**611341**	—
.042	**611342**	—
.043	**611343**	—
.044	**611344**	—
.045	**611345**	—
.046	**611346**	—
.046875 (3/64)	**611102**	**613104**
.047	**611347**	—
.048	**611348**	—
.049	**611349**	—
.05	**611105**	**613105**
.06	**611106**	—

Length (inch)	Order No.*	
	Steel	CERA
.0625	**611303**	**613303**
.07	**611107**	—
.078125 (5/64)	**611103**	**613100**
.08	**611108**	—
.09	**611109**	—
.09375 (3/32)	**611104**	**613101**
.1	**611191**	**613191**
.100025	**611111**	**613110**
.10005	**611135**	**613135**
.100075	**611112**	**613111**
.1001	**611121**	**613121**
.1002	**611122**	**613122**
.1003	**611123**	**613123**
.1004	**611124**	**613124**
.1005	**611125**	**613125**
.1006	**611126**	**613126**
.1007	**611127**	**613127**
.1008	**611128**	**613128**
.1009	**611129**	**613129**
.101	**611141**	**613141**
.102	**611142**	**613142**
.103	**611143**	**613143**
.104	**611144**	**613144**
.105	**611145**	**613145**
.106	**611146**	**613146**
.107	**611147**	**613147**
.108	**611148**	**613148**
.109	**611149**	**613149**
.109375 (7/64)	**611110**	**613102**

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page X for details.

*Suffix Number (-■■■) for Selecting Standard and Certificate Provided

ASME

Suffix No.	Grade	Inspection Certificate	Calibration Certificate JCSS
-516	K	O	O
-521	00	O	—
-531	0	O	—
-541	1	O	—
-551	2	O	—

BS

Suffix No.	Grade	Inspection Certificate	Calibration Certificate JCSS
-121	0	O	—
-131	1	O	—
-141	2	O	—

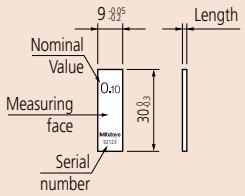
E

An inspection certificate is supplied as standard.
Refer to page X for details.

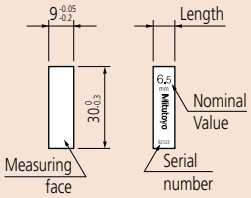
Dimensions

Unit: mm

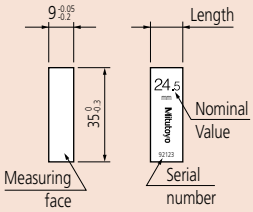
Nominal length:
0.1mm - 5.5mm
(.004" - .25")



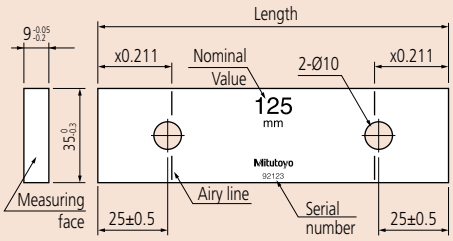
Nominal length:
6mm - 10mm
(.3" - .4")



Nominal length:
10.3mm - 100mm
(.45" - 4")



Nominal length 125mm - 1000mm (5" - 20")



SPECIFICATIONS

Inch Block

* Details of the overall sizes for forms of block are given on page E-3 and the accuracy standards to which they are manufactured are given on page E-5.

Length (inch)	Order No.*	
	Steel	CERA
.11	**611150**	**613150**
.111	**611151**	**613151**
.112	**611152**	**613152**
.113	**611153**	**613153**
.114	**611154**	**613154**
.115	**611155**	**613155**
.116	**611156**	**613156**
.117	**611157**	**613157**
.118	**611158**	**613158**
.119	**611159**	**613159**
.12	**611160**	**613160**
.121	**611161**	**613161**
.122	**611162**	**613162**
.123	**611163**	**613163**
.124	**611164**	**613164**
.125	**611165**	**613165**
.126	**611166**	**613166**
.127	**611167**	**613167**
.128	**611168**	**613168**
.129	**611169**	**613169**
.13	**611170**	**613170**
.131	**611171**	**613171**
.132	**611172**	**613172**
.133	**611173**	**613173**
.134	**611174**	**613174**
.135	**611175**	**613175**
.136	**611176**	**613176**
.137	**611177**	**613177**
.138	**611178**	**613178**

Length (inch)	Order No.*	
	Steel	CERA
.139	**611179**	**613179**
.14	**611180**	**613180**
.141	**611181**	**613181**
.142	**611182**	**613182**
.143	**611183**	**613183**
.144	**611184**	**613184**
.145	**611185**	**613185**
.146	**611186**	**613186**
.147	**611187**	**613187**
.148	**611188**	**613188**
.149	**611189**	**613189**
.15	**611115**	**613115**
.16	**611116**	**613116**
.17	**611117**	**613117**
.18	**611118**	**613118**
.19	**611119**	**613119**
.2	**611192**	**613192**
.21	**611221**	**613221**
.25	**611212**	**613212**
.3	**611193**	**613193**
.315	**611209**	**613209**
.35	**611213**	**613213**
.375 (3/8)	**611113**	**613112**
.4	**611194**	**613194**
.420	**611210**	**613210**
.45	**611214**	**613214**
.5	**611195**	**613195**
.55	**611215**	**613215**
.6	**611196**	**613196**

Length (inch)	Order No.*	
	Steel	CERA
.605	**611211**	**613211**
.65	**611216**	**613216**
.7	**611197**	**613197**
.710	**611220**	**613220**
.75	**611217**	**613217**
.8	**611198**	**613198**
.815	**611226**	**613226**
.85	**611218**	**613218**
.9	**611199**	**613199**
.920	**611227**	**613227**
.95	**611219**	**613219**
1	**611201**	**613201**
2	**611202**	**613202**
3	**611203**	**613203**
4	**611204**	**613204**
5	**611205**	**613205**
6	**611206**	**613206**
7	**611207**	**613207**
8	**611208**	**613208**
10	**611222**	**613222**
12	**611223**	**613223**
16	**611224**	**613224**
20	**611225**	**613225**

Inch Wear Blocks

Length (inch)	Order No.* Tungsten carbide
.05	**612105**
.1	**612191**

E

Gauge Blocks

Length Standards Brought to You by Mitutoyo

Rectangular Gauge Blocks Accessories SERIES 516

- To expand the range of rectangular gauge block (steel and CERA) applications, Mitutoyo offers the gauge block accessories set. By assembling the items in the set, together with gauge blocks, you can easily and quickly build up a precision gage.

516-601
(22 pcs)

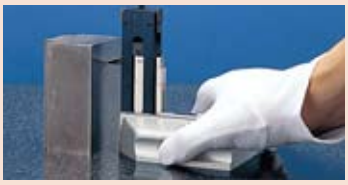
516-602
(14 pcs)

SPECIFICATIONS

Item Description	Item Order No.	Set		Qty
		22 pcs **516-601**	14 pcs **516-602**	
Holder	**619002**	—	○	1 pc.
	619003	○	○	
	619004	○	○	
	619005	○	○	
Base	**619009**	○	○	
Half round jaw	**619010**	○	○	One pair (2pcs)
	619011	○	○	
	619012	○	○	
	619013	○	—	
	619014	○	—	
Plain jaw	**619018**	○	—	
Scriber point	**619019**	○	○	1 pc.
Center point	**619020**	○	○	
Tram point	**619021**	○	—	One pair (2pcs)
Triangular straight edge	**619022**	○	○	1 pc.
	619023	○	—	

* Only 1 pc is supplied for each Order No. However, half round jaw, plain jaw, and tram point are supplied in a pair. (2 pcs).

Gaging a bore using a pair of half round jaws and a holder

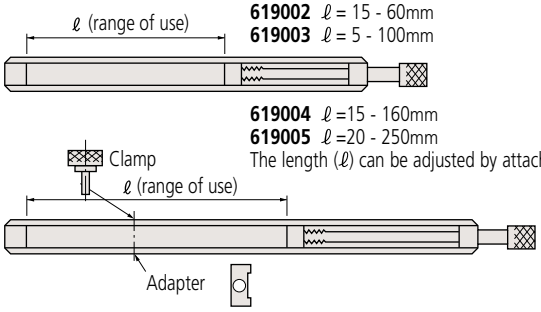


Marking a workpiece using the base, a holder and the scriber point

Setting a bore gage using a holder with the pair of Type I half-round jaws arranged as flat contact surfaces

Holder

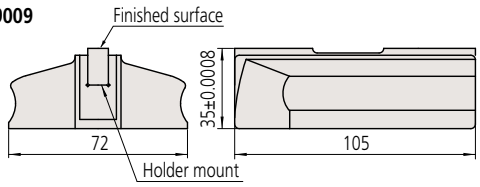
Thickness = 15mm
Width = 29.5mm



619002 ℓ = 15 - 60mm
619003 ℓ = 5 - 100mm

619004 ℓ =15 - 160mm
619005 ℓ =20 - 250mm
The length (ℓ) can be adjusted by attaching/removing the adapter.

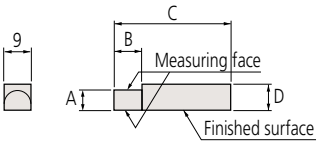
Base **619009**



Flatness tolerance of the finished surface 0.5μm
Flatness tolerance of the bottom surface 1μm

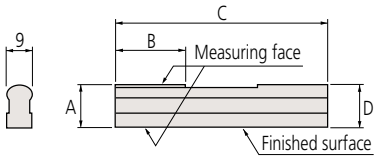
Half round jaw

Type I



Flatness tolerance of the finished surface 0.5μm

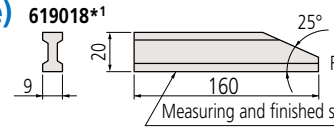
Type II



Unit: mm

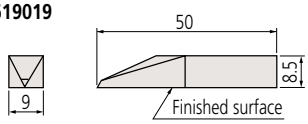
Order No.	Type	Size	A	B	C	D
619010*1	I	2	2±0.0005	5.5	40	7.5
619011*1		5	5±0.0005	15.5	45	7.5
619012*1		8	8±0.0005	20	50	8.5
619013*1	II	12	12±0.0005	25	75	13
619014*1		20	20±0.0005	25	125	20.5

Plain jaw (B type) **619018*1**



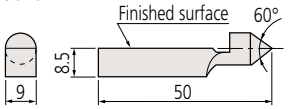
Flatness tolerance of the finished surface 1μm

Scriber point **619019**



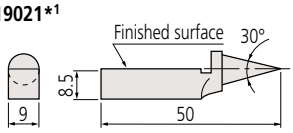
Flatness tolerance of the finished surface 0.5μm

Center point **619020**



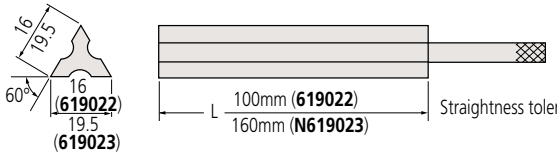
Eccentricity tolerance of the point ±10μm
Flatness tolerance of the finished surface 0.5μm

Tram point **619021*1**



Eccentricity tolerance of the point ±10μm
Flatness tolerance of the finished surface 0.5μm

Triangular straight edge



Straightness tolerance of the edge 1.2μm

*1 Qty: One pair (2 pcs)

E

Mitutoyo

Gauge Blocks

Length Standards Brought to You by Mitutoyo

Accessories for Rectangular Gauge Blocks over 100mm SERIES 516

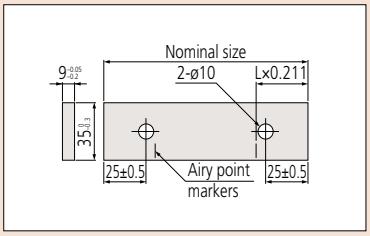
- Specially designed for standard size gauge blocks over 125mm which have two coupling holes on the body: coupling of two long gauge blocks and attachment of jaws is possible.
- These accessories can also be used for CERA blocks.

516-605
(14 pcs)

SPECIFICATIONS

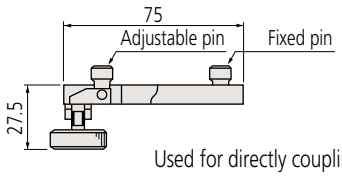
Set Order No.	Individual Item Order No.	Item Description	Quantity Supplied
516-605	619031	Connector A	1 pc.
	619032	Connector B	
	619033	Connector C	
	619034	Connector D	
	619035	Connector E	
	619036	Adapter	3 pcs.
	619009	Base	1 pc.
	619013	Half round jaw	One pair (2pcs)
	619018	Plain jaw	
	619019	Scriber point	1 pc.

* Only 1 pc is supplied for each Order No. However, half round jaw, plain jaw, and tram point are supplied in a pair. (2 pcs).



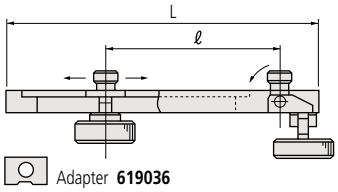
Coupling holes in long gauge blocks

Connector A 619031



Used for directly coupling two long gauge blocks.

Connectors B and C



	Order No.	ℓ (max.)	L	Adapter Qty
Connector B	619032	90mm	126mm	2
Connector C	619033	200mm	236mm	

Used for clamping jaws to the ends of one or more long gauge blocks in conjunction with adapters (619036). The length ℓ is highly adjustable to accommodate the variable length of a stack of regular gauge blocks that would be wrung to one of the long gauge blocks to achieve the required gaging size.

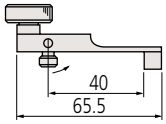
Use of B-type connectors in gage construction

E

Setting a dial test indicator to a long-gauge-block stack attached to the base with a D-type connector

Connector D

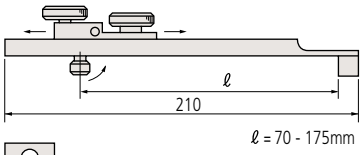
619034



Used for attaching a long gauge block directly to the base.

Connector E

619035

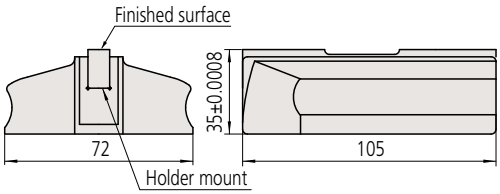


Used for attaching a long gauge block to the base over a stack of regular gauge blocks wrung between the base and long gauge block. The length ℓ is highly adjustable to accommodate the variable length of the stack.

Adapter **619036** (1pc.)

Base

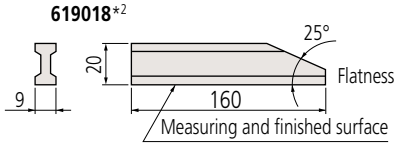
619009



Flatness tolerance of the finished surface 0.5μm
Flatness tolerance of the bottom surface 1μm

Plain jaw

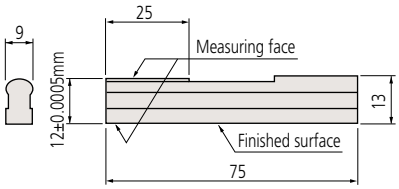
619018*2



Flatness tolerance of the finished surface 1μm

Half round jaw

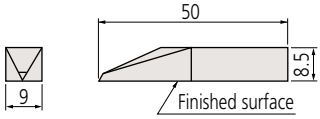
619013*2



Flatness tolerance of the finished surface 0.5μm

Scriber point

619019



Flatness tolerance of the finished surface 0.5μm

Assortment of accessories for gauge blocks

For inside and outside measurement inspection of 300 to 1000 mm (every 100mm) gauge blocks, select the appropriate combination of a rectangular gauge block and an accessory.

Items		Order No.	300mm		400mm		500mm		600mm		700mm		800mm		900mm		1000mm	
			Inner	Outer	Inner	Outer	Inner	Outer	Inner	Outer	Inner	Inner	Inner	Outer	Inner	Out	Inner	Outer
Rectangular gauge block (nominal dimension)	**200mm**	**611682**							1	1								
	300mm	**611683**	1	1							1	1	1	1				
	400mm	**611684**			1	1			1	1	1	1			1	1		
	500mm	**611685**					1	1					1	1	1	1	2	2
Connector A		**619031**							1	1	1	1	1	1	1	1	1	1
Connector B*1		**619032**	2		2		2		2		2		2		2		2	
Half round jaws*2		**619013**	1		1		1		1		1		1		1		1	
Adapter		**619036**	(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)	

*1 Provided with adapters (2 pcs)
*2 2 pcs/set

E

Mitutoyo

Gauge Blocks

Length Standards Brought to You by Mitutoyo

An inspection certificate is supplied as standard.
Refer to page X for details.

Metric/Inch Square Gauge Block Sets
SERIES 516 — Metric Block Sets, Long Block Sets, Wear Block Sets

- Square gauge block sets have several unique characteristics (refer to page E-4 for details.). A wide choice is provided to best match the target applications: sets containing from 2 to 112 blocks are available.
- Mitutoyo accessory sets are available for expanding the range of square gauge block applications, especially for rapid assembly of precision gages.

Steel 112-block set

Steel 103-block set

Steel 76-block set

Steel 47-block set

Steel 32-block set

Wear block set

Tungsten Carbide 2-block set

The wear to a frequently used square gauge block set can be drastically reduced by using tungsten-carbide wear blocks on the ends of a stack. There are two available, of nominal dimension 1mm and 2mm. These blocks are much more wear-resistant than steel blocks, and they also absorb most of the wear that would otherwise occur to the blocks in the set due to contact, and therefore maximize the set's longevity. Wear blocks are relatively inexpensive and can be readily discarded when no longer serviceable. To achieve maximum protection, the same face of each wear block should always be wrung to a set block, so the opposite, wearing, face never touches a set block.

Long block set

Steel 8-block set

An inspection certificate is supplied as standard.
Refer to page X for details.

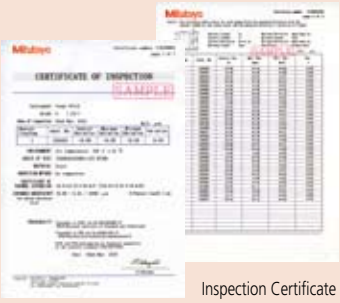
*Suffix Number (■) for Selecting Standard and Certificate Provided

ISO/DIN/JIS

Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	O	—
6	O	O

ASME

Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	O	—



Inspection Certificate

SPECIFICATIONS

Metric Block Sets

Blocks per set	Order No. Steel	Order No. CERA	Standard / grade available ISO/DIN/JIS	Standard / grade available ASME	Blocks included in set Size	Step	Qty.
112	516-437	—	—	00: -■6	1.005		1
	516-438	—	0: -■0	0: -■6	1.001 - 1.009	0.001	9
	516-439	—	1: -■0	1: -■6	1.01 - 1.49	0.01	49
	516-440	—	2: -■0	2: -■6	0.5 - 24.5	0.5	49
	—	—	—	—	25 - 100	25	4
103	516-441	—	—	00: -■6	1.005		1
	516-442	—	0: -■0	0: -■6	1.01 - 1.49	0.01	49
	516-443	—	1: -■0	1: -■6	0.5 - 24.5	0.5	49
	516-444	—	2: -■0	2: -■6	25 - 100	25	4
76	516-449	—	—	00: -■6	1.005		1
	516-450	—	0: -■0	0: -■6	1.01 - 1.49	0.01	49
	516-451	—	1: -■0	1: -■6	0.5 - 9.5	0.5	19
	516-452	—	2: -■0	2: -■6	10 - 40	10	4
	—	—	—	—	50 - 100	25	3
47	516-457	—	—	00: -■6	1.005		1
	516-458	—	0: -■0	0: -■6	1.01 - 1.09	0.01	9
	516-459	—	1: -■0	1: -■6	1.1 - 1.9	0.1	9
	516-460	—	2: -■0	2: -■6	1 - 24	1	24
		—	—	—	25 - 100	25	4
32	516-465	—	—	00: -■6	1.005		1
	516-466	—	0: -■0	0: -■6	1.01 - 1.09	0.01	9
	516-467	—	1: -■0	1: -■6	1.1 - 1.9	0.1	9
	516-468	—	2: -■0	2: -■6	1 - 9	1	9
	—	—	—	—	10 - 30	10	3
	—				60		1

Metric Long Block Sets

Blocks per set	Order No. Steel	Order No. CERA	Standard / grade available ISO/DIN/JIS	Standard / grade available ASME	Blocks included in set Size	Step	Qty.
8	516-751	—	—	00: -■6	125, 150, 175	25	3
	516-752	—	0: -■0	0: -■6	200, 250	50	2
	516-753	—	1: -■0	1: -■6	300, 400, 500	100	3
	516-754	—	2: -■0	2: -■6			

Metric Wear Block Sets

Blocks per set	Order No. Steel	Order No. CERA	Standard / grade available ISO/DIN/JIS	Standard / grade available ASME	Blocks included in set Size	Step	Qty.
2	516-820	—	0: -■0	—	1	—	2
	516-821	—	1: -■0	—			
2	516-822	—	0: -■0	—	2	—	2
	516-823	—	1: -■0	—			

Inch Block Sets

Blocks per set	Order No. Steel	Order No. CERA	Standard / grade available ISO/DIN/JIS	Standard / grade available ASME	Blocks included in set Size	Step	Qty.
81	516-401	516-201	—	00: -■6	.1001 - .1009	.0001	9
	516-402	516-202	—	0: -■6	.101 - .149	.001	49
	516-403	516-203	—	1: -■6	.05 - .95	.05	19
	516-404	516-204	—	2: -■6	1 - 4	1	4
36	516-421	516-221	—	00: -■6	.05"		1
	516-422	516-222	—	0: -■6	.1001 - .1009	.0001	9
	516-423	516-223	—	1: -■6	.101 - .109	.001	9
	516-424	516-224	—	2: -■6	.11 - .19	.01	9
	—	—	—	—	.1 - .5	.1	5
	—	—	—	—	1, 2, 4	1	3
28	516-417	—	—	00: -■6	.02005		1
	516-418	—	—	0: -■6	.0201-.0209	.0001	9
	516-419	—	—	1: -■6	.021-.029	.001	9
	516-420	—	—	2: -■6	.010-.090	.01	9
	—		—	—			

Inch Long Block Sets

Blocks per set	Order No. Steel	Order No. CERA	Standard / grade available ISO/DIN/JIS	Standard / grade available ASME	Blocks included in set Size	Step	Qty.
8	516-762	—	—	0: -■0	5 - 7	1	3
	516-763	—	—	1: -■0	8, 10, 12	2	3
	—	—	—		16, 20	4	2

Inch Wear Block Sets

Blocks per set	Order No. Carbide	Order No. CERA	Standard / grade available ISO/DIN/JIS	Standard / grade available ASME	Blocks included in set Size	Step	Qty.
2	516-824	516-846	—	0: -■0	.05	—	2
	516-825	516-847	—	1: -■0			
2	516-826	516-844	—	0: -■0	.1	—	2
	516-827	516-845	—	1: -■0			

E

Mitutoyo

Gauge Blocks

Length Standards Brought to You by Mitutoyo

Individual Metric Square Gauge Blocks

- Purchasing individual metric square gauge blocks is a cost-effective way to replace heavily used sizes.
- Please add the suffix number representing the national standard and grade required at the end of the Order No. when ordering these items.
- Special sizes that are not included in the charts can be supplied custom-made on request.
- Mitutoyo accessory sets are available for expanding the range of square gauge block applications, especially for rapid assembly of precision gages.

SPECIFICATIONS

Metric Blocks

* Details of the overall sizes for forms of block are given on page E-3 and E24, and the accuracy standards to which they are manufactured are given on page E-5.

Length (mm)	Order No.* Steel	Order No.* CERA
0.5	**614506**	—
1	**614611**	—
1.0005	**614520**	—
1.001	**614521**	—
1.002	**614522**	—
1.003	**614523**	—
1.004	**614524**	—
1.005	**614525**	—
1.006	**614526**	—
1.007	**614527**	—
1.008	**614528**	—
1.009	**614529**	—
1.01	**614561**	—
1.02	**614562**	—
1.03	**614563**	—
1.04	**614564**	—
1.05	**614565**	—
1.06	**614566**	—
1.07	**614567**	—
1.08	**614568**	—
1.09	**614569**	—
1.1	**614570**	—
1.11	**614571**	—
1.12	**614572**	—
1.13	**614573**	—
1.14	**614574**	—
1.15	**614575**	—
1.16	**614576**	—
1.17	**614577**	—
1.18	**614578**	—
1.19	**614579**	—
1.2	**614580**	—
1.21	**614581**	—
1.22	**614582**	—
1.23	**614583**	—
1.24	**614584**	—
1.25	**614585**	—
1.26	**614586**	—
1.27	**614587**	—
1.28	**614588**	—
1.29	**614589**	—
1.3	**614590**	—
1.31	**614591**	—
1.32	**614592**	—

Length (mm)	Order No.* Steel	Order No.* CERA
1.33	**614593**	—
1.34	**614594**	—
1.35	**614595**	—
1.36	**614596**	—
1.37	**614597**	—
1.38	**614598**	—
1.39	**614599**	—
1.4	**614600**	—
1.41	**614601**	—
1.42	**614602**	—
1.43	**614603**	—
1.44	**614604**	—
1.45	**614605**	—
1.46	**614606**	—
1.47	**614607**	—
1.48	**614608**	—
1.49	**614609**	—
1.5	**614641**	—
1.6	**614516**	—
1.7	**614517**	—
1.8	**614518**	—
1.9	**614519**	—
2	**614612**	—
2.5	**614642**	—
3	**614613**	—
3.5	**614643**	—
4	**614614**	—
4.5	**614644**	—
5	**614615**	—
5.5	**614645**	—
6	**614616**	—
6.5	**614646**	—
7	**614617**	—
7.5	**614647**	—
8	**614618**	—
8.5	**614648**	—
9	**614619**	—
9.5	**614649**	—
10	**614671**	—
10.5	**614650**	—
11	**614621**	—
11.5	**614651**	—
12	**614622**	—
12.5	**614652**	—

Length (mm)	Order No.* Steel	Order No.* CERA
13	**614623**	—
13.5	**614653**	—
14	**614624**	—
14.5	**614654**	—
15	**614625**	—
15.5	**614655**	—
16	**614626**	—
16.5	**614656**	—
17	**614627**	—
17.5	**614657**	—
18	**614628**	—
18.5	**614658**	—
19	**614629**	—
19.5	**614659**	—
20	**614672**	—
20.5	**614660**	—
21	**614631**	—
21.5	**614661**	—
22	**614632**	—
22.5	**614662**	—
23	**614633**	—
23.5	**614663**	—
24	**614634**	—
24.5	**614664**	—
25	**614635**	—
30	**614673**	—
40	**614674**	—
50	**614675**	—
60	**614676**	—
75	**614801**	—
100	**614681**	—
125	**614802**	—
150	**614803**	—
175	**614804**	—
200	**614682**	—
250	**614805**	—
300	**614683**	—
400	**614684**	—
500	**614685**	—

Metric Wear Blocks

Length (mm)	Order No. Tungsten carbide
1	**615611**
2	**615612**

An inspection certificate is supplied as standard. Refer to page X for details.

*Suffix Number (-■■■) for Selecting Standard and Certificate Provided

ISO/DIN/JIS

Suffix No.	Grade	Inspection Certificate	Calibration Certificate JCSS
-021	0	O	—
-026	0	O	O
-031	1	O	—
-036	1	O	O
-041	2	O	—
-046	2	O	O

ASME

Suffix No.	Grade	Inspection Certificate	Calibration Certificate JCSS
-521	00	O	—
-531	0	O	—
-541	1	O	—
-551	2	O	—

Inspection Certificate

E

An inspection certificate is supplied as standard.
Refer to page X for details.

*Suffix Number (-■■■) for Selecting Grade and Certificate Provided

ASME

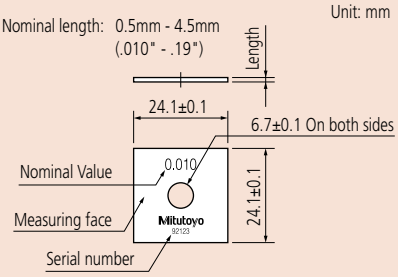
Suffix No.	Grade	Inspection Certificate	Calibration Certificate JCSS
-521	00	O	—
-531	0	O	—
-541	1	O	—
-551	2	O	—

Inspection Certificate

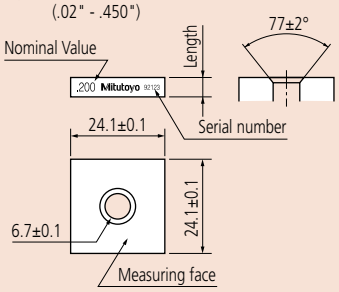
Dimensions

Unit: mm

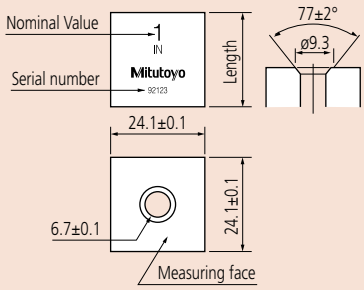
Nominal length: 0.5mm - 4.5mm (.010" - .19")



Nominal length: 5mm - 14.5mm (.02" - .450")



Nominal length: 15mm - 500mm (.500" - 20")



Individual Inch Square Gauge Blocks

SPECIFICATIONS

Inch Blocks

* Details of the overall sizes for forms of block are given on page E-3 and the accuracy standards to which they are manufactured are given on page E-5.

Length (inch)	Order No.* Steel	Order No.* CERA
.01	**614310**	—
.02005	**614240**	—
.0201	**614231**	—
.0202	**614232**	—
.0203	**614233**	—
.0204	**614234**	—
.0205	**614235**	—
.0206	**614236**	—
.0207	**614237**	—
.0208	**614238**	—
.0209	**614239**	—
.02	**614320**	—
.021	**614321**	—
.022	**614322**	—
.023	**614323**	—
.024	**614324**	—
.025	**614325**	—
.026	**614326**	—
.027	**614327**	—
.028	**614328**	—
.029	**614329**	—
.03	**614330**	—
.03125 (1/32)	**614301**	—
.04	**614340**	—
.046875 (3/64)	**614302**	—
.05	**614105**	**616105**
.06	**614106**	—
.0625	**614303**	**616303**
.07	**614107**	—
.078125 (5/64)	**614304**	—
.08	**614108**	—
.09	**614109**	—
.09375 (3/32)	**614305**	—
.1	**614191**	**616191**
.100025	**614307**	—
.10005	**614135**	**616135**
.100075	**614308**	—
.1001	**614121**	**616121**
.1002	**614122**	**616122**
.1003	**614123**	**616123**
.1004	**614124**	**616124**
.1005	**614125**	**616125**
.1006	**614126**	**616126**
.1007	**614127**	**616127**
.1008	**614128**	**616128**
.1009	**614129**	**616129**
.101	**614141**	**616141**
.102	**614142**	**616142**
.103	**614143**	**616143**
.104	**614144**	**616144**
.105	**614145**	**616145**

Length (inch)	Order No.* Steel	Order No.* CERA
.106	**614146**	**616146**
.107	**614147**	**616147**
.108	**614148**	**616148**
.109	**614149**	**616149**
.109375 (7/64)	**614306**	—
.11	**614150**	**616150**
.111	**614151**	**616151**
.112	**614152**	**616152**
.113	**614153**	**616153**
.114	**614154**	**616154**
.115	**614155**	**616155**
.116	**614156**	**616156**
.117	**614157**	**616157**
.118	**614158**	**616158**
.119	**614159**	**616159**
.12	**614160**	**616160**
.121	**614161**	**616161**
.122	**614162**	**616162**
.123	**614163**	**616163**
.124	**614164**	**616164**
.125	**614165**	**616165**
.126	**614166**	**616166**
.127	**614167**	**616167**
.128	**614168**	**616168**
.129	**614169**	**616169**
.13	**614170**	**616170**
.131	**614171**	**616171**
.132	**614172**	**616172**
.133	**614173**	**616173**
.134	**614174**	**616174**
.135	**614175**	**616175**
.136	**614176**	**616176**
.137	**614177**	**616177**
.138	**614178**	**616178**
.139	**614179**	**616179**
.14	**614180**	**616180**
.141	**614181**	**616181**
.142	**614182**	**616182**
.143	**614183**	**616183**
.144	**614184**	**616184**
.145	**614185**	**616185**
.146	**614186**	**616186**
.147	**614187**	**616187**
.148	**614188**	**616188**
.149	**614189**	**616189**
.15	**614115**	**616115**
.16	**614116**	**616116**
.17	**614117**	**616117**
.18	**614118**	**616118**
.19	**614119**	**616119**
.2	**614192**	**616192**

Length (inch)	Order No.* Steel	Order No.* CERA
.25	**614212**	**616212**
.3	**614193**	**616193**
.35	**614213**	**616213**
.375 (3/8)	**614309**	—
.4	**614194**	**616194**
.45	**614214**	**616214**
.5	**614195**	**616195**
.55	**614215**	**616215**
.6	**614196**	**616196**
.65	**614216**	**616216**
.7	**614197**	**616197**
.75	**614217**	**616217**
.8	**614198**	**616198**
.85	**614218**	**616218**
.9	**614199**	**616199**
.95	**614219**	**616219**
1	**614201**	**616201**
2	**614202**	**616202**
3	**614203**	**616203**
4	**614204**	**616204**
5	**614205**	—
6	**614206**	—
7	**614207**	—
8	**614208**	—
10	**614222**	—
12	**614223**	—
16	**614224**	—
20	**614225**	—

Inch Wear Blocks

Length (inch)	Order No.* Tungsten carbide
.05	**615105**
.1	**615191**

E

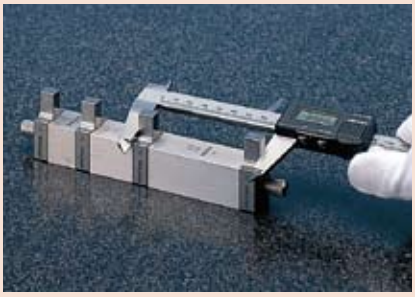
Gauge Blocks

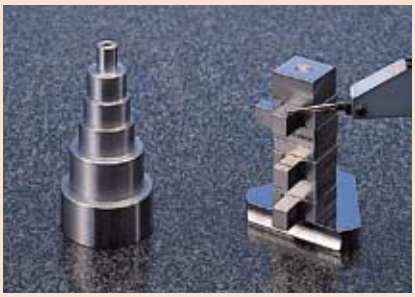
Length Standards Brought to You by Mitutoyo

Square Gauge Block Accessories Set

- To expand the application of square gauge blocks, Mitutoyo offers the Gauge Block Accessories Set. Square gauge blocks have a much broader range of application than rectangular gauge blocks due to the central clamping hole. Also, the accessories included in the set are sold individually depending on the application.
- Mitutoyo accessory sets are available for expanding the range of square gauge block applications, especially for rapid assembly of precision gages.

516-611





SPECIFICATIONS

Metric

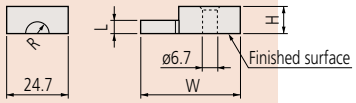
Order No. 516-611	Included in set	Quantity Supplied
619070	Half round jaw	2 pcs.
619071	Half round jaw	
619072	Plain jaw	
619073	Center point	1 pc.
619054	Scriber point	
619074	Base	
619057	Flat head screw	2 pcs.
619058	Flat head screw	
619059	Slotted head nut	
619060	Adjustable tie rod	
619061	Adjustable tie rod	
619062	Tie rod	1 pc.
619063	Tie rod	
619064	Tie rod	
619065	Tie rod	
619056	Stud	2 pcs.
619066	Knurled head screw	

Inch

Order No. 516-612	Included in set	Quantity Supplied
619050	Half round jaw	2 pcs.
619051	Half round jaw	
619052	Plain jaw	
619053	Center point	1 pc.
619054	Scriber point	
619055	Base	
619057	Flat head screw	2 pcs.
619058	Flat head screw	
619059	Slotted head nut	
619060	Adjustable tie rod	
619061	Adjustable tie rod	
619062	Tie rod	1 pc.
619063	Tie rod	
619064	Tie rod	
619065	Tie rod	
619056	Stud	2 pcs.
619066	Knurled head screw	

* 2 pcs of half round jaw, plain jaw, stud, flat head screw, slotted head nut, adjustable tie rod, and knurled head screw are included in each set. Please note that the abovementioned Order No. indicates only 1 set.

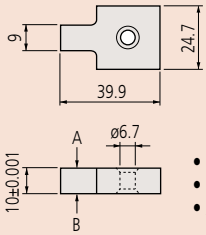
Half round jaw



Order No.	R	L	W	H
619070	1.95mm	2mm	33.6mm	5.3mm
619071	4.95mm	5mm	39.9mm	10.3mm

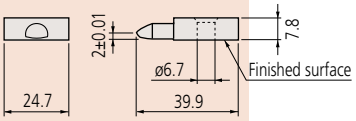
- Flatness tolerance 0.5μm
- Parallelism tolerance of L 0.5μm
- Tolerance of L ±0.5μm

Plain jaw 619072



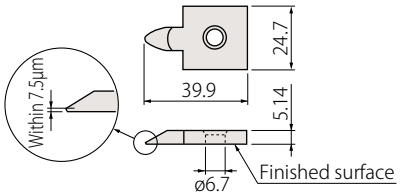
- Flatness tolerance 0.12μm
- Parallelism tolerance 0.12μm
- A and B are finished surfaces

Center point 619073

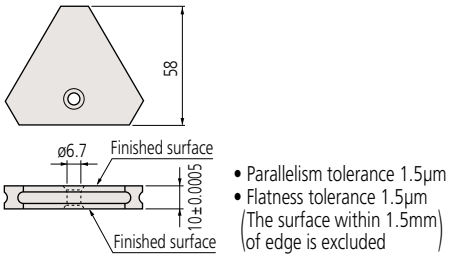


- Flatness tolerance 0.5μm

Scriber point 619054

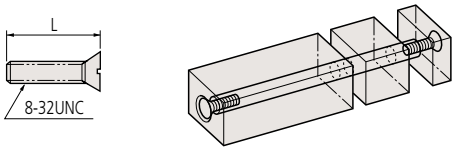


Base 619074



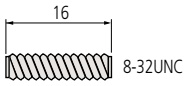
- Parallelism tolerance 1.5μm
- Flatness tolerance 1.5μm
  (The surface within 1.5mm of edge is excluded)

Flat head screw

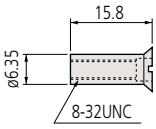


Order No.	L
619057	31.6mm
619058	15.8mm

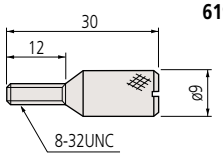
Stud 619056



Slotted head nut 619059



Knurled head screw 619066

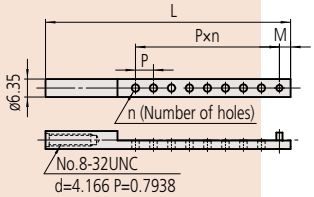


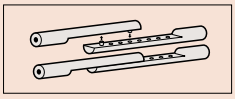
•Contraction caused by the clamping force

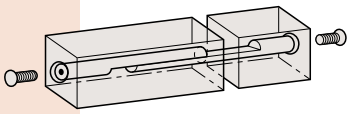
The minimum recommended torque to be applied to the clamping screws is approximately 600mN/m. The chart below shows the approximate length contraction of a 100mm gauge stack using typical torque values.

Driver	Contraction
Torque Driver 600mN·m	0.2μm/100mm
Ordinary Driver 700 - 800mN·m	0.3μm/100mm

Adjustable tie rod

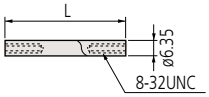


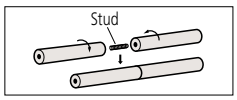


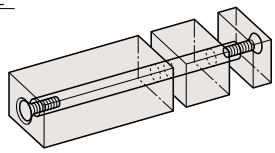


Order No.	L	M	P	n
619060	124.5mm	3.85mm	6.35mm	14
619061	86.5mm	3.95mm	6.35mm	8

Tie rod







Order No.	L
619065	19mm
619064	38mm
619063	57mm
619062	76mm

Accessories used for combining square gauge blocks

Order No.	Overall length (mm) / Included in set	Min.	21	36	34	41	45	58	64	72	77	82	91	95	109	117	130	148	121	167	143	160	205	180	223	240	258	295	375
		Max.	30	43	43	50	60	72	79	88	91	97	107	109	125	135	150	169	180	184	210	255	270	285	288	345	363	445	520
619059	Slotted head nut		1	1		1																							
619058	Flat head screw		1		2	1	2	1	2		1	2		1		1			2			2							
619057				1				1		2	1		2	1	2	1	2	2		2	2		2	2	2	2	2	2	2
619056	Stud					1										1	1	1		1			1		1	1	1	1	2
619065	Tie rod				1	1										1	1												
619064							1	1		1								1											
619063									1		1		1							1									
619062												1		1	1	1	1	1		1									
619061	Adjustable tie rod																		2		2		2		2			2	2
619060																						2		2		2	2	2	2

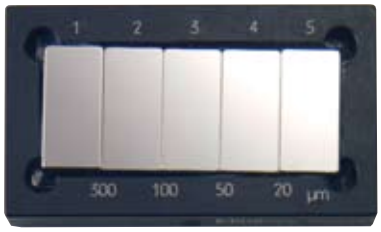
Gauge Blocks

Length Standards Brought to You by Mitutoyo

An inspection certificate is supplied as standard.
Refer to page X for details.

Step Master
SERIES 516

- Step Master is a gauge providing 4 small increments in height (steps) constructed from an assembly of 5 highly accurate steel or ceramic blocks.
- Each step is defined as the difference in height between the center of adjacent blocks, measured to a resolution of 0.01µm by using an interferometer with an accuracy tolerance of ±0.20µm.
- Steel and ceramic types are available to suit the application.
- Height differences are measured between the centers of adjacent steps.



Steel type
516-199

Ceramic type
516-499

SPECIFICATIONS

Steel type

Order No.	516-198					516-199				
Block No.	1	2	3	4	5	1	2	3	4	5
Cumulative step (µm)	0	10	15	17	18	0	300	400	450	470
Step value between adjacent blocks (µm)		10	5	2	1		300	100	50	20

Ceramic type

Ord er No.	516-498					516-499				
Block No.	1	2	3	4	5	1	2	3	4	5
Cumulative step (µm)	0	10	15	17	18	0	300	400	450	470
Step value between adjacent blocks (µm)		10	5	2	1		300	100	50	20

○○○ - ○○○ **-64**: Provided with Calibration Certificate
○○○ - ○○○ **-84**: Provided with Calibration Certificate and Traceability System Chart

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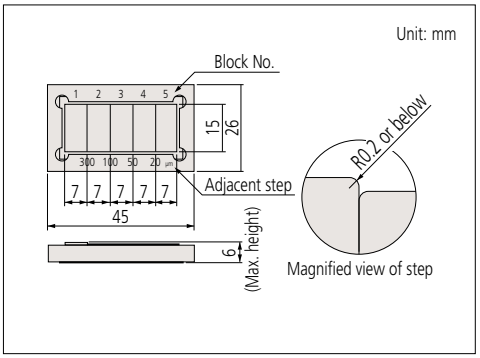
DIMENSIONS

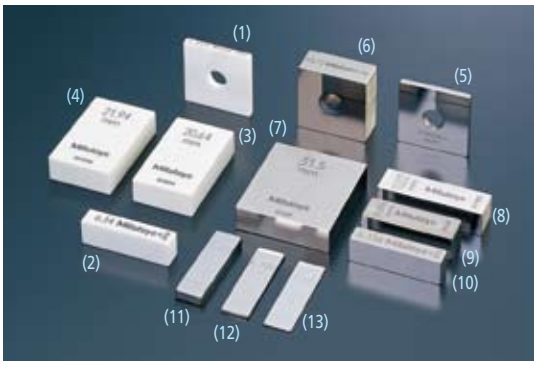


Custom-made Blocks & Gages

- Mitutoyo can manufacture Gauge Blocks and reference gages to your size and design.
- Nominal size range
  - · 0.1mm to 1000mm (steel)
  - · 0.5mm to 500mm (ceramic)
- Nominal size increment
  - · 0.0005mm (up to 100mm)
  - · 0.001mm (over 100mm)
- Cross section (same as the standard product)
  - · Nominal length of 10mm or less: 30 x 9mm
  - · Nominal length of more than 10mm: 35 x 9mm
  - · Square types are also available.
- Special ultra-low expansion ceramic types are also available.
- Gauge Blocks and reference gages to your specifications (section dimensions) are available, including precision spacers which normally absorb much time and effort to manufacture in-house.
- Special processing including boring, step gaging and special marking are available. Consult us for details.

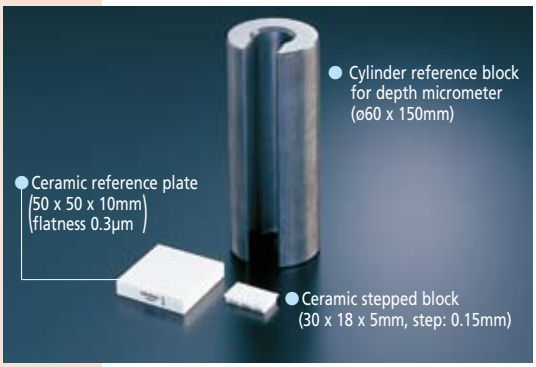
Note: Please specify that coupling holes are to be supplied if they are required in your long custom-made gauge blocks. These holes are always supplied with standard gauge blocks over 100mm but not for custom-made Gauge Blocks unless specified.

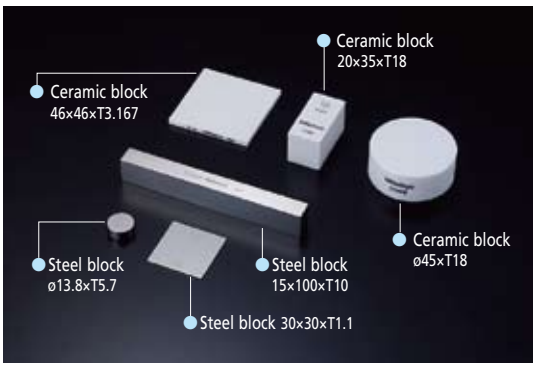
Typical examples of custom-made gauge blocks and reference gages.
Please enquire for price and delivery times for your particular requirements.



Ceramic
(1) Square gauge block (2.1005mm)
(2) Rectangular gauge block (6.34mm)
(3) Rectangular gauge block (20.64mm)
(4) Rectangular gauge block (21.94mm)

Steel
(5) Square gauge block (2.2065mm)
(6) Square gauge block (10.72mm)
(7) Rectangular gauge block (31.5mm)
(8) Rectangular gauge block (10.02mm)
(9) Rectangular gauge block (9.694mm)
(10) Rectangular gauge block (6.156mm)
(11) Rectangular gauge block (3.603mm)
(12) Rectangular gauge block (1.1505mm)
(13) Rectangular gauge block (0.555mm)





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Mitutoyo

Gauge Blocks

Length Standards Brought to You by Mitutoyo

Maintenance Kit for Gauge Blocks SERIES 516

- Maintenance kit for gauge blocks includes all the necessary maintenance tools for removing burrs and contamination, and applying anti-corrosion treatment after use, etc.

516-650

***Order No. 516-650E; 516-650**
Tools and accessories included:

1. Anti-corrosion oil (**600001**)
   (100ml, spray can)
   Used for both steel and tungsten-carbide gauge blocks.

2. Ceraston (**601645**)
   (both sides finished by lapping)

3. Optical flat (**158-117**)
   (ø45, 12mm thickness, JIS Grade 3)
   Used to check the wringing of thin gauge blocks and for the presence of burrs.

4. Tweezers (**600004**)
   Used for handling thin gauge blocks.

5. Blower brush (**600005**)
   Used for blowing dust from measuring surfaces.

6. Cleaning paper (**600006**)
   (lens paper, 82 x 304mm, 500 pcs)
   Used for wiping off rust preventive oil and contamination. Lint free.

7. Artificial leather mat (B4 size) (**600007**)
   Used as a gauge block mat in order to avoid scratches on the work table

8. Reagent bottle (**600008**)
   (polyethylene container, 100ml)
   Bottle of wiping solution.
   (Mitutoyo employs n-Heptane for solvent.)

9. Gloves (**600009**)
   Used for handling large gauge blocks. Effective for the prevention of corrosion and thermal expansion.

* **516-650E**: Excluding anti-corrosive oil (**600001**)
516-650: including anti-corrosive oil (**600001**) is for domestic sales only.
In the case of an order from overseas, place an order for **516-650E** : excluding anti-corrosive oil, and order anti-corrosive oil (**600001**) separateiy.

Recommendation for regular calibration

Gauge blocks are often used to define a company's standard of length for manufacturing and as such must be reliable. This means that they need regular calibration to verify accuracy. (The problem of damage or corrosion should be addressed during use and blocks seriously affected must be discarded immediately.) The frequency of calibration depends on the tolerance requirements of the work, the amount of use and conditions under which the gage blocks are used. The most economical cycle for any particular set of gauge blocks is best determined by studying the calibration history. The list below indicates timings for a typical initial calibration cycle for the various grades of block.

Application	Cycle	Grade (reference)
Reference	1 - 2	K
Standard	2	K or 0
Inspection	2	0 or 1
Shop floor	0.5 - 1	1 or 2

As an accredited calibration laboratory, Mitutoyo offers a traceable calibration service for customers' gauge blocks. Our regular calibration service features:

- Gauge blocks manufactured by any maker can be calibrated.
- Cleansing and removal of burrs.
- Central dimension and dimensional deviations of each block are measured.
- Calibration results are provided for immediate use and for building a calibration history of each block.

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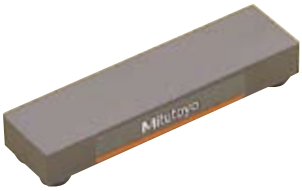
Application example

Ceraston
SERIES 516 — Accessory for Gauge Block Maintenance

- Alumina-ceramic abrasive stone for removing burrs from hard materials such as ceramics that ordinary stones cannot handle.
- Can be used both for steel gauge blocks and CERA blocks.
- Excellent in the ease of removing burrs and durability compared with Arkansas stones.
- Both sides can be used.

601644
150 (W) ×50 (D) ×20 (H) mm



601645
100 (W) ×25 (D) ×12 (H) mm

Removing burrs

Figure 1

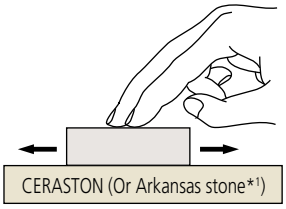
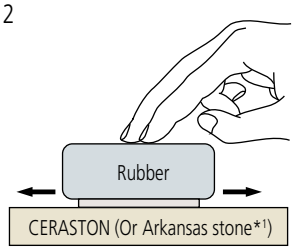


Figure 2



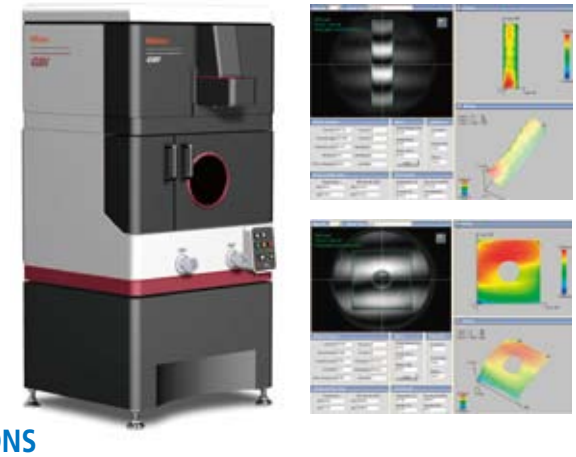
(1) Wipe any dust and oil films from the gauge block and the Ceraston (or Arkansas stone) using a solvent.
(2) Place the gauge block on the Ceraston so that the measuring face that has burrs is on the abrasive surface of the stone. While applying light pressure, move the gauge block to and fro about ten times (Fig. 1). Use a block rubber for thin gauge blocks to apply even pressure (Fig. 2).
(3) Check the measuring face for burrs with an optical flat. If the burrs have not been removed, repeat step (2). If burrs are too large, they may not be removed with an abrasive stone. If so, discard the gauge block.

*1 Mitutoyo does not offer Arkansas stones.

Gauge Blocks

Length Standards Brought to You by Mitutoyo

Automatic Gauge Block Interferometer GBI (Interference fringe analyzing processing)



An inspection certificate is supplied as standard. Refer to page X for details.

- Automatic primary-level measuring instrument for gauge block lengths between 0.1mm and 250mm using optical interference. GBI is a Twyman-Green interferometer which employs the method of multiple wavelength coincidence to calibrate lengths more accurately.
- The GBI automatically detects the distribution of interference fringes with a CCD camera and processes the data. Measurement of parallelism and flatness is provided as well as lengths based on the phase shift method and the interference fringe analysis software.
- The intensity and wavelength of the He-Ne laser light sources are highly stable. This allows highly accurate and repeatable measurement.
- Both the refractive index of air and the thermal expansion of gauge blocks are automatically compensated for by computer which is linked to a thermometer, hygrometer and barometer.

SPECIFICATIONS

Metric

Range	Measuring Uncertainty (Coverage range factor k = 2)	Number of gauge blocks that can be mounted on the measuring table	Light sources	Operating conditions
0.1mm - 250mm	0.025µm+0.2x10^{-6} L L = Gauge block length (mm)	12	632.8nm frequency-stabilized He-Ne laser 543.5nm frequency-stabilized He-Ne laser	20±0.5°C Under mild temperature change without direct exposure to cold or warm air

Gauge Block Comparator GBCD-100A SERIES 565 - Automatic Comparator with Dual Gage Heads

An inspection certificate is supplied as standard. Refer to page X for details.

- GBCD-100A measures the length of rectangular gauge blocks in the size range 0.5mm to 100mm. It automatically compares a test block with an appropriate reference gauge block.
- The compensation result is not affected by the warp of thinner gauge blocks due to the use of upper and lower gaging heads (dual-head system).
- Measurement configuration: 1 cycle of automatic comparison measurement with a standard gauge block.

- Compensation master for gauge block comparator

Special bridge-type block

516-145-E2

SPECIFICATIONS

Metric

Range	Resolution	Accuracy in narrow range (20°C)	Upper gage head		
			Type	Measuring force	Contact point
0.5mm - 100mm	0.00001mm (0.01µm)	±(0.03+0.3L/1000)µm* L = Gauge block length (mm)	Mu-Checker	1N (100gf)	Carbide contact point of radius of 20mm

Lower gaging head			Operating conditions
Type	Measuring force	Contact point	
Mu-Checker	0.6N (60gf)	Carbide contact point of radius 5mm	Temperature: 20°C ±1°C Humidity: 58%RH ±15%RH

* Uncertainty of measurement at the 95% confidence level (not including the calibration error of the reference gauge block).
Note: To denote your AC power cable add the following suffixes to the order No.: **A** for UL/CSA, **D** for CEE, **DC** for CCC, **E** for BS, **K** for KC, **No suffix** is required for JIS/100V

An inspection certificate is supplied as standard.
Refer to page X for details.

- Measuring capability: Rectangular Gauge Blocks; Square Gauge Blocks (requires dedicated holder - optional accessory)
- Measuring method: Differential measurement between upper and lower gaging heads (dual head system)

Gauge Block Comparator GBCD-250
SERIES 565 — Manual Comparator with Dual Gage Heads

SPECIFICATIONS

Metric

Range	Resolution	Accuracy (Confidence level 95%) Comparison measurement of the same nominal length	Accuracy (Confidence level 95%) Dimensional deviations between standard gauge block and measurement gauge block: ±3mm
0.1mm - 250mm	0.00001mm (0.01µm)	±(0.03+0.3L/1000)µm* L = Gauge block length (mm)	±(0.03+0.3L/1000)µm* L = Gauge block length (mm)

Upper gage head			Lower gaging head			Operating conditions
Type	Measuring force	Contact point	Type	Measuring force	Contact point	
Laser Hologage	0.7N	Carbide contact point of radius 20mm	Laser Hologage	0.2N	Carbide contact point of radius 5mm	Temperature: 20°C ±1°C Humidity: 58%RH ±15%RH

* Uncertainty of measurement at the 95% confidence level (not including the calibration error of the reference gauge block).

Note: To denote your AC power cable add the following suffixes to the order No.: **A** for UL/CSA, **D** for CEE, **DC** for CCC, **E** for BS, **K** for KC, **No suffix** is required for JIS/100V

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Definition of the Meter

The 17th General Conference of Weights and Measures in 1983 decided on a new definition of the meter unit as the length of the path traveled by light in a vacuum during a time interval of 1/299 792 458 of a second. The gauge block is the practical realization of this unit and as such is used widely throughout industry.

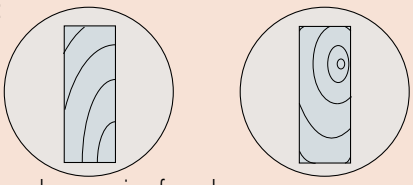
Selection, Preparation and Assembly of a Gauge Block Stack

Select gauge blocks to be combined to make up the size required for the stack.

(1) Take the following things into account when selecting gauge blocks.
- a. Use the minimum number of blocks whenever possible.
- b. Select thick gauge blocks whenever possible.
- c. Select the size from the one that has the least significant digit required, and then work back through the more significant digits.

(2) Clean the gauge blocks with an appropriate cleaning agent.

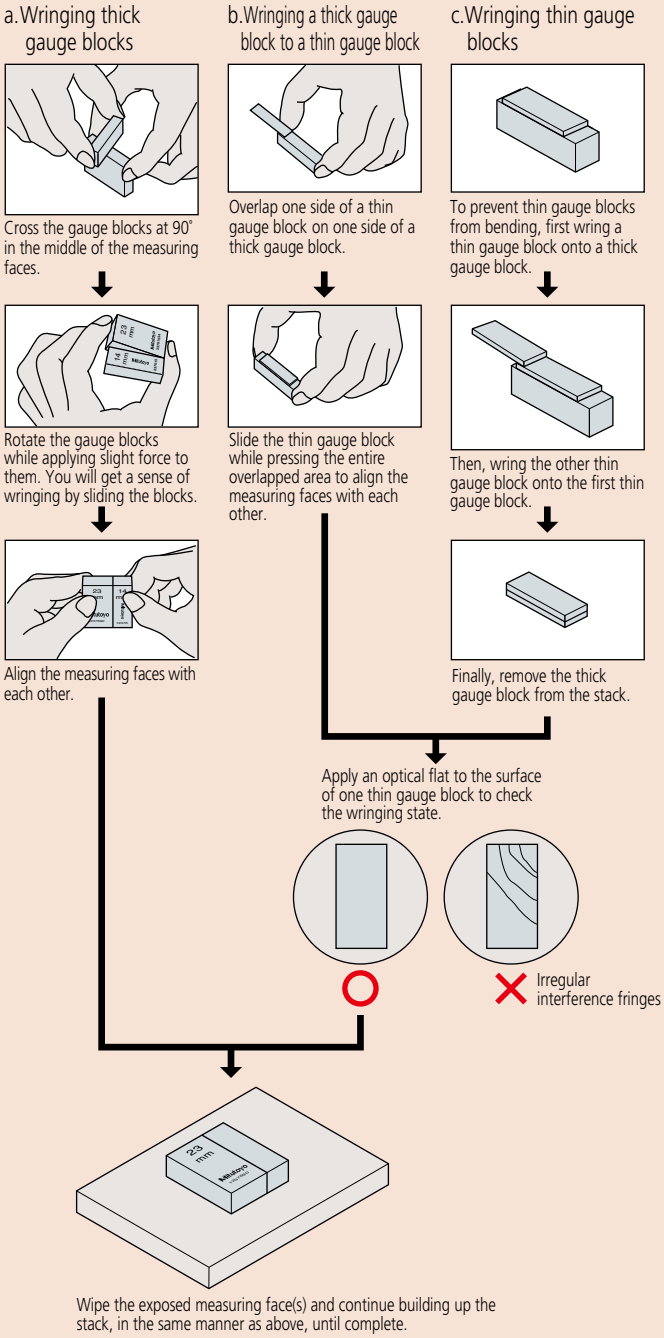
(3) Check the measuring faces for burrs by using an optical flat as follows:



- a. Wipe each measuring face clean.
- b. Gently place the optical flat on the gauge block measuring face.
- c. Lightly slide the optical flat until interference fringes appear.
  - Judgment 1: If no interference fringes appear, it is assumed that there is a large burr or contaminant on the measuring face.
- d. Lightly press the optical flat to check that the interference fringes disappear.
  - Judgment 2: If the interference fringes disappear, no burr exists on the measuring face.
  - Judgment 3: If some interference fringes remain locally while the flat is gently moved to and fro, a burr exists on the measuring face. If the fringes move along with the optical flat, there is a burr on the optical flat.
- e. Remove burrs, if any, from the measuring face using a flat, fine-grained abrasive stone.

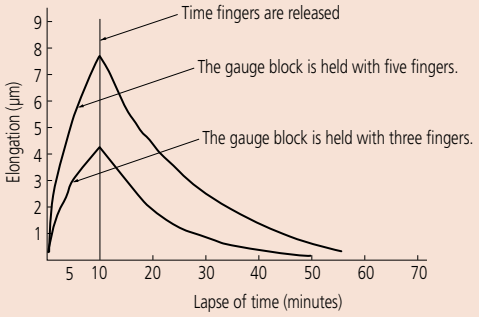
(4) Apply a very small amount of oil to the measuring face and spread it evenly across the face. (Wipe the face until the oil film is almost removed.) Grease, spindle oil, vaseline, etc., are commonly used.

(5) Gently overlay the faces of the gauge blocks to be wrung together. There are three methods to use (a, b and c as shown below) according to the size of blocks being wrung:



Thermal Stabilization Time

The following figure shows the degree of dimensional change when handling a 100mm steel gauge block with bare hands.



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