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Gauge Blocks

Features and Accuracies

Features of Mitutoyo gauge blocks

Mitutoyo offers gauge blocks for use as length standards that are fully domestically manufactured at our plant in Japan and highly trusted worldwide for their accuracy, quality, and durability. They are available in three types: steel rectangular gauge blocks, ceramic rectangular gauge blocks (CERA Blocks), and steel square gauge blocks. In addition, tungsten carbide rectangular gauge blocks and tungsten carbide square gauge blocks are available as protectors. Select the right gauge blocks depending on the conditions, environment, and application of use.

Accuracy

Our calibration technique combined with established traceability to the Japanese national standard ensures that highly reliable products are delivered. We ensure the traceability of all our gauge blocks and guarantee their accuracy based on the national standard, so you can feel confident when using them.

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

By adopting high-carbon, high-chrome steel that can satisfy various material characteristics necessary for gauge blocks, and thermally processing it carefully and repeatedly with our advanced technology, we produce high levels of hardness for reliable use and minimize aging deterioration as much as possible.

CERA Blocks

Produced by using our ultra-precision processing technology and ceramic materials with excellent surface smoothness, CERA Blocks feature the following advantages not delivered by steel blocks.

(1) Corrosion Resistant

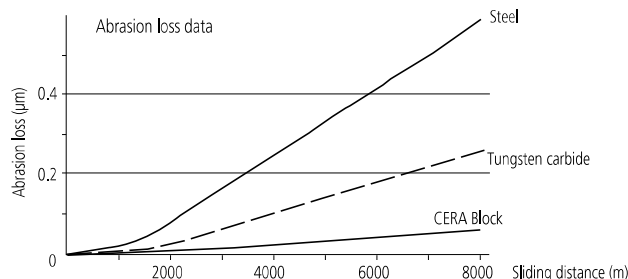
Anti-corrosion treatment is not required when handled normally (i.e. with fingers), resulting in simple maintenance and storage.

(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) Excellent abrasion resistance

CERA Blocks are 10 times more resistant to abrasion than steel blocks and therefore have a longer life (based on in-house test results).



(4) Dimensional Stability

CERA Blocks are highly resistant to dimensional changes 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

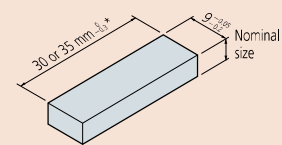
Superior flatness and surface finish provides maximum wringing force.



Classification of Gauge Blocks by Shape

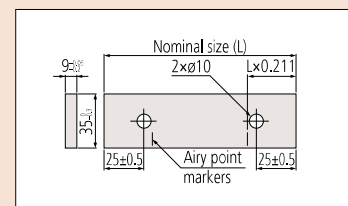
Mitutoyo broadly divides gauge blocks into two categories according to the block shape.

Rectangular gauge blocks



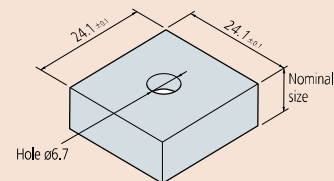
* Depends on the nominal size.
More than 10 mm: 35 mm
10 mm or less: 30 mm

All standard long blocks 125 mm or more have two coupling holes on the body.



Long rectangular gauge blocks

Square 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.



Product catalog
E12001



Selecting Gauge Blocks

- Select gauge blocks in accordance with the combination range required.
If a large length is required, use one or more blocks from a long-block set.
- Select gauge blocks in accordance with the minimum length step required. Add a wear block at each end of the stack if the workpiece material is abrasive, or if the stack will be used frequently.
- If a set containing a large number of gauge blocks is selected, the number of gauge blocks required for any particular length is reduced and the number of combinations is increased. Accuracy of the blocks in the set will be retained longer because normal wear will be spread over a larger number of blocks.
- Gauge block sets dedicated to micrometer and caliper inspection are available (refer to page 01-13 for details).
- If using only one length repeatedly, it is a good idea to purchase discrete gauge blocks (refer to pages 01-15, 01-16, 01-17, 01-18, 01-25, and 01-26 for details).
- Products can be provided in combinations other than those in our standard sets. When placing such orders, please specify whether a storage box is required. Feel free to consult us if you need gauge blocks compliant with British (BS), American, or other standards. The U.S. Federal Specification for gauge blocks was replaced by ASME B89.1.9 in 2002. Please contact your local Mitutoyo sales office for further information.
- 2 mm-based gauge blocks, which take the base of the minimum length step as 2 mm, are available and many people find them easier to handle than 1 mm-based gauge blocks.
- All Mitutoyo gauge blocks, whether sold in sets or individually, come with a measurement inspection certificate.

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=45.6785 mm

• For a 1 mm-based gauge block set

$$\begin{array}{r}
 1.0005 \\
 1.008 \\
 1.17 \\
 17.5 \\
 +) \quad 25 \\
 \hline
 45.6785 \text{ mm}
 \end{array}$$

• For a 2 mm-based gauge block set

$$\begin{array}{r}
 2.0005 \\
 2.008 \\
 2.17 \\
 14.5 \\
 +) \quad 25 \\
 \hline
 45.6785 \text{ mm}
 \end{array}$$

Note: Regarding the method for wringing, refer to "Quick Guide to Precision Measuring Instruments" on page 13-28.



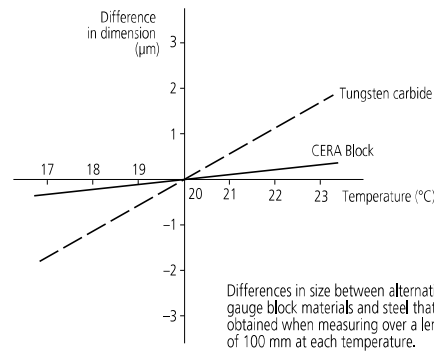
(8) Superior Material Characteristics of CERA Block

Property	Material	CERA Block (ZrO ₂)	Steel (Fe)	Tungsten Carbide (WC-Co)	ZERO CERA Blocks (Low thermal expansion)
Hardness (HV)		1350	800	1650	826
Coefficient of thermal expansion (10 ⁻⁶ /K)		9.3±0.5	10.8±0.5	5.5±1.0	0±0.02
Flexural strength by 3-point bending (MPa)		1270	1960	1960	210
Fracture toughness K _{1c} (MPa·m ^{1/2})		7	120	12	1.2
Young's modulus ×10 ⁴ (MPa)		20.6	20.6	61.8	130
Poisson's ratio		0.3	0.3	0.2	0.3
Specific gravity		6.0	7.8	14.8	2.5
Thermal conductivity (W/m·K)		2.9	54.4	79.5	3.7

Note: 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 under conditions of rapid temperature change.

(9) Difference in expansion coefficient between steel and CERA blocks is just 1.5×10⁻⁶/K

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 24.1×24.1 mm 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

Features and Accuracies

Grade and Application

The following table can be used to select the gauge block grade according to usage (specified by ISO3650, BS4311, and JIS B 7506).

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

ACCURACY SPECIFICATIONS: JIS B 7506-2004 (JAPAN) ISO 3650:1998 (at 20 °C)

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

ACCURACY SPECIFICATIONS: BS 4311:2007 (UK) (at 20 °C)

Nominal length (in)		Grade K		Grade 0		Grade 1		Grade 2	
		Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)	Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)	Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)	Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)
over 0	up to 0.4	±8	2	±5	4	±8	6	±18	12
over 0.4	up to 1	±12	2	±6	4	±12	6	±24	12
over 1	up to 2	±16	3	±8	4	±16	7	±32	12
over 2	up to 3	±20	3	±10	5	±20	7	±40	14
over 3	up to 4	±24	3	±12	5	±24	8	±48	14

Note 1: The accuracy of nominal lengths from 0.1 mm up to less than 0.5 mm follows that of nominal lengths from 0.5 mm up to 10 mm.

Note 2: Grade K gauge blocks are only available as made-to-order rectangular gauge blocks.

Note 3: Grade K gauge blocks are supplied with a JCSS calibration certificate. When ordering, kindly provide your formal name and contact information.

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

(at 20 °C)

Nominal length (in)		Grade K		Grade 00		Grade 0		Grade 1		Grade 2	
		Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)	Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)	Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)	Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)	Limit deviation of length at any point (μin)	Tolerance for the variation in length (μin)
	up to 0.05	±12	2	±4	2	±6	4	±12	6	±24	12
over 0.05	up to 0.4	±10	2	±3	2	±5	4	±8	6	±18	12
over 0.45	up to 1	±12	2	±3	2	±6	4	±12	6	±24	12
over 1	up to 2	±16	2	±4	2	±8	4	±16	6	±32	12
over 2	up to 3	±20	2	±5	3	±10	4	±20	6	±40	14
over 3	up to 4	±24	3	±6	3	±12	5	±24	8	±48	14
over 4	up to 5	±32	3	±8	3	±16	5	±32	8	±64	16
over 5	up to 6	±32	3	±8	3	±16	5	±32	8	±64	16
over 6	up to 7	±40	4	±10	4	±20	6	±40	10	±80	16
over 7	up to 8	±40	4	±10	4	±20	6	±40	10	±80	16
over 8	up to 10	±48	4	±12	4	±24	6	±48	10	±104	18
over 10	up to 12	±56	4	±14	4	±28	7	±56	10	±112	20
over 12	up to 16	±72	5	±18	5	±36	8	±72	12	±144	20
over 16	up to 20	±88	6	±20	6	±44	10	±88	14	±176	24
over 20	up to 24	±104	6	±25	6	±52	10	±104	16	±200	28
over 24	up to 28	±120	7	±30	7	±60	12	±120	18	±240	28
over 28	up to 32	±136	8	±34	8	±68	12	±136	20	±260	32
over 32	up to 36	±152	8	±38	8	±76	14	±152	20	±300	36
over 36	up to 40	±160	10	±40	10	±80	16	±168	24	±320	40

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

Note 1: The accuracy of nominal lengths from 0.1 mm up to less than 0.5 mm follows that of nominal lengths from 0.5 mm up to 10 mm.

Note 2: Grade K gauge blocks are only available as made-to-order rectangular gauge blocks.

Note 3: Grade K gauge blocks are supplied with a JCSS calibration certificate. When ordering, kindly provide your formal name and contact information.

Limit deviation of length at any point

This is the permitted deviation from nominal length.

The deviation of length, expressed as “actual length - nominal length”, is measured at a total of five points: the “middle point” of the gauge block measuring face and the “four corners, at 1.5 mm on the inside from the side faces”.

Tolerance for the variation in length

This is the permitted variation in length.

The variation in length is expressed as “deviation of length for the maximum (greatest length) - deviation of length for the minimum (smallest length)” among those measured at the five points mentioned above.

Gauge Blocks

Gauge Blocks with a Calibrated Coefficient of Thermal Expansion

- The products are the highest-quality gauge blocks exceeding Grade K and are provided with highly accurate thermal expansion coefficient data. They help minimize thermal correction and therefore are suitable for highly accurate calibration. (Uncertainty of thermal expansion coefficient: $0.035 \times 10^{-6}/K$ ($k=2$))
- The thermal expansion coefficient is measured with a highly accurate double-faced interferometer (DFI), and the dimensional accuracy is guaranteed with gauge block interferometer (GBI).
- Useful in highly accurate calibration of CMMs.
- A mark "Coefficient of Thermal Expansion" is engraved on the surface. They are available in the nominal sizes (100 to 500 mm) of steel and ceramic rectangular gauge blocks.



SPECIFICATIONS

Metric Blocks with CTE			Inch Blocks with CTE		
Code No. (steel)*1	Code No. (CERA)*1	Length (mm)	Code No. (steel)*1	Code No. (CERA)*1	Length (in)
611681	613681	100	611204	613204	4
611802	613802	125	611205	613205	5
611803	613803	150	611206	613206	6
611804	613804	175	611207	613207	7
611682	613682	200	611208	613208	8
611805	613805	250	611222	613222	10
611683	613683	300	611223	613223	12
611684	613684	400	611224	613224	16
611685	613685	500	611225	613225	20
Grade			K class in JIS/ISO, ASME		
Uncertainty of thermal expansion coefficient			$0.035 \times 10^{-6}/K$ ($k=2$)		
Uncertainty of length measurement			30 nm ($k=2$), for 100 mm block		

Note: 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.



*1: Suffix No. (-■■■■) for Selecting Standard Required

ISO/JIS			
Suffix No.	Grade	Inspection Certificate	Calibration Certificate
-01B	K	✓	✓
ASME			
Suffix No.	Grade	Inspection Certificate	Calibration Certificate
-51B	K	✓	✓
BS			
Suffix No.	Grade	Inspection Certificate	Calibration Certificate
-11B	K	✓	✓

Note: Only for 100 mm type

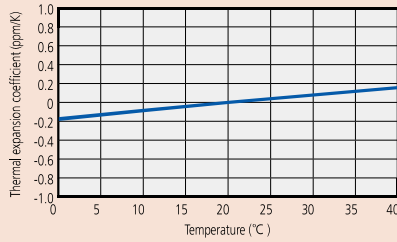


Inspection Certificate



ZERO CERA Blocks (Ultra-low Thermal Expansion)

Thermal expansion coefficient—Temperature characteristic



Comparison of maximum errors at 23 °C (500 mm size)

Temperature compensation error of typical ISO/JIS-certified product: $\pm 1.5 \mu\text{m}$
 Temperature compensation error of Mitutoyo standard gauge blocks: $\pm 0.75 \mu\text{m}$
 Temperature compensation error of gauge blocks with thermal expansion coefficient: $\pm 0.075 \mu\text{m}$
 Maximum thermal expansion of ZERO CERA Blocks: $+0.03 \mu\text{m}$
 Thermal expansion of steel gauge blocks: $+16.2 \mu\text{m}$
 Thermal expansion of CERA Blocks: $+13.95 \mu\text{m}$

- ZERO CERA Blocks are next-generation gauge blocks made of special ceramic materials that have extremely low thermal expansion. They are lightweight, easy to handle, and slow in aging (thermal expansion coefficient: $0 \pm 0.02 \times 10^{-6}/\text{K}$ (20 °C), specific gravity $2.4 \text{ kg}/\text{cm}^3$). Many research institutions and academic institutions rely on ZERO CERA Blocks in various applications, including the study of methods of calibrating CMM.
- Each block is marked with “ZERO CERA BLOCK” logo.
- Available in the nominal sizes (30 to 1,000 mm) of rectangular gauge blocks.



SPECIFICATIONS

Metric Blocks

Code No.			Length (mm)
JIS/ISO	BS	ASME	
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

Gauge Blocks



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. Please select the set most suited to your working conditions and applications.

Steel 1 mm 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

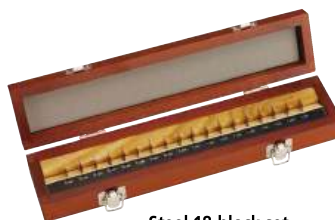


Steel 34-block set



Steel 32-block set

Steel 0.001 mm Step Block Sets

Steel 9-block set
(1.001 to 1.009 mm)Steel 9-block set
(0.991 to 0.999 mm)

Steel 18-block set

Steel Long Block Sets



Steel 8-block set

Steel Wear Block Sets



Steel (1 mm)

Steel Thin Block Sets



Steel 9-block set

Note: Details of the contents of any particular set are given on pages 01-11 to 01-12.



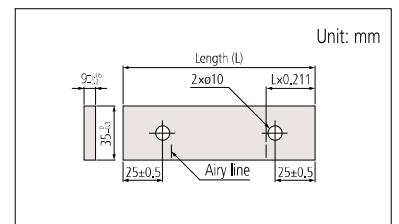
CERA 1 mm Base Block Sets



CERA 0.001 mm Step Block Sets



CERA Long Block Sets



CERA Wear Block Sets



Note: Details of the contents of any particular set are given on pages 01-11 to 01-12.

Gauge Blocks

SPECIFICATIONS

1 mm Base Block Sets

Blocks per set	Code No.		Standard/grade available and Suffix No.*1			Blocks included in set		
	Steel	CERA	ISO/JIS	ASME	BS	Size (mm)	Step (mm)	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
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	—	1.0005	—	1
	516-941	516-341	K: -#0	00: -#6	K: -#1	1.001 - 1.009	0.001	9
	516-942	516-342	0: -#0	0: -#6	0: -#1	1.01 - 1.49	0.01	49
	516-943	516-343	1: -#0	1: -#6	1: -#1	0.5 - 24.5	0.5	49
	516-944	516-344	2: -#0	2: -#6	2: -#1	25 - 100	25	4
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	—	—	—	—	—	1.0005	—	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
47	516-537	516-545	—	K: -#6	—	1.0005	—	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	—	—	—	—	—	1.0005	—	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
32	—	—	—	—	—	1.0005	—	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

Thin Block Sets

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

Note: Details of the overall sizes for forms of block are given on page 01-3 and the accuracy standards to which they are manufactured are given on page 01-5.



*1: Suffix No. (■) for Selecting Standard and Certificate Provided

ISO / JIS		
Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	✓	—
6	✓	✓

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

ASME		
Suffix No.	Inspection Certificate	Calibration Certificate JCSS
1	✓	—
6	✓	✓

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	✓	—
6	✓	✓

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

Suffix No. 6: Only for Grade K sets.

Inspection Certificate





SPECIFICATIONS

0.001 mm Step Block Sets

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

Long Block Sets

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

Wear Block Sets

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

Inch Block Sets

Blocks per set	Code No.		Standard/grade available and Suffix No.*1			Blocks included in set		
	Steel	CERA	ISO/JIS	ASME	BS	Size (in)	Step (in)	Qty.
82	516-548	516-556	—	K: -#6	—	0.10005		1
	516-905	516-305	—	00: -#6	—	0.1001 - 0.1009	0.0001	9
	516-906	516-306	—	0: -#6	0: -#1	0.101 - 0.149	0.001	49
	516-907	516-307	—	1: -#6	1: -#1	0.05 - 0.95	0.05	19
	516-908	516-308	—	2: -#6	2: -#1	1 - 4	1	4
81	516-549	516-557	—	K: -#6	—	0.1001 - 0.1009	0.0001	9
	516-901	516-301	—	00: -#6	—	0.101 - 0.149	0.001	49
	516-902	516-302	—	0: -#6	0: -#1	0.05 - 0.95	0.05	19
	516-903	516-303	—	1: -#6	1: -#1	1 - 4	1	4
	516-904	516-304	—	2: -#6	2: -#1			
49	—	—	—	—	—	0.1001 - 0.1009	0.0001	9
	516-910	—	—	—	—	0.101 - 0.109	0.001	9
	516-911	—	—	—	0: -#1	0.01 - 0.19	0.01	19
	516-912	—	—	—	1: -#1	0.2 - 0.9	0.1	8
35	516-550	516-558	—	K: -#6	—	0.10005		1
	516-913	516-313	—	00: -#6	—	0.1001 - 0.1009	0.0001	9
	516-914	516-314	—	0: -#6	0: -#1	0.101 - 0.109	0.001	9
	516-915	516-315	—	1: -#6	1: -#1	0.11 - 0.19	0.01	9
	516-916	516-316	—	2: -#6	2: -#1	0.1 - 0.3	0.1	3
						0.5, 1, 2, 4		4

Thin Block Sets

Blocks per set	Code No.		Standard/grade available and Suffix No.*1			Blocks included in set		
	Steel	CERA	ISO/JIS	ASME	BS	Size (in)	Step (in)	Qty.
28	516-551	—	—	K: -#6	—	0.02005		1
	516-917	—	—	00: -#6	—	0.0201 - 0.0209	0.0001	9
	516-918	—	—	0: -#6	—	0.021 - 0.029	0.001	9
	516-919	—	—	1: -#6	—	0.01 - 0.09	0.01	9
	516-920	—	—	2: -#6	—			
10	516-926	—	—	0: -#6	0: -#1	0.005 - 0.050	0.005	10
	516-927	—	—	1: -#6	1: -#1			
	516-928	—	—	—	2: -#1			

Long Block Sets

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

Wear Block Sets

Blocks per set	Code No.		Standard/grade available and Suffix No.*1			Blocks included in set		
	Carbide	CERA	ISO/JIS	ASME	BS	Size (in)	Step (in)	Qty.
2	516-809	516-836	—	0: -#6	—	0.05		2
	516-808	516-837	—	1: -#6	—			
2	516-805	516-834	—	0: -#6	—	0.1		2
	516-804	516-835	—	1: -#6	—			

Note: Details of the overall sizes for forms of block are given on page 01-3 and the accuracy standards to which they are manufactured are given on page 01-5.

Gauge Blocks

Micrometer Inspection Gauge Block Sets SERIES 516

- Special sets for micrometer inspection. **516-106/107/108** and **516-156/157/158** are useful for checking maximum permissible error. For inspection of large micrometers, we recommend using **516-115/116/117** and **516-165/166/167** together. **516-580/581/582** and **516-390/391/392** are special sets for inspection of QuantuMike, whose spindle moves 2.0 mm per one thimble rotation.

Steel



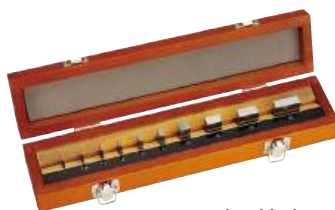
Steel 10-block set



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



Gauge Block Sets for Micrometer Inspection

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

(516-132/133/134/135/136/137)



516-607

Micro Checker

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

SPECIFICATIONS

Metric	Micro Checker (holder only)
Code No.	516-607
Applicable gauge block sets	516-106/107/108, 516-156/157/158
Applicable gauge block sizes (mm)	2.5, 5.1, 7.7, 10.3, 12.9, 15, 17.6, 20.2, 22.8, 25

Inch	Micro Checker (holder only)
Code No.	516-608
Applicable gauge block sets	516-921/922/923, 516-321/322/323
Applicable gauge block sizes (in)	0.105, 0.210, 0.315, 0.420, 0.5, 0.605, 0.710, 0.815, 0.920, 1

Typical application



(The gauge block and optical parallel shown are optional accessories.)

***1: Suffix No. (■) for Selecting
Standard and Certificate Provided**

ISO / JIS		
Suffix No.	Inspection Certificate	Calibration Certificate
1	✓	JCSS
6	✓	✓

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

ASME		
Suffix No.	Inspection Certificate	Calibration Certificate
1	✓	JCSS
6	✓	✓

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

Suffix No. 6: Only for Grade K sets.

BS		
Suffix No.	Inspection Certificate	Calibration Certificate
1	✓	JCSS

Inspection Certificate**SPECIFICATIONS**

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

Inch Block Sets						
Blocks per set	Code No.		Standard/grade available and			Blocks included in set
	Steel	CERA	ISO/JIS	ASME	BS	
10	516-528	516-318	—	00: -#6	0: -#1	0.087, 0.189, 0.307, 0.409, 0.472, 0.598, 0.669, 0.772, 0.890, 1 in
	516-529	516-319	—	0: -#6	1: -#1	
	516-530	516-320	—	1: -#6	2: -#1	
	—	—	—	—	—	
10	516-552	516-559	—	K: -#6	—	0.105, 0.210, 0.315, 0.420, 0.500, 0.605, 0.710, 0.815, 0.920, 1 in, Optical parallel (t=0.5 in)
	516-921	516-321	—	00: -#6	0: -#1	
	516-922	516-322	—	0: -#6	1: -#1	
	516-923	516-323	—	1: -#6	2: -#1	
10	516-553	516-560	—	K: -#6	—	0.105, 0.210, 0.315, 0.420, 0.500, 0.605, 0.710, 0.815, 0.920, 1 in, Micro checker, Optical parallel (t=0.5 in)
	516-138	516-188	—	00: -#6	0: -#1	
	516-139	516-189	—	0: -#6	1: -#1	
	516-140	516-190	—	1: -#6	2: -#1	
9	516-554	516-561	—	K: -#6	—	0.0625, 0.100, 0.125, 0.200, 0.250, 0.300, 0.500, 1, 2 in, Optical parallel (t=0.5 in)
	516-929	516-333	—	00: -#6	—	
	516-930	516-334	—	0: -#6	—	
	516-931	516-335	—	1: -#6	—	
9	516-555	516-562	—	K: -#6	—	0.0625, 0.100, 0.125, 0.200, 0.250, 0.300, 0.500, 1, 2 in, Micro Checker, Optical parallel (t=0.5 in)
	516-141	516-191	—	00: -#6	—	
	516-142	516-192	—	0: -#6	—	
	516-143	516-193	—	1: -#6	—	
9	516-144	516-194	—	2: -#6	—	0.0625, 0.100, 0.125, 0.200, 0.250, 0.300, 0.500, 1, 2 in
	—	516-563	—	K: -#6	—	
	516-934	516-330	—	00: -#6	—	
	516-935	516-331	—	0: -#6	—	
8	516-126	516-176	—	0: -#6	—	1, 2, 3, 4, 5, 6, 7, 8 in
	516-127	516-177	—	1: -#6	—	
	—	—	—	—	—	
	—	—	—	—	—	

SERIES 516 – Caliper Inspection Gauge Block Sets**SPECIFICATIONS**

Metric Block Sets						
Blocks per set	Code No.		Standard/grade available and			Blocks included in set
	Steel	CERA	ISO/JIS	ASME	BS	
5	—	516-174	2: -10	—	—	5 pcs.: 10.3, 24.5, 50, 75, 100 mm, Ceramic plain jaws, Holder (250 mm), Glove
4	516-526	516-566	1: -10	—	—	4 pcs.: 10, 30, 50, 125 mm, Setting ring (ø4 mm, ø10 mm), Pin gage (ø10 mm), Glove
	516-527	516-567	2: -10	—	—	
3	516-124	516-150	1: -10	—	—	3 pcs.: 30, 41.3, 131.4 mm, Setting ring (ø4 mm, ø25 mm), Glove
	516-125	516-151	2: -10	—	—	
2	516-122	516-172	1: -10	—	—	2 pcs.: 41.3, 131.4 mm, Setting ring (ø20 mm), Glove
	516-123	516-173	2: -10	—	—	

Gauge Blocks

Individual Metric Rectangular Gauge Blocks

- One or more gauge blocks can be purchased separately. If using only one length repeatedly, it is good practice to purchase discrete gauge blocks.
- Nominal sizes not shown in the list can also be manufactured.
- Each gauge block is supplied with an inspection certificate. When placing an order, please give us the code number with the suffix number corresponding to the applicable standard (see the suffix list).



SPECIFICATIONS

Metric Blocks

Length (mm)	Code No.*1		Length (mm)	Code No.*1		Length (mm)	Code No.*1	
	Steel	CERA		Steel	CERA		Steel	CERA
0.1	611821	—	0.53	611894	—	0.96	611937	—
0.11	611860	—	0.54	611895	—	0.97	611938	—
0.12	611861	—	0.55	611896	—	0.98	611939	—
0.13	611862	—	0.56	611897	—	0.99	611940	—
0.14	611863	—	0.57	611898	—	0.991	611551	613551
0.15	611822	—	0.58	611899	—	0.992	611552	613552
0.16	611864	—	0.59	611900	—	0.993	611553	613553
0.17	611865	—	0.6	611901	—	0.994	611554	613554
0.18	611866	—	0.61	611902	—	0.995	611555	613555
0.19	611867	—	0.62	611903	—	0.996	611556	613556
0.2	611823	—	0.63	611904	—	0.997	611557	613557
0.21	611868	—	0.64	611905	—	0.998	611558	613558
0.22	611869	—	0.65	611906	—	0.999	611559	613559
0.23	611870	—	0.66	611907	—	1	611611	613611
0.24	611871	—	0.67	611908	—	1.0005	611520	613520
0.25	611824	—	0.68	611909	—	1.001	611521	613521
0.26	611872	—	0.69	611910	—	1.002	611522	613522
0.27	611873	—	0.7	611911	—	1.003	611523	613523
0.28	611874	—	0.71	611912	—	1.004	611524	613524
0.29	611875	—	0.72	611913	—	1.005	611525	613525
0.3	611825	—	0.73	611914	—	1.006	611526	613526
0.31	611876	—	0.74	611915	—	1.007	611527	613527
0.32	611877	—	0.75	611916	—	1.008	611528	613528
0.33	611878	—	0.76	611917	—	1.009	611529	613529
0.34	611879	—	0.77	611918	—	1.01	611561	613561
0.35	611826	—	0.78	611919	—	1.02	611562	613562
0.36	611880	—	0.79	611920	—	1.03	611563	613563
0.37	611881	—	0.8	611921	—	1.04	611564	613564
0.38	611882	—	0.81	611922	—	1.05	611565	613565
0.39	611883	—	0.82	611923	—	1.06	611566	613566
0.4	611827	—	0.83	611924	—	1.07	611567	613567
0.41	611884	—	0.84	611925	—	1.08	611568	613568
0.42	611885	—	0.85	611926	—	1.09	611569	613569
0.43	611886	—	0.86	611927	—	1.1	611570	613570
0.44	611887	—	0.87	611928	—	1.11	611571	613571
0.45	611828	—	0.88	611929	—	1.12	611572	613572
0.46	611888	—	0.89	611930	—	1.13	611573	613573
0.47	611889	—	0.9	611931	—	1.14	611574	613574
0.48	611890	—	0.91	611932	—	1.15	611575	613575
0.49	611891	—	0.92	611933	—	1.16	611576	613576
0.5	611506	613506	0.93	611934	—	1.17	611577	613577
0.51	611892	—	0.94	611935	—	1.18	611578	613578
0.52	611893	—	0.95	611936	—	1.19	611579	613579

Note: Details of the overall sizes for forms of block are given on page 01-3 and the accuracy standards to which they are manufactured are given on page 01-5.



*1: Suffix No. (-■■■■) for Selecting Standard and Certificate Provided

ISO/JIS		Inspection Certificate	Calibration Certificate	
Suffix No.	Grade		JCSS	RvA
-016	K	✓	✓	
-021	0	✓		
-026	0	✓	✓	
-031	1	✓		
-036	1	✓	✓	
-041	2	✓		
-046	2	✓	✓	

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

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



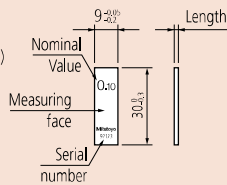
Inspection Certificate



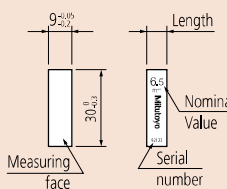
Dimensions

Unit: mm

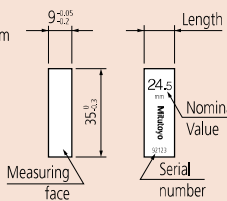
Nominal length:
0.1 mm to 5.5 mm
(0.004 in to 0.25 in)



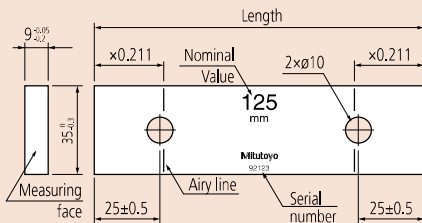
Nominal length:
6 mm to 10 mm
(0.3 in to 0.4 in)



Nominal length:
10.3 mm to 100 mm
(0.45 in to 4 in)



Nominal length 125 mm to 1000 mm (5 in to 20 in)



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

Note: Details of the overall sizes for forms of block are given on page 01-3 and the accuracy standards to which they are manufactured are given on page 01-5.

Gauge Blocks

Individual Inch Rectangular Gauge Blocks

SPECIFICATIONS

Inch Blocks								
Length (in)	Code No.*1		Length (in)	Code No.*1		Length (in)	Code No.*1	
	Steel	CERA		Steel	CERA		Steel	CERA
0.004	611304	—	0.024	611324	—	0.0625	611303	613303
0.005	611305	—	0.025	611325	—	0.07	611107	—
0.006	611306	—	0.026	611326	—	0.078125 (5/64)	611103	613100
0.007	611307	—	0.027	611327	—	0.08	611108	—
0.008	611308	—	0.028	611328	—	0.09	611109	—
0.009	611309	—	0.029	611329	—	0.09375 (3/32)	611104	613101
0.01	611310	—	0.03	611330	—	0.1	611191	613191
0.011	611311	—	0.031	611331	—	0.100025	611111	613110
0.012	611312	—	0.03125 (1/32)	611101	613103	0.10005	611135	613135
0.013	611313	—	0.032	611332	—	0.100075	611112	613111
0.014	611314	—	0.033	611333	—	0.1001	611121	613121
0.015	611315	—	0.034	611334	—	0.1002	611122	613122
0.016	611316	—	0.035	611335	—	0.1003	611123	613123
0.017	611317	—	0.036	611336	—	0.1004	611124	613124
0.018	611318	—	0.037	611337	—	0.1005	611125	613125
0.019	611319	—	0.038	611338	—	0.1006	611126	613126
0.02	611320	—	0.039	611339	—	0.1007	611127	613127
0.02005	611240	—	0.04	611340	—	0.1008	611128	613128
0.0201	611231	—	0.041	611341	—	0.1009	611129	613129
0.0202	611232	—	0.042	611342	—	0.101	611141	613141
0.0203	611233	—	0.043	611343	—	0.102	611142	613142
0.0204	611234	—	0.044	611344	—	0.103	611143	613143
0.0205	611235	—	0.045	611345	—	0.104	611144	613144
0.0206	611236	—	0.046	611346	—	0.105	611145	613145
0.0207	611237	—	0.046875 (3/64)	611102	613104	0.106	611146	613146
0.0208	611238	—	0.047	611347	—	0.107	611147	613147
0.0209	611239	—	0.048	611348	—	0.108	611148	613148
0.021	611321	—	0.049	611349	—	0.109	611149	613149
0.022	611322	—	0.05	611105	613105	0.109375 (7/64)	611110	613102
0.023	611323	—	0.06	611106	—			

Note: Details of the overall sizes for forms of block are given on page 01-3 and the accuracy standards to which they are manufactured are given on page 01-5.



*1: Suffix No. (-■■■■) for Selecting Standard and Certificate Provided

ASME			
Suffix No.	Grade	Inspection Certificate	Calibration Certificate
-516	K	✓	✓
-521	00	✓	
-531	0	✓	
-541	1	✓	
-551	2	✓	

BS			
Suffix No.	Grade	Inspection Certificate	Calibration Certificate
-121	0	✓	
-131	1	✓	
-141	2	✓	



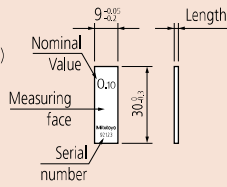
Inspection Certificate



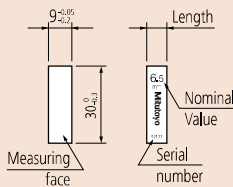
Dimensions

Unit: mm

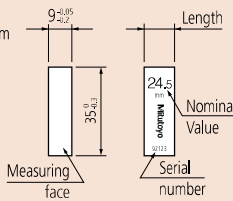
Nominal length:
0.1 mm to 5.5 mm
(0.004 in to 0.25 in)



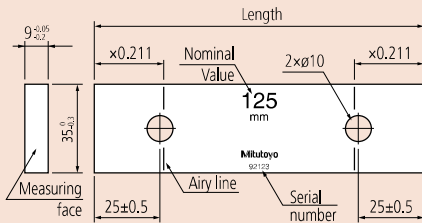
Nominal length:
6 mm to 10 mm
(0.3 in to 0.4 in)



Nominal length:
10.3 mm to 100 mm
(0.45 in to 4 in)



Nominal length 125 mm to 1000 mm (5 in to 20 in)



SPECIFICATIONS

Inch Blocks

Length (in)	Code No.*1	
	Steel	CERA
0.11	611150	613150
0.111	611151	613151
0.112	611152	613152
0.113	611153	613153
0.114	611154	613154
0.115	611155	613155
0.116	611156	613156
0.117	611157	613157
0.118	611158	613158
0.119	611159	613159
0.12	611160	613160
0.121	611161	613161
0.122	611162	613162
0.123	611163	613163
0.124	611164	613164
0.125	611165	613165
0.126	611166	613166
0.127	611167	613167
0.128	611168	613168
0.129	611169	613169
0.13	611170	613170
0.131	611171	613171
0.132	611172	613172
0.133	611173	613173
0.134	611174	613174
0.135	611175	613175
0.136	611176	613176
0.137	611177	613177
0.138	611178	613178

Length (in)	Code No.*1	
	Steel	CERA
0.139	611179	613179
0.14	611180	613180
0.141	611181	613181
0.142	611182	613182
0.143	611183	613183
0.144	611184	613184
0.145	611185	613185
0.146	611186	613186
0.147	611187	613187
0.148	611188	613188
0.149	611189	613189
0.15	611115	613115
0.16	611116	613116
0.17	611117	613117
0.18	611118	613118
0.19	611119	613119
0.2	611192	613192
0.21	611221	613221
0.25	611212	613212
0.3	611193	613193
0.315	611209	613209
0.35	611213	613213
0.375 (3/8)	611113	613112
0.4	611194	613194
0.420	611210	613210
0.45	611214	613214
0.5	611195	613195
0.55	611215	613215
0.6	611196	613196

Length (in)	Code No.*1	
	Steel	CERA
0.605	611211	613211
0.65	611216	613216
0.7	611197	613197
0.710	611220	613220
0.75	611217	613217
0.8	611198	613198
0.815	611226	613226
0.85	611218	613218
0.9	611199	613199
0.920	611227	613227
0.95	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 (in)	Code No.*1	
	Tungsten carbide	
0.05	612105	
0.1	612191	

Note: Details of the overall sizes for forms of block are given on page 01-3 and the accuracy standards to which they are manufactured are given on page 01-5.
4 inch or more is not listed in the standard of British Standards Institution.

Gauge Blocks

Rectangular Gauge Block Accessories SERIES 516

- Accessory sets for extending the range of application for rectangular gauge blocks.
- Available in 22-piece and 14-piece sets. Each accessory is also available separately for applications where a full set is not needed.
- Can be used with both steel and CERA blocks.



516-601
(22 pcs.)

SPECIFICATIONS

Item Description	Code No.	Nominal capacity/ dimension (mm)	Set		Quantity Supplied
			22 pcs. 516-601	14 pcs. 516-602	
Holder	619002	15 to 60		✓	1 pc.
	619003	5 to 100	✓	✓	
	619004	15 to 160	✓	✓	
	619005	20 to 250	✓	✓	
Base	619009	35	✓	✓	One pair (2 pcs.)
Half-round jaw	619010*	2	✓	✓	
	619011*	5	✓	✓	
	619012*	8	✓	✓	
	619013*	12	✓		
	619014*	20	✓		
Plain jaw	619018*	160	✓		1 pc.
Scriber point	619019	—	✓	✓	
Center point	619020	—	✓	✓	One pair (2 pcs.)
Tram point	619021*	—	✓		
Triangular straightedge	619022	100	✓	✓	1 pc.
	619023	160	✓		

* A single piece is supplied for each code number, except for half-round jaws, plain jaws (B type) and tram points, which are supplied as a two-pack.

Typical application



Half-round jaw (619013) 2 pcs.
Holder (619002) 1 pc.
Gauge block



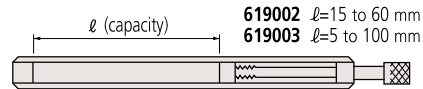
Base (619009) 1 pc.
Holder (619003) 1 pc.
Scriber point (619019) 1 pc.
Gauge block



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

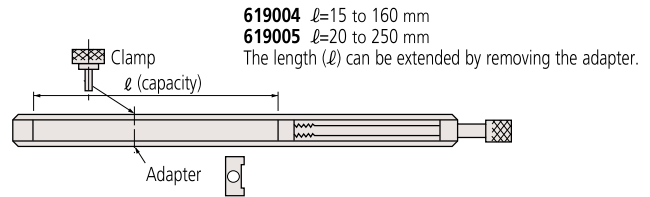
Holder

Thickness=15 mm
Width=29.5 mm



619002 $l=15$ to 60 mm

619003 $l=5$ to 100 mm

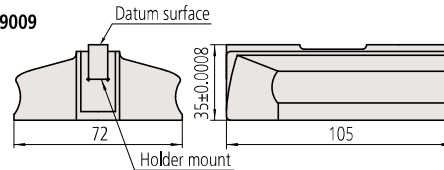


619004 $l=15$ to 160 mm

619005 $l=20$ to 250 mm

The length (l) can be extended by removing the adapter.

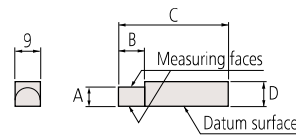
Base 619009



Flatness of the datum surface 0.5 μ m
Parallelism 0.8 μ m
Flatness of the bottom surface 1 μ m

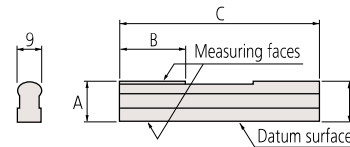
Half-round jaws

Type I



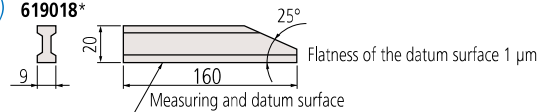
Flatness of the datum surface 0.5 μ m
Parallelism of A 0.5 μ m

Type II



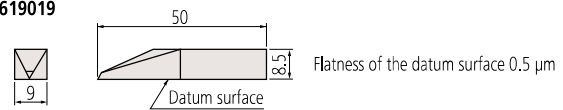
Code No.	Type	Size (mm)	A (mm)	B (mm)	C (mm)	D (mm)
619010*	I	2	2 ± 0.0005	5.5	40	7.5
619011*		5	5 ± 0.0005	15.5	45	7.5
619012*		8	8 ± 0.0005	20	50	8.5
619013*	II	12	12 ± 0.0005	25	75	13
619014*		20	20 ± 0.0005	25	125	20.5

Plain jaw (B type) 619018*



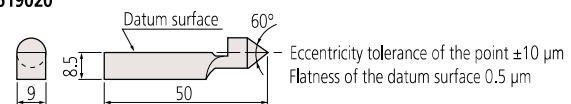
Flatness of the datum surface 1 μ m

Scriber point 619019



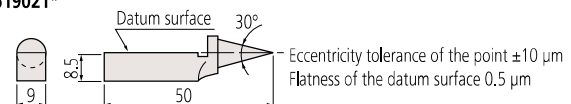
Flatness of the datum surface 0.5 μ m

Center point 619020



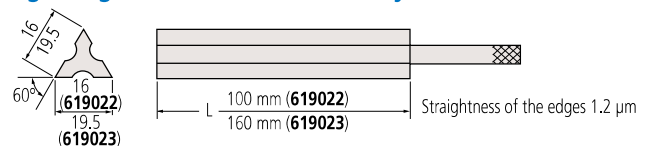
Eccentricity tolerance of the point ± 10 μ m
Flatness of the datum surface 0.5 μ m

Tram point 619021*



Eccentricity tolerance of the point ± 10 μ m
Flatness of the datum surface 0.5 μ m

Triangular straightedge (for handheld use only)



* A single piece is supplied for each code number, except for half-round jaws, plain jaws (B type) and tram points, which are supplied as a two-pack.

Gauge Blocks

Accessories for Rectangular Gauge Blocks over 100 mm SERIES 516

- Specially designed for long rectangular gauge blocks of 100 mm and over which have two coupling holes in the body: coupling of two long gauge blocks, a stack of regular gauge blocks and attachment of jaws is possible.
- Can be used with both long steel and CERA blocks.



516-605
(14 pcs.)

SPECIFICATIONS

Set code No.	Code No.	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.
	619018	Plain jaw (B-type)	2 pcs.
	619013	Half-round jaw	
	619019	Scriber point	1 pc.

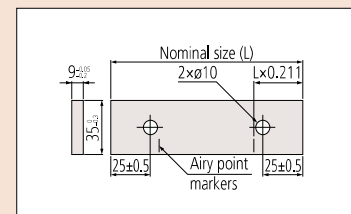
Typical application



Using an A-type connector

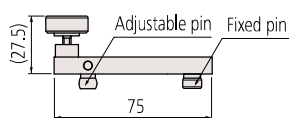


Use of B-type connectors in gage construction



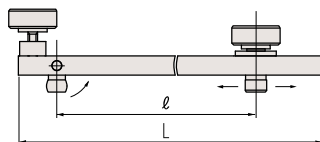
Coupling holes in long gauge blocks

Connector A 619031



Used for directly coupling two long gauge blocks.

Connectors B and C



Adapter (2 pcs.) **619036**

In addition to connecting long gauge blocks, the holders can also connect long gauge blocks with other types of gauge blocks inserted in between. Connector B is for gauge blocks with nominal size of 40 mm or less, and connector C for gauge blocks with nominal size of 150 mm or less (connector C can also be used to connect hole-less gauge blocks of 100 mm or less with various types of jaw). Adapters can be used to attach jaws on the edges of long gauge blocks.

Unit: mm

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

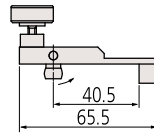
Typical application



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

Connector D

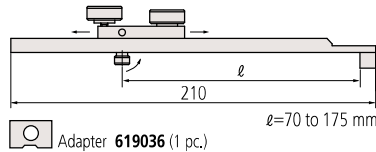
619034



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

Connector E

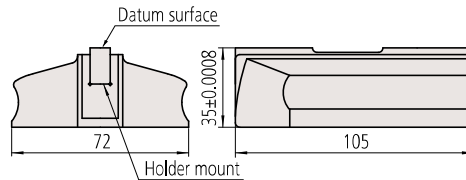
619035



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.

Base

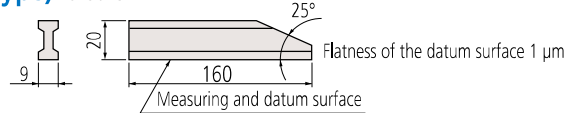
619009



Flatness of the datum surface $0.5 \mu\text{m}$
Parallelism $0.8 \mu\text{m}$
Flatness of the bottom surface $1 \mu\text{m}$

Plain jaw (B-type)

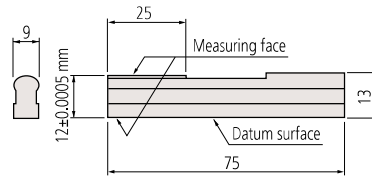
619018



Flatness of the datum surface $1 \mu\text{m}$

Half-round jaw

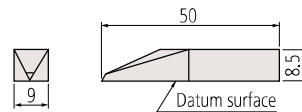
619013



Flatness of the datum surface $0.5 \mu\text{m}$
Parallelism $0.5 \mu\text{m}$

Scriber point

619019



Flatness of the datum surface $0.5 \mu\text{m}$

Example of use of accessories with long gauge blocks

The table below shows the appropriate combination of long rectangular gauge blocks and accessories for making inside and outside measurements in the approximate range 300 mm to 1000 mm in 100 mm steps. The numbers in the table represent the number of gauge blocks or accessories in use. Note that the ranges shown do not take into account the combined thickness of the half-round jaws for inside measurement (24 mm) and the length of any regular gauge block stack used.

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

* Provided with adapters (2 pcs.).

Gauge Blocks



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

- A square gauge block can retain stable orientation both longitudinally and laterally. A wide range of application measurements can be made. From various sets of 2 pieces up to 112 pieces, you can select the best type for your application.
- Always use genuine gauge block accessories.



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

Long block set



Steel 8-block set

These square wear gauge blocks made of cemented carbide have excellent resistance to abrasion, making them ideal for protecting the ends of a stack of blocks subject to frequent use. Available in two nominal sizes: 1 mm and 2 mm. We recommend that these wear gauge blocks of both sizes be wrung firmly to the stack when in use.



*1: Suffix No. (■) for Selecting Standard and Certificate Provided

ISO / JIS		
Suffix No.	Inspection Certificate	Calibration Certificate
1	✓	JCSS
6	✓	✓

ASME		
Suffix No.	Inspection Certificate	Calibration Certificate
1	✓	JCSS



Inspection Certificate

SPECIFICATIONS

Metric Block Sets

Blocks per set	Code No.		Standard/grade available and Suffix No.*1		Blocks included in set		
	Steel	CERA	ISO/JIS	ASME	Size (mm)	Step (mm)	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
103	—	—	—	—	25 - 100	25	4
	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
76	516-444	—	2: ■#0	2: ■#6	25 - 100	25	4
	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
47	516-452	—	2: ■#0	2: ■#6	10 - 40	10	4
	—	—	—	—	50 - 100	25	3
	516-457	—	—	00: ■#6	1.005	—	1
	516-458	—	0: ■#0	0: ■#6	1.01 - 1.09	0.01	9
32	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
	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	Code No.		Standard/grade available and Suffix No.*1		Blocks included in set		
	Steel	CERA	ISO/JIS	ASME	Size (mm)	Step (mm)	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	Code No.		Standard/grade available and Suffix No.*1		Blocks included in set		
	Steel	CERA	ISO/JIS	ASME	Size (mm)	Step (mm)	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	Code No.		Standard/grade available and Suffix No.*1		Blocks included in set		
	Steel	CERA	ISO/JIS	ASME	Size (in)	Step (in)	Qty.
81	516-401	516-201	—	00: ■#6	0.1001 - 0.1009	0.0001	9
	516-402	516-202	—	0: ■#6	0.101 - 0.149	0.001	49
	516-403	516-203	—	1: ■#6	0.05 - 0.95	0.05	19
	516-404	516-204	—	2: ■#6	1 - 4	1	4
36	516-421	516-221	—	00: ■#6	0.05	—	1
	516-422	516-222	—	0: ■#6	0.1001 - 0.1009	0.0001	9
	516-423	516-223	—	1: ■#6	0.101 - 0.109	0.001	9
	516-424	516-224	—	2: ■#6	0.11 - 0.19	0.01	9
28	—	—	—	—	0.1 - 0.5	0.1	5
	—	—	—	—	1, 2, 4	1	3
	516-417	—	—	00: ■#6	0.02005	—	1
	516-418	—	—	0: ■#6	0.0201 - 0.0209	0.0001	9
	516-419	—	—	1: ■#6	0.021 - 0.029	0.001	9
	516-420	—	—	2: ■#6	0.010 - 0.090	0.01	9
	—	—	—	—	—	—	—

Inch Long Block Sets

Blocks per set	Code No.		Standard/grade available and Suffix No.*1		Blocks included in set		
	Steel	CERA	ISO/JIS	ASME	Size (in)	Step (in)	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	Code No.		Standard/grade available and Suffix No.*1		Blocks included in set		
	Carbide	CERA	ISO/JIS	ASME	Size (in)	Step (in)	Qty.
2	516-824	516-846	—	0: ■#0	0.05	—	2
	516-825	516-847	—	1: ■#0	—	—	—
2	516-826	516-844	—	0: ■#0	0.1	—	2
	516-827	516-845	—	1: ■#0	—	—	—

Gauge Blocks

Individual Metric Square Gauge Blocks

- One or more gauge blocks can be purchased separately. Purchasing them loose is helpful. If using only one length repeatedly, it is good practice to purchase discrete gauge blocks.
- Each gauge block is supplied with an inspection certificate. When placing an order, please give us the code number with the suffix number corresponding to the applicable standard (see the suffix list).
- We make custom length gauge blocks.
- Always use genuine gauge block accessories.



SPECIFICATIONS

Metric Blocks								
Length (mm)	Code No.		Length (mm)	Code No.		Length (mm)	Code No.	
	Steel	CERA		Steel	CERA		Steel	CERA
0.5	614506	—	1.33	614593	—	13	614623	—
1	614611	—	1.34	614594	—	13.5	614653	—
1.0005	614520	—	1.35	614595	—	14	614624	—
1.001	614521	—	1.36	614596	—	14.5	614654	—
1.002	614522	—	1.37	614597	—	15	614625	—
1.003	614523	—	1.38	614598	—	15.5	614655	—
1.004	614524	—	1.39	614599	—	16	614626	—
1.005	614525	—	1.4	614600	—	16.5	614656	—
1.006	614526	—	1.41	614601	—	17	614627	—
1.007	614527	—	1.42	614602	—	17.5	614657	—
1.008	614528	—	1.43	614603	—	18	614628	—
1.009	614529	—	1.44	614604	—	18.5	614658	—
1.01	614561	—	1.45	614605	—	19	614629	—
1.02	614562	—	1.46	614606	—	19.5	614659	—
1.03	614563	—	1.47	614607	—	20	614672	—
1.04	614564	—	1.48	614608	—	20.5	614660	—
1.05	614565	—	1.49	614609	—	21	614631	—
1.06	614566	—	1.5	614641	—	21.5	614661	—
1.07	614567	—	1.6	614516	—	22	614632	—
1.08	614568	—	1.7	614517	—	22.5	614662	—
1.09	614569	—	1.8	614518	—	23	614633	—
1.1	614570	—	1.9	614519	—	23.5	614663	—
1.11	614571	—	2	614612	—	24	614634	—
1.12	614572	—	2.5	614642	—	24.5	614664	—
1.13	614573	—	3	614613	—	25	614635	—
1.14	614574	—	3.5	614643	—	30	614673	—
1.15	614575	—	4	614614	—	40	614674	—
1.16	614576	—	4.5	614644	—	50	614675	—
1.17	614577	—	5	614615	—	60	614676	—
1.18	614578	—	5.5	614645	—	75	614801	—
1.19	614579	—	6	614616	—	100	614681	—
1.2	614580	—	6.5	614646	—	125	614802	—
1.21	614581	—	7	614617	—	150	614803	—
1.22	614582	—	7.5	614647	—	175	614804	—
1.23	614583	—	8	614618	—	200	614682	—
1.24	614584	—	8.5	614648	—	250	614805	—
1.25	614585	—	9	614619	—	300	614683	—
1.26	614586	—	9.5	614649	—	400	614684	—
1.27	614587	—	10	614671	—	500	614685	—
1.28	614588	—	10.5	614650	—			
1.29	614589	—	11	614621	—			
1.3	614590	—	11.5	614651	—			
1.31	614591	—	12	614622	—			
1.32	614592	—	12.5	614652	—			

Note: Details of the overall sizes for forms of block are given on pages 01-3 and 01-26, and the accuracy standards to which they are manufactured are given on page 01-5.



Suffix No. (-■■■■) for Selecting Standard and Certificate Provided

ISO/JIS			
Suffix No.	Grade	Inspection Certificate	Calibration Certificate
-021	0	✓	JCSS
-026	0	✓	✓
-031	1	✓	
-036	1	✓	✓
-041	2	✓	
-046	2	✓	✓

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



Inspection Certificate

Metric Wear Blocks	
Length (mm)	Code No.
1	615611
2	615612

***1: Suffix No. (- ■■■■) for Selecting Grade and Certificate Provided**

ASME			
Suffix No.	Grade	Inspection Certificate	Calibration Certificate
-521	00	✓	
-531	0	✓	
-541	1	✓	
-551	2	✓	

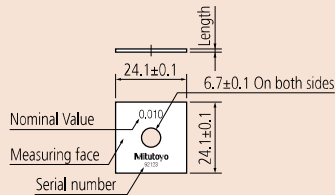


Inspection Certificate

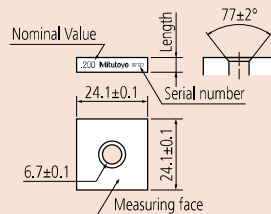
Dimensions

Unit: mm

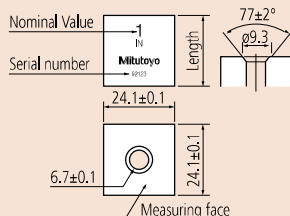
Nominal length: 0.5 mm to 4.5 mm (0.010 in to 0.19 in)



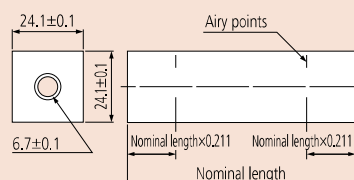
Nominal length: 5 mm to 14.5 mm (0.2 in to 0.450 in)



Nominal length: 15 mm to 500 mm (0.500 in to 20 in)



Nominal length: 125 mm to 500 mm (5 in to 20 in)

**Individual Inch Square Gauge Blocks****SPECIFICATIONS****Inch Blocks**

Length (in)	Code No.*1	
	Steel	CERA
0.01	614310	—
0.02005	614240	—
0.0201	614231	—
0.0202	614232	—
0.0203	614233	—
0.0204	614234	—
0.0205	614235	—
0.0206	614236	—
0.0207	614237	—
0.0208	614238	—
0.0209	614239	—
0.02	614320	—
0.021	614321	—
0.022	614322	—
0.023	614323	—
0.024	614324	—
0.025	614325	—
0.026	614326	—
0.027	614327	—
0.028	614328	—
0.029	614329	—
0.03	614330	—
0.03125 (1/32)	614301	—
0.04	614340	—
0.046875 (3/64)	614302	—
0.05	614105	616105
0.06	614106	—
0.0625	614303	616303
0.07	614107	—
0.078125 (5/64)	614304	—
0.08	614108	—
0.09	614109	—
0.09375 (3/32)	614305	—
0.1	614191	616191
0.100025	614307	—
0.10005	614135	616135
0.100075	614308	—
0.1001	614121	616121
0.1002	614122	616122
0.1003	614123	616123
0.1004	614124	616124
0.1005	614125	616125
0.1006	614126	616126
0.1007	614127	616127
0.1008	614128	616128
0.1009	614129	616129
0.101	614141	616141
0.102	614142	616142
0.103	614143	616143
0.104	614144	616144
0.105	614145	616145

Length (in)	Code No.*1	
	Steel	CERA
0.106	614146	616146
0.107	614147	616147
0.108	614148	616148
0.109	614149	616149
0.109375 (7/64)	614306	—
0.11	614150	616150
0.111	614151	616151
0.112	614152	616152
0.113	614153	616153
0.114	614154	616154
0.115	614155	616155
0.116	614156	616156
0.117	614157	616157
0.118	614158	616158
0.119	614159	616159
0.12	614160	616160
0.121	614161	616161
0.122	614162	616162
0.123	614163	616163
0.124	614164	616164
0.125	614165	616165
0.126	614166	616166
0.127	614167	616167
0.128	614168	616168
0.129	614169	616169
0.13	614170	616170
0.131	614171	616171
0.132	614172	616172
0.133	614173	616173
0.134	614174	616174
0.135	614175	616175
0.136	614176	616176
0.137	614177	616177
0.138	614178	616178
0.139	614179	616179
0.14	614180	616180
0.141	614181	616181
0.142	614182	616182
0.143	614183	616183
0.144	614184	616184
0.145	614185	616185
0.146	614186	616186
0.147	614187	616187
0.148	614188	616188
0.149	614189	616189
0.15	614115	616115
0.16	614116	616116
0.17	614117	616117
0.18	614118	616118
0.19	614119	616119
0.2	614192	616192

Length (in)	Code No.*1	
	Steel	CERA
0.25	614212	616212
0.3	614193	616193
0.35	614213	616213
0.375 (3/8)	614309	—
0.4	614194	616194
0.45	614214	616214
0.5	614195	616195
0.55	614215	616215
0.6	614196	616196
0.65	614216	616216
0.7	614197	616197
0.75	614217	616217
0.8	614198	616198
0.85	614218	616218
0.9	614199	616199
0.95	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	—

Note: Details of the overall sizes for forms of block are given on page 01-3 and the accuracy standards to which they are manufactured are given on page 01-5.

Inch Wear Blocks	
Length (in)	Code No. Tungsten carbide
0.05	615105
0.1	615191

Gauge Blocks

Square Gauge Block Accessories Set SERIES 516

- Mitutoyo offers the gauge block accessories set to expand the variety of square gauge block applications. Square gauge blocks with a hole at their center are much more widely used than rectangular gauge blocks. We also sell the accessories loose to meet your needs.
- Always use genuine gauge block accessories.



516-611

SPECIFICATIONS

Metric			Inch		
Code No.	Included in set	Quantity Supplied	Code No.	Included in set	Quantity Supplied
516-611			516-612		
619070	Half-round jaw 2 mm	2 pcs.	619050	Half-round jaw 0.125 in	2 pcs.
619071	Half-round jaw 5 mm		619051	Half-round jaw 0.25 in	
619072	Plain jaw 10 mm		619052	Plain jaw 0.5 in	
619073	Center point 2 mm	1 pc.	619053	Center point 0.1 in	1 pc.
619054	Scriber point		619054	Scriber point	
619074	Base 10 mm		619055	Base 0.5 in	
619056	Stud	2 pcs.	619056	Stud	2 pcs.
619057	Flat head screw 1 ¹ / ₄ in		619057	Flat head screw 1 ¹ / ₄ in	
619058	Flat head screw 5/8 in		619058	Flat head screw 5/8 in	
619059	Slotted head nut	1 pc.	619059	Slotted head nut	1 pc.
619060	Adjustable tie rod 6 in		619060	Adjustable tie rod 6 in	
619061	Adjustable tie rod 4 ¹ / ₂ in		619061	Adjustable tie rod 4 ¹ / ₂ in	
619062	Tie rod 3 in	1 pc.	619062	Tie rod 3 in	1 pc.
619063	Tie rod 2 ¹ / ₄ in		619063	Tie rod 2 ¹ / ₄ in	
619064	Tie rod 1 ¹ / ₂ in		619064	Tie rod 1 ¹ / ₂ in	
619065	Tie rod 3/4 in	2 pcs.	619065	Tie rod 3/4 in	2 pcs.
619066	Knurled head screw		619066	Knurled head screw	

Note: 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 code number indicates only 1 set.

Typical application



Using plain jaws, tie rods, knurled head screws and gauge blocks, a gage was constructed to enable rapid comparison measurement of a stepped workpiece. (Sample workpiece)

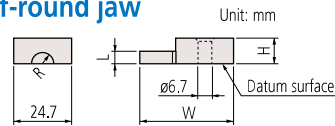
Measurement example



Using a base, plain jaws, tie rods, flat head screws and gauge blocks, a gage was constructed to enable rapid comparison measurement of a stepped workpiece. (Sample workpiece)

Note: Accuracy when using third-party accessories is not guaranteed.

Half-round jaw

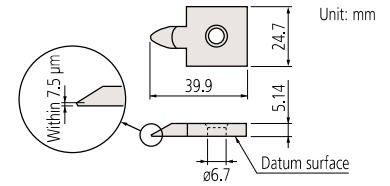


Code No.	R (mm)	L (mm)	W (mm)	H (mm)
619070	1.95	2	33.6	5.3
619071	4.95	5	39.9	10.3

- Flatness 0.5 μm
- Parallelism of L 0.5 μm
- Tolerance of L $\pm 0.5 \mu\text{m}$

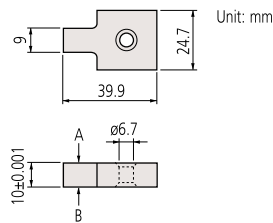
Scriber point

619054



- Flatness of datum surface 0.5 μm

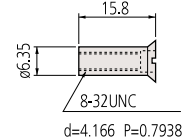
Plain jaw 619072



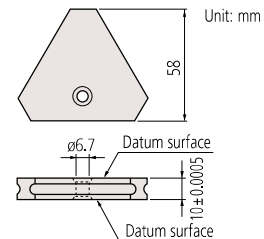
- Flatness 0.12 μm
- Parallelism 0.12 μm
- A and B are datum surfaces

Slotted head nut

619059

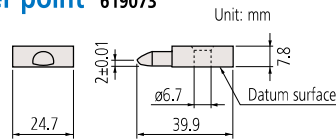


Base 619074



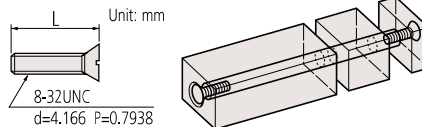
- Flatness 1.5 μm
- Parallelism 1.5 μm
(The surface within 1.5 mm of edge is excluded)

Center point 619073



- Flatness 0.5 μm

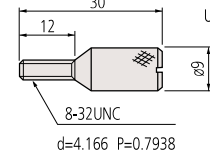
Flat head screw



Code No.	L (mm)
619057	31.6
619058	15.8

Knurled head screw

619066



- Contraction caused by the clamping force

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

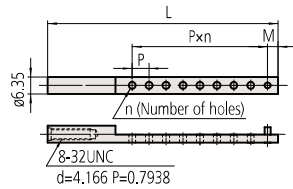
Driver	Contraction
Torque Driver 600 mN·m	0.2 $\mu\text{m}/100 \text{ mm}$
Ordinary Driver 700 to 800 mN·m	0.3 $\mu\text{m}/100 \text{ mm}$

Gauge Blocks

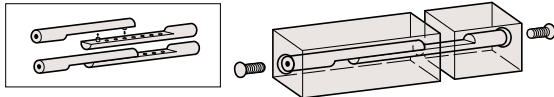
Square Gauge Block Accessories Set SERIES 516

Adjustable tie rod

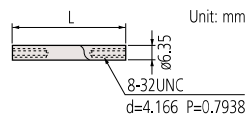
Unit: mm



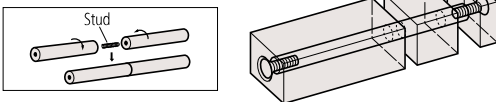
Code No.	L (mm)	M (mm)	P (mm)	n (Number of holes)
619060	124.5	3.85	6.35	14
619061	86.5	3.95	6.35	8



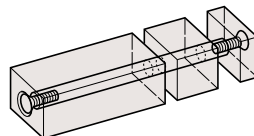
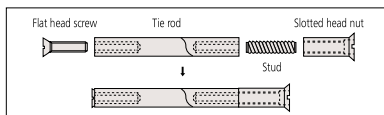
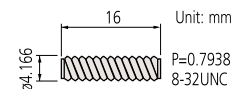
Tie rod



Code No.	L (mm)
619065	19
619064	38
619063	57
619062	76



Stud 619056



Accessories used for combining square gauge blocks

Overall length (mm)		Min.	21	36	34	41	45	58	64	72	77	82	91	95	109	117
Code No.	Included in set	Max.	30	43	43	50	60	72	79	88	91	97	107	109	125	135
619059	Slotted head nut	1	1		1											
619058	Flat head screw	1		2	1	2	1	2			1	2		1		1
619057			1					1		2	1		2	1	2	1
619056	Stud					1										1
619065					1	1										1
619064	Tie rod						1	1		1						
619063									1		1		1			
619062												1		1	1	1
619061	Adjustable tie rod															
619060																

Overall length (mm)		Min.	130	148	121	167	143	160	205	180	223	240	258	295	375
Code No.	Included in set	Max.	150	169	180	184	210	255	270	285	288	345	363	445	520
619059	Slotted head nut														
619058	Flat head screw				2			2							
619057		2	2			2	2		2	2	2	2	2	2	2
619056	Stud	1	1		1			1		1	1	1	1	1	2
619065		1													
619064	Tie rod			1											
619063						1			1			1			
619062		1	1		1						1		1		1
619061	Adjustable tie rod				2		2		2		2		2	2	2
619060								2		2		2	2	2	2



Step Master SERIES 516

- Step master is a master gage of different height that is useful for the z-axis (vertical direction) calibration of optical instruments.
- Each adjacent step is measured down to $0.01\text{ }\mu\text{m}$ by using a interferometer within $\pm 0.20\text{ }\mu\text{m}$ allowance.
- Steel and ceramic types are available.



Steel type
516-199



Ceramic type
516-499

SPECIFICATIONS

Steel type

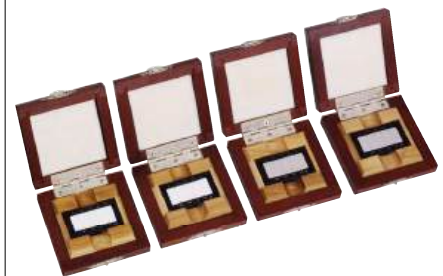
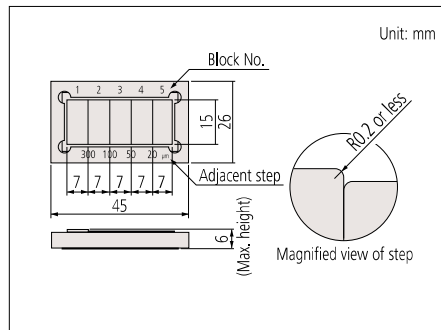
Code No.	516-198					516-199				
Block No.	1	2	3	4	5	1	2	3	4	5
Cumulative step (μm)	0	10	15	17	18	0	300	400	450	470
Step value between adjacent blocks (μm)		10	5	2	1		300	100	50	20

Ceramic type

Code 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

Note: ○○○○ - ○○○○ -24: Provided with Calibration Certificate

DIMENSIONS



Gauge Blocks

Custom-made Blocks & Gages

Gauge blocks

- We can provide gauge blocks in sizes for your specific needs. You can request a particular size you frequently use or a special size in small increments that cannot be created by wringing.
- Nominal size range
 - 0.1 mm to 1000 mm (steel)
 - 0.5 mm to 500 mm (ceramic)
 - 30 mm to 1000 mm (ZERO CERA Blocks)
- Nominal size increment
 - 0.0005 mm (up to 100 mm)
 - 0.001 mm (over 100 mm)
- Cross section (same as the standard product)
 - Nominal length of 10 mm or less: 30×9 mm
 - Nominal length of more than 10 mm: 35×9 mm
 - Square types are also available.

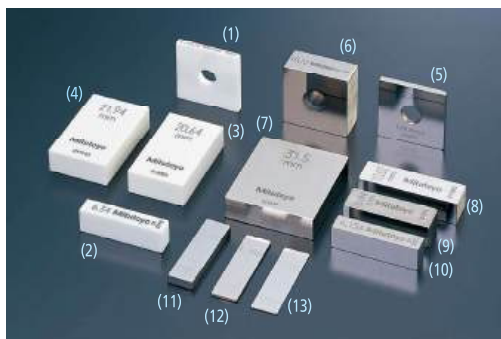
Reference gages

- We can provide gages in special dimensions not specified by JIS. Free yourself from the time-consuming work of gage creation by using our service that creates precision spacers and other gages in your preferred sizes. Gages with a hole or specified mark can also be created. Please contact us for details.
- Step masters
 - We can create your preferred height difference between adjacent blocks.

Notes on "coupling holes" on custom gauge blocks:

- Steel, from 100 mm to less than 500 mm
 - Without coupling holes
(Let us know if a hole is required)
- Steel, from 500 mm to less than 1000 mm
 - With coupling holes
(Let us know if a hole is not required)
- Ceramic, from 100 mm to less than 500 mm
 - With coupling holes
(Let us know if a hole is not required)

Special gauge blocks



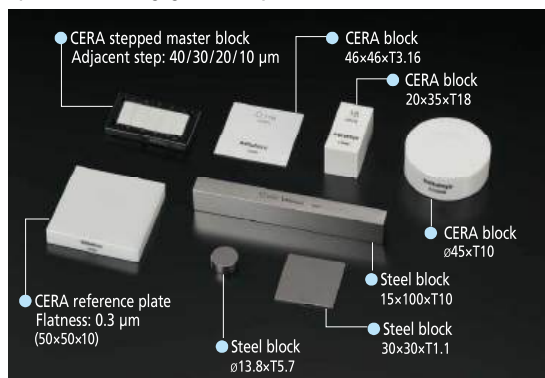
Ceramic

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

Steel

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

Special reference gages and step master (T: nominal size)



Unit: mm

Typical application



Recommendation for Regular Calibration

As is widely known, gauge blocks are end measures based on distance measurements traceable to the wavelength of the iodine stabilized He-Ne laser. Because they serve as the standard based on which measuring instruments are adjusted, even the smallest of errors can be critical. Therefore, we recommend periodical calibration even when use is infrequent. Please calibrate your gauge blocks as described in the table below (best practices may vary according to frequency of use and grade).

Application	Cycle (years)	Grade
Reference standard	1 to 2	K
Calibration	2	K or 0
Inspection	2	0 or 1
Shop floor	0.5 to 1	1 or 2

As an accredited calibration laboratory, Mitutoyo offers a periodical calibration service for gauge blocks.

Our regular calibration service features:

- Gauge blocks manufactured by any maker can be calibrated.
 - Cleaning 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.
- For detailed information, contact the nearest Mitutoyo sales office.

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.



516-650E

Code No. 516-650E

Tools and accessories included:

- (1) Ceraston (**601645**)
(both sides finished by lapping)
(100×25×12 mm)
- (2) Optical flat (**158-117**)
(ø45, 12 mm thickness, Flatness 0.2 μm)
Used to check the wringing of thin gauge blocks and for the presence of burrs.
- (3) Tweezers (**600004**)
Used for handling thin gauge blocks.
- (4) Blower brush (**600005**)
Used for blowing dust from measuring surfaces.
- (5) Cleaning paper (**600006**)
(lens paper, 82×304 mm, 500 pcs.)
Used for wiping off rust-preventative oil and contamination. Lint free.
- (6) Artificial leather mat (B4 size, Artificial buckskin) (**600007**)
Used as a gauge block mat in order to avoid scratches on the work table.
- (7) Reagent bottle (**600008**)
(polyethylene container, 100 ml)
Bottle of wiping solution.
(Mitutoyo employs n-Heptane for solvent.)
- (8) Gloves (**600009**)
Used for handling large gauge blocks.
Effective for the prevention of corrosion and thermal expansion.

Gauge Blocks

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.
- The grinding stones can be used on CERA Blocks and other steel gauge blocks. They are useful for removing burrs on any precision-processed surface.
- Excellent in durability and ease of removing burrs compared to Arkansas stones.
- Both sides can be used.



601644
150 (W) x 50 (D) x 20 (H) mm



601645
100 (W) x 25 (D) x 12 (H) mm

Removing burrs

Figure 1

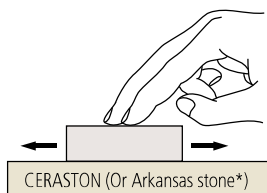
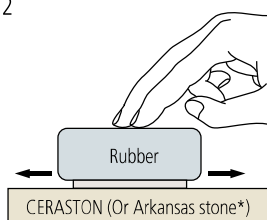


Figure 2



- (1) Wipe any dust and oil film from the gauge block and the Ceraston (or Arkansas stone*) using a solvent.
- (2) Place the gauge block on the Ceraston (or Arkansas stone*) so that the measuring face that has burrs is on the abrasive surface of the stone. While applying light pressure, move the gauge block back and forth about ten times (Fig. 1). Use a rubber block 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.

* Mitutoyo does not offer Arkansas stones.

Typical application





Gauge block set for comparator calibration (optional)

Standard type **516-145-E2**



Special bridge-type block

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

- Measures Rectangular Gauge Blocks and Square Gauge Blocks through automatic comparison with an appropriate Reference gauge block in the size range 0.5 mm to 100 mm.
- The measurement result is not affected by any warping of thinner gauge blocks due to the use of upper and lower gage heads (dual-head system).
- Measurement configuration: 1 cycle of automatic comparison measurement with a Reference gauge block.



SPECIFICATIONS

Metric					
Range	Resolution	Accuracy (95% confidence interval)	Upper gaging head		
			Type	Measuring force	Contact point
0.5 mm - 100 mm	0.01 μ m	$\pm(0.03 + 0.3L/1000) \mu$ m* L=Gauge block length (mm)	Mu-Checker	0.8 N	Carbide contact point of radius 20 mm
Lower gaging head			Operating conditions		
Type	Measuring force	Contact point	20 °C \pm 1 °C Humidity: 58% RH \pm 15% RH (Under less temperature change, and hot or cold direct air flow should be avoided.)		
Mu-Checker	0.4 N	Carbide contact point of radius 5 mm			

* Not including the uncertainty of reference gauge block and influence of temperatures.

Gauge Block Calibration



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

- Measures Rectangular Gauge Blocks and Square Gauge Blocks through manual comparison with an appropriate Reference gauge block in the size range 0.1 mm to 250 mm.
- The measurement result is not affected by any warping of thinner gauge blocks due to the use of upper and lower gage heads (dual-head system).



SPECIFICATIONS

Metric						
Range		Resolution (Effective indication)	Accuracy (95% confidence interval) [Comparison measurement of the same nominal length]		Accuracy (95% confidence interval) [Dimensional deviations between Reference gauge block and measurement gauge block: ±3 mm]	
0.1 mm - 250 mm		0.001 μm (0.01 μm)	±(0.03 + 0.3L/1000) μm* L=Gauge block length (mm)		±(0.06 + 0.3L/1000) μm* L=Gauge block length (mm)	
Upper gaging head			Lower gaging head			Operating conditions
Type	Measuring force	Contact point	Type	Measuring force	Contact point	
Linear Gage	0.4 N	Carbide contact point of radius 20 mm	Linear Gage	0.2 N	Carbide contact point of radius 5 mm	20 °C±1 °C Humidity: 30% RH to 60% RH (Under less temperature change, and hot or cold direct air flow should be avoided.)

* Not including the uncertainty of reference gauge block and influence of temperatures.

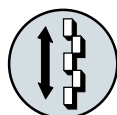
Reference Gages

Height Master SERIES 515

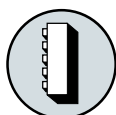
- For calibrating and setting height gages.
- Staggered arrangement of block stack have two measuring faces on the same level, one facing up and the other down (except for **515-310**).



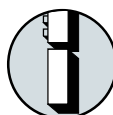
515-322



Staggered 20 mm blocks (movable)



Vertical orientation



Riser block

SPECIFICATIONS

Metric		
Code No.	515-322	
Range (H)	5 < H ≤ 310 mm	
Graduation (analog scale)	0.001 mm	
Block step	20 mm (staggered)	
Micrometer adjustment	20 mm	
Micrometer feed	0.5 mm/rev	
Block pitch accuracy	±1.5 μm	
Parallelism of blocks	1.0 μm	
Feed error	±1.0 μm	
Retrace error	1.0 μm	
Mass	23 kg	

Inch		
Code No.	515-310	515-311
Range (H)	0.2 in < H ≤ 12.2 in	
Graduation (analog scale)	0.00001 in	
Block step	0.5 in (straight)	1 in (staggered)
Micrometer adjustment	1 in	
Micrometer feed	0.025 in/rev	
Block pitch accuracy	±50 μin	
Parallelism of blocks	40 μin	
Feed error	±40 μin	
Retrace error	40 μin	
Mass	23 kg	

Note 1: The block pitch accuracy and the parallelism of blocks are relative to the main unit reference surface.

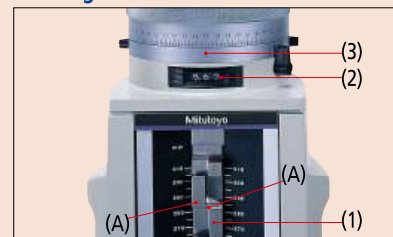
Note 2: Supplied with a wooden storage case as standard.



Typical application



Reading



(A) Height A

(1) Scale	280. mm
(2) Counter	5.67 mm
(3) Thimble	0.000 mm
	285.670 mm

Function

Zero setting
Origin-setting
Origin restoration
Data hold
Auto power off
Data output

Optional Accessories

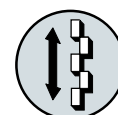
Code No.	Type	Description
959149	C	connection cable (1 m)
959150	C	connection cable (2 m)

Digital Height Master SERIES 515

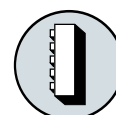
- For calibrating and setting height gages.
- Staggered arrangement of block stack have two measuring faces on the same level, one facing up and the other down.
- Equipped with a data output port that enables incorporation into measurement networking and statistical process control systems. (Refer to page 09-3 for details)



515-374



Staggered 20 mm
blocks (movable)



Vertical
orientation



Riser block

SPECIFICATIONS

Metric				
Code No.		515-374	515-376	515-378
Range (H)		10 < H ≤ 310 mm	10 < H ≤ 460 mm	10 < H ≤ 610 mm
Resolution (digital display)		0.001 mm		
Block step		20 mm (staggered)		
Micrometer adjustment		20 mm		
Micrometer feed		0.5 mm/rev		
Block pitch accuracy	0 < H ≤ 310 mm	±1.5 μm		
	310 < H ≤ 460 mm	—	±2.5 μm	
	460 < H ≤ 610 mm	—	—	±3.5 μm
Parallelism of blocks	0 < H ≤ 310 mm	2.0 μm		
	310 < H ≤ 610 mm	—	2.5 μm	
Feed error		±2.0 μm		±2.5 μm
Retrace error		2.0 μm		2.5 μm
Mass		9.5 kg	13.6 kg	16 kg
Inch				
Code No.		515-375	515-377	515-379
Range (H)		0.5 in < H ≤ 12 in	0.5 in < H ≤ 18 in	0.5 in < H ≤ 24 in
Resolution (digital display)		0.0001 in		
Block step		1 in (staggered)		
Micrometer adjustment		1 in		
Micrometer feed		0.025 in/rev		
Block pitch accuracy	0 < H ≤ 12 in	±100 μin		
	12 in < H ≤ 18 in	—	±100 μin	
	18 in < H ≤ 24 in	—	—	±150 μin
Parallelism of blocks	0 < H ≤ 12 in	50 μin		
	12 in < H ≤ 18 in	—	100 μin	
Feed error		±100 μin		100 μin
Retrace error		100 μin		100 μin
Mass		9.5 kg	13.6 kg	16 kg

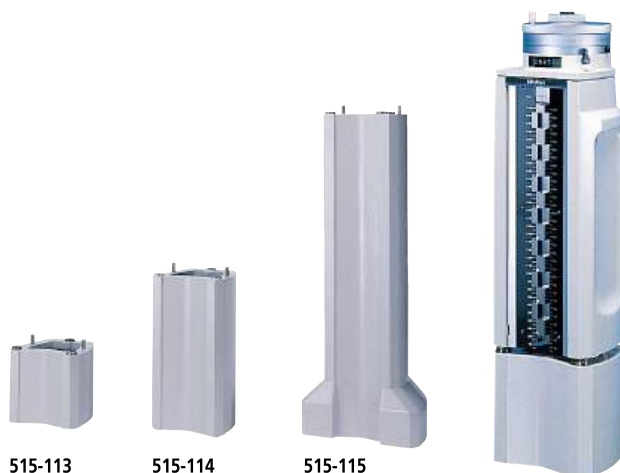
- Display: 6 digits
 - Power source: SR44 battery (2 pcs.), **938882** included as standard (for operational checks)
 - Battery life: Approx. 1.8 years under normal use
- Note: The block pitch accuracy and the parallelism of blocks are based on main unit reference surface, which does not include the retrace error.

Reference Gages

Height Master SERIES 515 — Optional accessories

Riser Blocks SERIES 515

- The measuring range of a Height Master can be extended by using riser blocks.
- They can also be used on Square Master models **311-215** and **311-225**. (Refer to page 01-46 for details)



Typical application



Bore gage zero-setting

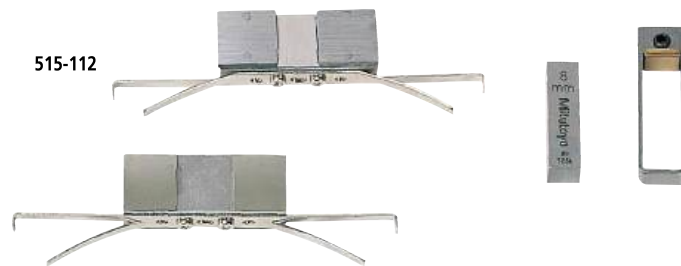
SPECIFICATIONS

Metric				
Code No.	Height (mm)	Accuracy (μm)	Variation in length (μm)	Mass (kg)
515-113	150	±0.6	0.6	5.7
515-114	300	±1.0	0.8	9.8
515-115	600	±2.0	1.0	26.8

Inch				
Code No.	Height (in)	Accuracy (μin)	Variation in length (μin)	Mass (kg)
515-116	6	±20	20	4.8
515-117	12	±40	30	11.3
515-118	24	±80	40	31

Auxiliary Block Kit SERIES 515 – for Bore Gage

- Used for efficient zero-setting of dial bore gages and tubular inside micrometers (18 - 150 mm) on a Height Master.



SPECIFICATIONS

Metric	
Code No.	Model
515-110	Universal Height Master
515-111	Digital Height Master (515-374/376/378)
515-112	Height Master (515-322)
Inch	
Code No.	Model
515-119	Universal Height Master, Height Master (515-310)
515-120	Digital Height Master (515-375/377/379)
515-121	Height Master (515-311)

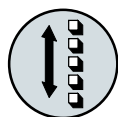
Reference Gages

Universal Height Master SERIES 515 — Usable in Vertical and Horizontal Orientations

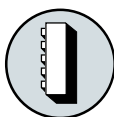
- The Universal Height Master is designed for both vertical and horizontal orientation, providing a wide range of applications such as accuracy checking of machine tool table movements.
- Analog display by the built-in counter – the appearance and specifications are the same as **515-322**. (Refer to page 01-37 for details)



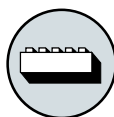
515-520



Single-row 10 mm blocks (movable)



Vertical orientation



Horizontal orientation



Riser block

SPECIFICATIONS

Metric			
Code No.		515-520	515-523
Range (H)		5 < H ≤ 610 mm	5 < H ≤ 1010 mm
Graduation (analog scale)		0.001 mm	
Block step		10 mm (straight)	
Micrometer adjustment		20 mm	
Micrometer feed		0.5 mm/rev	
Block pitch accuracy	H ≤ 310 mm	±1.5 μm	
	310 < H ≤ 610 mm	±2.5 μm	
	610 < H ≤ 1010 mm	—	
Parallelism of blocks	H ≤ 610 mm	1.5 μm	
	610 < H ≤ 1010 mm	—	
Feed error		±1.2 μm	±1.5 μm
Retrace error		1.2 μm	1.5 μm
Mass		42 kg	63.5 kg

Inch			
Code No.		515-512	515-510
Range (H)		0.2 in < H ≤ 18.2 in	0.2 in < H ≤ 24.2 in
Graduation (analog scale)		0.00001 in	
Block step		0.5 in (straight)	
Micrometer adjustment		1 in	
Micrometer feed		0.025 in/rev	
Block pitch accuracy	H ≤ 12 in	±50 μin	
	12 in < H ≤ 24 in	—	
	24 in < H ≤ 40 in	—	
Parallelism of blocks	H ≤ 24 in	60 μin	
	24 in < H ≤ 40 in	—	
Feed error		±40 μin	±60 μin
Retrace error		40 μin	60 μin
Mass		42 kg	63.5 kg

Note 1: The block pitch accuracy and the parallelism of blocks are relative to the main unit reference surface.

Note 2: Supplied with a wooden storage case as standard.



Typical application



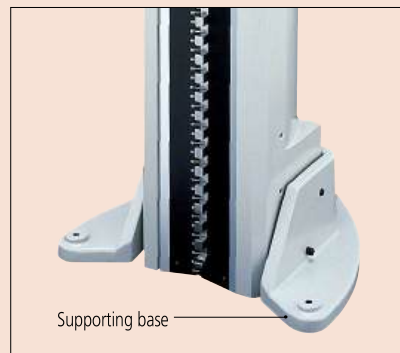
Using in horizontal orientation

Optional Accessories

Supporting base

900574 (Dedicated for the Universal Height Master. Provided for **515-523** and **515-513** as standard.)

- Stable vertical orientation is available.

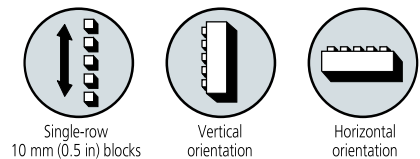


Supporting base



Check Master SERIES 515

- Designed to check the accuracy of table movements of machine tools and calibrate CMMs. Permanently wrung stack of gauge blocks is housed in a rigid frame.
- Can be used in either vertical or horizontal orientation.



SPECIFICATIONS

Metric					
Code No.	515-720	515-721	515-722	515-723	515-724
Range (H)	310 mm	450 mm	610 mm	1010 mm	1510 mm
Block step	10 mm				
Block pitch accuracy	$H \leq 310$ mm	$\pm 2.5 \mu\text{m}$			
	$310 < H \leq 610$ mm	—	$\pm 3.5 \mu\text{m}$		
	$610 < H \leq 1010$ mm	—	—	$\pm 5.0 \mu\text{m}$	
	$1010 < H \leq 1510$ mm	—	—	—	$\pm 8.0 \mu\text{m}$
Parallelism of blocks	$H \leq 310$ mm	1.2 μm			
	$310 < H \leq 610$ mm	—	1.5 μm		
	$610 < H \leq 1010$ mm	—	—	2.0 μm	
	$1010 < H \leq 1510$ mm	—	—	—	2.5 μm
Mass	7 kg	10 kg	13 kg	22 kg	30 kg
Inch					
Code No.	515-710	515-711	515-712	515-713	
Range (H)	12.5 in	18.5 in	24.5 in	40.5 in	
Block step	0.5 in				
Block pitch accuracy	$H \leq 12.5$ in	$\pm 100 \mu\text{in}$			
	$12.5 \text{ in} < H \leq 24.5$ in	—	$\pm 150 \mu\text{in}$		
	$24.5 \text{ in} < H \leq 40.5$ in	—	—	—	$\pm 200 \mu\text{in}$
Parallelism of blocks	$H \leq 12.5$ in	50 μin			
	$12.5 \text{ in} < H \leq 24.5$ in	—	60 μin		
	$24.5 \text{ in} < H \leq 40.5$ in	—	—	—	80 μin
Mass	7 kg	10 kg	13 kg	22 kg	

Note 1: The block pitch accuracy and the parallelism of blocks are relative to the main unit reference surface.

Note 2: Supplied with a wooden storage case as standard.

Note 3: High-accuracy type is available by special order.

Reference Gages



Standard Scales SERIES 182 — Made of Low Expansion Glass

- High-precision glass scales manufactured under Mitutoyo's leading-edge Linear Scale production technology. They are considered top-grade length standards.
- Standard scales can be used as a traceable standard of length for calibrating measuring instruments.



182-502-50
182-502-60

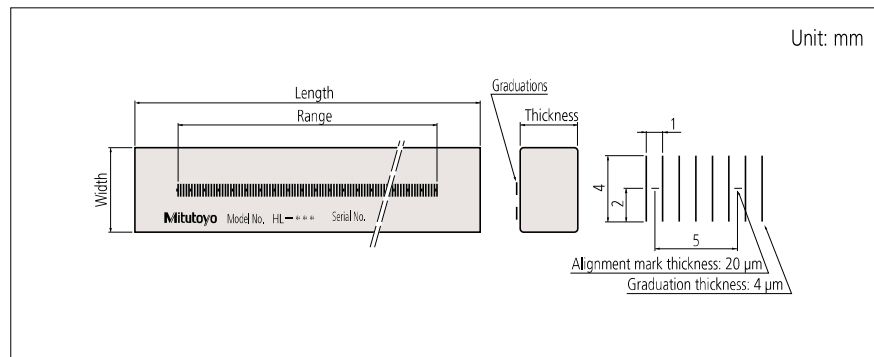
182-501-50
182-501-60

SPECIFICATIONS

Metric						
Code No.	Range (mm)	Length (mm)	Width (mm)	Thickness (mm)	Graduation thickness (μm)	Graduation (mm)
182-501-50	250	280	20	10	4	1
182-501-60*						
182-502-50	500	530	30	20		
182-502-60*						

- Material: Low expansion glass
- Thermal expansion coefficient: $(0.00 \pm 0.02) \times 10^{-6}/K$
- Accuracy (at 20 °C): $(0.5 + L/1000) \mu m$, L=Measured length (mm)
- * With English JCSS certificate.

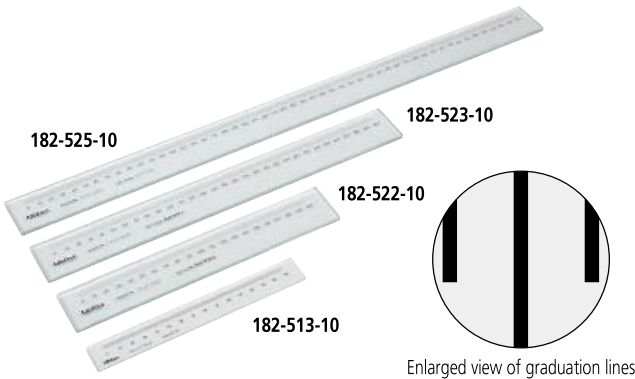
DIMENSIONS





Working Standard Scales SERIES 182

- High-precision glass scales manufactured under Mitutoyo's leading-edge Linear Scale production technology. They are available in various types and sizes to suit to your application.
- Ideal for checking magnification accuracy of profile projectors and microscopes, and the table feeding accuracy of measuring equipment.

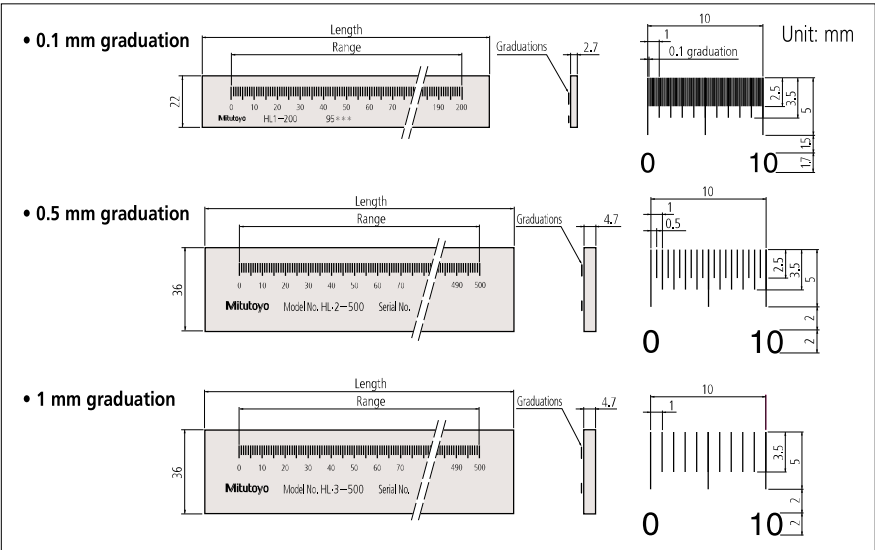


SPECIFICATIONS

Metric						
Code No.	Range (mm)	Graduation (mm)	Length (mm)	Inspection pitch (mm)	Graduation thickness (μm)	Mass (kg)
182-511-10	50	0.1	75	5	20	0.23
182-512-10	100		125			0.24
182-513-10	150		175			0.25
182-514-10	200		225			0.26
182-521-10	100	0.5	130	10	50	0.27
182-522-10	200		230			0.32
182-523-10	300		330			0.57
182-524-10	400		430			0.71
182-525-10	500	1	530	20	100	0.86
182-531-10	250		280			0.55
182-532-10	500		530			1.22
182-533-10	750		780			0.23
182-534-10	1000		1030			1.54

- Material: Soda-lime glass
 - Thermal expansion coefficient: $8.5 \times 10^{-6}/K$
 - Accuracy (at 20 °C): $(1.5 + 2L/1000) \mu m$, L=Measured length (mm)
- Note: An inspection certificate produced by a standard scale automatic calibration system is supplied as standard.

DIMENSIONS



Reference Gages

High Precision Square SERIES 311

- The High-Precision Square gage is used for inspecting the travel straightness and axial perpendicularity of moving elements on equipment, such as machine tools and CMMs.
- Four precision-lapped reference surfaces, finished using ultra-precision technology built on our experience in gauge blocks.
- Better than 1 $\mu\text{m}/300\text{ mm}$ straightness and perpendicularity of each (four) reference surface. In addition, front and back faces are accurate to better than 5 $\mu\text{m}/300\text{ mm}$.
- Three nominal sizes are available (90×110, 160×210 and 260×310 mm) so that you can select the size that best suits the application.



311-113

SPECIFICATIONS

Metric						
Code No.	Dimension (W×L×T) (mm)	Perpendicularity tolerance (μm)		Straightness tolerance (μm)		Mass (kg)
		Reference surface	Front/ back faces	Reference surface	Front/ back faces	
311-111	90×110×25	1	5	1	5	1.5
311-112	160×210×25					5.0
311-113*	260×310×30					14.0

• Dedicated wooden case is provided.

* Supplied with a removable handle.



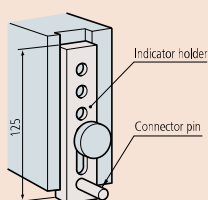
Square Master SERIES 311 — Squareness/Straightness Measuring

Typical application

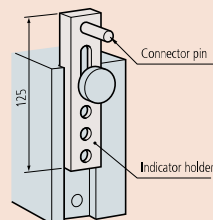


Mounting the Indicator Holder

Example 1



Example 2



- Squareness (perpendicularity) and straightness measurements can be performed accurately and efficiently by just moving a lever. Use the vertical motion handle on the rear of the main unit for operation.
- Highly accurate measurement of squareness and straightness is available by calibrating a square as a master using the built-in perpendicularity adjustment mechanism. Prepare a square to be used for accuracy check/adjustment separately.
- Sliding force: Approx. 2 to 5 N



311-245

SPECIFICATIONS

Code No.	Vertical travel (mm)	Squareness (μm)	Straightness (μm)	Dimension (mm)			Mass (kg)
				Width	Depth	Height	
311-215*	150	3	2	180	200	420	13.7
311-225*	250	6	2.5	180	200	520	16.2
311-245	450	9	3.5	220	220	720	24

- **513-401-10H** (Metric): Dial test indicator
- **902053**: Clamp
- **601471**: Indicator holder
- **538616**: Hexagonal-head wrench (3 mm)

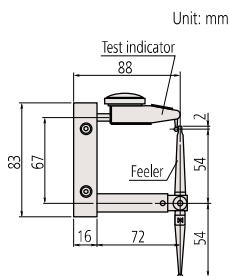
* Riser blocks to extend the height of Square Masters can be used. (Refer to page 01-39 for details)

Note: Inspection certificate is not attached. Contact your local Mitutoyo sales office.

Optional accessories

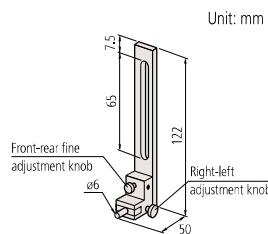
900565: Feeler

For probing surfaces that the contact point of a detector cannot reach.



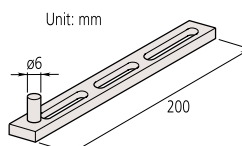
900571: Adjustable holder

Enables easy adjustment of indicator position.



900551: Extension holder

Measurement position can be extended by using this 200 mm length holder instead of the indicator holder.



Reference Gages

Steel Rules SERIES 182

- Clear graduations on satin-chrome finish.
- Stainless tempered.



182-101



182-201



182-302

SPECIFICATIONS

Metric Wide Rigid Rules			
Code No.	Graduations (mm)	Range (mm)	Width (mm)
182-111	1, 0.5 (on both faces)	150	19
182-131		300	25
182-151		450	30
182-171		600	30

Metric Fully-Flexible Rules			
Code No.	Graduations (mm)	Range (mm)	Width (mm)
182-211	1, 0.5 (on both faces)	150	12
182-231		300	12
182-251		450	19
182-271		600	19

Inch/Metric Semi-Flexible Rules			
Code No.	Graduations*	Range	Width (in)
182-302	1/16 in, 1/32 in, 1/64 in, 1 mm, 0.5 mm	6 in/150 mm	0.51
182-303		8 in/200 mm	0.51
182-305		12 in/300 mm	0.59
182-307		20 in/500 mm	0.59
182-309		40 in/1000 mm	0.59

* Engraved on the front side only.

Inch/Metric Wide Rigid Rules			
Code No.	Graduations	Range	Width (in)
182-105	1/32 in, 1/64 in, 1 mm, 0.5 mm	6 in/150 mm	0.75
182-125		12 in/300 mm	0.98
182-145		18 in/450 mm	1.18
182-165		24 in/600 mm	1.18
182-106	1/50 in, 1/100 in, 1 mm, 0.5 mm	6 in/150 mm	0.75
182-126		12 in/300 mm	0.98
182-107	1/10 in, 1/100 in, 1 mm, 0.5 mm	6 in/150 mm	0.75
182-108		6 in/150 mm	0.75

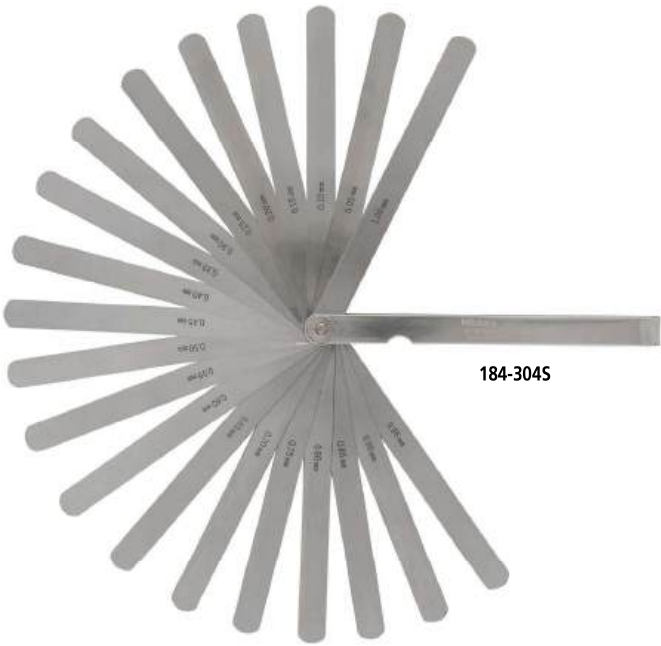
Inch/Metric Fully-Flexible Rules			
Code No.	Graduations	Range	Width (in)
182-205	1/32 in, 1/64 in, 1 mm, 0.5 mm	6 in/150 mm	0.47
182-225		12 in/300 mm	0.47
182-245		18 in/450 mm	0.75
182-265		24 in/600 mm	0.75
182-206	1/50 in, 1/100 in, 1 mm, 0.5 mm	6 in/150 mm	0.47
182-226		12 in/300 mm	0.47
182-207	1/10 in, 1/100 in, 1 mm, 0.5 mm	6 in/150 mm	0.47
182-208		6 in/150 mm	0.47

Inch Wide Rigid Rules			
Code No.	Graduations (in)	Range (in)	Width (in)
182-101	1/8, 1/16, 1/32, 1/64	6	0.75
182-121		12	0.98
182-141		18	0.71
182-161		24	1.18
182-102	1/50, 1/100, 1/32, 1/64	6	0.75
182-122		12	0.98
182-142		18	1.18
182-162		24	1.18
182-103	1/10, 1/100, 1/32, 1/64	6	0.75
182-123		12	0.98
182-143		18	1.18
182-163		24	1.18
182-104	1/10, 1/50, 1/32, 1/64	6	0.75
182-124		12	0.98

Inch Fully-Flexible Rules			
Code No.	Graduations (in)	Range (in)	Width (in)
182-201	1/8, 1/16, 1/32, 1/64	6	0.47
182-221		12	0.47
182-241		18	1.18
182-261		24	0.75
182-202	1/50, 1/100, 1/32, 1/64	6	0.47
182-222		12	0.47
182-242		18	0.75
182-262		24	0.75
182-203	1/10, 1/100, 1/32, 1/64	6	0.47
182-223		12	0.47
182-243		18	0.75
182-263		24	0.75
182-204	1/10, 1/50, 1/32, 1/64	6	0.47
182-224		12	0.47

Thickness Gages
SERIES 184

- Metric thickness gages are available with tapered leaves.
- Each leaf is marked with its thickness.
- Each leaf is detachable if necessary.



SPECIFICATIONS

Metric			
Code No.	Range (mm)	Composition of leaves	Remarks
184-313S	0.05 - 1	28 leaves: 0.05 - 0.15 mm by 0.01 mm, 0.2 - 1 mm by 0.05 mm	—
184-303S		28 leaves: 0.05 - 0.15 mm by 0.01 mm, 0.2 - 1 mm by 0.05 mm	Long leaf
184-304S		20 leaves: 0.05 - 1 mm by 0.05 mm	Long leaf
184-305S	0.05 - 1	13 leaves: 0.05 - 0.3 mm by 0.05 mm, 0.4 - 1 mm by 0.1 mm	—
184-301S		13 leaves: 0.05 - 0.3 mm by 0.05 mm, 0.4 - 1 mm by 0.1 mm	Long leaf
184-306S		10 leaves: 0.05 - 0.2 mm by 0.05 mm, 0.3 - 0.8 mm by 0.1 mm	—
184-308S	0.05 - 0.8	10 leaves: 0.05 - 0.2 mm by 0.05 mm, 0.3 - 0.8 mm by 0.1 mm	Long leaf
184-307S		13 leaves: 0.03 - 0.1 mm by 0.01 mm, 0.2 - 0.5 mm by 0.1 mm, 0.15 mm	—
184-302S	0.03 - 0.5	13 leaves: 0.03 - 0.1 mm by 0.01 mm, 0.2 - 0.5 mm by 0.1 mm, 0.15 mm	Long leaf

DIMENSIONS

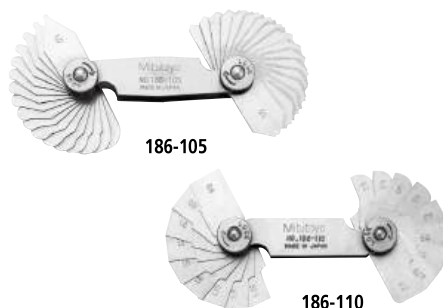
Unit: mm

Code No.	L1	L2
184-313S	100	106
184-303S	150	156
184-304S	150	156
184-305S	100	106
184-301S	150	156
184-306S	100	106
184-308S	150	156
184-307S	100	106
184-302S	150	156

Reference Gages

Radius Gages SERIES 186

- Radius size is stamped on each gage leaf.
- Each leaf comprises an internal and an external radius gage of the same size.
- With locking clamp.

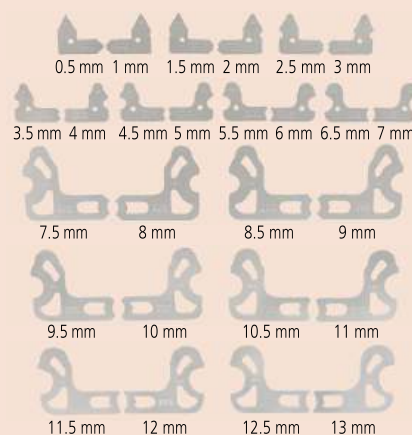


SPECIFICATIONS

Metric				
Code No.	Range (mm)	Accuracy	Composition of leaves	Remarks
186-110	0.4 - 6	±0.04 mm	18 leaves: 0.4, 0.8, 1, 1.2, 1.5, 1.6 mm, 1.75 - 3 mm by 0.25 mm, 3.5 - 6 mm by 0.5 mm	90° arc
186-902	0.5 - 13		26 leaves: 0.5 - 13 mm by 0.5 mm	90° arc, separate part type
186-105	1 - 7		34 leaves: 1 - 3 mm by 0.25 mm, 3.5 - 7 mm by 0.5 mm	180° arc
186-106	7.5 - 15		32 leaves: 7.5 - 15 mm by 0.5 mm	180° arc
186-107	15.5 - 25		30 leaves: 15.5 - 20 mm by 0.5 mm, 21 - 25 mm by 1 mm	180° arc

Inch				
Code No.	Range (in)	Accuracy	Composition of leaves	Remarks
186-103	1/32 - 17/64	±0.002 in	16 leaves: 1/32 in - 17/64 in by 64ths	90° arc
186-101	1/32 - 1/4		30 leaves: 1/32 in - 1/4 in by 64ths	180° arc
186-102	17/64 - 1/2		32 leaves: 17/64 in - 1/2 in by 64ths	180° arc
186-104	9/32 - 33/64		16 leaves: 9/32 in - 33/64 in by 64ths	90° arc
186-901*	1/64 - 1/2	±0.0016 in	25 leaves: 1/64 in - 17/64 in by 64ths, 9/32 in - 1/2 in by 32nds	Holder
186-903	1/64 - 17/64		17 leaves: 1/64 in - 17/64 in by 64ths	—
186-904	9/32 - 1/2		8 leaves: 9/32 in - 1/2 in by 32nds	—
186-905	9/16 - 1		8 leaves: 9/16 in - 1 in by 16ths	Holder
186-906	0.010 - 0.500		26 leaves: 0.10 in - 0.30 in by 0.005 in 0.40 in - 0.100 in by 0.010 in 0.120 in - 0.300 in by 0.020 in 0.350 in - 0.500 in by 0.050 in	Holder
186-907	0.550 - 1		10 leaves: 0.550 in - 1 in by 0.50 in	—

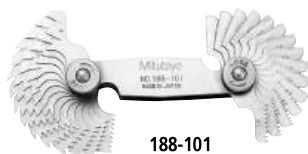
* Each gage has five measuring locations.



Composition of leaves for 186-902

Thread Pitch Gages SERIES 188

- Thread pitch is stamped on each gage.
- Metric, Unified, and Whitworth screw pitch gages.



SPECIFICATIONS

Metric Screw Pitch Gages			
Code No.	Range (mm)	Integration pitch error	Composition of leaves
188-130	0.35 - 6	±0.05 mm	22 leaves: 0.35, 0.4, 0.45, 0.5, 0.6, 0.7, 0.75, 0.8, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6 mm and 60° angle gage
188-122	0.4 - 7		21 leaves: 0.4, 0.5, 0.7, 0.75, 0.8, 0.9, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7 mm
188-121	0.4 - 7		18 leaves: 0.4, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7 mm

Unified Screw Pitch Gages

Code No.	Range	Integration pitch error	Composition of leaves
188-111	4 - 42 TPI	±0.002 in	30 leaves: 4, 4 ^{1/2} , 5, 5 ^{1/2} , 6, 7, 8, 9, 10, 11, 11 ^{1/2} , 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42 TPI

Note: Metric and Unified Pitch Gage Set (188-151) is available.

Metric and Unified Screw Pitch Gage Set

Code No.	Range	Integration pitch error	Composition of leaves
188-151	0.4 - 7 mm/4 - 42 TPI	±0.05 mm/ ±0.002 in	51 leaves: Set of 188-122 and 188-111

Whitworth Screw Pitch Gages

Code No.	Range	Integration pitch error	Composition of leaves
188-101	4 - 42 TPI	±0.002 in	30 leaves: 4, 4 ^{1/2} , 5, 5 ^{1/2} , 6, 7, 8, 9, 10, 11, 11 ^{1/2} , 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42 TPI
188-102	4 - 60 TPI		28 leaves: 4, 4 ^{1/2} , 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34, 36, 40, 48, 60 TPI

Function

- Presetting

**Digimatic Universal Protractor
SERIES 187**

- Data output function makes it easy to gather statistical data.
- Can be attached to height gages using a gage holder (**950750**, metric)
- Setting preset value.
- Removable blade.



187-501

SPECIFICATIONS

Code No.	Blade length	Range	Resolution	Accuracy	Repeatability	Remarks (standard accessory)
187-501	150 mm	-360° to +360°	1' (0.01°)	±2' (±0.03°)	1'	Height gage holder (950750)
187-502	300 mm					Height gage holder (950750)
187-551	6 in					Height gage holder (950749)
187-552	12 in					Height gage holder (950749)

- Power source: CR2032 battery (1 pc.), included as standard (for operational checks)
- Battery life: 2,000 hours

**Universal Bevel Protractor
SERIES 187**

- High-precision instrument for accurate angle measurement on machines, molds, and jigs.
- There is no height difference between the main scale and Vernier. The scale magnifier can reduce parallax differences.
- The fine adjustment knob allows for fine feed adjustment.
- Graduation: 5'



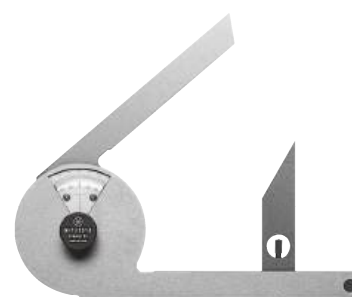
187-901-10

SPECIFICATIONS

Metric			Inch		
Code No.	Blade length (mm)	Remarks	Code No.	Blade length (in)	Remarks
187-901-10	150, 300	w/60°, 45°, 30° edges	187-902-10	6, 12	w/60°, 45°, 30° edges
187-907-10	150	w/60°, 45° edges	187-904-10	6	w/60°, 45° edges
187-908-10	300	w/60°, 45° edges	187-906-10	12	w/60°, 45° edges

**Bevel Protractor
SERIES 187**

- Consists of three sheets of stainless steel, the middle one of which is made for angle measurements.



187-201

SPECIFICATIONS

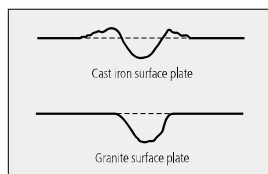
Code No.	Blade length (mm)	Range	Graduation	Blade edge angle	Mass (g)	Remarks
187-201	137	90°x4 (360°)	5' (0° to 90° to 0°)	30° and 60°	260	w/60°, 30° edges

Typical application

Reference Gages

Black Granite Surface Plates SERIES 517

- The plates are made of natural granite that is uniform in structure and largely averse to deterioration. (Natural stones may have unique patterns on their surface.)
- Granite surface plate has many advantages over cast iron surface plates: Twice as hard as cast iron.
- Free from wringing effects, so there is no interruption of work.
- Free from burrs or protrusions because of the fine grain structure and insignificant stickiness; this ensures a high degree of flatness over a long service life and causes no damage to other parts or instruments.
- Use these plates in a stable temperature environment. Since flatness error occurs when there is a temperature difference between the working surface and the underside, avoid working in direct sunlight. Also, do not place a plate in the vicinity of an air conditioner or heater. (Recommended environment: Temperature 20 ± 1 °C, Humidity 58 ± 2 %)



1000×750 mm



600×600 mm

Machining of optional through holes, screw bushings, etc.

Through holes and screw holes (bushings) can be machined to order on surface plates. For detailed information, contact the nearest Mitutoyo sales office.



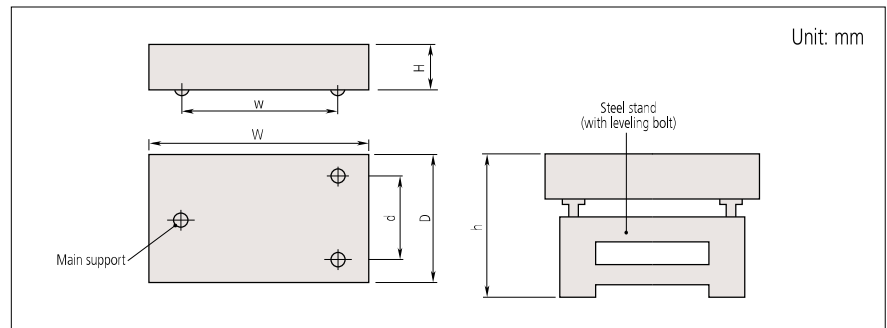
SPECIFICATIONS

Code No.	Grade	Size (mm)			Flatness (μm)	Mass (kg)	Optional stands for black granite surface plates			h (mm)
		WxDxH	d	w			Standard type	with safety frame	with casters (with safety frame)	
517-401-4	00	300×300×100	240	240	2	27	—	—	—	—
517-301	0				3					
517-101	1				5					
517-411-4	00	450×300×100	240	390	2	40	—	—	—	—
517-311	0				3					
517-111	1				6					
517-414-4	00	600×450×100	370	500	2.5	80	517-203-2	517-203R	517-203CR	755 to 775
517-314	0				4					
517-114	1				8					
517-403-4	00	600×600×130	500	500	2.5	140	517-204-2	517-204R	517-204CR	755 to 775
517-303	0				5					
517-103	1				8					
517-405-4	00	750×500×130	420	630	3	146	517-205-2	517-205R	517-205CR	755 to 775
517-305	0				5					
517-105	1				9					
517-407-4	00	1000×750×150	630	700	3	337	517-206-2	517-206R	517-206CR	755 to 775
517-307	0				6					
517-107	1				12					
517-409-4	00	1000×1000×150	700	700	3.5	450	517-207-2	517-207R	517-207CR	735 to 775
517-309	0				7					
517-109	1				13					
517-413-4	00	1500×1000×200	700	1100	4	900	517-208-4	517-208R	517-208CR	735 to 775
517-313-4	0				8					
517-113-4	1				16					
517-410-4	00	2000×1000×250	700	1500	4.5	1500	517-209-4	517-209R	517-209CR	735 to 775
517-310-4	0				9.5					
517-110-4	1				19					
517-416-4	00	2000×1500×300	1100	1500	5	2700	517-210-4	517-210R	517-210CR	735 to 775
517-316-4	0				10					
517-116-4	1				20					
*1	00	2000×2000×350	1500	1500	5.5	4200	—	—	—	700 to 706*2
*1	0				11					
*1	1				22					
*1	00	3000×1500×400	1100	2000	6.5	5400	—	—	—	700 to 706*2
*1	0				12.5					
*1	1				25					
*1	00	3000×2000×500	1500	2000	7	9000	—	—	—	700 to 706*2
*1	0				13.5					
*1	1				27					

*1 2000×2000 or larger is available by special order. Consult your local Mitutoyo sales office.

*2 Distance from the bottom of the large granite plate block mount to the granite plate top surface.

DIMENSIONS



SPECIFICATIONS: Main and auxiliary supports for large surface plates

Code No.	Applicable surface plates
	Size (WxDxH) (mm)
06AAY174	2000×2000×350
06AAY175	3000×1500×400
06AAY176	3000×2000×500