



Calibration Certificate

ZERO CERA Blocks

Ultra-low Expansion Ceramic Gauge Blocks

These are ultra-low expansion ceramic gauge blocks.

The ZERO CERA Blocks offer you the following benefits:

- Thermal expansion at 20 ± 1°C is less than 1/500 that of steel.
- There is almost no secular change either in the dimension or coefficient of thermal expansion.
- You will find them light and easy to handle.
- They are rust free.
- They are magnetisation free.



Specifications

Standard accessories	Inspection certificate, Calibration certificate and custom-made aluminium case
Material	Ultra-low thermal expansion fine ceramic 826HV10*2
Grade*1	K
Coefficient of thermal expansion	0 ± 0,02 × 10 ⁻⁶ /K (at 20°C)*2
Density*2	2,5 g/cm ³

*1

If you require a grade other than K, please contact Mitutoyo.

*2

Value claimed by the material supplier.

Metric

No.	Accuracy	Remarks
516-771-60	EN ISO 3650, Grade K	Below set

No.	Accuracy	Length [mm]
617673-016	EN ISO 3650, Grade K	30
617675-016	EN ISO 3650, Grade K	50
617681-016	EN ISO 3650, Grade K	100
617682-016	EN ISO 3650, Grade K	200
617683-016	EN ISO 3650, Grade K	300
617684-016	EN ISO 3650, Grade K	400
617685-016	EN ISO 3650, Grade K	500
617840-016	EN ISO 3650, Grade K	600
617841-016	EN ISO 3650, Grade K	700
617843-016	EN ISO 3650, Grade K	800
617844-016	EN ISO 3650, Grade K	900
617845-016	EN ISO 3650, Grade K	1000

Characteristics comparison of gauge block materials

	ZERO CERA BLOCK	Low expansion glass	CERA BLOCK	Steel	Tungsten carbide
Coefficient of thermal expansion (10 ⁻⁶ /K)	0 ± 0,02 *2) *3)	0 ± 0,02 *2) *3)	9,3 ± 0,5	10,8 ± 0,5	5,5 ± 1
Thermal conductivity (W/m*K)	3,7	1,7	2,9	54,4	79,5
Specify gravity	2,5	2,55	6	7,8	14,8
Young modulus (GPa)	130	90	206	206	618
Poisson ratio	0,3	0,25	0,3	0,3	0,2
Flexural strength (3 points) (MPa)	210	143	1270	1960	1960
Fracture toughness (MPa*m ^{1/2})	1,2	0,69 *4)	7	120	12
Vickers hardness (HV)	826 *3)	680	1350	800	1650

1) Material for Mitutoyo Products

2) Value at 20°C

3) Claimed value by the material supplier

4) Value measured by the material supplier (reference)