ZERO CERA Blocks

Ultra-low Expansion Ceramic Gauge Blocks

- Thermal expansion at 20 ±1°C less than 1/500 that of steel.
- Almost no secular change both in dimension and coefficient of thermal expansion.
- Light and easy to handle.
- Rust free
- Magnetization free

Calibration certificate

Specifications

Appearance	Rectangular black
Coefficient of thermal expansion*2	0 ± 0.02 x 10^{-6}/K (at 20°C)
Density*2	2.5 g/cm^3
Grade*1	K
Material	Ultra-low thermal expansion fine ceramic
Standard accessories	Inspection certificate, Calibration certificate and custom-made aluminium case
Applicable Standards pcs.	ISO/JIS/DIN and ASME
Vickers hardness*2	826HV10 (by JIS R 1610 "Testing Method for Vickers Hardness of High Performance Ceramics")

*1 : If you require a grade other than K, please contact Mitutoyo.
*2 : Value claimed by the material supplier.

No.	Length (mm)
617673-016*	30
617675-016*	50
617681-016*	100
617682-016*	200
617683-016*	300
617684-016*	400
617685-016*	500
617840-016*	600
617841-016*	700
617843-016*	800
617844-016*	900
617845-016*	1000
516-771-60*	Above set

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 ± 1.0
Thermal conductivity (W/m*K)	3.7	1.7	2.9	54.4	79.5
Specify gravity	2.5	2.55	6.0	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)