

Calibration standards made of Low Thermal Expansion Ceramics

" NEXCERA™ "

The calibration standard is a very important tool for correcting mechanical positioning tolerances for Coordinate Measuring Machine(CMM), X-ray CT scanner and other precision equipment.

NEXCERA™ has the following characteristics that make it well suited for the calibration standards, and is used in Japan and around the world.

1. Nearly zero thermal expansion at room temperature
2. High dimensional stability in the face of aging, temperature and orientation change
3. High precision machining possible
4. Rustless
5. Easy handling (Light weight)

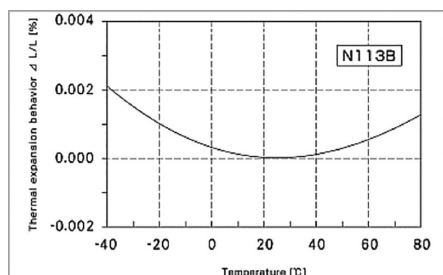


Fig.1 Thermal expansion behavior

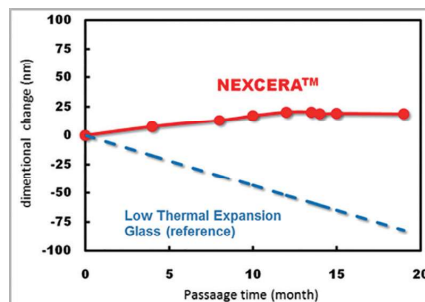


Fig.2 Long-term dimensional change (200mm sample)

Table1 Comparison of physical properties with varial materials

LTEG: Low Thermal Expansion Glass
A7075 : Aluminium alloy (ASTM No. 7075)

Code	unit	NEXCERA		Reference		
		N113B	N117B	LTEG	invar alloy	A7075
Bulk Density	g/cm ³	2.50	2.55	2.56	8.15	2.8
Young's Modulus	GPa	130	140	90	135	71
Specific Stiffness	GPa/(g/cm ³)	52	55	36	17	25
Thermal Expansion Coefficient	X10 ⁻⁶ /°C 23°C	< 0.03	< 0.03	< 0.02	1	23

Applications

Used as calibration standards for CMM, X-ray CT scanners and other precision equipment.



photo1 Hole plate

Hole precision
Roundness <2 μm
Cylindricity <2 μm
Roughness Ra<0.05 μm

size : □310~□610mm



photo2 Step gauge

Step precision
Flatness <1 μm
Parallelism <2 μm
Roughness Ra<0.2 μm

size : ~1000mm



photo3 Hole bar



photo4 Sphere standard



photo5 Daily check tool