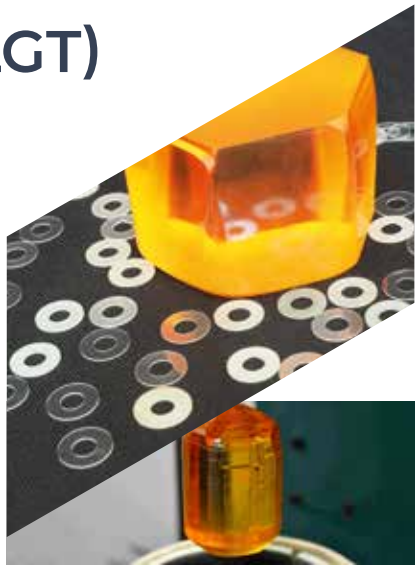
CRYSTAL INNOV
Tailored for tech performance

LANGATATE (LGT)



Langatate (or LGT) is a piezoelctric material that belongs to the same symmetry class as quartz. This is an advantage as all the well-known models developed on quartz can be easily transfered.

It is a very stable material (mechanical and chemical) without any phase transition up to its melting temperature (~1500°C) which allows the use of langatate for harsh environment and also for the high temperature steps sometimes required during the fabrication of components.

In addition, langatate is a non-pyroelectric and non-ferroelectric material. Its factors of merit make an excellent candidate for various applications : direct piezoelectric sensors, SAW sensors, resonators, transductors, actuators.

	Langatate (LGT)*
Chemical formula	$La_3Ga_{5.5}Ta_{0.5}O_{14}$
Density	6,13 g cm^{-3}
Melting temperature	~1500°C
Symmetry Class	32
Lattice parameters (at room temperature)	a = 8,229 Å, c = 5,123 Å
Mohs Hardness	~6,5
Coefficients of thermal expansion (Cristal Innov measurement)	$a_a = 7,9x10^{-6}$ $a_c = 6,4x10^{-6}$
Piezoelectric constants* * rom Bohm et al, 2000; signs depend on the chosen convention for X+ axis	d_{11} =7,06 pC/N d_{14} = - 4,32 pC/N
Relative permittivity	$Ɛ_{11}$ = 19,9 $Ɛ_{33}$ = 79,1
Resistivity Ω.cm (measured in air)	$4\text{-}5x10^{14}$
Elastic Modulus (Gpa) (source : Davulis and Pereira da Cunha, 2013)	C_{11} = 192 C_{12} = 111 C_{13} = 103 C_{14} = 13,8 C_{33} = 264 C_{44} = 51

CUTTING AND WAFERING

Orientation	X, Y and Z : precision down to 5' Single and double rotation possible upon request
Dimensions	Wafers : up to 2" - Squares : up to 1,5"
Surface	Polished or lapped
Thickness	From 0,4 to a few mm upon request
Flats	Any orientation X,Y, Z with precision down to 5' - Any dimensions.

MICRO MACHINING - RINGS

Orientation	X, Y, Z : precision down to 5'
Dimensions	External diameter : 5-20 mm. Precision down to 0,05 mm. Internal diameter : 2-15 mm. Precision down to 0,05 mm.
Surface	Lapped : roughness 0,1-0,7 µm
Thickness	0,4-0,8 mm. Precision down to 0,04 mm.
Flats	Any orientation X, Y, Z. Precision down to 1°
Coatings	Thickness precision in the range of 20%.

Precision Crystal Engineering
From quartz to LGT, we design and produce synthetic crystals and parts tailored for aerospace, defense, energy, and sensor technologies.

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