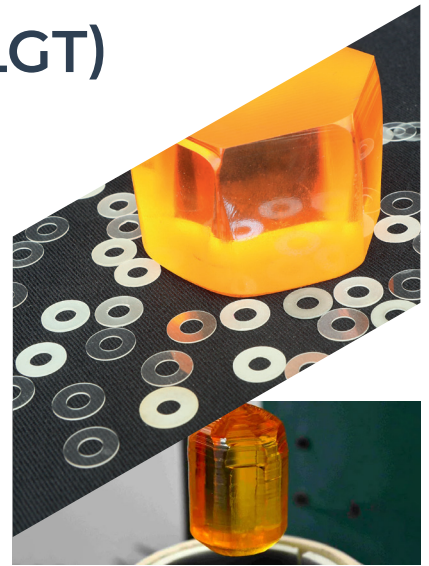


Langatate (or LGT) is a piezoelectric material that belongs to the same symmetry class as quartz. This is an advantage as all the well-known models developed on quartz can be easily transferred.

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, transducers, actuators.



	Langatate (LGT)*
Chemical formula	$\text{La}_3\text{Ga}_{5,5}\text{Ta}_{0,5}\text{O}_{14}$
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* <small>* rom Bohm et al, 2000; signs depend on the chosen convention for X+ axis</small>	d ₁₁ = 7,06 pC/N d ₁₄ = - 4,32 pC/N
Relative permittivity	ε ₁₁ = 19,9 ε ₃₃ = 79,1
Resistivity Ω.cm (measured in air)	4-5x10 ¹⁴
Elastic Modulus (Gpa) <small>(source : Davulis and Pereira da Cunha, 2013)</small>	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%.

CRYSTALS > SUBSTRATES & PROCESSES