

GGG 钆镓石榴石 Gadolinium Gallium Garnet

简介 Introduction:

GGG 和 SGGG 都应用于衬底液体外延生长。钆镓石榴石 (GGG) 是用于磁光薄膜的专用基片。在光通讯设备中, 需大量使用 1.3 μ 及 1.5 μ 的光隔离器, 其核心部件为置于磁场中的 YIG 或 BIG 膜。

不同切向的 GGG 单晶基片可以做到与这类磁光材料晶格的匹配, 从而保证 YIG、BIG 薄膜成功的外延生长。GGG 良好的物理、机械性能和化学稳定性也保证薄膜制备过程中对膜的各项要求。而 SGGG 即钙镁锆掺杂钆镓石榴石, 是铋铁石榴石外延膜的极佳衬底材料。

在磁制冷行业, GGG 成功应用在 20K 以下温区, 用于市场 HeII 流以及氦氮液化前级制冷。

GGG, SGGG and NGG Garnets are used as substrates for liquid epitaxy. GGG substrate is dedicated substrates for magneto-optical film. In the optical communication devices, require a lot of using 1.3 μ and 1.5 μ optical isolator, its core component is the YIG or BIG film been placed in a magnetic field.

GGG single crystal substrates of different tangential, which can achieve the best lattice match with this magneto-optical material, thus ensuring the YIG, BIG film epitaxial growth be successful. It has good physical and mechanical properties and chemical stability. And SGGG (calcium magnesium zirconium doped gadolinium gallium garnet) is an excellent substrate material for bismuth iron garnet epitaxial films.

GGG has been successfully applied in the magnetic refrigeration industry in the temperature zone below 20 K for market HeIII flow and helium-nitrogen liquefaction pre-stage refrigeration.

主要优点 Main Advantages:

低光学损耗 (< 0.1%/厘米)

高导热性 (7.4W m-1K-1)

高激光损伤阈值 (± 1 GW/cm²)

Low optical losses (< 0.1%/cm)

High thermal conductivity (7.4W m-1K-1)

High laser damage threshold (> 1GW/cm²)



材料特性 Material Properties:

材料 Material	GGG	SGGG
分子式 Chemical Formula	Gd ₃ Ga ₅ O ₁₂	Substituted Gd ₃ Ga ₅ O ₁₂
晶体结构 Crystal Structure	立方晶系 Cubic	立方晶系 Cubic
晶格常数 Lattice Constant	a=12.383 Å	a=12.497 Å
生长方法 Growth Method	Czochralski	Czochralski
硬度 Hardness	8.0	7.5
密度 Density	7.13g/cm ³	7.09g/cm ³
熔点 Melting Point	1725°C	1730°C
反射系数 Refractive Index	1.954 at 1064nm	1.954 at 1064nm

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尺寸 Dimensions	Max 101.6mm(4 inches)
厚度 Thickness	0.5mm /1mm 可定制 Other thickness upon request
抛光 Polishing	单面或双面 Single or double sides polishing
晶向 Orientation	<111>±0.2°
边缘定向精度 Redirection the Edge	2° (特殊要求可达到 1°以内/special in 1°)
表面粗糙度 Ra	Ra≤1nm, EPI ready
斜切晶片 Angle of Crystalline	可根据要求定制 Special size and orientation are available upon request

备注：以上参数为参考数据，具体产品技术要求请联系销售人员确认。

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