



## Tm:YAG

Tm:YAG crystal is an excellent laser crystal for AlGaAs diode pumping, emitting 2μm eye-safe laser. It has superior optical and thermal properties, comes in various forms, and is widely used in medical, industrial, and meteorological fields.

Classification: [Laser Crystals](#)

## Detailed introduction

Tm:YAG(Tm<sup>3+</sup>:YAlO<sub>3</sub>) crystal is an excellent laser crystal for AlGaAs diode pumping, emitting 2μm eye-safe laser. It has superior optical and thermal properties, comes in various forms, and is widely used in medical, industrial, and meteorological fields.

### PRODUCT FEATURE

- Operates in 2μm eye-safe band with high quantum efficiency
- High LD pumping efficiency and stable optical-thermal performance
- Customizable in multiple forms with short cycle and controllable cost

|                      |                                            |
|----------------------|--------------------------------------------|
| Specifications       |                                            |
| Material             | Tm:YAG                                     |
| Concentration        | 0.5~5at%                                   |
| Orientation          | <111>±5°                                   |
| Dimension            | Φ2~10mm, L:3~150mm                         |
| Dimension Tolerance  | Φ±0.00/-0.05mm, L:±0.5mm                   |
| Barrel Finish        | Precision Grinding, Polishing or Threading |
| Parallelism          | ≤10"                                       |
| Perpendicularity     | ≤5'                                        |
| Flatness             | ≤λ/8 @632.8nm                              |
| Surface Quality      | 10/5                                       |
| Chamfer              | 0.15±0.05mm                                |
| Wavefront Distortion | ≤0.125λ/25mm @632.8nm                      |
| Coating              | ARcoating:≤0.25% @2μm                      |

|                                         |                                                           |
|-----------------------------------------|-----------------------------------------------------------|
| Optical properties                      |                                                           |
| Laser Transition                        | <sup>3</sup> F <sub>4</sub> → <sup>3</sup> H <sub>6</sub> |
| Laser Wavelength                        | 1.87~2.16μm                                               |
| Fluorescence Lifetime                   | 11ms                                                      |
| Diode Pumping Bands                     | 680nm, 785nm                                              |
| Absorption Cross Section                | 7.5×10 <sup>-21</sup> cm²                                 |
| Emission Cross Section                  | 2.9×10 <sup>-20</sup> cm² @2013nm                         |
| Refractive Index                        | 1.83 @632nm                                               |
| Refractive Index Temperature Dependence | 7.3×10 <sup>-6</sup> /K                                   |

|                                  |                               |
|----------------------------------|-------------------------------|
| Physical and Chemical Properties |                               |
| Crystal Structure                | Cubic                         |
| Lattice Constant                 | 12.01Å                        |
| Melting Point                    | 1970°C                        |
| Mohs Hardness                    | 8.5                           |
| Density                          | 4.56±0.04g/cm³                |
| Specific Heat                    | 0.59J/g·°C                    |
| Elastic Modulus                  | 310GPa                        |
| Poisson's Ratio                  | 0.25~0.3                      |
| Thermal Expansion Coefficient    | <100>8.2×10 <sup>-6</sup> /K, |
|                                  | <110>7.7×10 <sup>-6</sup> /K, |
|                                  | <111>7.8×10 <sup>-6</sup> /K  |
| Thermal Conductivity             | 14W/mK @20°C, 10.5W/mK @100°C |
| Thermo-Optic Coefficient         | 7.3×10 <sup>-6</sup> /K       |

Keywords: YAG

Previous: [Nd:Ce:YAG](#)

Next: [Ho:YAG](#)