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# Crylink Nd:YLF

## For High Energy Lasers

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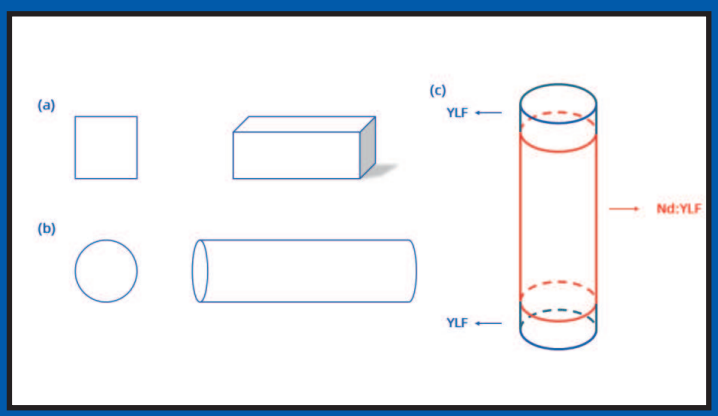
## Crylink Nd:YLF · Superior Quality

Crylink, as one of the world's leading manufacturers of Nd:YLF crystals, leverages its independently developed advanced crystal growth technology to stably produce crystal blanks with doping concentrations ranging from 0.5% Nd at to 2.0% Nd at.

Nd:YLF crystals feature exceptionally broad fluorescence linewidths (485 μs at 1% Nd doping concentration), long upper-level lifetimes, linearly polarized output, and natural birefringence significantly greater than stress-induced birefringence.

Crystal Growth Furnace for CZ Methond

## Crylink Nd:YLF · Product Type



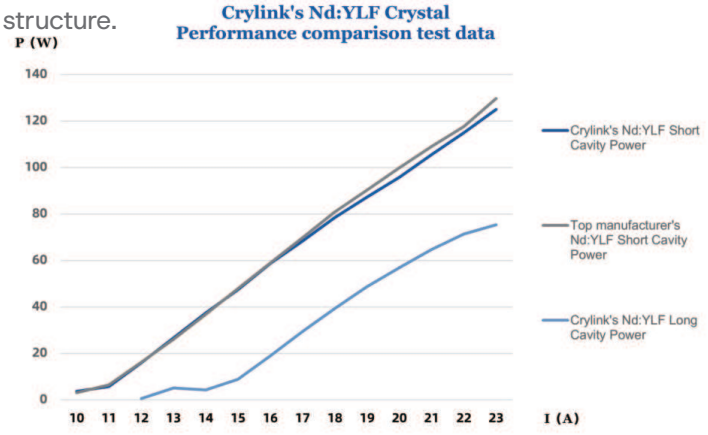

Crylink's standard Nd:YLF crystal products are designed as dual-pass coated rods. Users can integrate these crystal rods with upstream LD pump modules or side-pumping systems to achieve high-energy pulse laser outputs ranging from hundreds of millijoules to joules.

Additionally, we offer customized crystal solutions tailored to specific user requirements, such as block-shaped crystals and bonded structures like YLF + Nd:YLF + YLF, ensuring optimal performance and application outcomes.

## Crylink Nd:YLF · Product Performance

Crylink's Nd:YLF crystals are renowned for their exceptionally broad fluorescence linewidth and low thermal lensing effect, making them ideal for high-power, high-energy laser systems. These advantages enhance the lasers' performance and help optimize their internal structure.

Specifically, laser systems based on Nd:YLF crystals typically require only a single-stage amplification to achieve performance on par with or surpass the effects of three to four-stage laser amplification systems based on Nd:YAG crystals. The following chart compares the performance of Crylink's Nd:YLF crystals with that of the top global crystal manufacturers.

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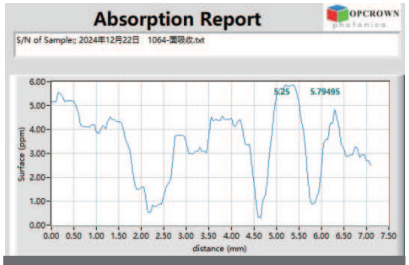
## Crylink Nd:YLF · Test on Inner Quality

Crylink has established a dedicated laser testing platform to evaluate the internal quality of Nd:YLF crystals. The Agilent spectrophotometer is used to measure their absorption and transmittance, to determine crystal's doping concentration and the consistency of the concentration gradient.

Additionally, the laser-induced weak absorption meter (LID) is employed to test the weak absorption coefficient of the crystal's interior using efficient and precise laser irradiation techniques. This ensures that every crystal meets high standards of internal quality.

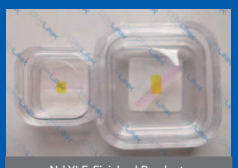
Test Weak Absorption within Nd:YLF Crystal by LID Absorption Measurement




Weak Absorption Report for the End Faces of Nd:YLF @1064nm

## Crylink Nd:YLF · Test on Production Process

ZYGO Interferometer

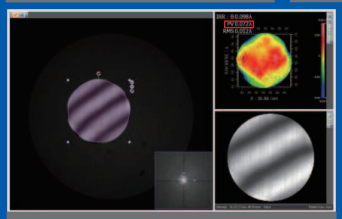


Nd:YLF Finished Product

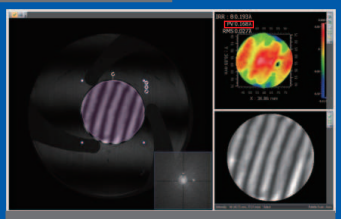
*Crylink's Nd:YLF crystal processing capability is shown in the ZYGO assay data (PV value):

Flatness < λ/12@633nm;

Wavefront distortion < λ/6@633nm



The Measurement Result of Nd:YLF Flatness



The Measurement Result of Nd:YLF Wavefront Distortion

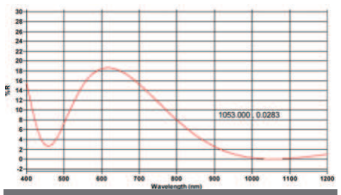
Crylink adheres to the ISO production system, implementing strict standards at every stage of the manufacturing process. We utilize an interferometer to precisely measure the surface roughness of Nd:YLF crystals with nanometer-level, non-contact accuracy, after each phase of processing.

Additionally, a Zygo interferometer is employed to assess the flatness and wavefront distortion of the crystals, enabling precise quantification of minute surface defects and irregularities.

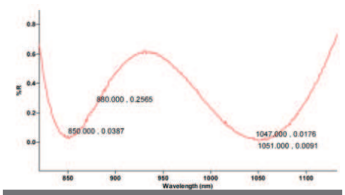
## Crylink Nd:YLF · Test on Coating

Crylink conducts rigorous final product testing on Nd:YLF crystals. We use a surface profilometer to precisely measure the thickness and uniformity of the crystal's thin film. By creating steps and scanning surface height variations, we ensure the film meets the designed specifications.

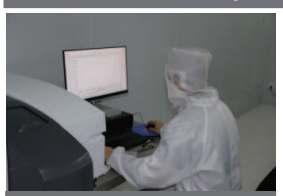
An Agilent spectrophotometer is employed to measure the transmittance and reflectance of the crystals. Additionally, some samples were sent to third-party testing organizations, such as LIDARIS, Spica, and SIOM, for damage threshold testing. This ensures the reliability and performance of the Nd:YLF crystal's coated surfaces.



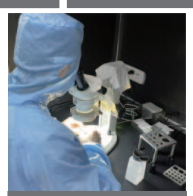

Transmittance of Nd:YLF Coating@1053nm




Transmittance of Nd:YLF Coating @1047nm



Agilent Spectrophotometer



Wiping Nd:YLF Coating Surface

*Crylink's transmittance of the coated surface of Nd:YLF crystals is shown in the spectrophotometer testing data below:

R<<0.1% @1053nm&1047nm

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# Crylink Nd:YLF · Properities Index

| Physical and Chemical Properties of Nd:YLF | |
|---|---|
| Properties | Value |
| Chemical Formula | Nd:LiYF4 (Nd:YLF) |
| Crystal Structure | Tetragonal |
| Thermal Conductivity | 6.3$Wm^{-1}K^{-1}$ |
| Thermal Expansion Coefficient | 13.3x$10^{-6}$/K(⊥c)<br>8.3x10-6/K(//c) |
| Melting Point | 819℃ |
| Mohs Hardness | 5Mohs |
| Doping Concentration | 0.5%Nd~2%Nd |

| Optical Properties of Nd:YLF | |
|---|---|
| Absorption Peak Wavelength | 792nm |
| Peak absorption coefficient (1.2%Nd at) | α=10.8 $cm^{-1}$(//c)@972nm<br>α=3.59 cm-1 (⊥c)@972nm |
| Emission Peak Wavelength | 1047nm(π polarization)<br>1053nm(σ polarization) |
| Emission Cross Section | 15×$10^{-20}$$cm^2$(//c)@1047nm<br>10×10-20 cm2 (⊥c) @1053nm |
| Fluorescence Lifetime (1%Nd at) | 485μs |
| Scatter Losses (1%Nd at) | ＜0.2% /cm |

# Crylink Nd:YLF · Standard Product

| Crystal Type | Concentration | Diameter(mm) | Length(mm) | Coating | Damage Threshold |
|---|---|---|---|---|---|
| Nd:YLF | 0.6%Nd at | 3 | 95 | AR/AR@ 1053nm | ＞10J/$cm^2$ @1064nm,10ns,10hz |
| | | 4 | 95 | | |
| | | 5 | 105 | | |
| | 0.8%Nd at | 3 | 120 | | |
| | | 4 | 120 | | |
| | | 5 | 120 | | |
| | | 4 | 150 | | |
| | | 5 | 150 | | |

*The above is part of the standard product information, please contact sales for details:(+86 021-66566068/sales@crylink.com)

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SUBSCRIBE

Note: All information and specifications in this product manual are subject to change at any time without notice. We reserve the right to make improvements and changes to our products and services. All test data is for reference only and actual performance may vary depending on specific applications and conditions of use.

Follow us on social media to get more information about Nd:YLF Crystal

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