

# APG-760 Phosphate Laser Glass

For High Power Applications at 1.05  $\mu\text{m}$

## Product information

APG-760 is the next generation of our advanced laser glasses with increased thermo-mechanical properties. It is recommended to be used as active material in laser systems with high repetition rates. The glass will be available in doping levels from 1 % to 4 % Nd<sup>3+</sup>. All properties displayed are exemplary for all doping levels, if not otherwise indicated.

## Applications

- High Power Applications
- Material processing

## Quality assurance

Quality control is carried out under rigorous final inspection of the finished component. Selected glass properties and doping levels are measured for every melt. Measurements include chemical composition control, a range of photometric measurements, physical property test and inspection of inner quality.

## Forms of supply

The glass is available as fully finished components, such as rods, slabs and discs, manufactured according to customer specifications including dielectric coatings (AR, HR, etc.) with high laser damage threshold. Please contact us to find out which of the various doping levels are available from stock according to your needs.

## Application support

Please contact us with your laser components specification. Our experienced expert application team will find the right solution for your application.



### Laser Properties (Calculated, Judd-Ofelt)

Emission Peak $\lambda$ [nm]	1054
Effective Linewidth [nm]	29.2
Linewidth FWHM [nm]	24.9
Radiative Lifetime $\tau_{\text{rad}}$ [ $\mu\text{s}$ ]	376
Emission Cross Section $\sigma_{\text{em}}$ [ $10^{-20} \text{ cm}^2$ ]	3.2

### Optical Properties

$n_d$	1.5328
$v_d$	68.54
$n_2$ [ $10^{-20} \text{ m}^2/\text{W}$ ] (calc.)	3.01
$dn/dT_{\text{rel.}}$ (1060 nm, 20°–40°C) [ $10^{-6}/\text{K}$ ]	1.9
$n_{1054 \text{ nm}}$ (calc. from Sellmeier)	1.5232
$n_{633 \text{ nm}}$ (calc. from Sellmeier)	1.5312
Stress Optical Coefficient K [ $10^{-6} \cdot \text{mm}^2/\text{N}$ ] (588 nm)	2.33

**Sellmeier Coefficients**

B1	0.85792298	C1	0.00455294
B2	0.46272994	C2	0.01471901
B3	0.96370235	C3	104.406880

**Attenuation Coefficient [cm<sup>-1</sup>]**

400 nm	≤ 0.20	3333 nm	≤ 2.00
1054 nm	≤ 0.0015		

**Physical Properties**

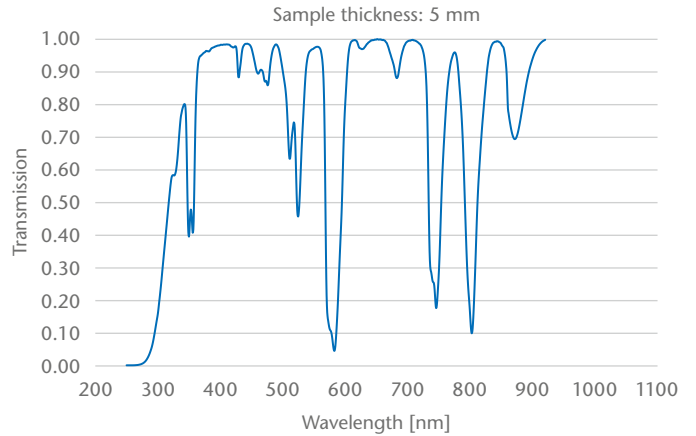
Density ρ [g/cm <sup>3</sup> ]	2.70
Thermal Conductivity λ <sub>25°C</sub> [W/(m·K)]	0.76
Thermal Conductivity λ <sub>90°C</sub> [W/(m·K)]	0.83
Young's Modulus E [10 <sup>3</sup> N/mm <sup>2</sup> ]	74
Poisson's Ratio μ	0.24
Fracture Toughness, K <sub>1C</sub> [MPa·m <sup>1/2</sup> ]	0.73
Knoop Hardness HK <sub>0.1/20</sub>	472
Heat Capacity c <sub>p, 20°C</sub> [J/(g·K)]	0.77
Thermal Expansion α <sub>(+20/+300°C)</sub> [10 <sup>-6</sup> /K]	8.9
Thermal Expansion α <sub>(+20/+40°C)</sub> [10 <sup>-6</sup> /K]	6.1
Transformation Temperature T <sub>g</sub> [°C]	520

**Chemical Properties**

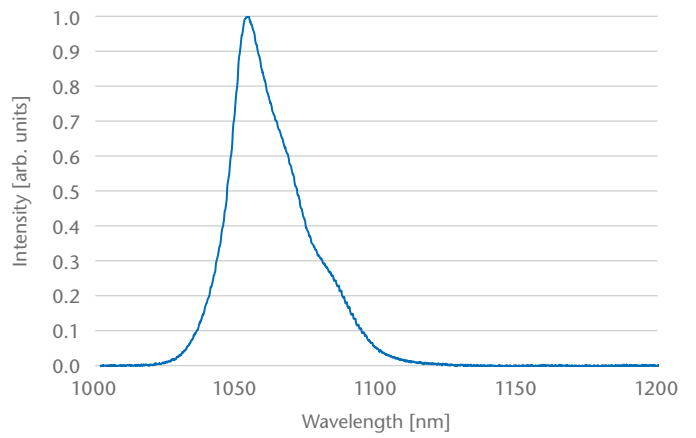
Weight Loss in 50 °C Water [mg/(cm<sup>2</sup> d)]

SR	2.3
AR	3.3
FR	0
CR	1

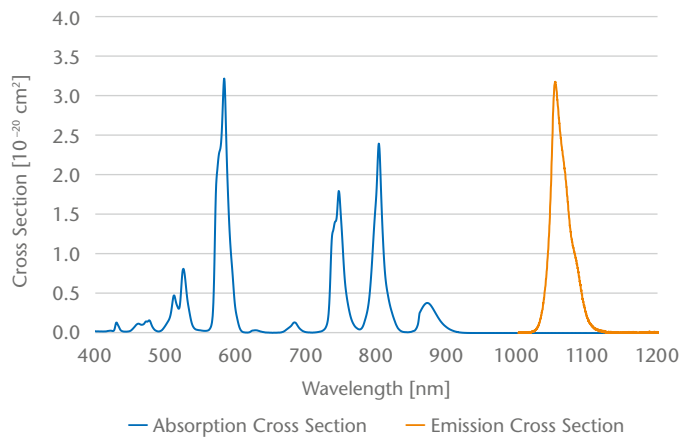
**Transmission Curve**



**Fluorescence Curve**



**Cross Section**



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