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COATINGS ON LASER RODS

- AR coatings on laser rods with
 - High laser damage thresholds (Our coatings are used in industrial high power Q-switch and cw lasers of several laser manufacturers.)
 - Low residual reflectivities (<0.1% at 808nm on Nd:YAG)
- Broadband and multiple wavelength AR coatings
- HR and HR/HT-coatings for compact laser designs (e.g. HR (532 + 1064nm) + HT (808nm) on Nd:YVO₄ for diode pumped and frequency doubled "green" lasers)
- Maximum rod length: 180mm
- Variable substrate holders

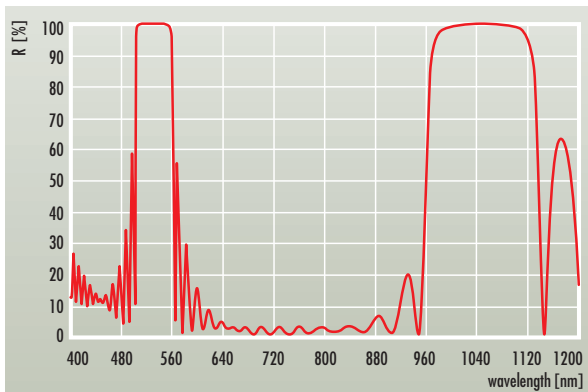


Figure 1: Calculated reflectance spectrum of a dual HR mirror for 532nm and 1064nm with a HT region around 808nm for pumping with a laser diode (on Nd:YAG)

COATINGS ON NONLINEAR OPTICAL CRYSTALS

- AR coatings even on slightly hygroscopic nonlinear optical crystals (e.g. LBO)
- Broadband and multiple wavelength AR coatings
- HR and HR/HT-coatings for compact laser designs (e.g. HR (1064nm) + HT (532nm) on KTP for frequency doubled Nd:YAG or Nd:YVO₄ lasers)
- Coating of crystals with variable sizes and shapes

All coatings are produced by magnetron sputtering thus showing very low straylight losses and a high thermal and climatical stability of the optical parameters.

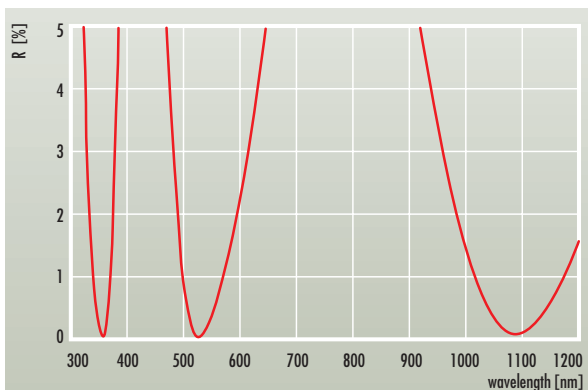


Figure 2: Calculated reflectance spectrum of a triple AR coating for 355nm, 532nm and 1064nm on LBO

Laser applications using crystal optics have reached a high standard in industry and research. Optical coatings on crystals are an essential part of modern laser designs and cover the wide range from single wavelength AR coatings on laser and nonlinear optical crystals up to complex multilayer coatings providing several high-reflectance and high-transmittance wavelength ranges and thus replacing external laser mirrors.

The quality of coatings on crystals depends on the coating technique as well as on the surface quality of the crystal. The rapid progress in crystal growth techniques resulted in a wide variety of new crystals for laser applications, e. g. laser crystals as several tungstanates and vanadates or nonlinear optical crystals as RTP. Every crystal requires optimized polishing procedures and coating techniques. Besides the optical properties, especially the thermal expansion coefficients and the surface quality after storage and transport influence the coating quality. Especially hygroscopic crystals like LBO require special pretreatments to achieve high damage thresholds and long lifetime of the coatings. Thus, coatings on new crystals always require experimental investigations to find the best coating procedures.

The following table gives an overview about the crystals which have already been coated at LAYERTEC and about the types of layer systems which have been manufactured.

Crystal type	AR / BBAR	Single HR optional with HT	Double HR / BBHR optional with HT
Nd:YAG	x	x	x
Ho:YAG	x	x	
Er:YAG	x	x	
Nd:YVO ₄	x	x	x
Nd:LSB	x	x	x
Nd:GGG	x		
Nd:YALO (YAP)	x		
Nd:Cr:GSGG	x	x	
Ti:Sapphire	x	x	
Yb:KGW	x	x	
Ruby	x	x	
KTP	x	x	
LiNbO ₃	x		
CTA	x		
LMA	x		
LBO	x		
YLF	x	x	
KTA	x	x	
CaCO ₃	x		

Every coating run will be performed with detailed measurement data sheets. Do not hesitate to contact us for any special problem.