

4.7. Passive Q-Switch Crystals



Passive Q-switches or saturable absorbers provide high power laser pulses without electro-optic Q-switches, thereby reducing the package size and eliminating a high voltage power supply. We offer a wide range of solid state saturable absorbers such as $\text{Co}_2^+:\text{MgAl}_2\text{O}_4$, $\text{Cr}_4^+:\text{YAG}$ or others.

4.7.1. Cr:YAG Passive Q-Switch Crystals

$\text{Cr}_4^+:\text{YAG}$ is an excellent passive Q-switch crystal for Nd and Yb doped lasers (especially for Nd:YAG, Nd:YLF or Yb:YAG), if the wavelength is in the range of 900-1200 nm.

When Ordering please specify

Shape: rectangular or round

Dimensions: (width x height) or diameter, length mm

Initial transmission

Description of AR coatings on Side 1 and Side 2

Code	Name	Material	Height (mm)	Width (mm)	Length (mm)	Shape	Transmission	Coating	Price	Currency
PAC2	Passive Q-Switch Crystal	Cr:YAG	3	3	1.5	Rectangular	30-99%	AR/AR@1064 nm	73,800	JPY
PAC3	Passive Q-Switch Crystal	Cr:YAG	3	3	4	Rectangular	30-99%	AR/AR@1064 nm	75,000	JPY
PAC7	Passive Q-Switch Crystal	Cr:YAG	4	4	3	Rectangular	30-99%	S1: AR@1064 and HT@1572 S2: HR@1064, R>99,8% + PR85%+/-2%@1572	159,000	JPY
PAC1	Passive Q-Switch Crystal	Cr:YAG	4	4	7	Rectangular	30-99%	AR/AR@1064 nm	129,000	JPY
PAC5	Passive Q-Switch Crystal	Cr:YAG	4		7	Round	30-99%	AR/AR@1064 nm	93,000	JPY
PAC4	Passive Q-Switch Crystal	Cr:YAG	6		3	Round	30-99%	AR/AR@1064 nm	67,800	JPY
PAC6	Passive Q-Switch Crystal	Cr:YAG	8		0.3	Round	30-99%	AR/AR@1064 nm	138,000	JPY

4.7.2. Co:MgAl₂O₄ Passive Q-Switch Crystals

Co₂₊:MgAl₂O₄ is a relatively new material for saturable absorber passive Q-switching in lasers emitting from 1200 to 1600nm, in particular, for eye-safe 1540nm Er:glass laser. High absorption cross section of $3.5 \times 10^{-19} \text{ cm}^2$ permits Q-switching of Er:glass laser without intracavity focusing both with flash-lamp and diode-laser pumping. Negligible excited-state absorption results in high contrast of Q-switch, i.e. the ratio of initial (small signal) to saturated absorption is higher than 10. Finally, excellent optical, mechanical, and thermal properties of the crystal give an opportunity to design compact and reliable laser sources with this passive Q-switch.

Standard specifications
Shape: rectangular or round
Wavelength range: 1200-1600 nm
Damage threshold: 10 J/cm ²
Contrast: >10
Aperture: 5-12 mm
Thickness: 1-5 mm
Initial transmittance: 30-99%
AR coatings at 1540nm or other particular wavelengths

When Ordering please specify
Shape: rectangular or round
Dimensions: (width x height) or diameter, length mm
Initial transmission 30-99%
Description of AR coatings on Side 1 and Side 2

Code	Name	Material	Height (mm)	Width (mm)	Length (mm)	Shape	Transmission	Coating	Price	Currency
PAC11	Passive Q-Switch Crystal	Co:MgAl ₂ O ₄	6			Round	80%	AR/AR@1350 and 1540	132,000	JPY
PAC12	Passive Q-Switch Crystal	Co:MgAl ₂ O ₄	8			Round	92%	AR/AR@1350 and 1540	118,500	JPY
PAC10	Passive Q-Switch Crystal	Co:MgAl ₂ O ₄	9			Round	90%	AR/AR@1350 and 1540	126,000	JPY
PAC13	Passive Q-Switch Crystal	Co:MgAl ₂ O ₄	12.7			Round	90%	AR/AR@1350 and 1540	142,500	JPY

4.7.3. V:YAG Passive Q-Switch Crystals

V₃₊:YAG is a relatively new material for saturable absorber passive Q-switching in lasers emitting from 1060 to 1440nm, in particular, for 1300nm Nd-lasers. Extremely high ground state absorption (GSA) cross section of $7 \times 10^{-18} \text{ cm}^2$ near 1300nm and negligible excited state absorption (ESA) permits Q-switching of 1300 and 1440nm Nd-lasers without intracavity focusing both with flash-lamp and diode-laser pumping. Negligible excited-state absorption results in high contrast of Q-switch, i.e. the ratio of initial (small signal) to saturated absorption is higher than 10. Finally, excellent optical, mechanical, and thermal properties of the host crystal give an opportunity to design compact and reliable laser sources with this passive Q-switch.

Standard specifications
Shape: rectangular or round
Wavelength range: 1000-1450 nm
Damage threshold: 7-10 J/cm ²
Contrast: >10
Aperture: 5-20 mm
Thickness: 1-5 mm
Initial transmittance: 50-99%

When Ordering please specify
Shape: rectangular or round
Dimensions: (width x height) or diameter, length mm
Initial transmission 50-99%
Description of AR coatings on Side 1 and Side 2

Code	Name	Material	Height (mm)	Width (mm)	Length (mm)	Shape	Transmission	Coating	Price	Currency
PAC9	Passive Q-Switch Crystal	V:YAG	9			Round	94%	AR/AR@1350 and 1540	141,000	JPY
PAC8	Passive Q-Switch Crystal	V:YAG	9			Round	90%	AR/AR@1350 and 1540	141,000	JPY