

Reinvent Your Nd:YAG Laser



APPLICATION NOTE # 18

THE APPLICATION

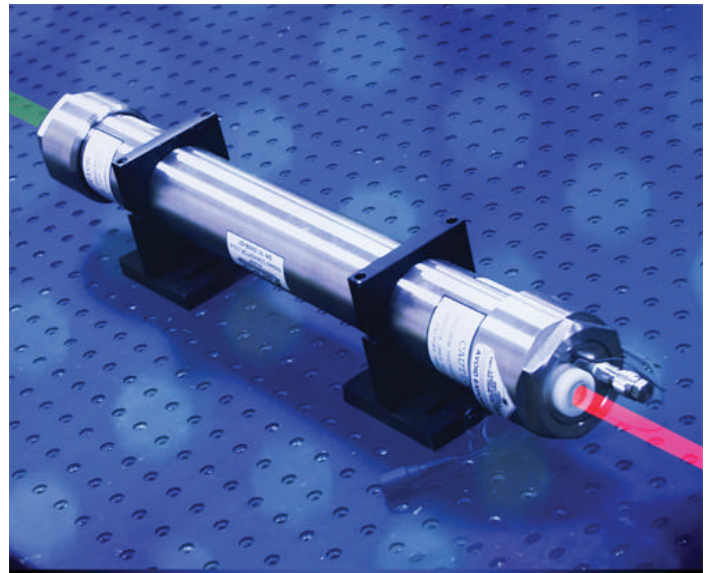
Your fixed wavelength Nd:YAG laser can reach new wavelengths from the deep UV, UV, visible and IR. The Light Age 101 PAL-RCs are a family of state-of-the-art, compact, high pressure Raman converters capable of shifting the output wavelength of your pulsed Nd:YAG laser. This is an easy to use, safe addition to your laser which can increase its wavelength range to allow new capabilities. High output energies with UV, visible and IR can be achieved with most commercial pulsed Nd:YAG lasers. This efficient wavelength convertor can be used with the fundamental (1064 nm) or any of the harmonics (532 nm, 355 nm, 266 nm, 212 nm). Refer to the table below to see some of the available wavelengths.

In the Light Age RC, a unique gas recirculation system minimizes thermo-optic effects, permitting operation at power levels unachievable in any other Raman convertor. This system is easy to setup and optimize due to its integrated optics. Energy efficiencies of 20%-40% to the first Stokes are commonly achieved.

Q-switched laser pulses are focused into the high pressure gas sample and then recollimated by an integral lens system. Output consists of the incident wave number, ν_0 and the Stokes and anti-Stokes laser lines at $\nu_0 \pm n\nu_M$, where ν_M corresponds to the frequency of a Raman-active vibration of the scattering molecule and n takes values 1, 2, 3, ...etc. Stokes output laser radiation at longer wavelengths than the incident beam is recollimated and emitted essentially along the laser beam direction. Anti-Stokes lines at higher frequency are emitted colinearly or along specific directions which are determined by conservation of momentum.

The technical staff at Light Age stands ready to offer their years of laser experience in assisting you to rapidly locate the optimum conditions for matching the Raman convertor to optimum output wavelength.

Applications include: T-jump measurements, deep UV micro-machining, LIDAR, laser induced breakdown spectroscopy, UV resonance Raman, generation of eye-safe wavelengths, ranging, undergraduate laser laboratory demonstrations and many more...



YAG Laser CONTINUED

FEATURES

- Compatible with UV lasers, visible lasers, and Infrared lasers
- Generates VUV, UV, visible, IR by Stokes and antiStokes shifting
- Compatible with all pulsed Nd:YAG lasers at all of the harmonics
- Compatible with many OPO's and/or dye lasers
- Integrated focusing and recollimating optics for effortless laser alignment
- Efficient wavelength conversion at **high average power**
- Can be used with most Raman active gases. Most commonly H₂(4155 cm⁻¹), D₂(2991 cm⁻¹), and CH₄(2914 cm⁻¹)
- Exclusive Internal Gas Recirculation System provides improved laser beam quality, even for > 50 W output powers
- 0.3 m, 0.5 m, and 1.0 m Raman Converter lengths standard
- Compact and convenient...max. diameter only 3 inches
- Stainless steel construction for long term reliability
- Highest pressure range commercially available: 15,000 psi body, 4,000 psi safety relief and 2,500 psi rating
- Extremely rugged...Flight tested
- Simple rapid gas changes. No vacuum pump required
- Data and references for most pulsed lasers available upon request...

GAS	Shift (cm ⁻¹)	1st	2nd	3rd	1st	2nd	3rd
		Stokes (nm)	Stokes (nm)	Stokes (nm)	antiStokes (nm)	antiStokes (nm)	antiStokes (nm)
Fundamental 1064 nm							
H ₂	4155	1907.12	9186.99		737.82	564.7	457.38
D ₂	2991	1560.67	2926.98		807.14	650.17	544.32
CH ₄	2914	1542.14	2800.73		812.18	656.75	551.25
H ₂ (rot)	587	1134.88	1215.88	1309.33	1001.45	945.85	896.1
SHG 532 nm							
H ₂	4155	682.97	953.56	1579.28	435.69	368.91	319.88
D ₂	2991	632.67	780.34	1017.92	458.97	403.57	360.1
CH ₄	2914	629.6	771.07	994.53	460.6	406.09	363.12
H ₂ (rot)	587	549.15	567.44	586.99	515.89	500.73	486.43
THG 355 nm							
H ₂	4155	415.96	502.88	635.71	309.11	273.93	245.94
D ₂	2991	396.75	450.18	520.22	320.65	292.59	269.05
CH ₄	2914	395.55	447.08	514.05	321.45	293.91	270.73
H ₂ (rot)	587	362.21	370.08	378.29	347.43	340.49	333.82
FHG 266 nm							
H ₂	4155	299.05	341.48	397.95	239.53	217.85	199.76
D ₂	2991	288.99	316.34	349.39	246.4	229.48	214.74
CH ₄	2914	288.35	314.8	346.6	246.86	230.3	215.81
H ₂ (rot)	587	270.22	274.57	279.07	261.91	257.94	254.1

Please call Light Age Inc at (732) 563-0600 for references and/or additional information.



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