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Comparable Advantages of Fiber Lasers Over Nd:YAGs

	20 Watt TEM ₀₀ Fiber Laser	50-100 watt Multimode (Lamp or Diode) 20 Watt TEM ₀₀ Diode Nd:YAG Laser
Laser System Laser, Power Supplies, Computer, Software, Q-Switch RF Driver, Scan Head, Control Cards	\$47,500	\$55,000 - \$65,000
Reliability MTBF (Mean Time Between Failure)	50,000 – 100,000 Hours	500 to 1,000 Hours (Lamp-pumped) 10,000 – 20,000 Hours (Diode-pumped)
Consumables	\$0 Note: Fiber laser modules can be repaired – average repair costs range from \$1,000 to \$5,000 USD.	\$2,000 - \$15,000 Lamps: \$100 USD each (average cost) Diode Packs: \$5,000 – 12,000 USD each (average cost)
Power Consumption Two eight hour shifts running 365 days per year at \$0.04 kW	\$39.71 Annually 170W per Hour	\$1,401.60 Annually 6kW per Hour
Maintenance	Cost: \$0.00 <ul style="list-style-type: none"> No maintenance No consumables No cleaning or aligning of mirrors No filters (chiller) No aligning of beam path 	Cost: \$1,500 - \$10,000 USD (Individual results may vary – Diode pumped systems require significant training for replacement procedures) <ul style="list-style-type: none"> Optical path requires frequent adjustments to optimize power output Periodic replacement of flash lamps, diode packs, and solid state crystals Diode pack maintenance requires factory-trained personnel and extended down time Cleaning, replacement, and aligning of laser mirrors
Power Efficiency	Up to 50%	2-3% (0.2% with 3x Nd:YAG)
Beam Quality	Round, concentric Near M ₂ =1 (<1.05)	Not symmetric on both sizes Inferior M ₂
Spot Size	50% smaller than Nd:YAG spot size Requires less power for the same result in comparison with the Nd:YAG system.	Significantly larger than those of a fiber laser. Requires more lasing power to achieve the same result.
Optical Path / Beam Path	Flexible cable Up to 50m	Mirrors, Optical Path Loss of beam quality and significant power drop-off with fiber delivery scan head system
Cooling	Air Cooled	De-ionized (DI) Water
Size	19” Rack Mount Unit	Large Footprint
Chiller	No chiller necessary up to 200 Watt, Q-Switched (pulsed) or CW Cost: \$0	30X Watt to laser output power Cost: \$5,000 - \$8,000 USD (Replacement required every 1-2 years)
First Year Total Cost of Ownership	\$47,539.71	\$99,400.00
First Year Savings	\$51,860.29	

