



Light Engine Advantages

Parameter	Light Engines based on ARC LAMPS	Light Engines based on LEDS	Light Engines based on LASERS	LUMENCOR Light Engines	LUMENCOR Performance Advantages
Power, 0.6 NA, 20 nm bandpass	5 - 25 mW depending on color	10 - 50 mW depending on color	5 - 10 mW depending on color	Up to 1 W independent of color	High power: 90% output within a 15 nm band
Size	Typically 12 x 6 x 6" plus large power supply	Miniature size	Typically 12 x 6 x 6" plus large power supply	Flexible footprint, miniaturizable	Suitable for portability
Subsystem purchase price	≥ \$5000	≥ \$5000 bundling for power and optics	≥ \$10,000	Significantly lower than the competition	Enhanced performance and low cost
Cost of ownership	Frequent lamp replacement	Little maintenance	Frequent laser replacement	No maintenance	Best value per photon
Color output of source	≥ 1000nm	≥ 100 nm	Multiple ≥ 1-2 nm lines, color balance drifts with time	10 - 25 nm output	Broadest range of narrow bands with no spectral drift
Spectral purity	Out of band noise typically 10 ⁻⁶	Out of band noise typically 10 ⁻⁶	Out of band noise typically 10 ⁻⁶	Out of band noise typically 10 ⁻⁶	High power in the λ of interest maximizes S/N
Spectral breadth	UV to IR with sharp, bright emission lines	UV to IR with bright spectral bands	Few sharp, bright emission lines	UV/VIS/NIR with very bright bands	Broadest range of narrow bands through out UV/VIS/NIR
Power consumption	Require expensive, high power supply	Low voltage 7.5V DC power supply	Require expensive, high power supply	Low voltage power supply or battery	Cost reduction, Power savings
Heat production	Samples can be overheated by source heat	Minimal LED heat	Samples can be overheated by source heat	Very low heat produced	Diminished noise and greater sample stability
Stability	Notorious drift	Stability is a function of drive power	Prone to dirt, focus changes, thermal drift	No spectral drift No power drift	Measurement accuracy, low engineering costs
Lifetime	≤ 1000 hours	20,000 hours	< 2000 hours	> 10,000 hours	Long lived light engines
Durability	Replacement and handling is hazardous	Replacement rare and easy	Replacement and handling is hazardous	No replacement parts within working life	Cost reduction Safe to use
Modulation	Requires shutter external to source	kHz	Requires shutter external to source	kHz	Easy modulation of color and intensity
Warm-up time	Must be on for hours to stabilize	Unaffected by instant on-off switching	Warm up (30 min) for stable output	Unaffected by instant on-off switching	Easy modulation of color and intensity