

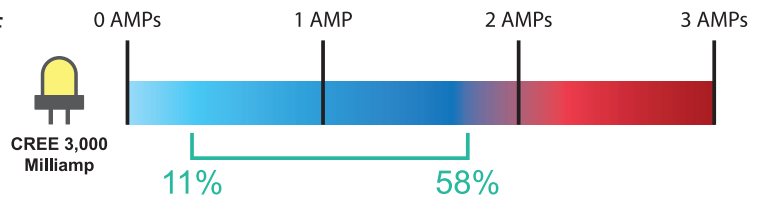
10 Points of Light

Clarté Lighting's LED fixtures operate -30°C to -44°C cooler at junction temperature as compared to most other LED fixture manufacturers, creating a premium life LED, allowing Clarté to offer a 7 year warranty.

<p>-10 to -12°C Lower Junction Temperature BOARD DESIGN</p>	<p>-15 to -20°C Lower Junction Temperature EXTRUDED ALUMINUM HEAT SINK</p>	<p>-2 to -5°C Lower Junction Temperature ALUMINUM SLUG</p>	<p>-2 to -4°C Lower Junction Temperature THERMAL GREASE</p>	<p>-1 to -3°C Lower Junction Temperature THERMAL PAD</p>
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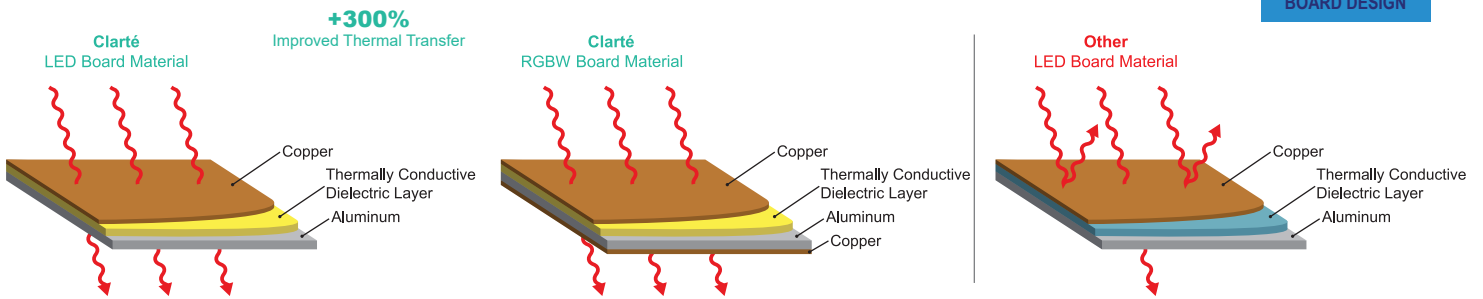
1 Clarté operates CREE's 3,000 milliamp rated LEDs, from a low of 11% and a high of 58%, of CREE's maximum rating of the CREE XPL LED.

PAR16 20 watt = 1750 milliamps = 58% of CREE's maximum rating
 PAR20 28 watt = 1400 milliamps = 47% of CREE's maximum rating
 PAR30 55 watt = 1650 milliamps = 55% of CREE's maximum rating



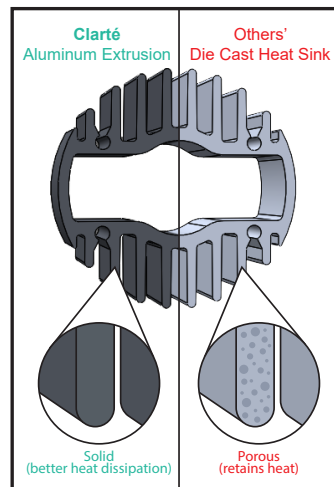
2 Clarté utilizes a superior LED board material & design, which provides increased thermal conductivity of heat transfer from the LED to the heat sink, creating lower LED junction temperatures and longer LED LM70 life.

-10 to -12°C
Lower Junction Temperature
 BOARD DESIGN



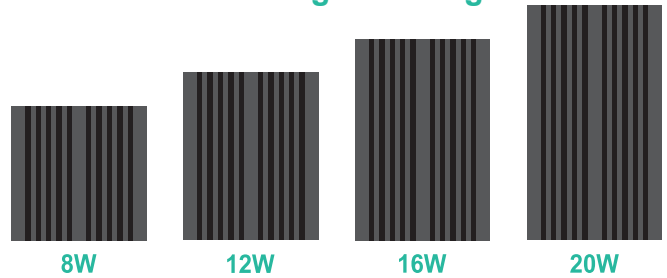
3 Clarté engineers aluminum extrusions to be up to 53% more efficient in managing heat than by utilizing castings, due to the higher density of metal present in extruded aluminum heat sinks, versus the air filled porous density of die casted heat sinks.

-15 to -20°C
Lower Junction Temperature
 EXTRUDED ALUMINUM
 HEAT SINK



4 Clarté heat sink extrusions are precision cut to length from 8' sections, the higher the milliamps & heat, the longer the heat sink.

Heat Sinks Cut According to Wattage



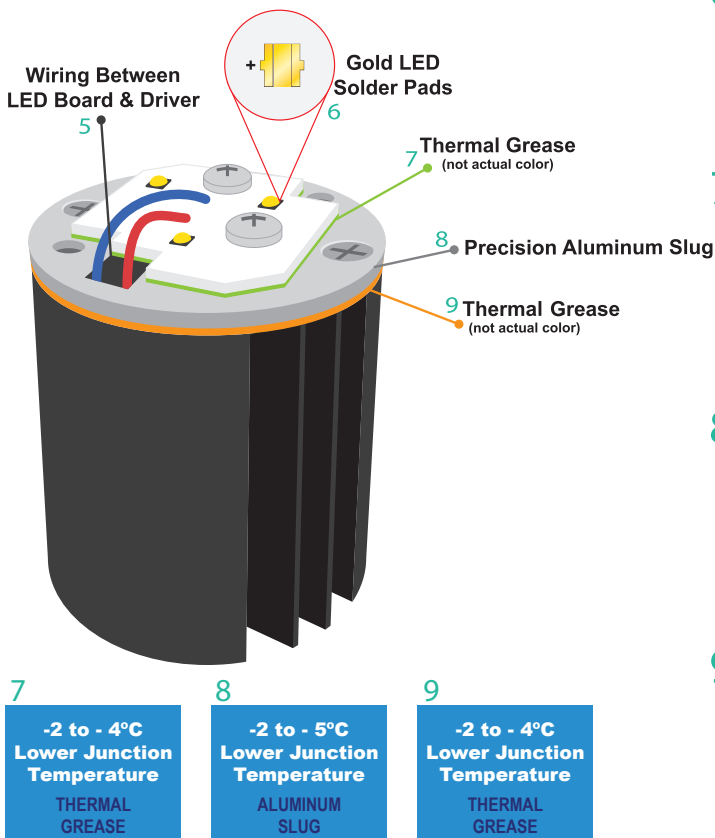
5 Clarté uses braided wires that are robust and attached to withstand the test of time.

6 Clarté features an electroless nickel immersion gold finish (ENIG) on all our boards, resulting in longer shelf life, flatter surfaces and perfect connection to LED pad surface.

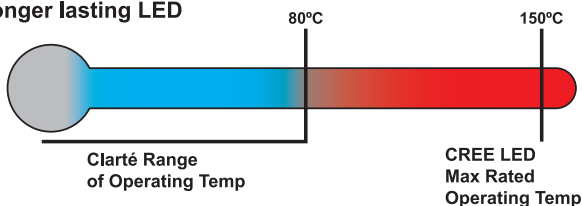
7 Clarté applies thermal joint material to help eliminate pockets of air between two surfaces by filling in air pocket spaces with thermal compound. Greater thermal transfer is achieved by moving heat from the LED junction to the heat sink.

8 Clarté designs its interface slug to be machined to aerospace standards. This creates precision matching to other components, which improves thermal transfer away from the LED, lowering junction temperature while increasing LM70 life.

9 Clarté implements thermally conductive material between the slug and heat sink resulting in better thermal conductivity and contributing to lower overall thermal profile for the fixture, resulting in lower LED junction temperatures and longer life.



Operating at lower temps = longer lasting LED



10 Clarté doesn't operate CREE LEDs beyond 80°C junction temperature. CREE's XPL LED has a 150°C maximum temperature rating. Clarté only operates CREE LED's from the topmost of 58% of CREE's maximum rated operating temperature.

Clarté Lighting -LM70 Life Rating*

Scale	Maximum Wattage	Minimum Wattage
PAR16	= 104,500 hrs. (20 watt/1750 milliamps) to 261,000 hrs. (8 watt/700 milliamps)	
PAR20	= 109,000 hrs. (28 watt/1400 milliamps) to 155,700 hrs. (16 watt/700 milliamps)	
PAR30	= 107,000 hrs. (55 watt/1650 milliamps) to 192,600 hrs. (11 watt/350 milliamps)	

*Thermal testing and LM70 life ratings completed by CREE's Tempo testing lab.

