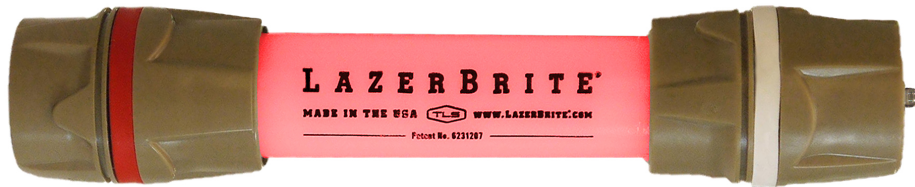

LazerBrite®



LazerBrite Single Mode vs Chem light Performance comparison

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The LazerBrite Tactical Lighting System (LB) is a **revolutionary replacement** for chemical lights (chem-lights). The LB is functionally superior, safer, more soldier efficient, infinitely more versatile, and is available at a significantly lower cost of ownership.

A series of tests were conducted by an independent testing laboratory comparing the light intensity and service life of LBs as compared with light intensity and service life of chem-lights. These tests were conducted a few years ago on the previous version of LB. In the current version, the red, green, white, and blue LED bulbs are significantly brighter than they were for these tests, therefore the LB Lux values in the graphs that follow would be higher than shown. In the testing, the total light capacity is defined as the combined light intensity and service life of a lighting device. In summary, on average a Single Mode LB package, consisting of two light heads and two sets of batteries, has the **equivalent total light capacity** of 36 chem-lights. In addition, LB's can be turned On and Off, as opposed to the **'use once and discard'** limitation of a chem-light. When a 12 hour Green chem-light is activated for a 5-minute signal requirement, 0.7% of the total light capacity is utilized while 99.3% of the total light capacity is discarded.

The On/Off feature insures that the entire light capacity is used for every LB Tactical Light. It is therefore conceivable that a single LB package can replace thousands of chem-lights depending on the signal duration. Using conservative signaling duration estimates, we believe the use of LB system as a replacement for chem-lights can eliminate as much as 70% of annual chem-light consumption by the military.

Chem-lights have many weaknesses and limitations. They are **unsafe** in many battle situations due to poor light control. Once activated, chem-lights cannot be shut off and therefore must be either hidden or buried. They are **single use** devices. They are **environmentally unfriendly**, as millions are thrown away or are left in the field each year. They provide **only radiant light** and are useless as directional light. They have a **limited service life** (6 to 12 hours depending on color). They are **bulky and heavy to carry** in regular usage quantities. Performance and shelf life are **reduced in high heat** environments.

In every aspect, LB's are superior signaling and marking devices as well as being a much more versatile tool for the soldier. The following table summarizes the superiority of the LB vs. the chem-light:

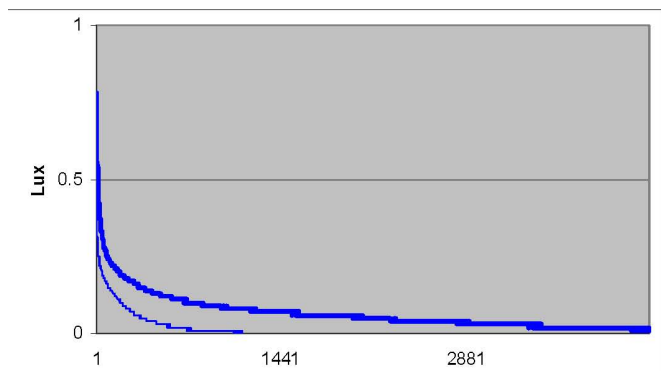
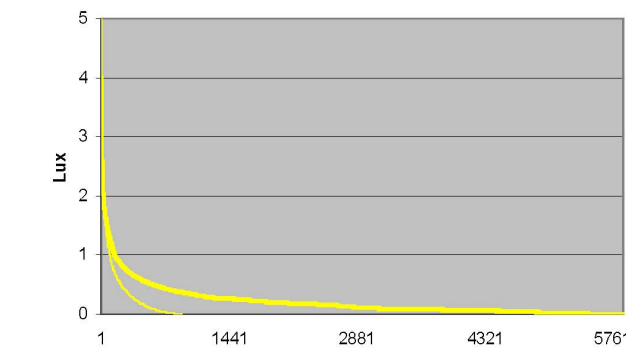
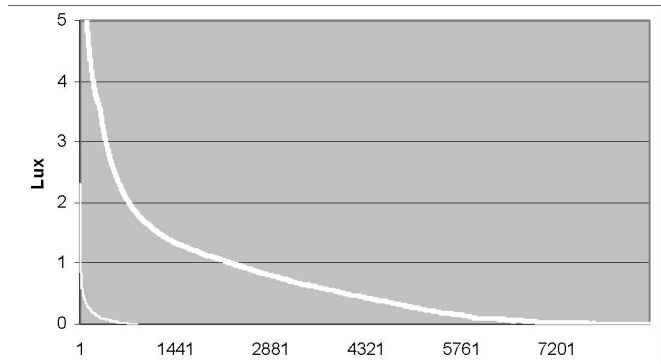
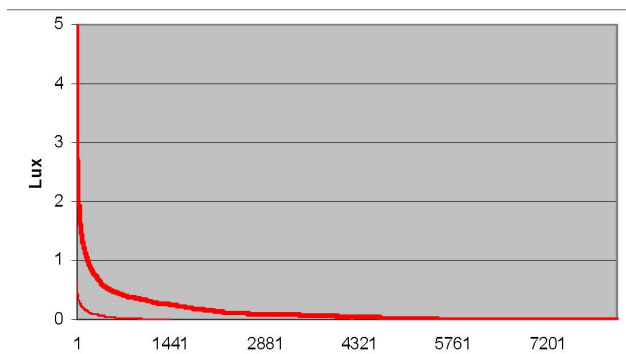
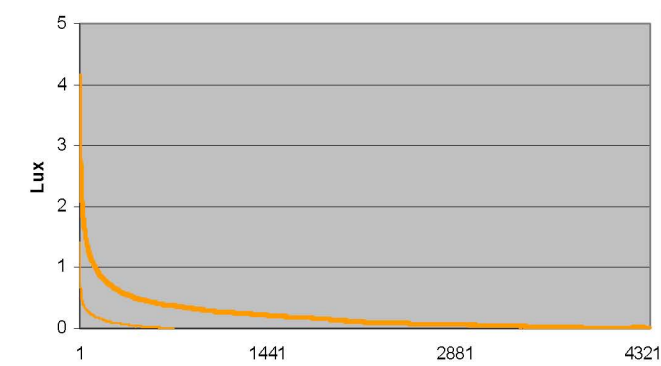
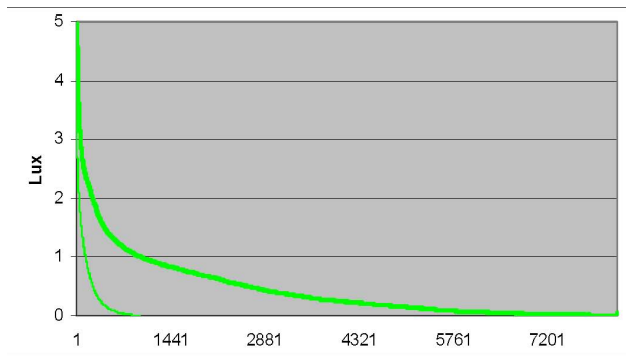
A Single Mode LB with new batteries will shine continuously for several days. Infrared (IR), Blue, Orange, and Yellow LB's will shine continuously for 2 to 3 days. Red, Green, and White LB's will shine continuously for 5 to 6 days declining in brightness over time. Multi-Lux LB have the same burn times on high, but a bit less on the low and flashing modes (48hrs) because those two modes utilize a microprocessor that has a min. voltage requirement.

Comparison Matrix	chem-light (CL)	LB	Advantage
Safety - Control of Light	On only	On/Off	LB
Number of uses	Single use	Multiple use - LB can replace from a handful to thousands of chem-lights depending on signal duration	LB
Environmental Impact	Disposable/Trash	Reusable/very low impact	LB
Brightness	-	Visible light = avg. 8.9* times brighter	LB
	-	IR = avg. 60* times brighter	LB
Service Life (continual use)	8 to 12 hrs.	Avg. 8.6* times longer use	LB
Type of Light	Radiant only	Radiant, Directional, Focused spot	LB
Versatility	Single use Radiant Marker	Signaling, Marking, Flashlight, Infinitely Connectable	LB
Space & Weight	1 chem-light = 1 signal event	1 LB can produce multiple to signal events, reducing chem lights required	LB

Extensive testing from an independent testing laboratory has concluded that in every case LB's are brighter and longer lasting than the equivalent colored chem-light. The charts below show light output intensity, measured in Lux units, of continuously operating LB's and chem-lights of each color over time. The charts clearly illustrate the LB superiority in both brightness and duration for every color tested. Note: The thick lines represent LB's and the thin lines represent chem-lights for each of the colors tested. The X-Axis shows 'minutes in day boundaries' on each graph.

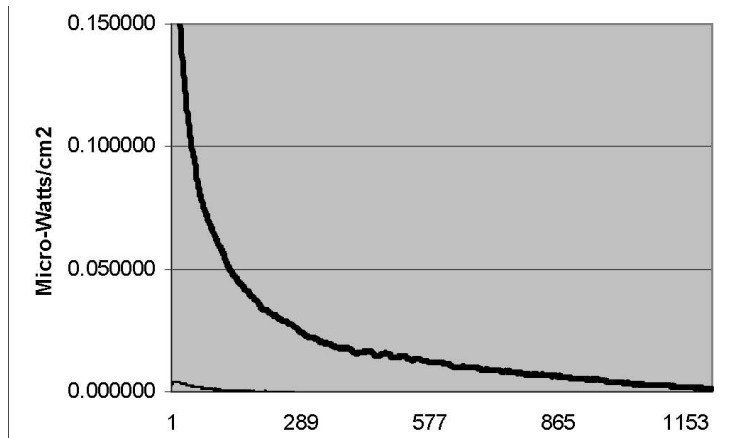
Lux is the standard unit of luminance. It is used in photometry as a measure of the intensity of light, with wavelengths weighted according to the luminosity function, a standardized model of human brightness perception.

NOTE ALL LUX VALLUES ARE IN THOUSANDS (5=5K)



2

Infrared light is not visible to the human eye and is therefore measured in microwatts per cm² instead of Lux as illustrated in the chart below. The X-Axis shows 'data samples in day boundaries' on this graph.



The following table is a numerical representation of some of the test results. The numbers shown on top of the white background are a comparative ratio of the light intensity of an LB versus the same color chem-light at the specified test time. For example, the Red LB was 7.3 times brighter on the first reading (when it was first turned on) than a Red chem-light upon activation. The Red LB was 5.9 times brighter at the 20-minute mark, etc. Overall LB2's on average are 7.1 times brighter across all visible colors.

Color	Stated chem-light Mfr's Service Life (Hrs)	LB2 vs. chem-light comparative Intensity							Avg LB2 intensity advantage over the chem-light service life
		1st Reading	20 min	40 min	1 hr.	4 hr.	(80% of 8 hr. Svc Life) 6.4 hr.	(80% of 12 hr. Svc Life) 9.6 hr.	
Red	12	7.3	5.9	5.9	6.2	8.2	9.8	11.8	7.9
Green	12	0.9	1.7	1.8	1.8	3.9	7.2	18.4	5.1
Blue	8	1.7	1.7	1.7	1.6	2.3	2.8		1.9
White	8	7.2	11.8	12.8	14.0	25.1	37.8		18.1
Yellow	12	0.5	0.8	1.0	1.1	1.8	2.7	5.7	1.9
Orange	12	2.9	4.6	4.7	4.7	7.0	10.6	21.0	7.9
IR	8	171.1	79.9	55.7	49.0	38.1	52.2		74.3

Visible Avg 7.1

The next table shows a service life metric for each color. This metric is obtained by taking the light intensity of the chem-light at the end of 80% of the chem-light manufacturer's stated service life and then comparing it to how long the LB Single Mode needs to *continuously* shine until its light intensity reaches the same value. For example, the Red chem-light after glowing continuously for 9.6 hours (80% of the 12 hour manufacturers stated service life for a Red chem-light) has a measured light intensity of 0.04 Lux. Comparatively (see table below), it takes a Red LB 74.1 hours until the light intensity decays to 0.04 Lux. This means the service life advantage for a Red LB as compared to a Red chem-light is 7.7 times longer (74.1 hours divided by 9.6 hours). On the average, for all visible colors, the LB has 9.0 times longer service life than a chem-light.

Color	Stated chem-light Mfr's Service Life (Hrs.)	Light Intensity of chem-light at 80% of Service Life	LB hours to reach 80% Service Life chem-light Light Intensity	LB Service Life advantage over chem-light (ratio)
Red	12	0.04	74.1	7.7
Green	12	0.07	96.5	10.1
Blue	8	0.05	46.8	7.3
White	8	0.08	107.1	16.7
Yellow	12	0.09	60.3	6.3
Orange	12	0.02	59.2	6.2
IR	8	0.0014	101.6	15.9