



**MLDOT-46K**  
Headlight LED with High  
& Low Beam  
Qty 2 sets



**MLD-12-60**  
12W Extra Wide LED  
Qty 6 pcs



**MLSB-7.2-A**  
7.2W Safety Beacon  
Qty 1 pc (+1 opt)  
(Heavy Duty LED available)



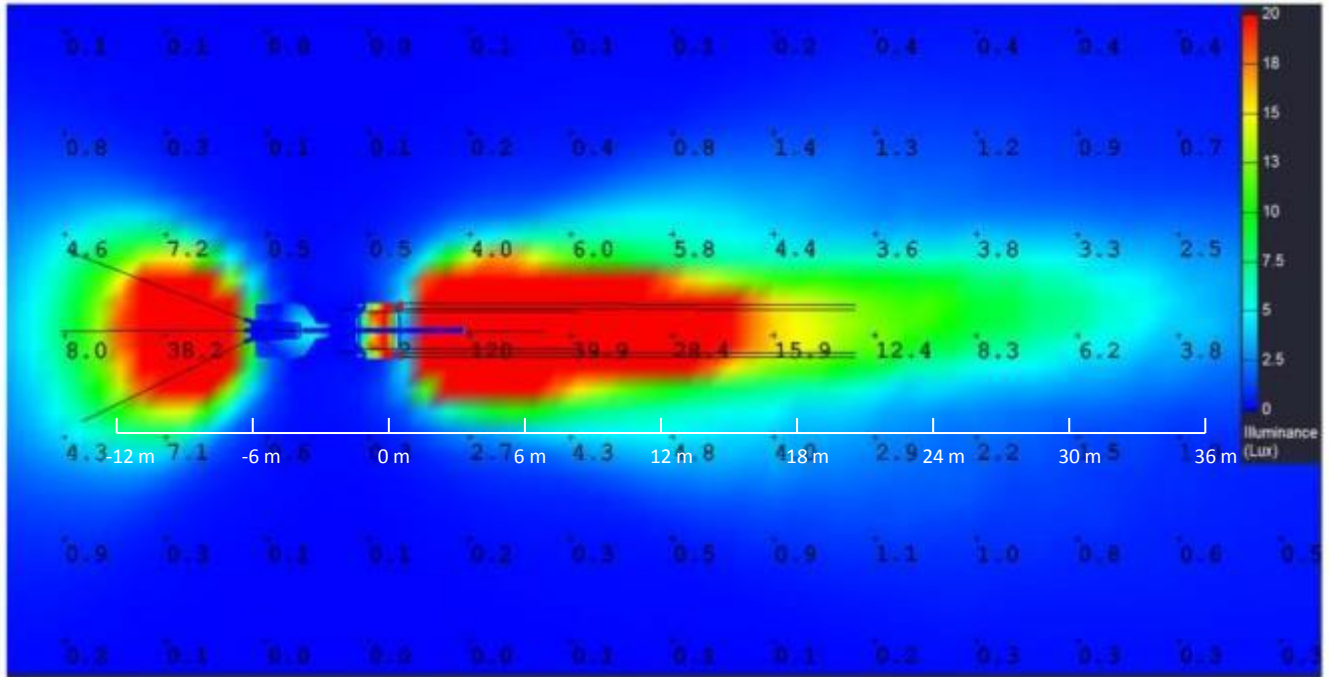
**MLVL-K**  
30W LED Camera  
with Monitor  
Qty 1 pc (+1 opt)

Position	Part No	Orientation	Side	Position
1	MLDOT-46K	Front Facing	Left Side	Outer OEM Head Light
2		Front Facing	Left Side	Inner OEM Head Light
3	MLDOT-46K	Front Facing	Right Side	Inner OEM Head Light
4		Front Facing	Right Side	Outer OEM Head Light
5	MLD-12-60	Front Facing	Centre	Top Centre Front of Cab
6	MLD-12-60	Front Facing	Left Side	Under Hydraulic Boom Support
7	MLD-12-60	Front Facing	Right Side	Under Hydraulic Boom Support
8	MLD-12-60	Rear Facing	Left Side	Top Left of Rear Radiator
9	MLD-12-60	Rear Facing	Centre	Top Centre of Rear Radiator
10	MLD-12-60	Rear Facing	Right Side	Top Right of Rear Radiator
11	MLSB-7.2-A	Around	Centre	Top of Back
12	MLSB-7.2-A	Around	Centre	Top of End Boom (Optional)
13	MLVL-K	Rear Facing	Centre	Below Boom, Winch Facing
14	MLVL-K	Rear Facing	Centre	Top Centre of Rear Radiator (Optional)

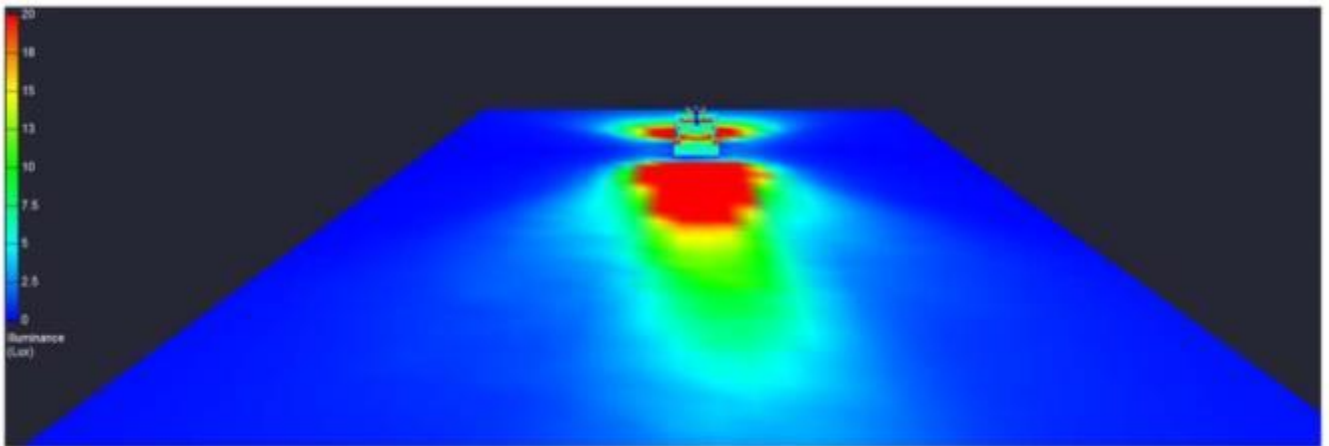
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## RENDERING LED FIT OUT

Pseudo Color Top Down View



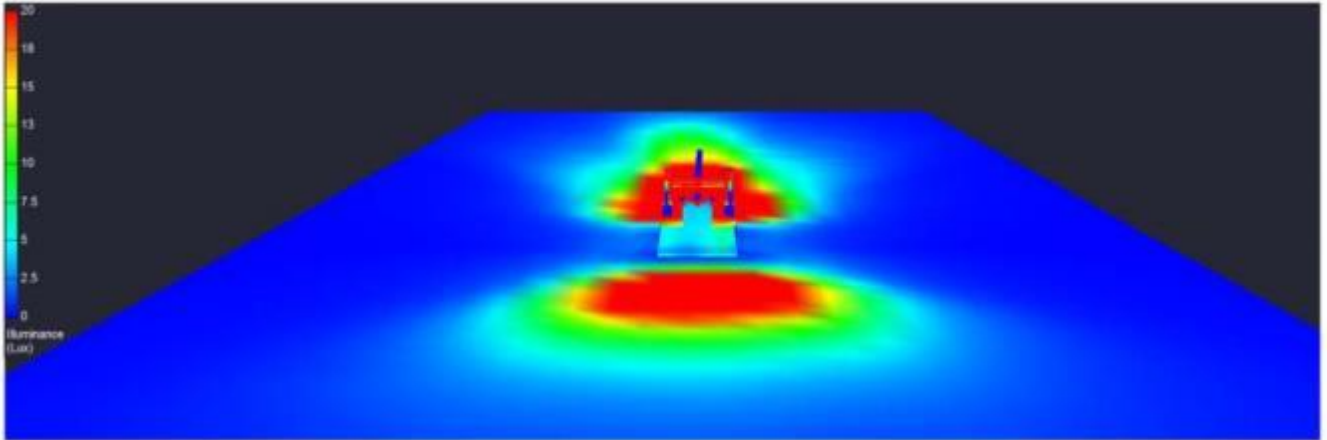
Pseudo Color Front View



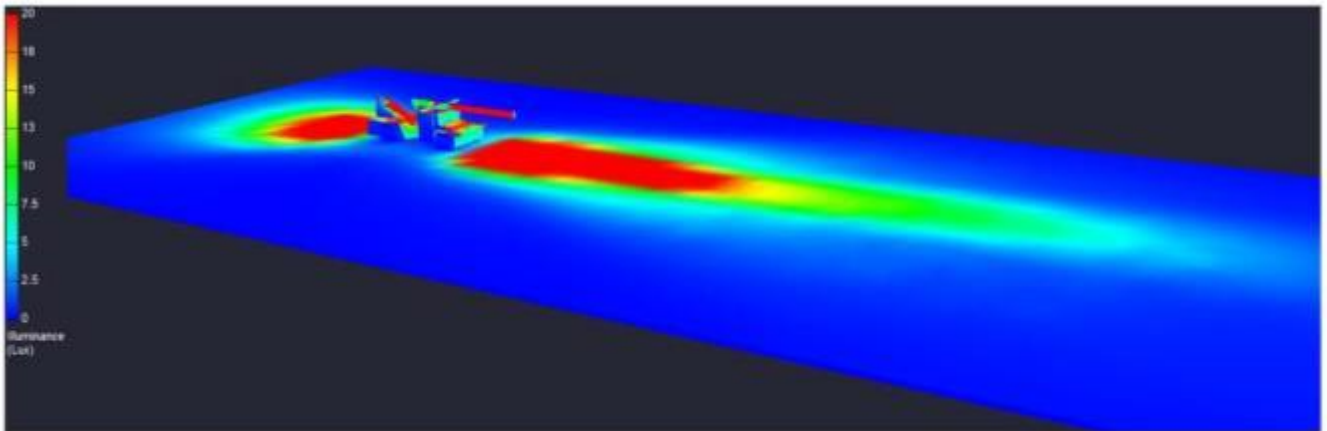
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### RENDERING LED FIT OUT

Pseudo Color Rear View



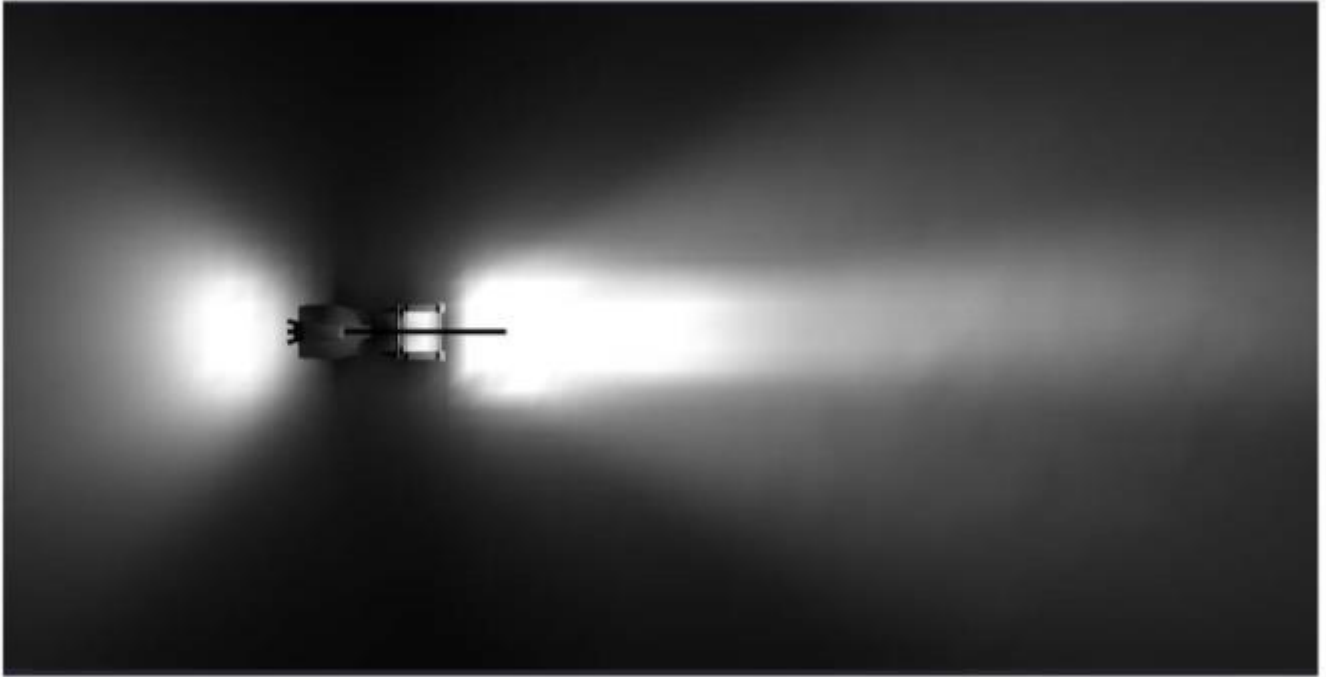
Pseudo Color Side View



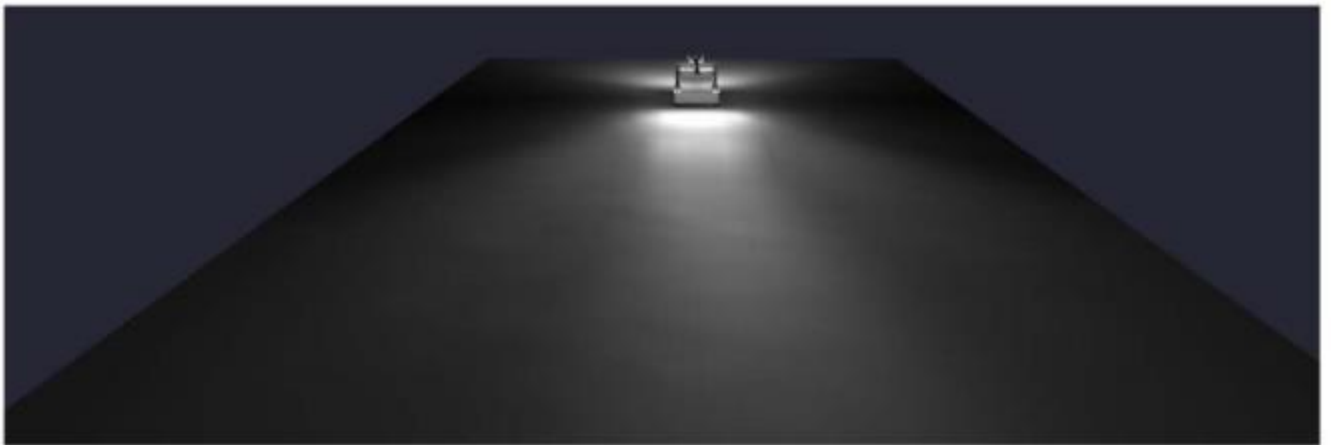
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### **RENDERING LED FIT OUT**

Simulation Top Down View



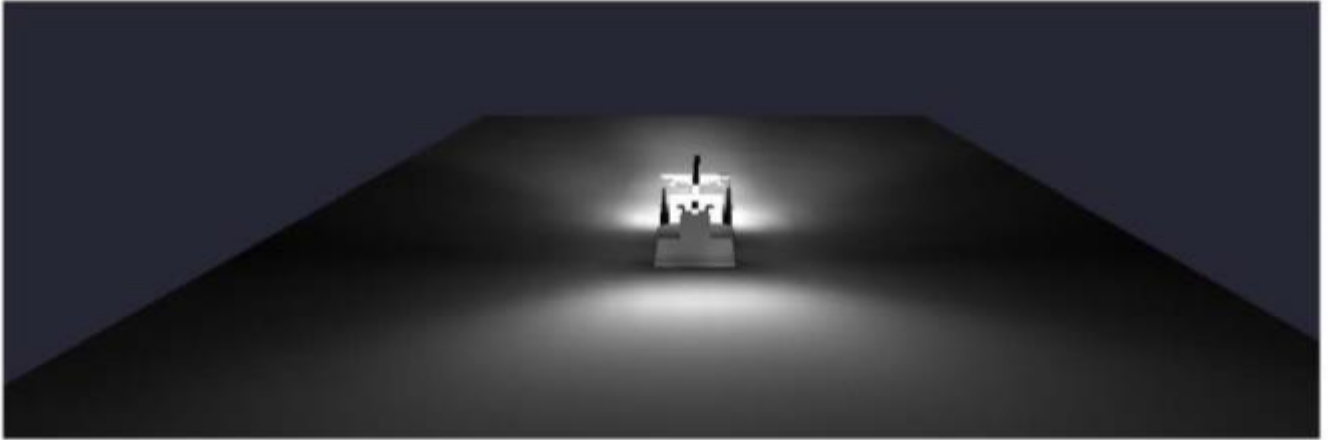
Simulation Color Front View



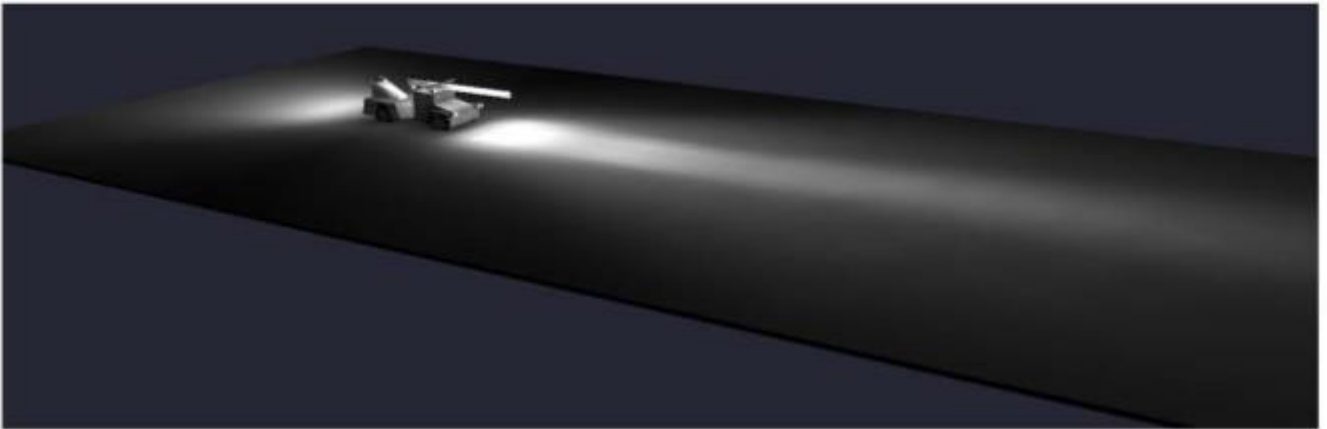
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### RENDERING LED FIT OUT

Simulation Color Rear View



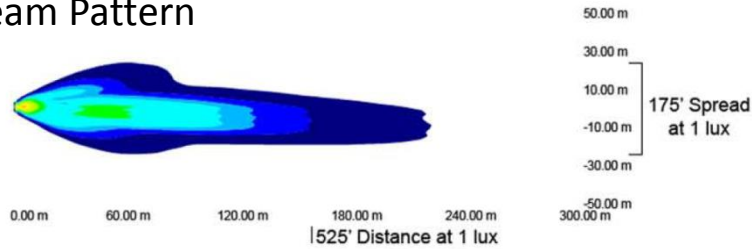
Simulation Color Side View



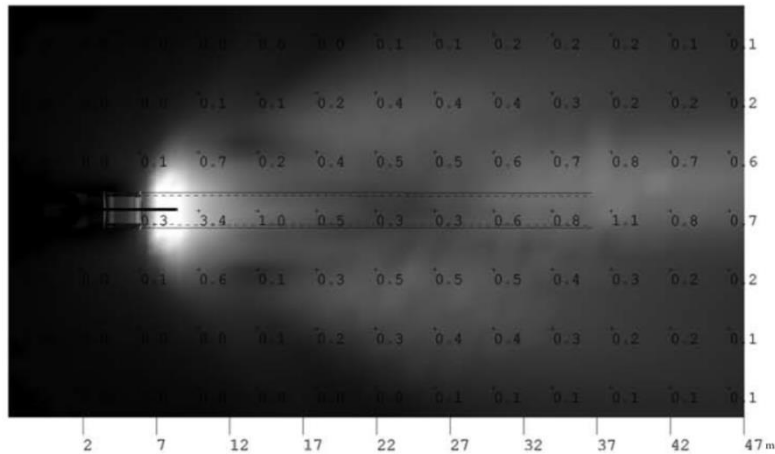
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## COMPARISON HEADLIGHT MLDOT-46 LED vs STOCK HALOGEN

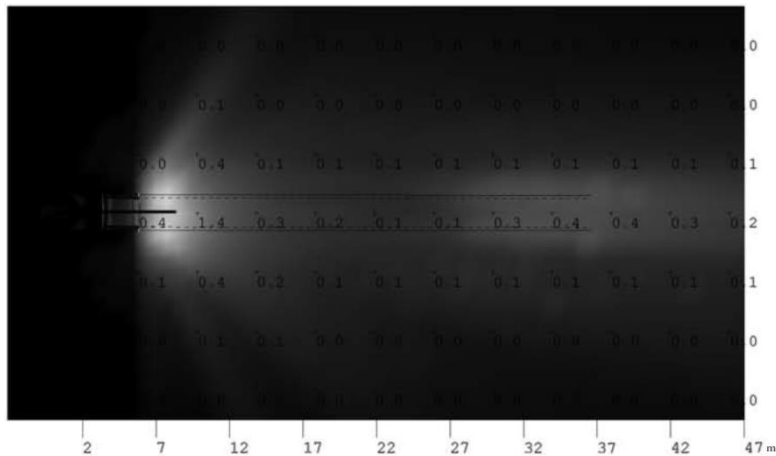
### MLDOT-46 Low Beam Pattern



### Outer MLDOT-46 Low Beams



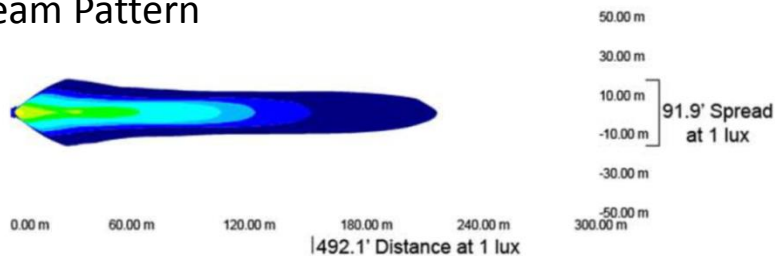
### Outer Halogen Low Beams



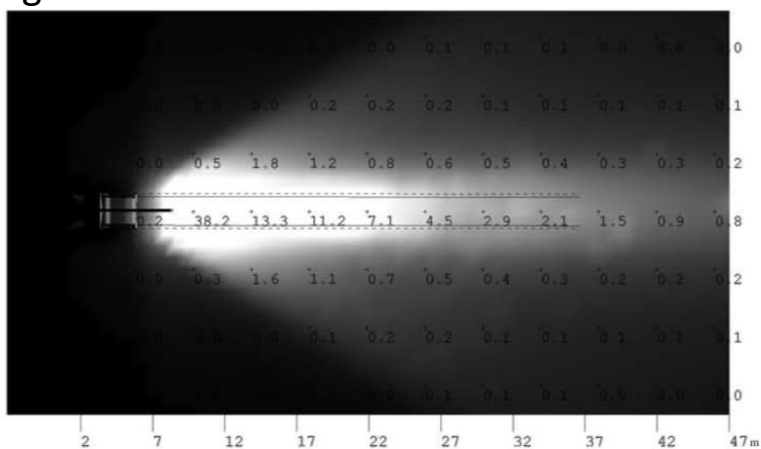
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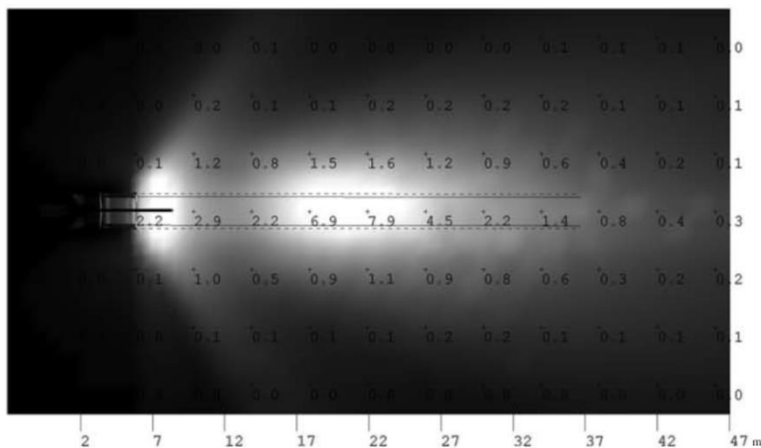
### MLDOT-46 High Beam Pattern



### Inner MLDOT-46 High Beams



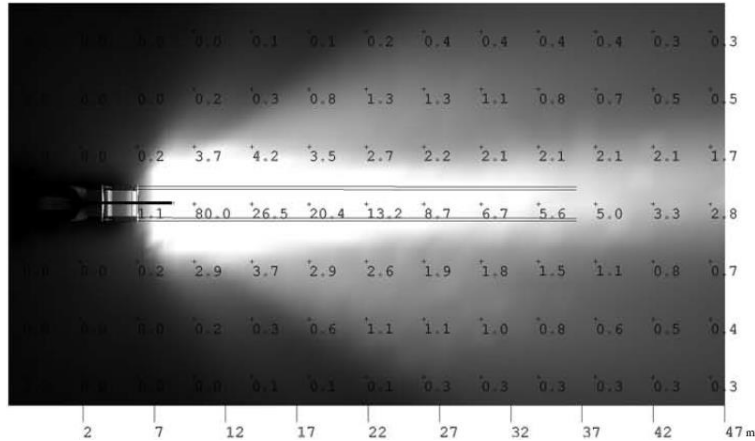
### Inner Halogen High Beams



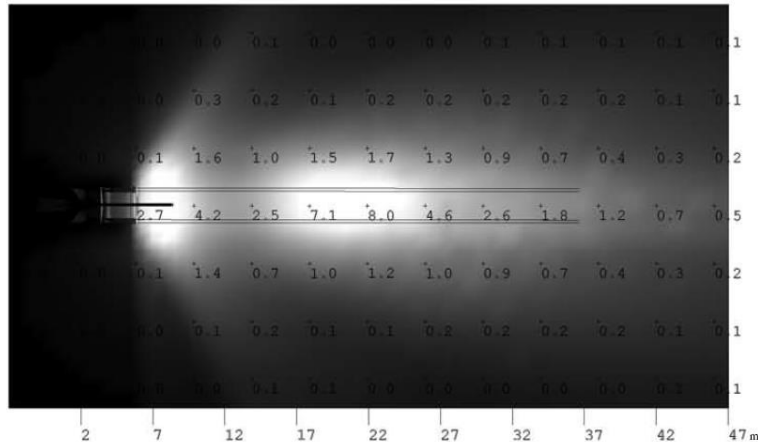
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### COMPARISON HEADLIGHT MLDOT-46 LED vs STOCK HALOGEN

MLDOT-46 High and Low Beam on All Four Lights (Using Hi-4 adapter)



Halogen High and Low Beam on All Four Lights



MLDOT-46-A Adapter



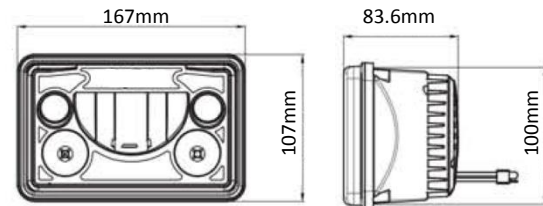
The MLDOT-46-A Adapter was specially designed to accompany the MLDOT-46 LED Headlight and allow the High and Low beams to shine simultaneously.

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**MLDOT-46K**



MLDOT-46 LED Headlight are a simple way to dramatically boost the total light output of your vehicle. Within the one housing the headlight has your low beam, high beam and a daytime running light around the outer edge.

Meeting DOT requirements

### Added Features

- Multiple Wiring Accessories Available
- Hybrid Aluminum Housing
- Polycarbonate Lens
- Sold as a kit of 2 or Individually for replacement
- Plug and Play replacement
- H4 Factory plug

### 3 Lighting Modes

- High Beam
- Low Beam
- Ring



### Technical Information

Warranty	Extended
Raw Lumens	4,210 lm
Effective Lumens	2,947 lm
Wattage HIGH / LOW / RING	20 / 23 / 8 W
Weight	0.88 kg
LED Lifespan	50,000 Hours
Dimensions	167 x 107 x 83.6mm
Input Voltage	9-32 VDC
Amp Draw (12V) HIGH / LOW / RING	1.67 / 1.92 / 0.67 A
IP Rating	IP 68
Vibration Rating	21 Grms
Operating Temp	-40 ~ +85 °C

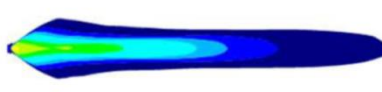
MLDOT-46 Low Beam



0.00 m 60.00 m 120.00 m 180.00 m 240.00 m  
1525' Distance at 1 lux

50.00 m  
30.00 m  
10.00 m  
-10.00 m  
-30.00 m  
-50.00 m  
175' Spread at 1 lux

MLDOT-46 High Beam



0.00 m 60.00 m 120.00 m 180.00 m 240.00 m  
1492.1' Distance at 1 lux

50.00 m  
30.00 m  
10.00 m  
-10.00 m  
-30.00 m  
-50.00 m  
91.9' Spread at 1 lux

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**MLD-12-60**



MLD 12W LED work light is a ultimate compact fixture for universal applications. Direct HID replacement for machinery in commercial, industrial machinery and heavy equipment applications.

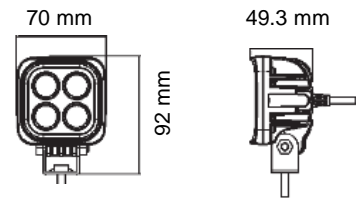
**Features**

- Weatherproof Integrated Deutsch Connector
- Adjustable Trunnion Bracket Mount
- Vertical Fins Maximize heat dissipation
- PWM integrated dimming Circuitry
- Die-Cast Aluminum housing
- Polycarbonate Lens

**MLD-12-60**  
60° Extra Wide Beam



**Dimensions**



**Technical Information**

Warranty	Extended
Raw Lumens	2,000 lm
Effective Lumens	950 lm
Wattage	12 W
Weight	0.4 kg
LED Lifespan	50,000 Hours
Dimensions	70 x 92 x 49.4 mm
Input Voltage	11-65 VDC
Amp Draw (12V)	1.0 A
IP Rating	IP 68

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**MLSB-7.2-A**



### KEY FACTS

#### Safety

Easily add and LED Strobe beacon too your vehicle or equipment to enable others to see it from all direction

#### Colored LEDs

The Utility Beacon is available in Amber, Red, Blue, Green and White LEDs to match your needs.



#### Lower Power Consumption

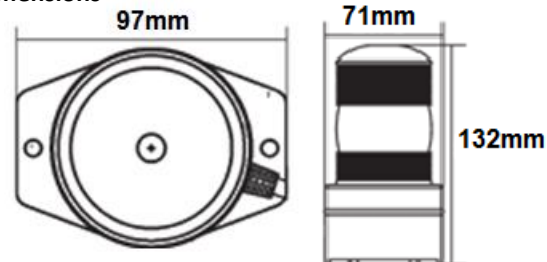
With a extremely low power draw of less than an amp, and being battery operated it will put no strain on your vehicle battery

#### Magnetic Base

Each Utility Beacon comes standard with a magnetic base, allowing for easy mounting and enables it to be repositioned once wired.



#### Dimensions



#### Technical Information

Warranty	Extended
Raw Lumens	504 lm
Wattage	7.2 W
Amp Draw (12V)	0.9 A
Input Voltage	12-32V
LED Lifespan	50,000 Hours
Dimensions	97x71x132mm
Weight	0.4 kg
Beam Pattern	360° Strobe
IP Rating	IP 68
Vibration Rating	15.6 (Grms)
Temperature	-40°C to 85°C

Reference	Description
MLSB-7.2-A	SAFETY BEACON AMBER LED, 7.2W WITH REFLECTORS
MLSB-7.2-B	SAFETY BEACON BLUE LED, 7.2W WITH REFLECTORS
MLSB-7.2-G	SAFETY BEACON GREEN LED, 7.2W WITH REFLECTORS
MLSB-7.2-R	SAFETY BEACON RED LED, 7.2W WITH REFLECTORS
MLSB-7.2-W	SAFETY BEACON WHITE LED, 7.2W WITH REFLECTORS

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### MLVL-K



#### Features:

- Reverse LED light and back –up camera
- Standard Pick up, long-haul commercial vehicle, utility service equipment,...
- Kit Available With 7" LED Monitor And 20' Cord
- Short-Shield Blocks Glare From Camera Lens
- Trunion Mounting Bracket Available
- 3,168 Raw Lumens
- IP68 Waterproof
- Illuminates Area While Simultaneously Relaying Video Feed



Item	Description
MLVL-1	Video Light 4" Square 60 degree Optics 72 degree Camera Angle Short Shield
MLVL-2	Video Light 4" Square 60 degree Optics 72 degree Camera Angle Short Shield using Infrared 850NM LED
MLVL-K	Video Light and Monitor Kit 60 degree Beam 72 degree Camera Visible Light with 20' Cord
MLVL-M	7" LED Monitor for Video Light
MLVL-B	Trunion Bracket for Video Light

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## RETURN ON INVESTMENT

In this section, we will focus on the return on investment for the headlight only. The study done below is based on the feedback from the field and rate used in Indonesia. On this first scenario, we are using the rate for the Indonesian manpower. (USD Currency)

CONSUMABLE PARTS FOR 1 CRANE BASED ON 2000h/year					
Item	Description	Lifetime	Replacement	Unit Price	Total
1	H4 Insert	1000 h	4	\$ 19.52	\$ 78.08
2	H4 Bulb	500 h	8	\$ 11.67	\$ 93.36
3	H1 Insert	2000 h	2	\$ 67.36	\$ 134.72
4	H1 Bulb	2000 h	2	\$ 6.77	\$ 13.54
<b>TOTAL</b>					<b>\$ 319.70</b>

MANPOWER REQUIRED FOR 1 CRANE BASED ON 0.5h/service job					
Hour rate	Intervention	Hours	Cost	Person	Total
\$ 25.00	16	8	\$ 200.00	2	\$ 400.00
<b>TOTAL</b>					<b>\$ 400.00</b>

YEARLY COST FOR 1 CRANE	
Consumable Parts	\$ 319.70
Manpower	\$ 400.00
<b>TOTAL</b>	<b>\$ 719.70</b>

COST CALCULATION THROUGH THE YEARS			
Cost based on fixed rate on manpower and price of parts (no inflation)	5	Years	\$ 3,598.50
	10	Years	\$ 7,197.00
	15	Years	\$ 10,795.50
	20	Years	\$ 14,394.00
	25	Years	\$ 17,992.50

LED HEADLIGHT FIT OUT					
Price ( MLDOT-46K x2 )					\$ 1,598.00
Installation	Hours rate	Hours	Cost	Person	\$ 100.00
	\$ 25.00	2	\$ 50.00	2	
<b>TOTAL</b>					<b>\$ 1,698.00</b>

RETURN ON INVESTMENT		
Yearly Cost 1 Crane		\$ 719.70
LED Headlight Fit Out		\$ 1,698.00
	<b>ROI</b>	<b>Years</b>
		<b>2.4</b>
	<b>ROI</b>	<b>Months</b>
		<b>28.3</b>

## RETURN ON INVESTMENT

In this section, we will focus on the return on investment for the headlight only. The study done below is based on the feedback from the field and rate used in Indonesia. On this second scenario, we are using the rate for the Australian manpower. (USD Currency)

CONSUMABLE PARTS FOR 1 CRANE BASED ON 2000h/year					
Item	Description	Lifetime	Replacement	Unit Price	Total
1	H4 Insert	1000 h	4	\$ 19.52	\$ 78.08
2	H4 Bulb	500 h	8	\$ 11.67	\$ 93.36
3	H1 Insert	2000 h	2	\$ 67.36	\$ 134.72
4	H1 Bulb	2000 h	2	\$ 6.77	\$ 13.54
<b>TOTAL</b>					<b>\$ 319.70</b>

MANPOWER REQUIRED FOR 1 CRANE BASED ON 0.5h/service job					
Hour rate	Intervention	Hours	Cost	Person	Total
\$ 85.00	16	8	\$ 680.00	1	\$ 680.00
<b>TOTAL</b>					<b>\$ 680.00</b>

YEARLY COST FOR 1 CRANE	
Consumable Parts	\$ 319.70
Manpower	\$ 400.00
<b>TOTAL</b>	<b>\$ 999.70</b>

COST CALCULATION THROUGH THE YEARS			
Cost based on fixed rate on manpower and price of parts (no inflation)	5	Years	\$ 4,998.50
	10	Years	\$ 9,997.00
	15	Years	\$ 14,995.50
	20	Years	\$ 19,994.00
	25	Years	\$ 24,992.50

LED HEADLIGHT FIT OUT					
Price ( MLDOT-46K x2 )					\$ 1,598.00
Installation	Hours rate	Hours	Cost	Person	\$ 170.00
	\$ 85.00	2	\$ 170.00	1	
<b>TOTAL</b>					<b>\$ 1,768.00</b>

RETURN ON INVESTMENT		
Yearly Cost 1 Crane		\$ 999.70
LED Headlight Fit Out		\$ 1,768.00
	<b>ROI</b>	<b>Years</b>
		<b>1.8</b>
	<b>ROI</b>	<b>Months</b>
		<b>21.2</b>

## RETURN ON INVESTMENT

### Others Benefits

One of the benefits with the LED Headlights, is the low amps consumption due to lower voltage compared to the stock models. This means less power required from the engine alternator to run the LED headlights.

STOCK HEADLIGHT AMPS CONSUMPTION					
STOCK	Voltage	Watts	Amps	Number	Amps Consumed
H4	24	75	3.13	2	6.25
H1	24	70	2.92	2	5.83
<b>TOTAL</b>					<b>12.08</b>

LED HEADLIGHT AMPS CONSUMPTION					
LED	Voltage	Watts	Amps	Number	Amps Consumed
Low Beam	24	23	0.96	2	1.93
High Beam	24	20	0.96	2	1.67
<b>TOTAL</b>					<b>3.58</b>

SAVINGS	
Amps Reduction	<b>8.50</b>
Watt Reduction	<b>204.00</b>
KW Reduction	<b>0.20</b>
KW-Hours Reduction yearly (2000h)	<b>408.00</b>

The major benefit besides the lower operating cost and more efficient light output provided by the LED, is a significant reduction in machine downtime. Current regulations in place does not authorise to use of a crane when the lights are not functioning correctly., which is a common issue with stock headlight. When the operator notices a problem with its lights, coordination with the maintenance department is required to service the lights to get the machine operational. This may take days to rectify the problem, as this depends on the service technician availability and the part availability.

The MLDOT-46 LED headlight has a lifespan of 50,000 hours, approximately 25 years, and a reduced maintenance is required during this period.

OUTPUT – LUMENS					
Stock Headlight	Lumens	LED Headlight	Lumens	Gain	
H4	1,750 lm	Low Beam	2,106 lm	<b>+ 356 lm</b>	
H1	1,900 lm	High Beam	2,104 lm	<b>+ 204 lm</b>	

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### RETURN ON INVESTMENT

#### Summary

RETURN ON INVESTMENT (1 <sup>st</sup> scenario)		
Yearly Cost 1 Crane		\$ 719.70
LED Headlight Fit Out		\$ 1,698.00
	ROI	Years
		2.4
	ROI	Months
		28.3

RETURN ON INVESTMENT (2 <sup>nd</sup> scenario)		
Yearly Cost 1 Crane		\$ 999.70
LED Headlight Fit Out		\$ 1,768.00
	ROI	Years
		1.8
	ROI	Months
		21.2

On average, with these scenarios, the return on investment of the LED headlight is approximately 2 years, which is quick when compared to the lifespan of the LED headlight which is 50,000 hours.

Through this analysis, we can see the cost of the stock headlight by year, reaching 1,000 USD/year.

The MLDOT-46K will greatly improve operating cost, provides greater light output and reduces the machine downtime and improves machine availability.