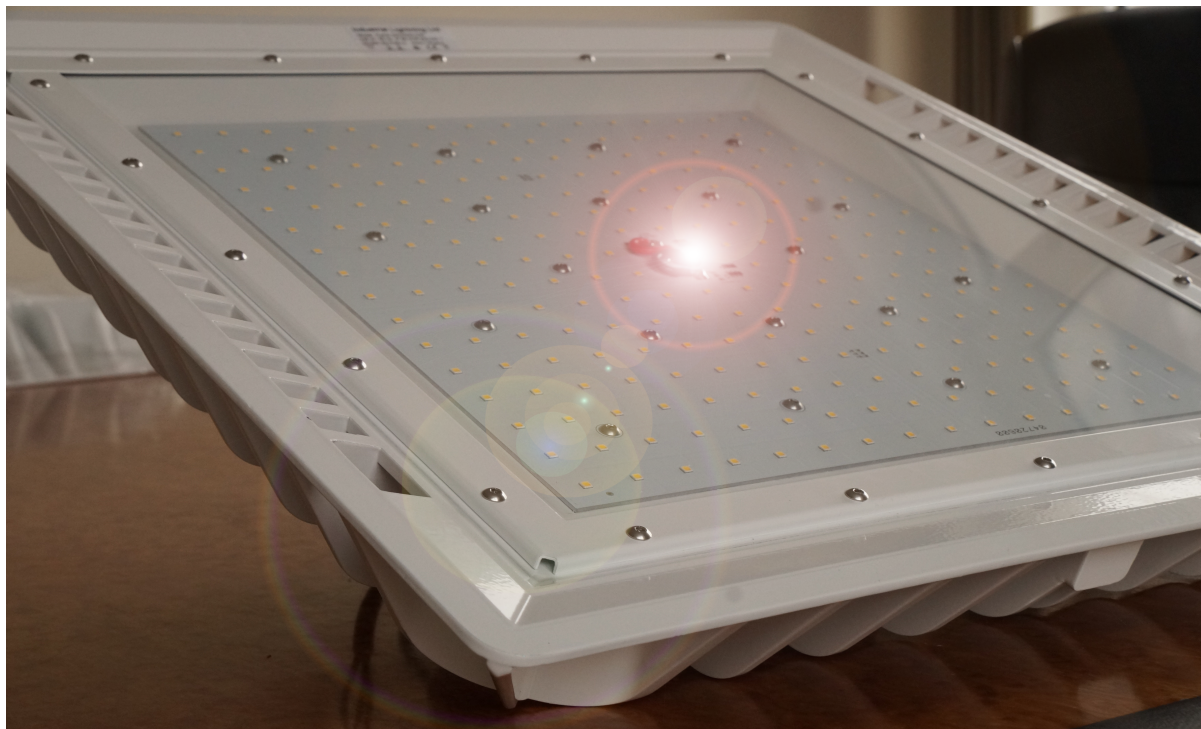


SERIES LED LIGHTING TYPE „HYDRA“



Designed to replace the conventional LED High Bay Light and Metal Halide, HPS & Mercury Vapor. used to illuminate industrial premises.

Comparative information.

Standard 200W LED High Bay type "Bell", emitting a luminous flux of 14598 lm, efficiency 74,25 lm / W.



Data from photometric measurements of a 200W Conventional High Bay type luminaire, 14598 lm, ;

Efficiency 74.24 lm / W.;

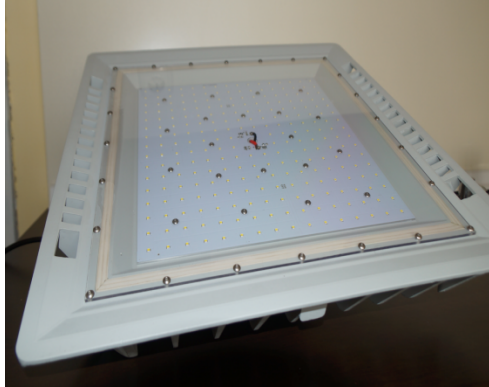
Name: High Bay;

Dimensions: Diameter 400 * Height 640 mm.;

Number of diodes 4 COB * 40W;

Mass 10.5 kg.;

Hydra LED High Bay



Data from photometric measurements of the 235,4 W High Bay LED Hydra,
34,991lm, efficiency 148.7lm / W;

Name: High Bay type "Hydra"

Dimensions: 500 * 500 * 160 mm

Number of diodes 252 * 1W

Mass 14.8 kg

Standard 275W mercury High Bay Bell-type, emitting a 12700 lm luminous flux,
efficiency 46 lm / W.



Data from photometric measurements of 275 W mercury type "Bell"
12,700 lm, efficiency 46 lm / W;

Name: High Bay type "Bell"
Dimensions: 410 * 700 mm.;
Light source: mercury lamp 250 W.;
Mass 10.8 kg.;

WARNINGS TO BUYERS PURCHASING LUMINARIES!

1. If your provider cannot provide you with Ldt. Files from a certified light laboratory, just do not trust the technical parameters which you have been provided.

"The best thing to do is take the light of your choice and to check it in a light lab. And please do not be surprised if your 200 W lamp actually consumes more energy and if the light output emitted by it is lower than that of the Hydra luminaire consuming just 90 W.

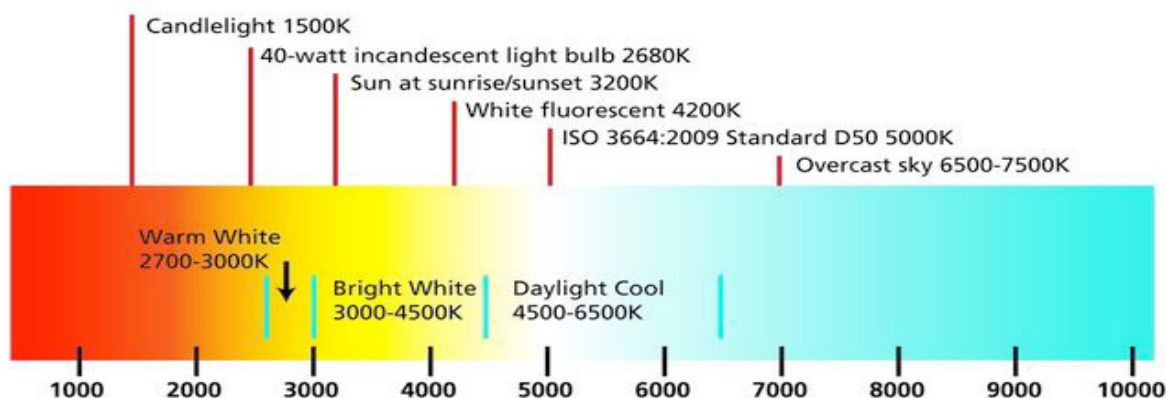
2. If you are an expert in lighting, you should be aware that the low CRI color rendering index increases the lumens emitted by the luminaire and increases its efficiency.

- Color rendering of light sources is an indication of their ability to reproduce realistically the colors of an object.
- Most conventional LED high bays luminaires have CRI 55 to 65;
- In the Hydra luminaires it has a minimum value of 70, which is determined by the

Osram LED manufacturer (CRI over 70 is acceptable for over 99% of industrial projects).

- If you need a higher CRI for your project, this is not a problem for us, you just have to show your desire.

3. Color temperature of the LEDs.



With Hydra lights, this temperature is typically around 5000K and does not exceed 6000K (this is the color temperature that corresponds to daylight and is used in most projects).

- Be careful, very often this indicator is not kept to and you are offered lights with a color temperature above 6500K, which is not only unpleasant but also harmful to human vision.

4. Never compare luminaires based on how many watts they are. The only accurate performance indicator is lm / W (lumen per watt), i.e. How much light flow will emit the luminaire for 1W of electricity consumed for this radiation.

- The logic is simple: a 100 W lamp with efficiency 70 lm / W will emit 7,000 lm, the same 100 W luminaire with efficiency 140 lm / W will emit 14,000 lm. i.e. simply, the second light will light twice brightly at the same power consumption.

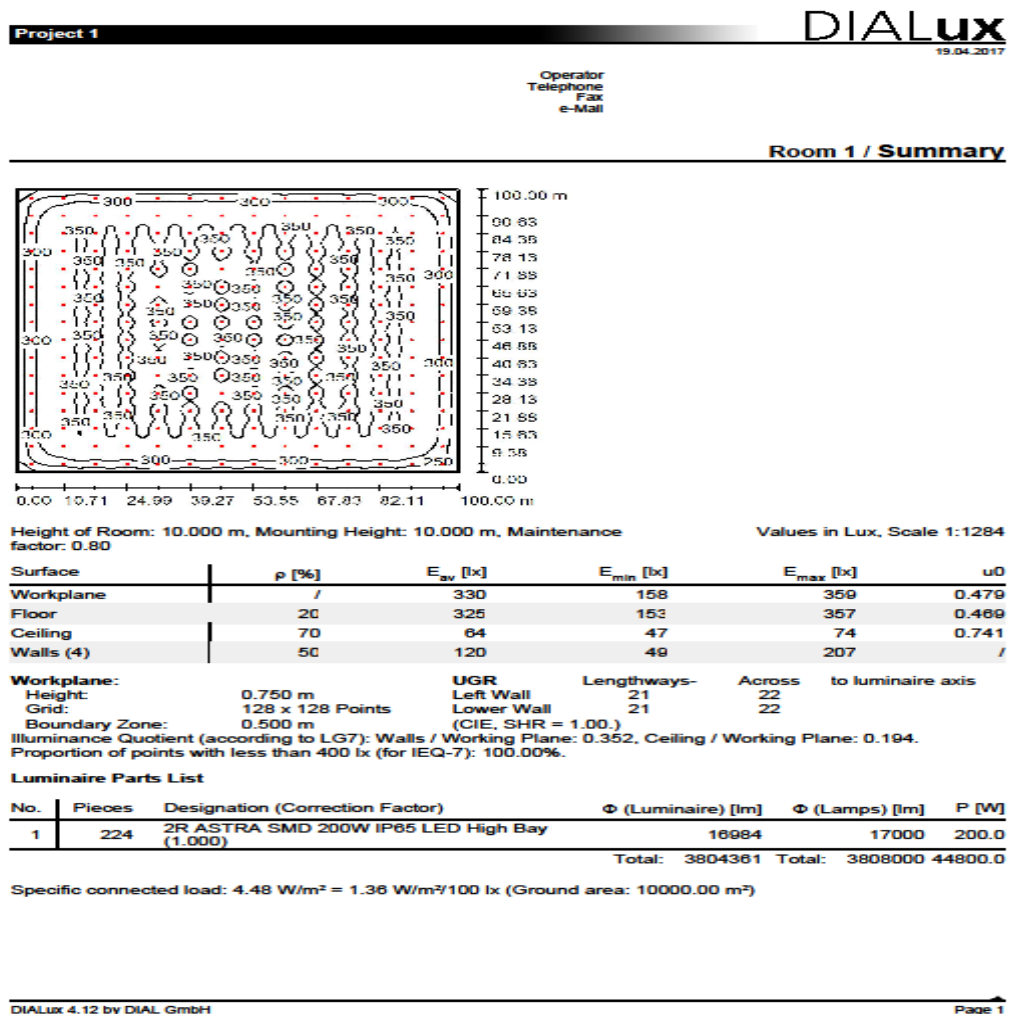
DIALux simulation comparison

Let's compare with computer simulation three light bodies with the Ltd. supplied by their manufacturers and check the results.

For this purpose in the simulation we will use a square room with a side 100m x 100m and height 10m.

The desired average illumination is the standard for most industrial premises 300 lux (1 lux = 1 lm / m²).

Let's start with a conventional Hi Bay 200W available at distribution network.

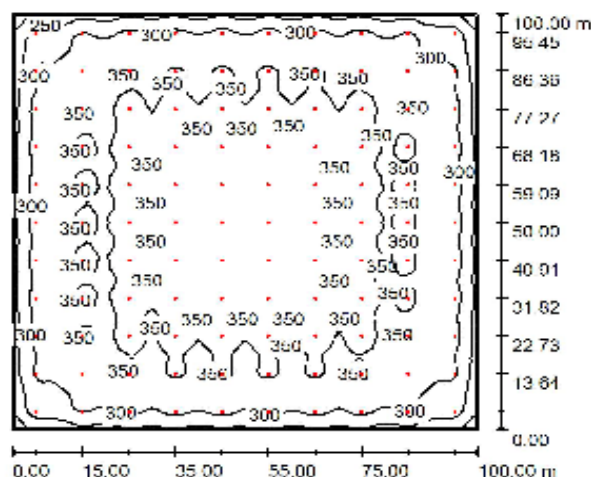


And let's do the same measurement now with the Hydra 236 W.

Project 1
DIALux

19.04.2017

Operator
 Telephone
 Fax
 e-Mail

Room 1 / Summary


Height of Room: 10.000 m, Mounting Height: 10.000 m, Maintenance factor: 0.80

Values in Lux, Scale 1:1284

Surface	ρ [%]	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0
Workplane	/	330	171	375	0.518
Floor	20	325	166	369	0.521
Ceiling	70	68	59	89	0.868
Walls (4)	50	170	62	248	/

Workplane:

Height: 0.750 m
 Grid: 128 x 128 Points
 Boundary Zone: 0.500 m

UGR

Lengthways-
 Left Wall >30
 Lower Wall >30
 (CIE, SHR = 1.00.)

Across to luminaire axis
 >30
 >30
 Illuminance Quotient (according to LG7): Walls / Working Plane: 0.499, Ceiling / Working Plane: 0.207.
 Proportion of points with less than 400 lx (for IEQ-7): 100.00%.

Luminaire Parts List

No.	Pieces	Designation (Correction Factor)	Φ (Luminaire) [lm]	Φ (Lamps) [lm]	P [W]
1	110	Industrial Lighting Hydra 240W goli diodi (Type 1)* (1.000)	35866	35866	236.0

*Modified Technical Specifications

Total: 3945227 Total: 3945260 25960.0

Specific connected load: 2.60 W/m² = 0.79 W/m²/100 lx (Ground area: 10000.00 m²)

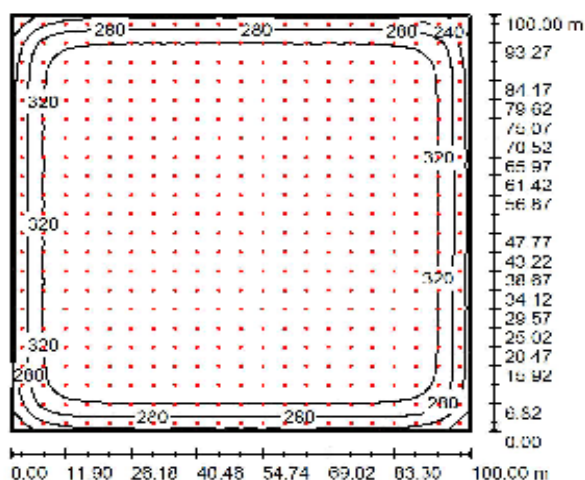
Finally, let's do the same measurement with a 275W mercury-type mercury type luminaire

Project 1

DIALux
 19.04.2017

Operator
 Telephone
 Fax
 e-Mail

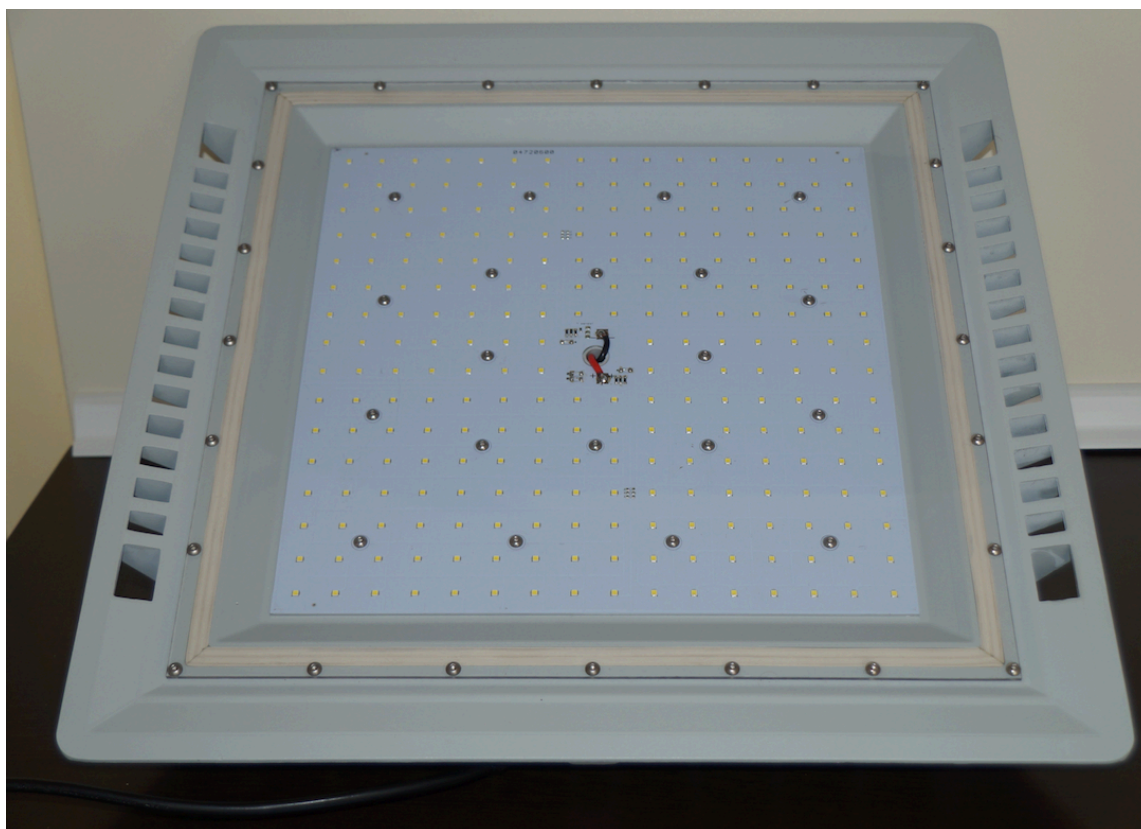
Room 1 / Summary



For all non-professionals, the results represent above show the following:

1. The average illumination for all three simulations is 330 lux.
2. This illumination is achieved by:
 - 110 units of 234 W LEDs Hydra;
 - 224 pieces 200 W Hi-Bay LED Illuminators;
 - 462 pieces 275W mercury-type luminaires.
3. The conclusion is that with one Hydra luminaire we replace two standard Hi Bay LED lights and four mercury-type luminaires.

What is the secret of such a good performance of the Hydra Lighting?



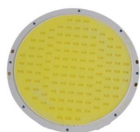
DO YOU SEE THE LARGE NUMBER OF LEDs IN THIS 240 W LIGHT HYDRA?

We use 252 LEDs of 1W to make our 240W LED light. It may seem crazy, but it is the greatest help we give to the outgoing light stream. Because the more LEDs we use on the same watts, the less the load on each separate LED chip. This results in less heat dissipation, higher efficiency and longer life of LEDs and illuminators in general. In addition, we use the latest generation Duris S5 LEDs from the German company Osram, each with an efficiency of 170 lm / W.

Here are more secrets behind this good performance!

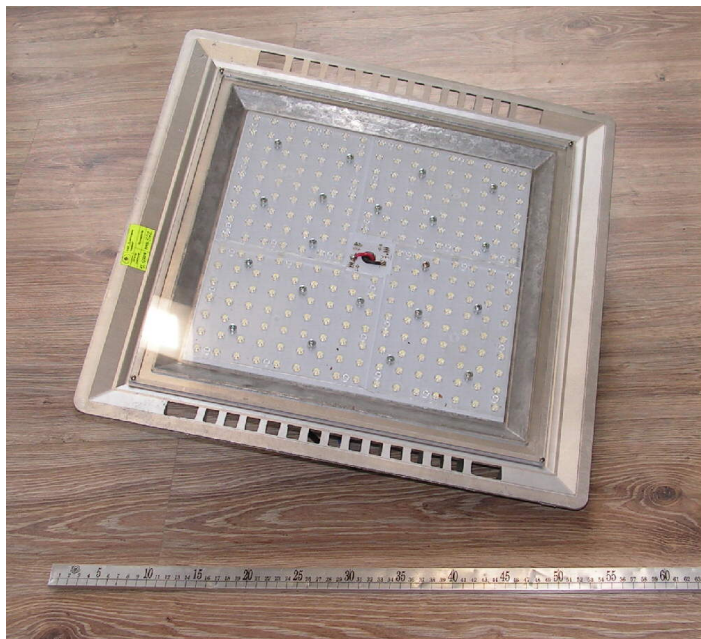
If two LED boards are of the same quality, they use the same LEDs and the only difference between them is their size. In your opinion, which one will have better heat removal?

This is a standard COB diode used for standard Hi Bay LEDs. Its diameter is 50 mm or has an area of 19.6 cm².



And this is the LED board we use for Hydra.

Its side is 36 cm, or has an area of 1296 cm².



That means we have a 66 times larger cooling area.

But that's not all, we use aluminum boards with more than 40% thicker than standard and with a double (70um) copper coating of electrically conductive contours.

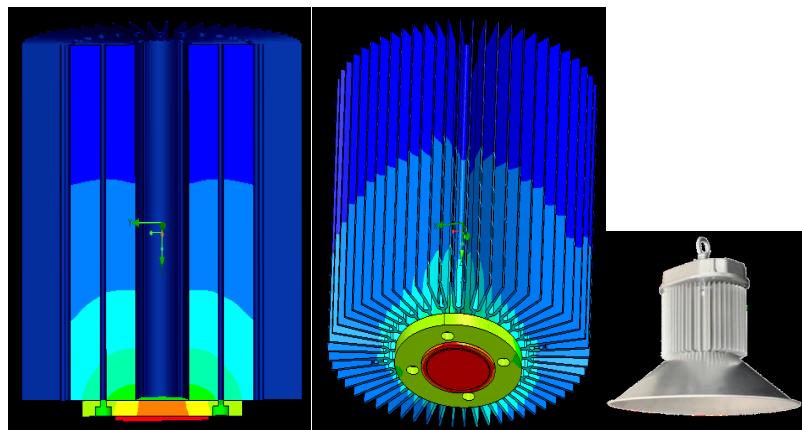
Proper temperature management is key to the design and implementation of powerful LED lighting.

The only weakness of LED technology is that poor cooling of LEDs leads to their rapid degradation and thus shortens their lives.

A major element in the good heat output of the luminaires is their housing. For the production of the Hydra hulls an aluminum alloy such as the automotive industry is used, which guarantees the high quality of the used raw material and meets the highest physical and mechanical requirements for a quality product. The raw material used is chosen not only for its better heat transfer, but also in terms of subsequent machining, painting and design.

Different manufacturers use different technologies to produce their housings, but this is what laboratory tests show with a thermal imaging camera.

This is a standard 150W led lamp in red is the heated to 74.10 °C. board with COB LEDs. A yellow temperature is indicated at 67 °C. By height, the temperature decreases in the light blue area to 52,96 °C., in the blue zone at 49,43 °C. and in the dark blue area at 42,98 °C.



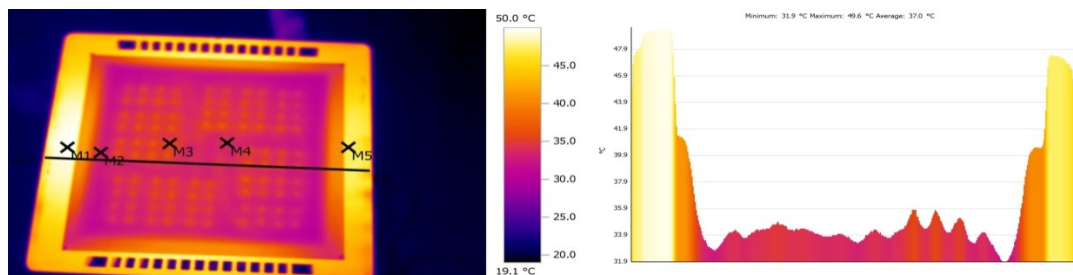
Too much and too close-up LED chips on a small area concentrate the heat mainly around the LED board. The hot zone is too far from the radiator end, which prevents heat smooth dispersion from working on the LEDs.

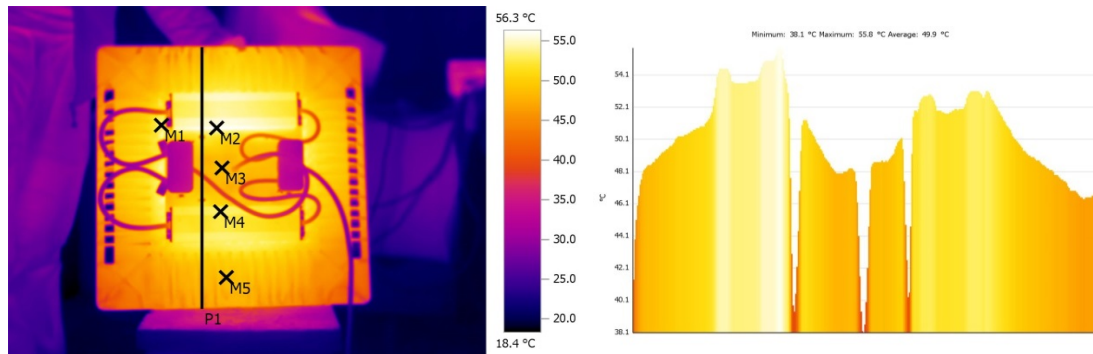
And remember that when you touch the radiator of the luminaire and it is cold, it does not mean that he is very good. You should check the temperature of the LED board.

The thin, specially designed aluminum body of Hydra, thanks to its large area, allows the rapid removal of heat into the surrounding atmosphere.

These are the thermal imaging of the 315W * tunnel luminaire "Hydra", the same is with two 150W power supplies, the maximum temperature is 55.8 °C measured not on the housing but on the power supply.

* We have used two 150W power supplies because the maximum power of the Mean Well HBG series is 240 watts.





But that is not enough. Our research shown that even a thin body with improved thermal design of the modern Hi Bay UFO type luminaires is not enough to take away the heat from the LEDs. Especially in high industrial premises, where the temperature in the summer often exceeds 80 °C. For such purpose, we placed each of the 252 LEDs just below a needle rib with a raised height. We increased the size of the luminaire to a square of 500 mm and added twice as much aluminum to the radiator casting.

Yes, only the body of the Hydra luminaire has a mass of 10 kg. of pure aluminum! All this has a reason, and it is that the reassured thermal management allows us to be sure of the durability and long life of the luminaire. Measurements with a power supply of even 440 watts found that at 25 °C ambient temperature, even after 3 hours, the housing reached its equilibrium point after which its temperature did not rise.

Another very important point - the power supply used.



The power supply we use is specially designed by the world's leading manufacturer of power supplies. It has a five-year warranty in fully enclosed aluminum housing with improved heat output that is in direct contact with the environment.



By contrast, conventional luminaire supplies are directly connected to the housing radiator, resulting in an increase of the supply temperature connected to that of the LEDs. There is no ventilation and direct access to the environment. This way you are never sure about the temperature of the power supply, and it is key to its life.

Very often we ask why Hydra lamps do not have a reflector for directing the light? Do you think the refiner assists the world's distribution?

Let's look at the information below.

LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:220.2V I:0.9035A P:196.6W PF:0.9886 Lamp Flux:14598x1 lm		
NAME: HIGH BAY	TYPE:LED HIGH BAY LIGHT	WEIGHT:10.5kg±0.4kg
DIM.: D400*H640	SPEC.:40W*4	SERIAL No.:HB200_B_90
MFR.: [REDACTED]	SUR.:0.025	PROTECTION ANGLE:44

DATA OF LAMP	PHOTOMETRIC DATA	Eff: 74.24 lm/W
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The last row marks the efficiency of the illuminator at a 90 degree reflector. It is 72.24 lm / W.

LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:220.2V I:0.8782A P:191.0W PF:0.9877 Lamp Flux:16215x1 lm		
NAME: HIGH BAY	TYPE:LED HIGH BAY LIGHT	WEIGHT:10.5kg±0.4kg
DIM.: D400*H640	SPEC.:40W*4	SERIAL No.:HB200_B_120
MFR.: [REDACTED]	SUR.:0.025	PROTECTION ANGLE:44

DATA OF LAMP	PHOTOMETRIC DATA	Eff: 84.91 lm/W
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On the last row, the efficiency of the illuminator at the 120 degree reflector is noted. It is 84.91 lm / W.

When the same conventional LED Hi Bay uses reflectors with different angles. Its effectiveness varies considerably. Therefore, it is simply useless to use a reflector with a smaller angle than that of the LEDs. Besides, of course, if you do not care about the light flow from the luminaire.

We have solved this problem with Hydra by using high-performance optics.

Another issue that we would like to address is how successfully a 120 W LED light can replace a 400 W high pressure sodium lamp.
We leave the photos without comment.



Picture on the left: 400 W sodium lamp and right: 120 W LED light.

Strict observance of the ecological criteria and the pursuit of clean technologies are leading principles in the work of INDUSTRIAL LIGHTING Ltd.

Innovative products are tailored to modern eco-friendly measures, resource efficiency improvement and sustainable use of raw materials.

All of this, of course, is great, but all of the above information would be interested only by some specialist. Unfortunately, most of our customers are not. They do not understand and do not want to understand this matter. By the way, they all understand the prices and the money they have to invest. For all of them, we use the following example.

You need 200W conventional LED lamps to illuminate your workshop with the 300 lux labor inspection required. Your shop lights up 10 hours a day and the price of electricity is 0.11 Eur. per 1kW. The cost of one LED Hi Bay lamp is 150 Eur. without VAT.

The investment you need is $100 \text{ lamps} \times 150 \text{ Eur.} = 15000 \text{ Eur.}$ without VAT.

Your annual electricity consumption will be:

$100 \text{ lamps} \times 200 \text{ W (or 0.2 kW)} \times 10 \text{ hours of operation} \times 365 \text{ days} \times 0.11 \text{ Eur. per 1kW.}$
Each year you pay for electricity 13030 Eur.

To achieve the same illumination of 300 lux, you will need 50 Hi Bay HIDRAs of 240 W (see page 8)

The investment you need is $50 \text{ lamps} \times 300\text{eur} = 15000 \text{ Eur.}$ without VAT.

With the difference that instead of 2 luminaries of 200 W, you will only mount one with a total consumption of 237 W.

Your annual electricity consumption will be:

$50 \times 237 \text{ W lamps (or 0.237 kW)} \times 10 \text{ hours} \times 365 \text{ days} \times 0.11 \text{ Eur. for 1kW.}$

You will pay 4757 Eur. a year for electricity.

That is, the annual profit from the difference in the paid electricity will amount to 3272 eur

And not only:

Your cost of installing the luminaires, building a lighting system and the required power from the power plant will be twice as low.

You also get a 5 / five / year full warranty instead of 3 / three / or 2 / two / year.

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A secondary aluminum / aluminum block of recycled metals is used to produce the luminaire housings. In this way, the company realizes resource-efficient production,

using as its main raw material 100% processed metal waste. This raw material allows, on the one hand, a reduction in the amount of waste deposited and, on the other, ensures the production of new products with recyclable materials.

The company's years of experience show that the alloy selected for the corpus manufacturing is 100% used in the automotive industry, which is a guarantee of high quality for the raw material used.

Also, the alloy used conforms to the best price-quality ratio and meets the highest physical and mechanical requirements for a quality product.

The main applications of the raw material used are also chosen on the basis of better heat transfer, which is the basic aspect of the operation of LED lights, but also from the point of view of subsequent machining, painting and designing.