



FRIGOLED LED LIGHTING SYSTEMS

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FRIGOLED

LED LIGHTING SYSTEMS FOR COLD STORES
Ideal Refrigeration Equipments Import&Export Corporation





Led Technology

LED lighting is believed to be the biggest revolution in lighting technology since the invention of lamp by Edison.

Today, the LED bulbs have begun to replace the commonly used halogen, fluorescent lamp, and sodium for lighting purposes.

The LEDs will be the light source of the future with their high efficiency, low energy consumption and up to 100,000 hours life-span.

These devices are made of semi-conductive chips on surface-mounted module in the body of a standard lamp. The working principle based on semi-conductor technology that directly produces photon (light) when current flows through the LED chip.

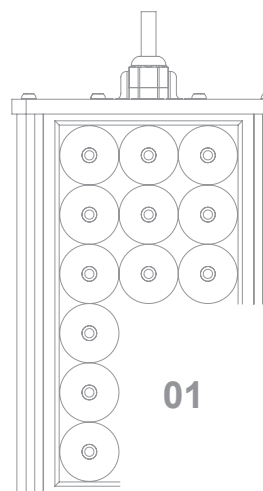
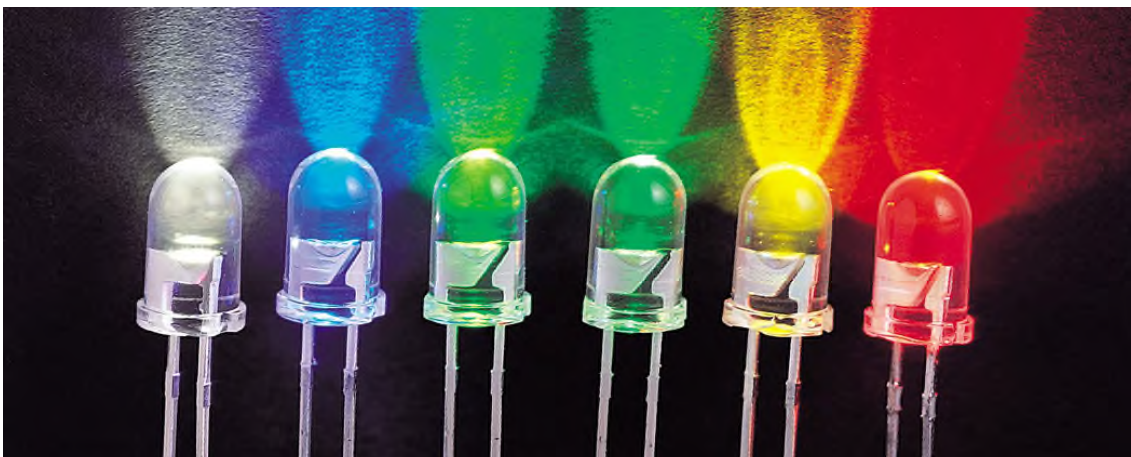
Is there a better light than a lighting system that can work for 8 hours a day, intact for nearly 35 years and consumes ten times less energy than an ordinary light bulb?

In short, new technology called LED (Light Emitting Diode) will illuminate our streets and homes as well as the cars.

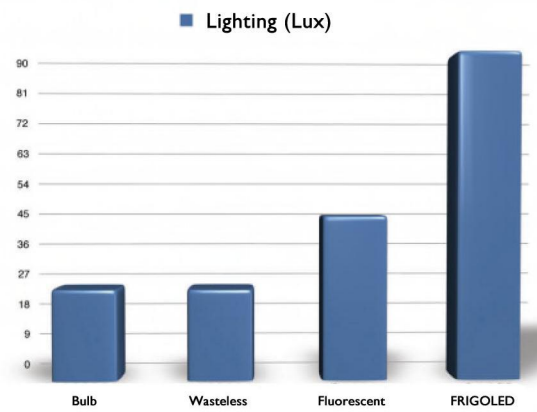
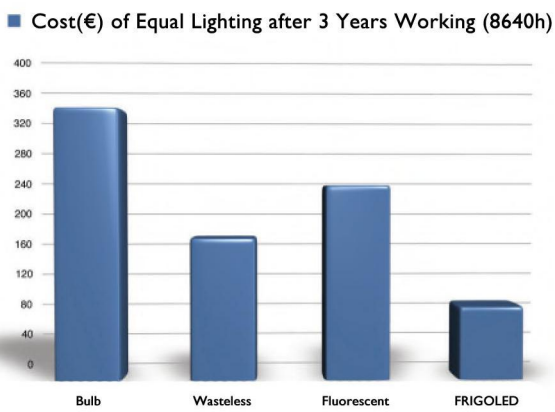
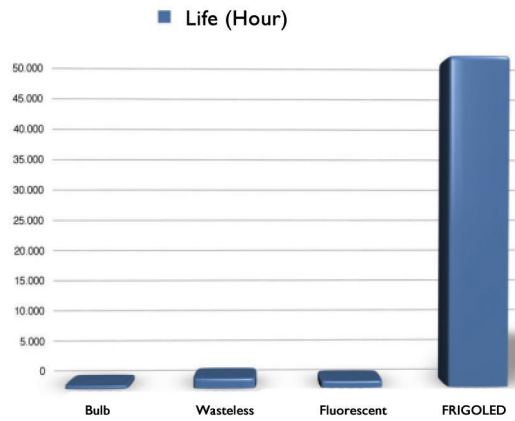
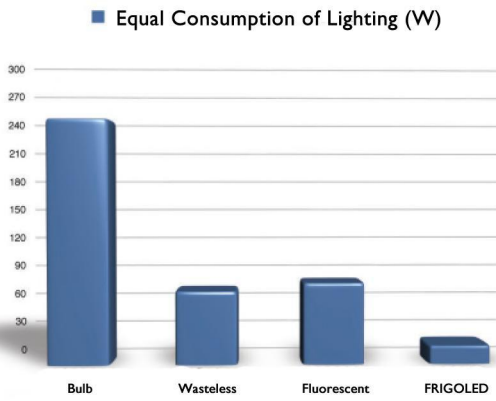
This lighting system has a record for durability. The LEDs have 100,000 hours (approximately 10 years) working life even if it depends on the operating current, temperature and color.

This new lighting system is already in use in broad spectrum from automobile headlights to the home using.

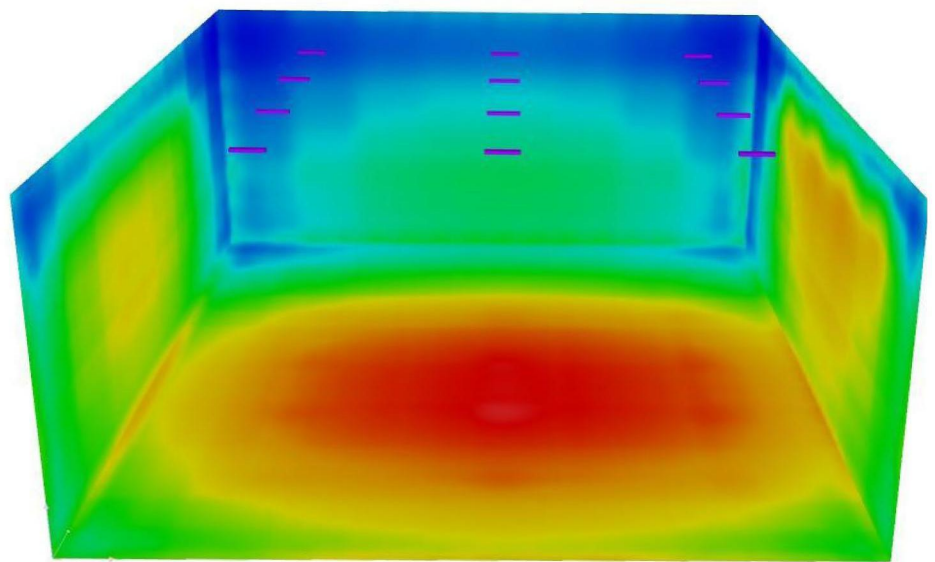
Moreover, being long – lasting is not the only advantage of this technology. If LED technology dominates 50% percent of the USA market then 17 gigawatt of electricity consumption will decline in the country. This is equivalent to seventeen conventional nuclear power plants.



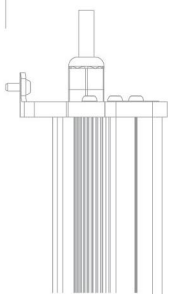
COMPARISON OF FRIGOLED LIGHTING SYSTEM WITH OTHER ALTERNATIVES



THERMAL COLOR DISTRIBUTION OF FRIGOLED LIGHTING SYSTEM



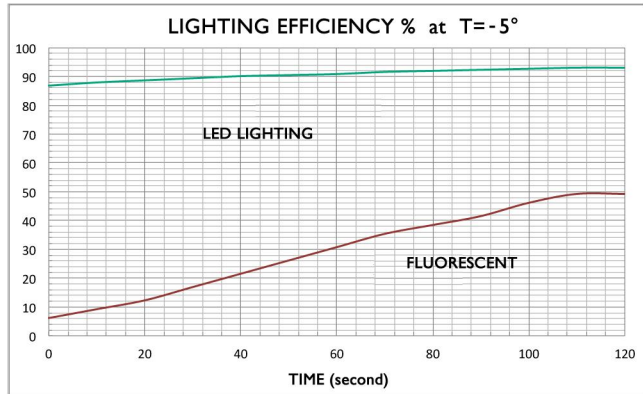
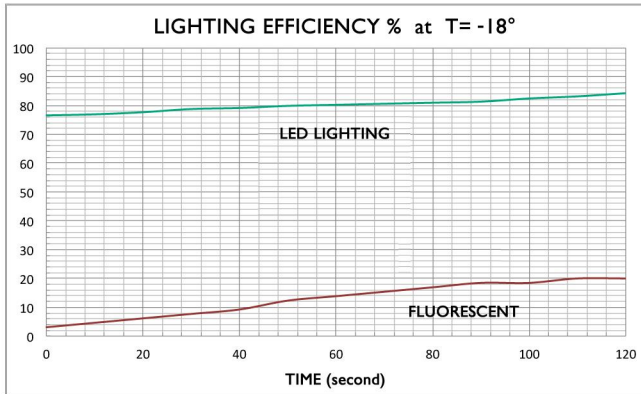
LUX



THE EFFECTS OF THE COLD ENVIROMENTS ON LIGHTING SYSTEMS

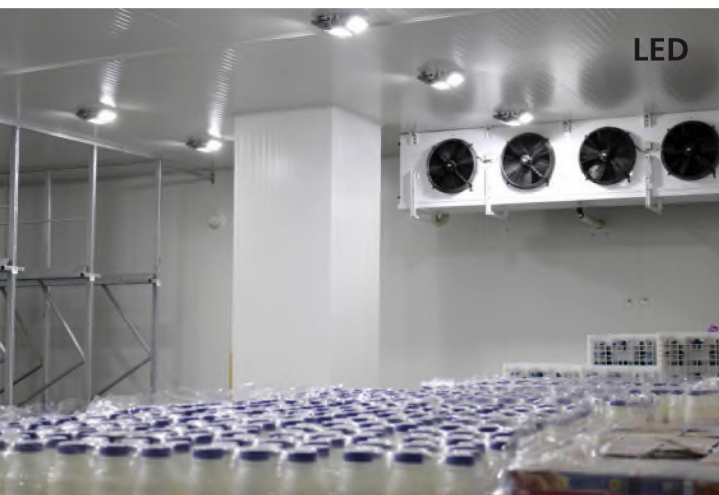
Normal and compact fluorescent lightings (energy saving lamps) used in cold rooms are being replaced by LED armatures.

The most important reason of this replacement is the excessive decline in lighting intensity connected with the decreasing temperature. In the tests at different temperatures carried out by different refrigeration firms, it has been observed that the compact fluorescents lose too much lighting intensity compared to LED armatures in cold environments.



Tests were carried out at 5°C, -5°C, -18°C and -25°C storage temperatures. In these tests measured light intensities were accepted as 100 units. These values are calculated over 100 lighting unit named as lighting efficiency. Normal and compact fluorescents lighting efficiency decreases by 10% especially at lower temperatures than -15°C. A light density has observed in every 10 seconds in 120 seconds time period.

According to the observed results it is obvious that led armatures are more efficient than compact ones. If the input-output time of the loading goods is accepted average 120 sec to the cold storages; old lighting systems can't reach even the half capacity of LED lighting.



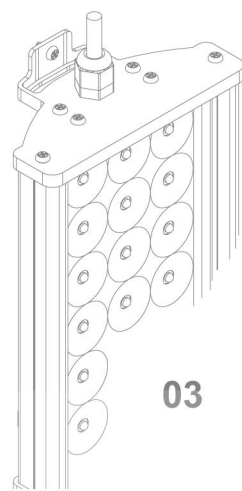
LED

In extremely cold environments, it takes a few minutes for fluorescent lighting to illuminate at desired levels. In LED lighting, this time is lower than a second.



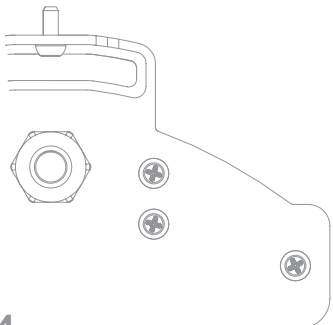
FLUORESCENT

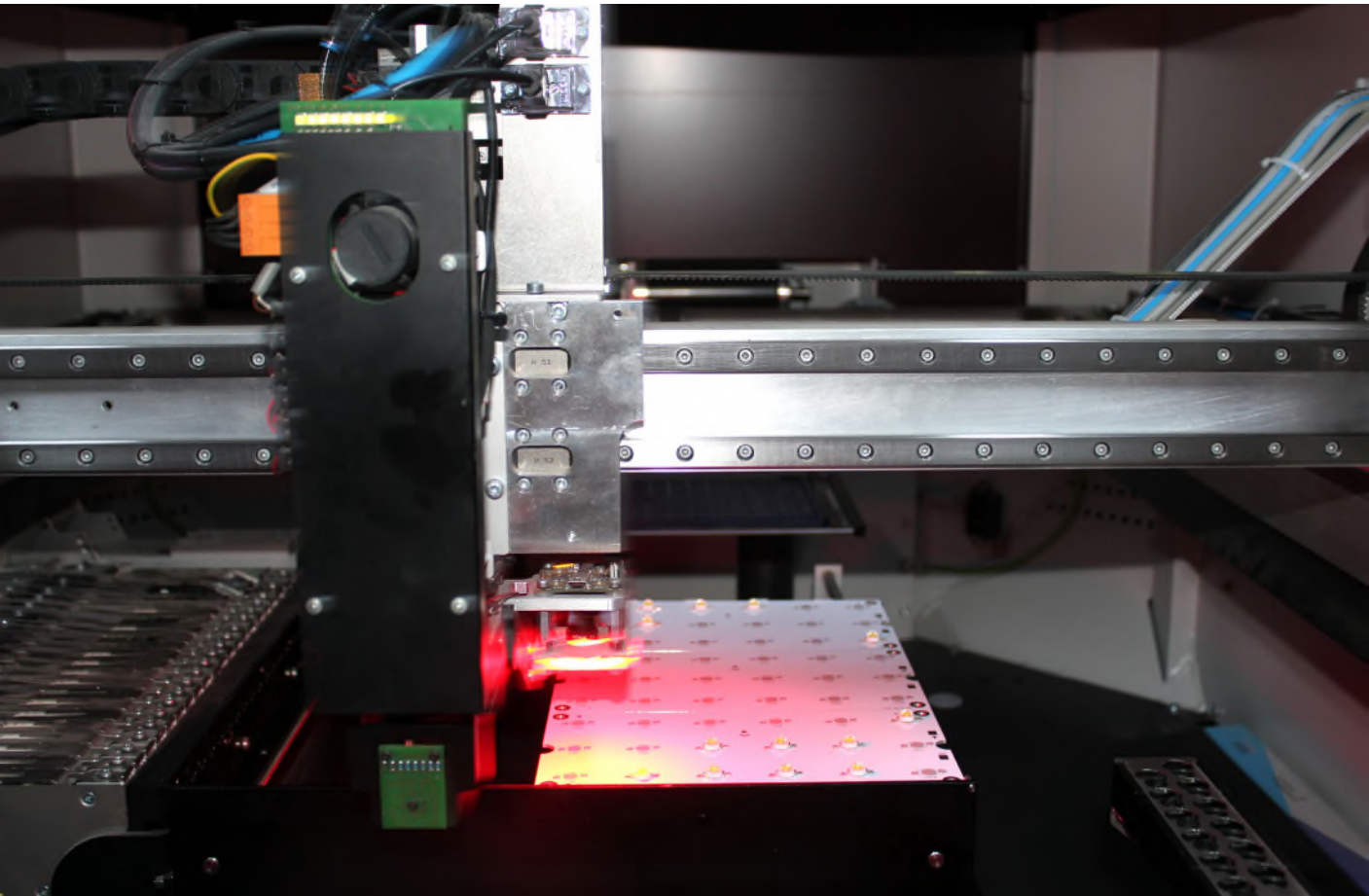
The product life of normal and compact fluorescents decreases everytime they are switched on and off. LED armatures are not affected by this.





LED Technology is preferred mainly in cold rooms and interior lighting cause of the high energy savings compared to other light sources .

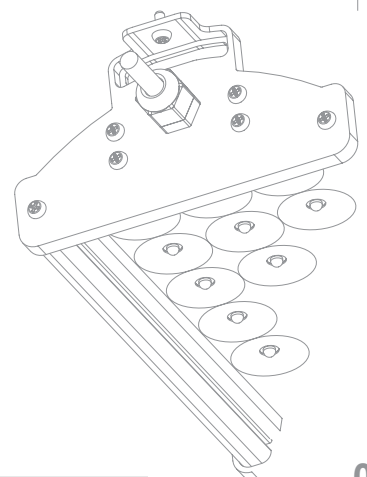




STRING HANDLING OF FRIGOLED CARD PRODUCTION PROCESS

Advantages of FRIGOLED lighting

1. Operating life up to 100.000 hours
2. Very low energy consumption (about 10% of the conventional sources)
3. Almost no heat production
4. 100% accessibility of light and color as soon as it's on
5. No need for a filter as they are produced in desired colors
6. Single and multi-color can be obtained
7. Light adjustment (0-100 %).
8. Maintenance-free. Easy to install.
9. Shock and vibration resistant. Does not contain fragile elements such as glass, filament
10. Does not include ultraviolet and infrared rays; safer to use for the food sector and light-sensitive materials.
11. Low DC operation voltage
12. There is no heavy metal in its structure such as mercury and halogen
13. Interoperability at temperatures as low as -40°C .
14. Suitable for indoor and outdoor use.



FRIGOLED LIGHTING ARMATURE SELECTION TABLES

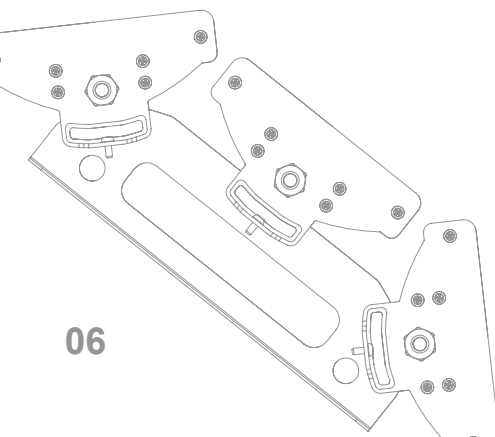


900
800 LM
11 W

FRIGOLED 900																	
STANDART						GOOD						EXCELLENT					
50 LUX	2 m	2.2 m	2.4 m	2.6 m	2.8 m	100 LUX	2 m	2.2 m	2.4 m	2.6 m	2.8 m	200 LUX	2 m	2.2 m	2.4 m	2.6 m	2.8 m
8 m ²	1	1	1	1	1	8 m ²	2	2	2	2	2	8 m ²	3	3	4	4	4
10 m ²	1	1	1	1	1	10 m ²	2	2	2	2	2	10 m ²	4	4	4	5	5
12 m ²	1	1	1	2	2	12 m ²	2	2	2	3	4	12 m ²	4	5	5	6	7
14 m ²	1	1	2	2	2	14 m ²	2	2	3	4	4	14 m ²	4	5	6	7	8
16 m ²	2	2	2	2	2	16 m ²	3	4	4	4	4	16 m ²	6	7	8	8	8
18 m ²	2	2	2	2	3	18 m ²	4	4	4	5	5	18 m ²	8	8	9	10	10

FRIGOLED 1800																	
STANDART						GOOD						EXCELLENT					
50 LUX	2 m	4 m	6 m	7,5 m	9 m	100 LUX	2 m	4 m	6 m	7,5 m	9 m	200 LUX	2 m	4 m	6 m	7,5 m	9 m
20 m ²	1	2				20 m ²	2	3				20 m ²	4	6			
50 m ²	2	3	4	4		50 m ²	4	6	8	9		50 m ²	8	12	15	17	
100 m ²		5	6	6		100 m ²		9	11	12		100 m ²		18	22	24	
250 m ²			10	12	14	250 m ²			20	24	30	250 m ²			40	44	48
500 m ²			18	20	22	500 m ²			36	40	45	500 m ²			72	80	90

An hour power consumption referred to the specified values in watt.
LM (Lumen): The unit of luminous flux per unit from a light source.
LUX: Sum of the fluxes of a surface illuminated by light sources per square meter



Z



**FRIGOLED LIGHTING ARMATURE
SELECTION TABLES**

**FRIGOLED
3600**
3200 LM
44 W

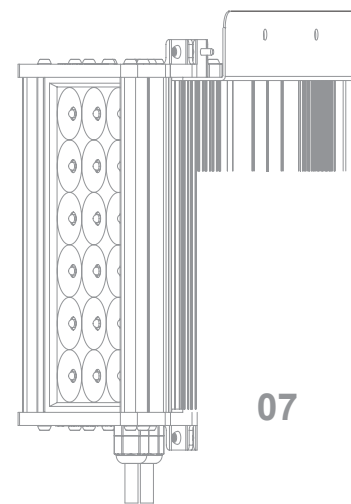


FRIGOLED 3600																	
STANDART						GOOD						EXCELLENT					
50 LUX	2 m	4 m	6 m	7,5 m	9 m	100 LUX	2 m	4 m	6 m	7,5 m	9 m	200 LUX	2 m	4 m	6 m	7,5 m	9 m
20 m ²	1	1				20 m ²	1	2				20 m ²	2	3			
50 m ²	1	1	2	2		50 m ²	2	3	4	4		50 m ²	4	6	7	8	
100 m ²		2	3	3		100 m ²		5	6	6		100 m ²		9	11	12	
250 m ²			5	6	6	250 m ²			10	12	12	250 m ²			20	24	27
500 m ²			9	9	10	500 m ²			18	20	22	500 m ²			36	38	40

FRIGOLED 5400																	
STANDART						GOOD						EXCELLENT					
50 LUX	2 m	4 m	6 m	7,5 m	9 m	100 LUX	2 m	4 m	6 m	7,5 m	9 m	200 LUX	2 m	4 m	6 m	7,5 m	9 m
20 m ²						20 m ²						20 m ²					
50 m ²	1	1	1	1		50 m ²	1	2	3	3		50 m ²	2	4	6	7	
100 m ²		1	2	2		100 m ²		2	3	4		100 m ²		5	7	8	
250 m ²			4	5	5	250 m ²			7	8	8	250 m ²			14	15	16
500 m ²			6	7	8	500 m ²			12	13	15	500 m ²			24	26	29

An hour power consumption referred to the specified values in watt.
LM (Lumen): The unit of luminous flux per unit from a light source.
LUX: Sum of the fluxes of a surface illuminated by light sources per square meter

**FRIGOLED
5400**
4800 LM
66 W



**FRIGOLED LIGHTING ARMATURE
SELECTION TABLES**

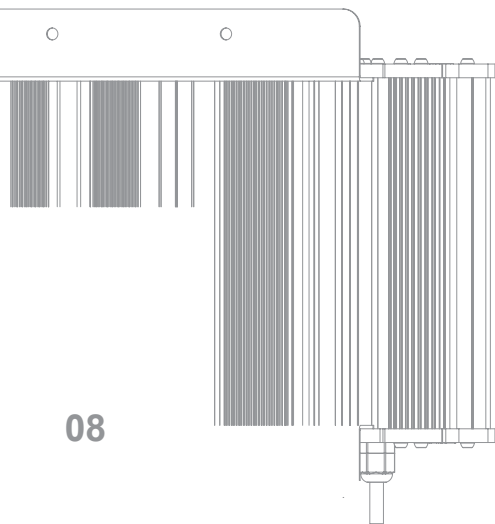


**ANGLED 3X FRIGOLED
3X1800
4800 LM
66 W**

ANGLED 3X FRIGOLED 1800																	
STANDART						GOOD						EXCELLENT					
50 LUX	2 m	4 m	6 m	7,5 m	9 m	100 LUX	2 m	4 m	6 m	7,5 m	9 m	200 LUX	2 m	4 m	6 m	7,5 m	9 m
20 m ²						20 m ²						20 m ²					
50 m ²	1	1	1	1		50 m ²	1	2	3	3		50 m ²	2	4	6	7	
100 m ²		1	2	2		100 m ²		2	3	4		100 m ²		5	7	8	
250 m ²			4	5	5	250 m ²			7	8	8	250 m ²			14	15	16
500 m ²			6	7	8	500 m ²			12	13	15	500 m ²			24	26	29

ANGLED 3X FRIGOLED 3600																	
STANDART						GOOD						EXCELLENT					
50 LUX	2 m	4 m	6 m	7,5 m	9 m	100 LUX	2 m	4 m	6 m	7,5 m	9 m	200 LUX	2 m	4 m	6 m	7,5 m	9 m
20 m ²						20 m ²						20 m ²					
50 m ²						50 m ²						50 m ²					
100 m ²		1	1	1		100 m ²		1	2	2		100 m ²		2	3	4	
250 m ²			2	2	3	250 m ²			3	4	4	250 m ²			6	7	8
500 m ²			3	4	4	500 m ²			6	7	8	500 m ²			12	13	14

An hour power consumption referred to the specified values in watt.
LM (Lumen) : The unit of luminous flux per unit from a light source.
LUX : Sum of the fluxes of a surface illuminated by light sources per square meter



**FRIGOLED 3X3600
9600 LM
132 W**



FRIGOLED LIGHTING ARMATURE SELECTION TABLES

FRIGOLED 3X5400
14400 LM
198 W

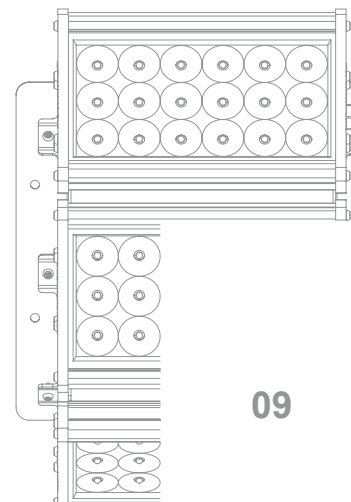


ANGLED X FRIGOLED 5400																	
STANDART						GOOD						EXCELLENT					
50 LUX	2 m	4 m	6 m	7,5 m	9 m	100 LUX	2 m	4 m	6 m	7,5 m	9 m	200 LUX	2 m	4 m	6 m	7,5 m	9 m
20 m ²						20 m ²						20 m ²					
50 m ²						50 m ²						50 m ²					
100 m ²		1	1	1		100 m ²		1	1	2		100 m ²		2	2	3	
250 m ²			1	2	2	250 m ²			2	3	3	250 m ²			4	5	6
500 m ²			2	2	3	500 m ²			4	4	5	500 m ²			7	8	9

An hour power consumption referred to the specified values in watt.
LM (Lumen) : The unit of luminous flux per unit from a light source.
LUX : Sum of the fluxes of a surface illuminated by light sources per square meter

LIGHTING CLASSIFICATION

Product range is the determining factor in the LED lighting applications of the cold storages. While 50 LUX **Standard** illumination is recommended for larger products, 100 Lux **Good** lighting for smaller pieces are recommended. 200 Lux **Excellent** lighting is recommended for very small pieces.





Sagun Fishery Antalya
15 pcs / 3 Angle x FRIGOLED 1800 / 990 W
290 m2 / 6,6 m height / Observed value 118 lux



Pelit Bakery İstanbul
5 pcs / FRIGOLED 1800 / 330 W
52 m2 / 2,8 m height / Observed value 135 lux

DIMENSIONS OF FRIGOLED ARMATURE

