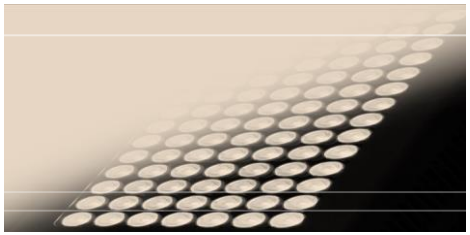
High Power LED Sports Lighting

Global Value LED Solution Provider







VISOL Inc.
#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheong-ro 502beon-gil, Gwangmyeong-si,
Gyeonggi-do, 423-030 KOREA Tel : +82-2-2612-2111 Fax : +82-2-2612-0660



Why, LED?

All the countries in the world are very vulnerable to the global warming, so they have built 'low-carbon' and 'green growth' as a strategy reinforcing environmental regulation of LED supply as energy efficiency and alternative energy.

High Efficiency

Electricity consumption saves up to 40% with low-cost and high efficiency

Low Consumption

Only 60% electricity consumption occurs comparing to MH lamps.

Prolonged Life Span

Economic maintenance cost

Development Story

High Power LED Lighting Solution on the condition of night games, harbor security

24hr continuous running !!!





Needed to make 'light weight' in order to increase radiant heat efficiency getting over typical type of high power LED lamps

Solved high power LED radiant heat !

Market Fact
Even though several companies launched 600W LED lamps, it hasn't been possible to get over occurred high heat and one on one replacement either. As a result, failed to be commercialized.

Finally, VISOL succeeded to develop high power LED solution !

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

SENi

High Power LED Sports Lighting





LED merits + VISOL LED technologies

VISOL has been dedicating advanced LED high power technology to the sports Lighting solution business field culminating LED general advantage and replacing Metal halide lightings.

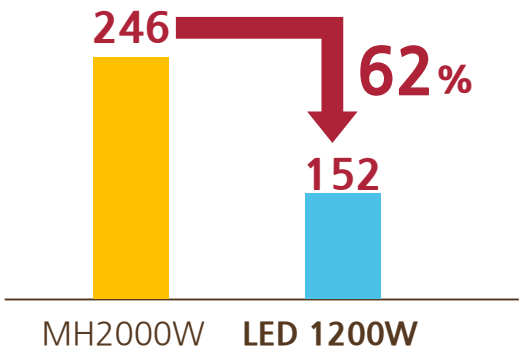
- Compact light Weight design
- Comfortable night game
- Eco-friendly Energy saving
- Low cost High efficiency

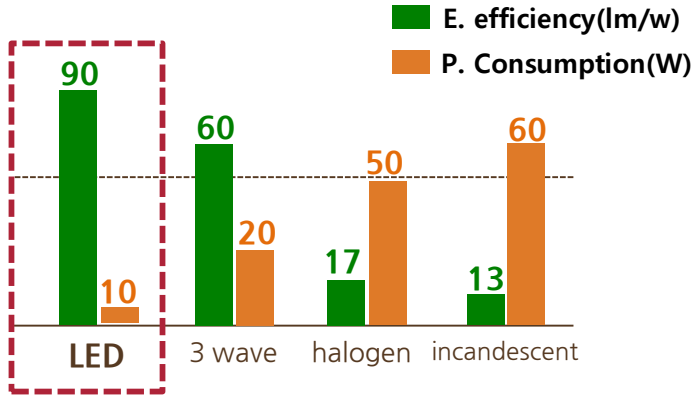
#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Features 1

Sustainable development to sports lighting perfectly

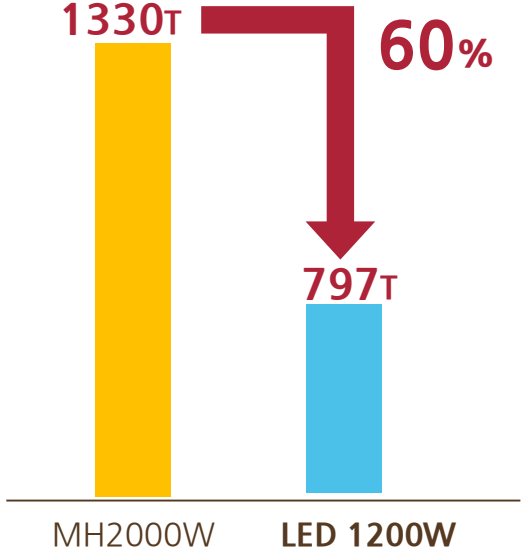
Annual electricity consumption Reduced up to 62%





Low CO_2 emission Low cost and comfortable night game

CO_2 emission 'reduced up to 60%'



LED1200W (6hrs a day-716unit) against MH2000W

CO_2 emission is the factor to gather mosquitos and insects.

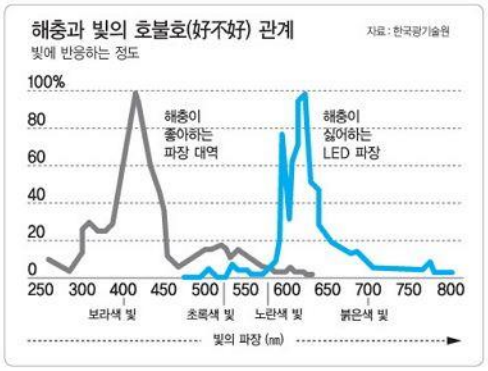
LED with low CO_2 emission makes players be comfortable while playing any games on the field.

Feature 2

Comfortable rounding blocking off insects, mosquitos etc.

Be out of ultra violet….





SENi visible ray with over 410nm blocks insects, pest away from the lamps and has players enjoy sports comfortably.

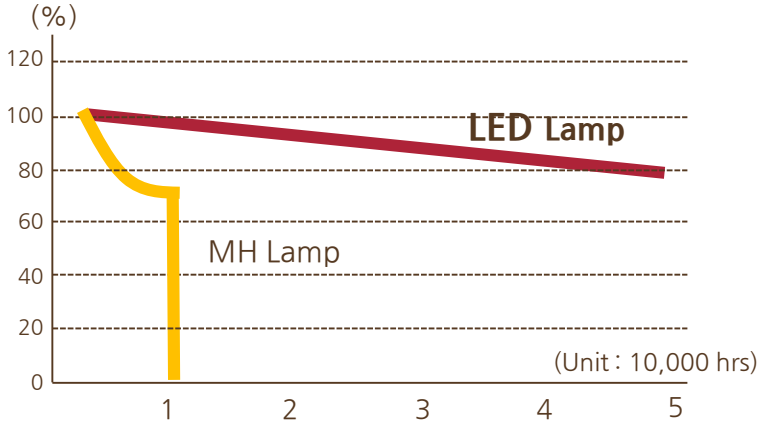
VS

Conventional

Under 410nm Visible Ray.
Uncomfortable night game during summer season.

Prolonged usage time (low cost, high efficiency)

Maintenance Cost Reduction



Compared initial luminous flux, Usable time up to 70% L.F decrease is

50,000 hrs.

Feature 3

SENi **94M (K.Won) saved for 1 years**

(Unit : Won)

Electricity Rate			Maintenance Cost			Cost Saving
Power(W)	LED 1200	Metal 2000	LED 1200	Metal 2000		
P.Consumption(kw)	1.2	2	Lamp, P.Supply	Lamp	P. Supply	
Quantity	716	716	716	716	716	
Usage(h/day)	6	6				
Consump.(kw/day)	5155	8592				
A.Rate (kw/day)	415,410	675,276	3,000,000	220,000	150,000	
A. Rate(Month)	12,635,378	20,539,658	0	0	0	7,904,280
Annual(365day)	151,624,540	246,475,897	0	0	0	94,851,357

- Depending on electricity rate from each countries
- Maintenance Cost (Labor cost for replacement job is not included)

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Applications












Specification



May differ from the actual product.

High Power 400W LED Lamp

Light Source	LED
Input Voltage	AC90V ~ 240V
P. Consumption	400W
Life Span	50,000 hrs
Color Temp.	6000K
Luminous Flux.	30,000lm
Input Method	Dimming(Option)
Beam Angle	22°, 45°, 60°
Int'l Protective	IP66
CRI	69
Size	300(W) x 550(H) x 120(D)mm
Weight	12kg
Material	Aluminum

- No Time to Warm-Up
- Dimming Control
- Continuous high brightness for illumination
- Optimized Flicker-Free for TV broadcasting and HSC shot.

Specification

SENi



High Power 800W LED Sports Lamp

Light Source	LED
Input Voltage	AC90V ~ 220V
P. Consumption	800W
Life Span	50,000 hrs
Color Temp.	6000K
Luminous Flux.	55,000lm
Input Method	Dimming(Option)
Beam Angle	22°, 45°, 60°
Int'l Protective	IP66
Cooling	Dual Cooled
Size	250(W) x 450(H) x 134(D) (mm)
Weight	10kg
Material	Aluminum

- No Time to Warm-Up
- Dimming Control
- Continuous high brightness for illumination
- Optimized Flicker-Free for TV broadcasting and HSC shot.

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Specification

SENi



May differ from the actual product.

High Power 1200W LED Sports Lamp

Light Source	LED
Input Voltage	AC90V ~ 220V
P. Consumption	1200W
Life Span	50,000 hrs
Color Temp.	6,000K
Luminous Flux.	89,730lm
Input Method	Dimming(Option)
Beam Angle	22°, 45°, 60°
Int'l Protective	IP66
Cooling	Dual Cooled
Size	352(W) x 580(H) x 126.5(D) mm
Weight	16kg
Material	Aluminum

- No Time to Warm-Up
- Dimming Control
- Continuous high brightness for illumination
- Optimized Flicker-Free for TV broadcasting and HSC shot.

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Pre-Consideration for Installation

In order to provide optimized game environment, the quality of light, the quantity of light and brightness have to be formed as trinity controlling the brightness to the game objective.

With the above solution, players, spectators are showed on TV clearly and plainly.

Quantity

- Horizontal
- Vertical
- Initial, continuous illumination

Brightness

- Fast Movement
- Objective
- Game Level
- Number of Spectators
- TV Broadcasting

Quality

- Uniformity
- Rate of change
- limited glaring
- cubic effect shadow

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Patent



CERTIFICATE OF PATENT

PATENT NUMBER
10-1228757

APPLICATION NUMBER 10-2012-0090132
FILING DATE 2012. 08. 17
REGISTRATION DATE 2013. 01. 25

TITLE OF THE INVENTION
LED lighting devices with dual cooling structure

PATENTEE
VISOL Inc.(110111-1******)
#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15,
Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Gyeonggi-do,
423-030 KOREA

INVENTOR
Inventors are filled out in a registration page.

THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.

2013. 05. 07.

COMMISSIONER, THE KOREAN INTELLECTUAL PROPERTY OFFICE KIM, Young Min

Patent No. 10-1228757

LED lighting devices with Dual cooling structure

Lighter weight

Much longer shelf life

200% increased radiant heat effect,
50% reduction in weight

ISO 9001 / 14001



Orion Registrar, Inc., USA
Certificate of Registration

This is to certify the Quality Management System of

VISOL INC.
#601 Gwangmyeong Jomyeong-town
#626-3 Cheolsan-dong, Gwangmyeong-si,
Gyeonggi-do, Korea

Has been assessed by Orion Registrar and found to be in compliance with the following Quality Standard

ISO 9001:2008

The Quality Management System is applicable to:

Design, Development, Manufacture, Installation and Service of LED High Speed Lighting, Imaging System and Automatic Optical Inspection System

The Registration period is from August 07, 2012 to August 06, 2015
This registration is subject to the company maintaining its system to the required standard, and applicable exceptions, which will be monitored by Orion.
Certificate Identification Number: KOR-1721-10-03
EAC / KOSC Code: 19 / 19

ANAB ACCREDITED
IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

09/04/2012
Mr. Paul M. Burck, President — Date

Orion Registrar Inc. ★ PO Box 745070 ★ Arvada, Colorado 80006-5070 ★ 303-456-6010 ★ FAX 303-456-6681
To authenticate this certificate please visit www.orion4value.com

Orion Registrar, Inc., USA
Certificate of Registration

This is to certify the Environmental Management System of

VISOL INC.
#601 Gwangmyeong Jomyeong-town
#626-3 Cheolsan-dong, Gwangmyeong-si,
Gyeonggi-do, Korea

Has been assessed by Orion Registrar and found to be in compliance with the following Environmental Management Standard

ISO 14001:2004

The Environmental Management System is applicable to:

Design, Development, Manufacture, Installation and Service of LED High Speed Lighting, Imaging System and Automatic Optical Inspection System

The Registration period is from September 07, 2011 to September 06, 2014
This registration is subject to the company maintaining its system to the required standard, and applicable exceptions, which will be monitored by Orion.
Certificate Identification: KOR-EMS-263-10-03
EAC / KOSC Code: 19/19

ANAB ACCREDITED
IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

07/07/2011
Mr. Paul M. Burck, President — Date

Orion Registrar Inc. ★ PO Box 745070 ★ Arvada, Colorado 80006-5070 ★ 303-456-6010 ★ FAX 303-456-6681
To authenticate this certificate please visit www.orion4value.com

Golf (Driving range)

Example

Golf ranges should be provided the optimal visibility of the distance and direction of the golf ball.







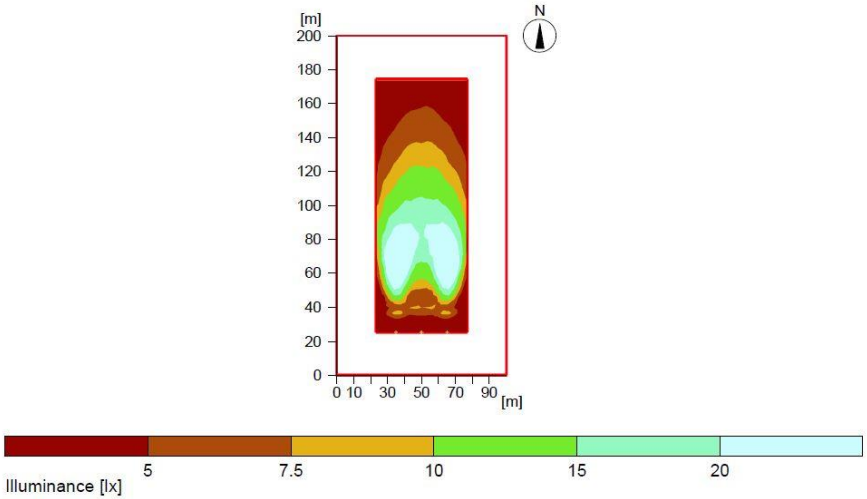
The lighting should be bright to see the movement of flying ball and make the brightness uniform by each floor.

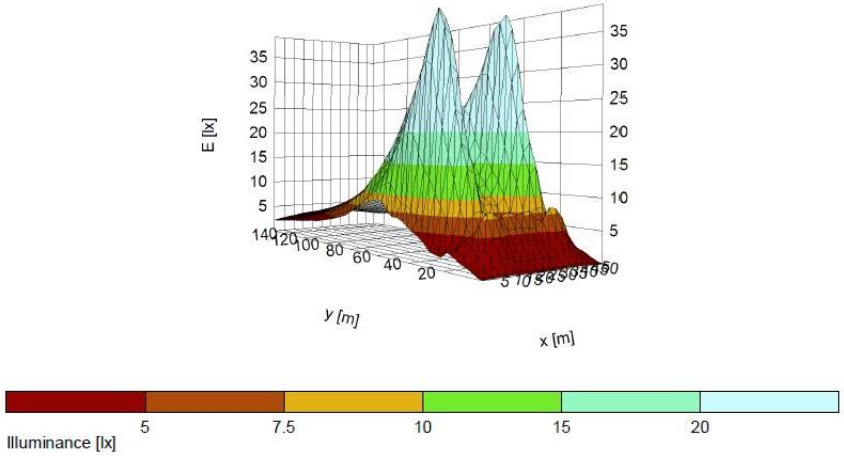
The lighting is to minimize the effect from environment conditions such as hot season, intense cold and insects.

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Golf (Driving range)

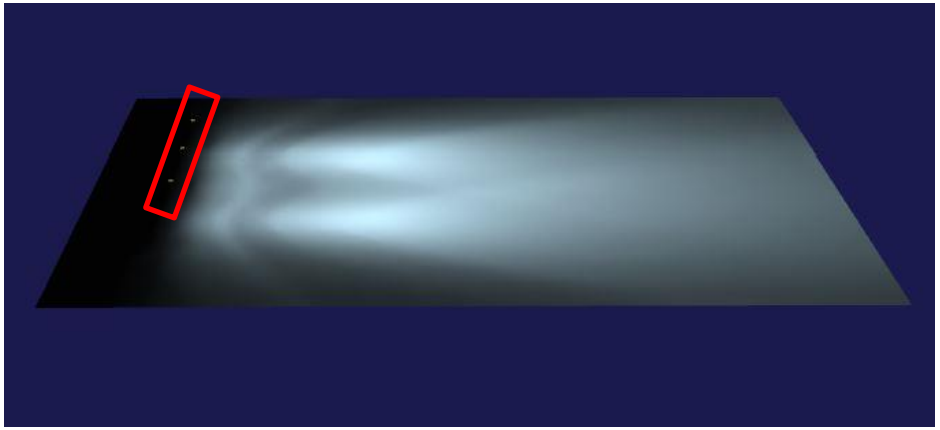
Simulation





Illuminance

Average illuminance	Eav	10.6 lx
Minimum illuminance	Emin	0.1 lx
Maximum illuminance	Emax	39.1 lx
Uniformity Uo	Emin/Em	1:99.1 (0.01)
Uniformity g2	Emin/Emax	1:364 (0)



Golf (tee ground, fairway, green)

Lightings on the golf course is necessary to display as daytime playing.







It has to be designed and configured depending on how much players feel comfortable and play. The management and judge of golf course affects to its turnover up to lighting brightness.

Lightings on the golf course have to illuminate suitably to tee ground, fairway and ground. It also has to minimize unexpected happenings.

The golf course lighting design

Lighting q'ty

Hole	Pole position								Qty (LED 1200W)	Power (kW)
	Pole 1	Pole 2	Pole 3	Pole 4	Pole 5	Pole 6	Pole 7	Pole 8		
Par 3	9						6	5	20	24
Par 4	7	4	9	9			6	5	40	48
Par 5	5	5	9	9	9	9	6	7	59	70.8

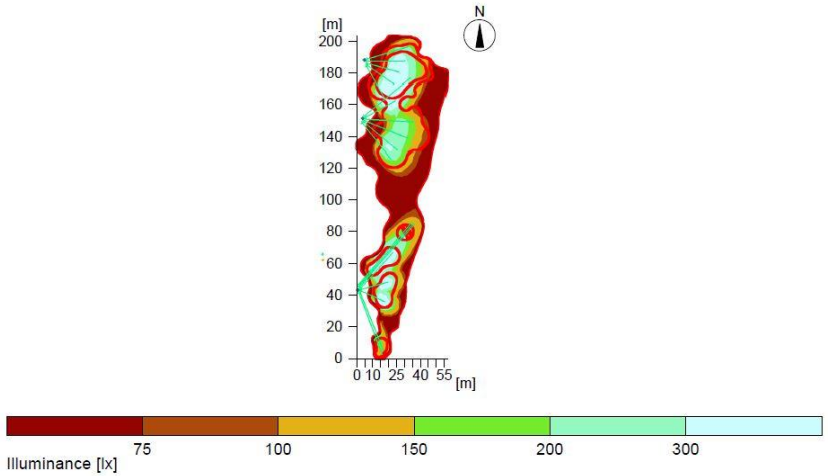
Ave. illuminance(Lux)

Hole	Tee 1	Tee 2	Tee 3	Tee 4	Fairway		Green
					Fairway 1	Fairway 2	
Par 3	145	297	373	173	227		323
Par 4	355	206	124	391	262	122	368
Par 5	425	361	169	451	192	148	346

The golf course lighting design data

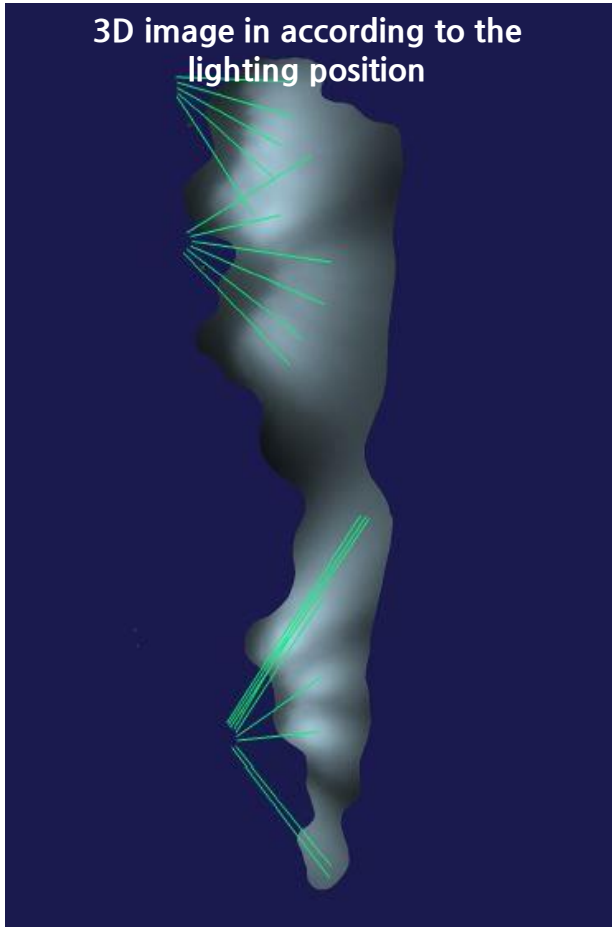
Par3

Illuminance distribution



Illuminance		
Average illuminance	Eav	149 lx
Minimum illuminance	Emin	4 lx
Maximum illuminance	Emax	523 lx
Uniformity g1	Emin/Em	1:36.2 (0.03)
Uniformity g2	Emin/Emax	1:127 (0.01)

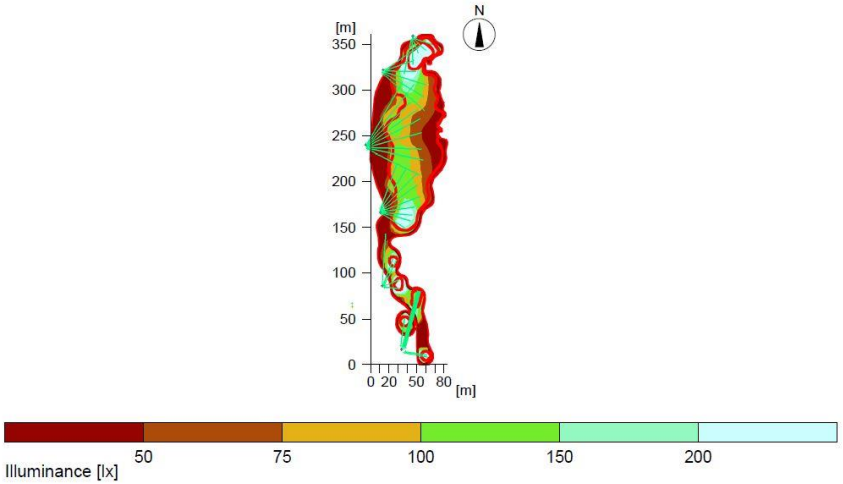
3D image in according to the lighting position



The golf course lighting design data

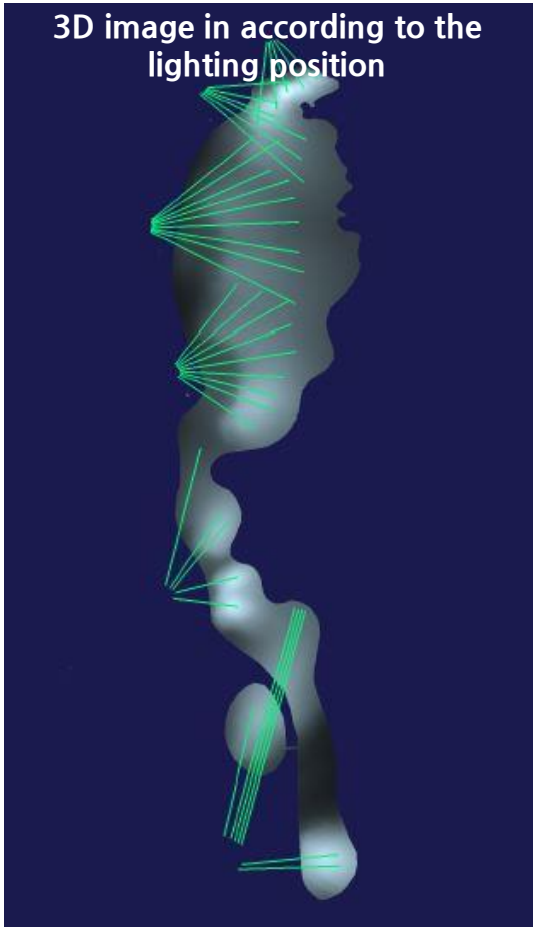
Par4

Illuminance distribution



Illuminance		
Average illuminance	Eav	105 lx
Minimum illuminance	Emin	6 lx
Maximum illuminance	Emax	619 lx
Uniformity g1	Emin/Em	1:18 (0.06)
Uniformity g2	Emin/Emax	1:106 (0.01)

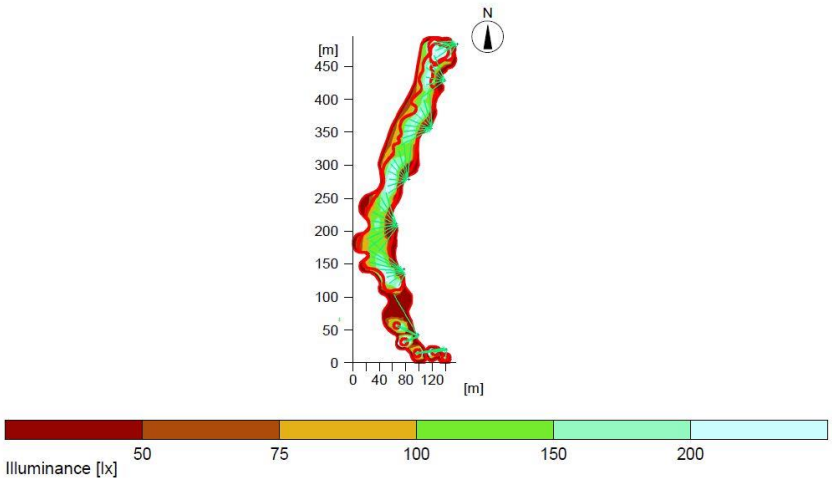
3D image in according to the lighting position



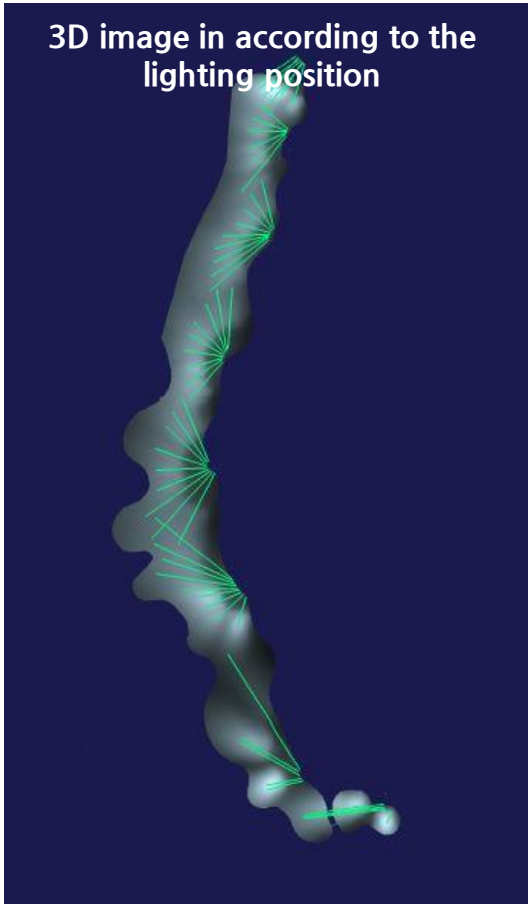
The golf course lighting design data

Par5

Illuminance distribution



Illuminance		
Average illuminance	Eav	119 lx
Minimum illuminance	Emin	4 lx
Maximum illuminance	Emax	632 lx
Uniformity g1	Emin/Em	1:28.9 (0.03)
Uniformity g2	Emin/Emax	1:154 (0.01)



Soccer field

Example

Quick emitting speed, long life time and low power consumption of LED is the best solution for soccer field.







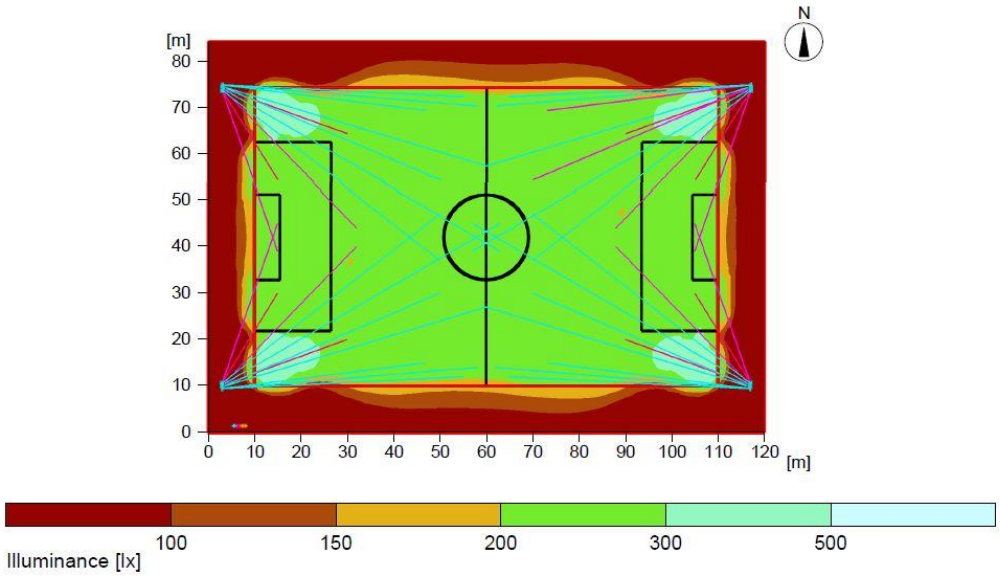
Players, referees and game officials should be able to see all situations at the soccer field.

It can be installed by each column of the corners of soccer field on the mast, the roof of the stand or the bottom frame.

But the angle should be set less than 70 degree.

Soccer field

Simulation



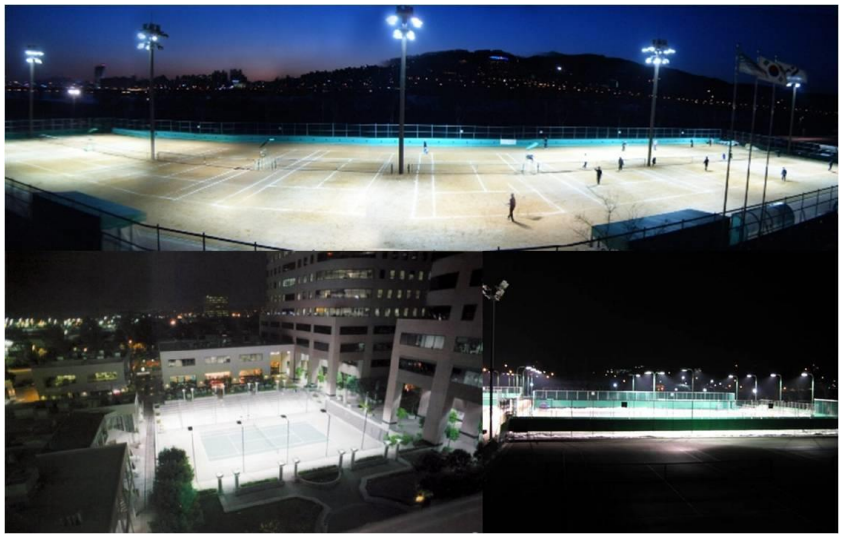
	800W LED
Ave. illuminance	236 lux
Max. illuminance	400 lux
Min. illuminance	114 lux
Uniformity (max.illuminance /min.illuminance)	**3.52**
Required qty	**800W LED 48ea**
Power consumption	**38.4kW**
Advantages	Provide an optimal level of illuminance for soccer game. **Maintain over 90% of initial illuminance level**, it makes a pleasant environment.
	It can make a various event to use instant on/off function.
	To direct various circumstances, it is able to adjust the **overall level of brightness (10% ~ 100%)**

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Tennis court

Example

LED lighting's flicker free function is best solution to track fast moving ball .





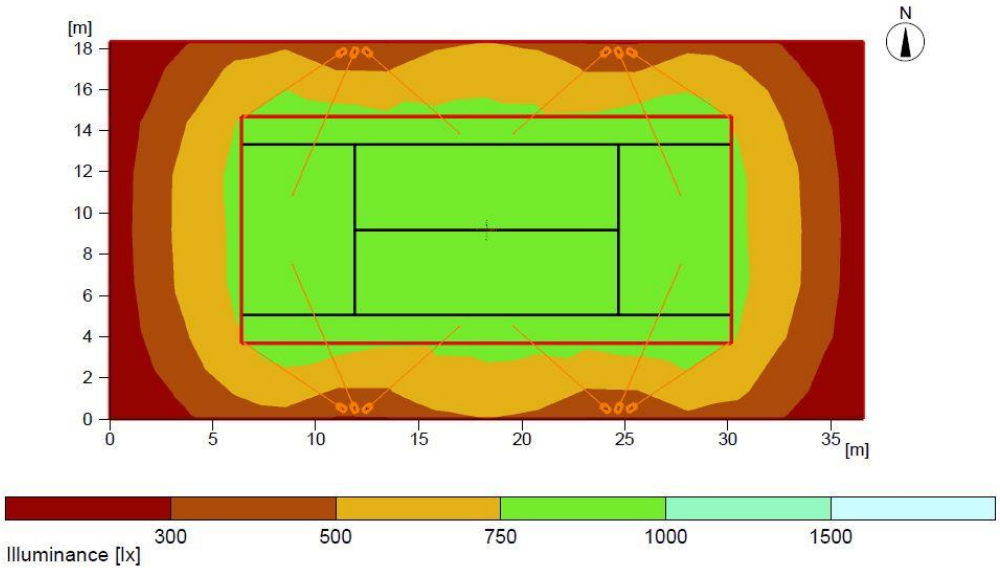


High level of the illuminance is required in case of international game because the ball is fast and the accurate judgment is needed during the game.

The lighting should be placed based on the max. uniformity and min. brilliantness.
To reduce the brilliantness, the illuminator in back line should be higher than the side line and designed not to spill outside.

Tennis court

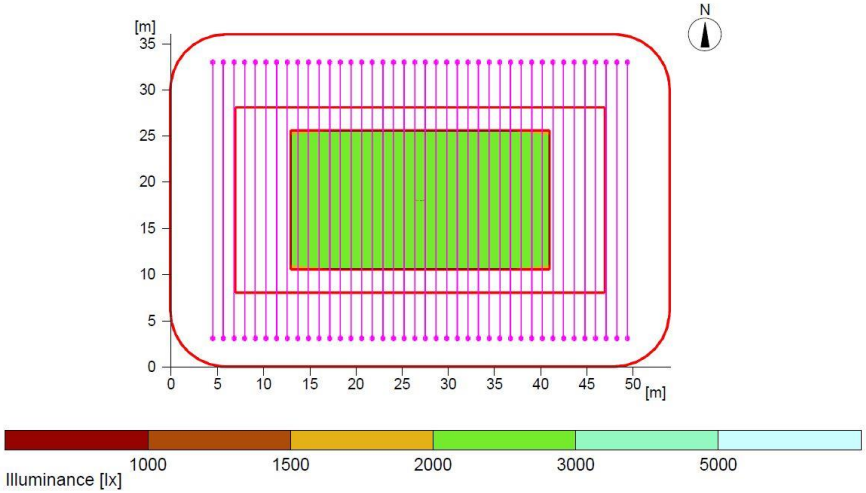
Simulation

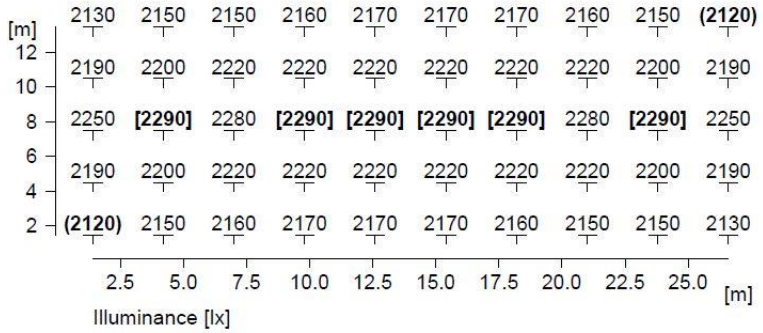


	800W LED
Ave. illuminance	856 lux
Max. illuminance	960 lux
Min. illuminance	804 lux
Uniformity (max.illuminance /min.illuminance)	**1.19**
Required qty	**800W 12EA**
Power consumption	**9.6kW**
Advantages	Provide an optimal level of illuminance for tennis game. **Maintain over 90% of initial illuminance level**, it makes a pleasant environment.
	It can make a various event to use instant on/off function.
	To direct various circumstances, it is able to adjust the **overall level of brightness (10% ~ 100%)**

Basketball court

Simulation



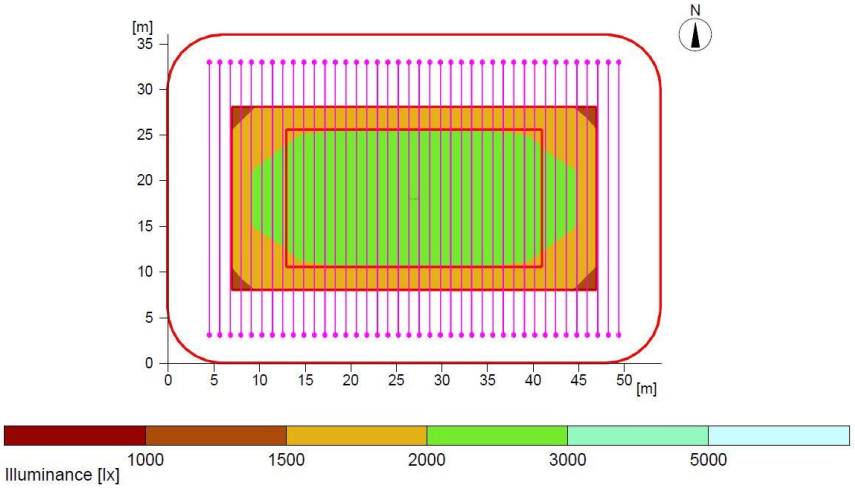


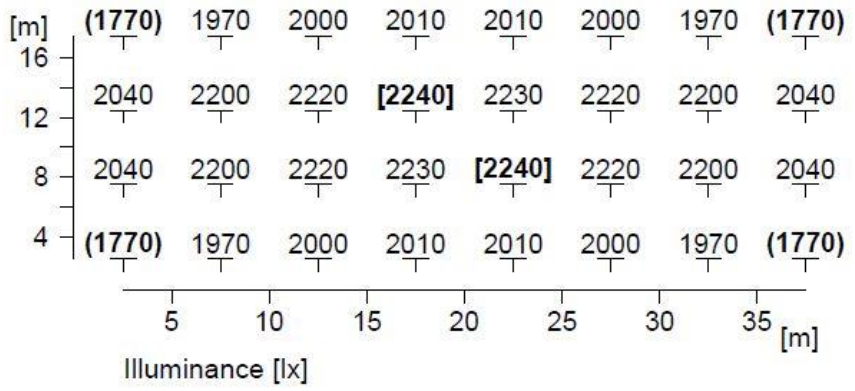
	800W LED
Ave. illuminance	2200 lux
Max. illuminance	2290 lux
Min. illuminance	2120 lux
Uniformity (max.illuminance /min.illuminance)	**1.08**
Required qty	**800W 80EA**
Power consumption	**64kW**
Advantages	Provide an optimal level of illuminance for basketball game. **Maintain over 90% of initial illuminance level**, it makes a pleasant environment.
	It can make a various event to use instant on/off function.
	To direct various circumstances, it is able to adjust the **overall level of brightness (10% ~ 100%)**

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Handball court

Simulation

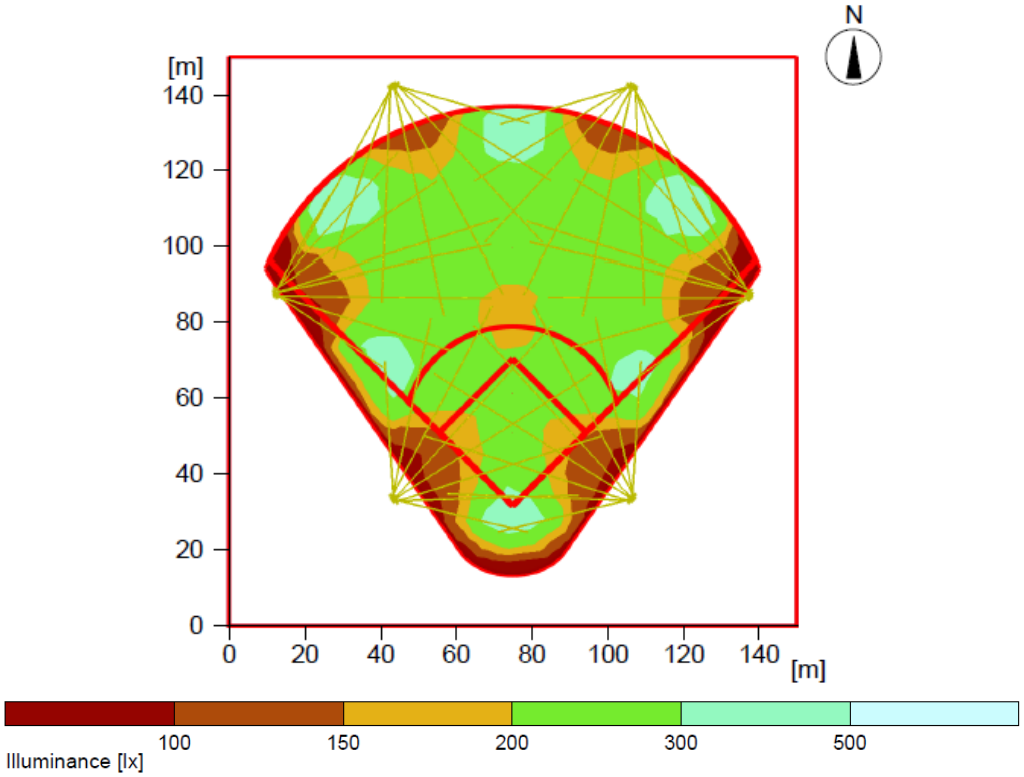




	800W LED
Ave. illuminance	2060 lux
Max. illuminance	2240 lux
Min. illuminance	1770 lux
Uniformity (max.illuminance /min.illuminance)	1.27
Required qty	800W 80EA
Power consumption	64kW

Baseball court(community)

Simulation



Ave. illuminance	221 lx
Max. illuminance	434 lx
Min. illuminance	63 lx
Uniformity (max.illuminance /min.illuminance)	6(8EA by pole)
Required qty	1200W 48EA
Power consumption	58kW
Advantages	Provide an optimal level of illuminance for the game. **Maintain over 90% of initial illuminance level**, it makes a pleasant environment.
	It can make a various event to use instant on/off function.
	To direct various circumstances, it is able to adjust the **overall level of brightness (10% ~ 100%)**

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Cycling (Indoor Velodrome)

Example

Lightings on cycling is a basic element for the safety and measurement recording of the games.







LED lighting is best solution for timing measurement system because of flicker free function

It should be designed in consideration of the moderate quantity and position of the lightings to maintain the uniformity of illumination and prevent the shadow by natural light.

Horse Racing

Example

Lightings on track game is a basic element for the accuracy measurement.







The track of horse racing is long, so it should be able to light up the whole track and this can make the game and showing on TV smoothly.

The lighting tower is used to illuminate over 4000 lux for the shooting of high speed camera of photo finish system at the finish line of the track.\

Speed Skating , Short Track

Example

LED lighting's flicker free function is the best solution for the shooting of the high speed camera for the timing measurement system.







It should be designed around various factors of the ice link.

In case of indoor ice link, in order to make the illumination higher, additional lighting is installed on the ceiling at the finish line.

#601, (Gwangmyeong Techno-Town, Cheolsan-dong) 15, Annyangcheon-ro 502beon-gil, Gwangmyeong-si, Kyonggi-do, 423-030 Korea / www.visol.co.kr

Athlete (Stadium)

Example

Lightings on track game is a basic element for the safety and accuracy measurement.







In order to make the illumination higher, additional lighting is installed on the ceiling at the finish line.

It should be designed in consideration of field and track event.
It can be controlled the illumination individually due to there should be no interference of light in the games such as the pole jump and the javelin.

Air Port / High bay

Metal Lighting is replaced by LED Lighting at the Airport and high bay for reduce the maintenance.







Above Photos are not a reference by VISOL, Inc.