

SPORTS LIGHTING

LIGHT YOU ON YOUR WAY



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for sports field

10 Project at a glance

Key factors
and benefits



TUPEX
solutions for
sports field



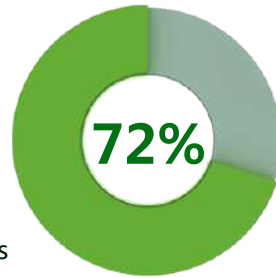
Project at a
glance



WHY SPORTS LIGHTING?



Percentage of EU population sports outside working hours



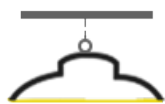
55%  Save Energy



Average energy savings by replacing HID fixtures with LED floodlights



Commercial lighting



Industrial lighting



Sports lighting



WHY CHOOSE TUPEX?

Complete product line

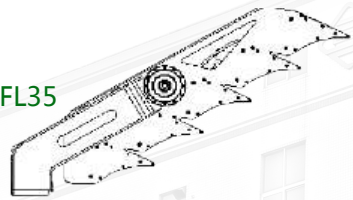
A complete product line that fits your project need.



FL01



FL35



Professional team

A professional team that ensures you get the newest products regularly.



1 engineer



a delicate team who focus on flood lighting



7 people create new ideas and concept



3 people develop optics



8 people implement the design and tests

Enriched project experience

We have an enriched project experience that helps you sell the flood lights to recreational and professional sports facilities.



OUR KEY ADVANTAGES



Keep innovating



Value customers feedback



Solution customization



ODM service



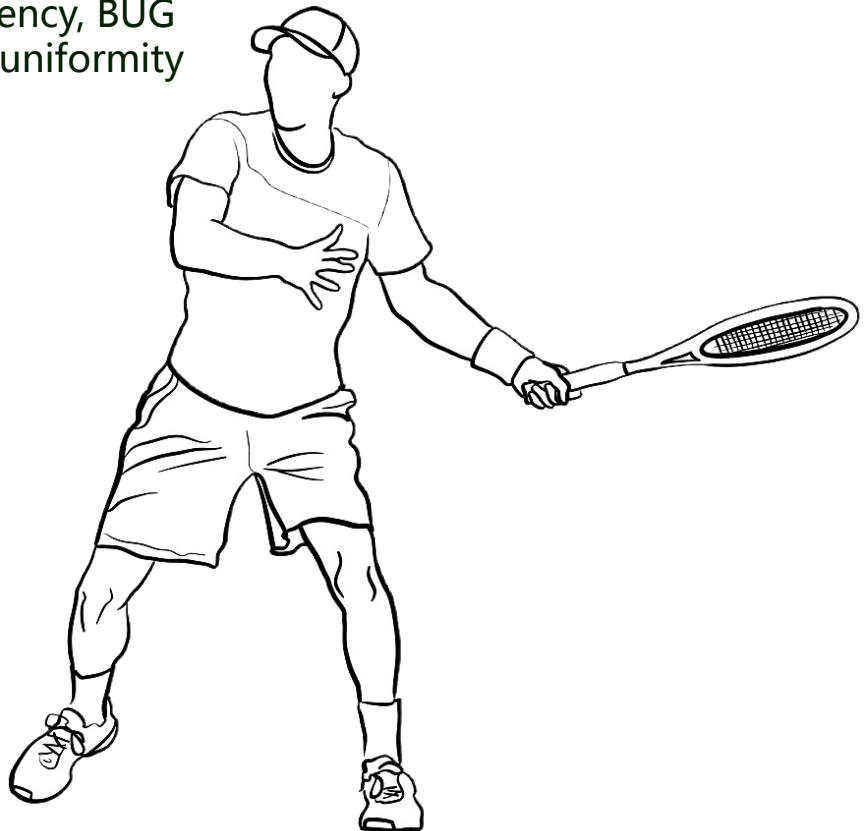


LED SPORTS LIGHTING

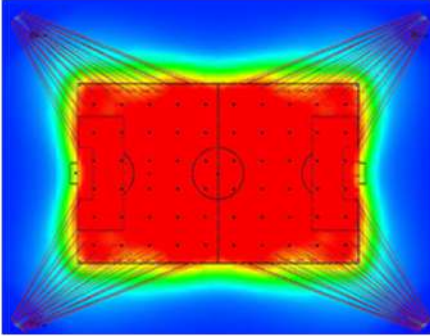
Every project will come with questions, especially for sports lighting.

- 🎾 How much light is enough?
- 🎾 How is the performance? How to identify the quality?
- 🎾 How can costs be kept down for the long term?

There are many factors that should be considered such as the luminaire system efficiency, BUG control (Backlight, Uplight, Glare), uniformity and maintenance.

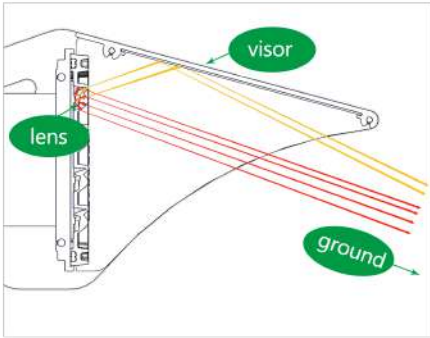


KEY FACTORS AND BENEFITS



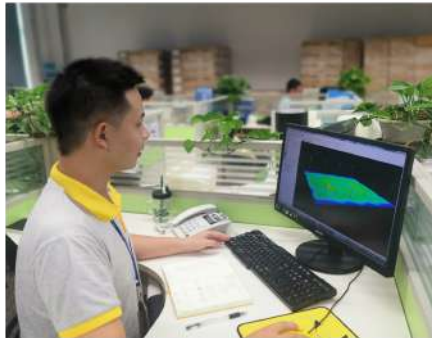
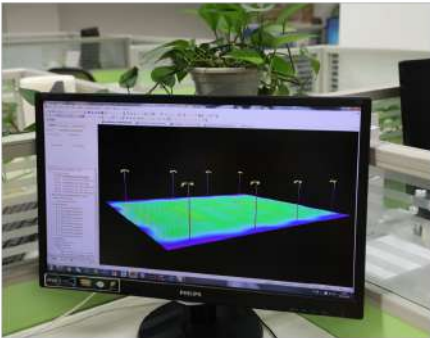
High system efficiency

Using fewer bright fixtures with the precision lighting distribution in application results in lower installation costs and higher energy savings.



Superior BUG control

With good back light control, the neighbors will be happy. With good up light control, the light pollution will be reduced. With good glare control, both the spectators and players will feel comfortable.



Uniformity

It is identified by U_0 , the maximum value is 1. Normally, U_0 (E_{min}/E_{av}) should be more than 0.5, the higher U_0 ratio, the better uniformity is, moreover, the higher lux level needed, the better uniformity should be.



Easy maintenance

Since the fixtures for sports lighting are installed very high, convenient maintenance is critical important. For LED fixtures, the defective part is mainly the driver, so remote gear box is considered in many projects.

TUPEX Lighting standards

The Swedish/European Standard EN 12193 is especially established for sports lighting to enable a good quality sports lighting through recommendations and requirements. The main norms defines:

Average level of illuminance ($E_{h\text{ ave}}$ in lux [lx])

- Maximise visual perception

Light uniformity (U0)

- Maximise visual comfort

Colour rendering index (Ra or CRI)

- Maximise real colour perception

Glare (GR)

- Minimise discomfort

Upward light ratio (ULR x%)

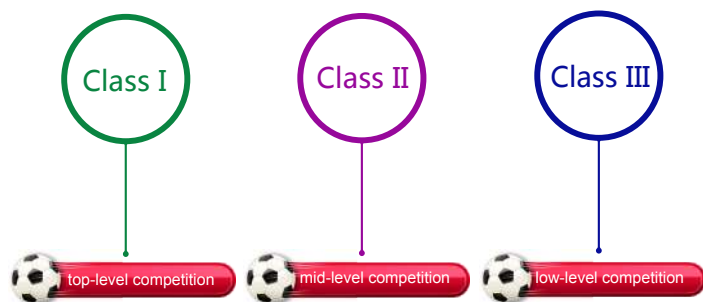
- Minimise upward light

Maintenance factor (MF)

- Maximise the lumen maintenance



Class definition



Level of competition

Class			
	I	II	III
International/National	•		
Regional	•	•	
Local	•	•	•
Training		•	•
Recreational			•

TUPEX solutions for sports field

10 Lighting a football field

17 Lighting a tennis court field

- Outdoor
- Indoor





LIGHTING A FOOTBALL FIELD

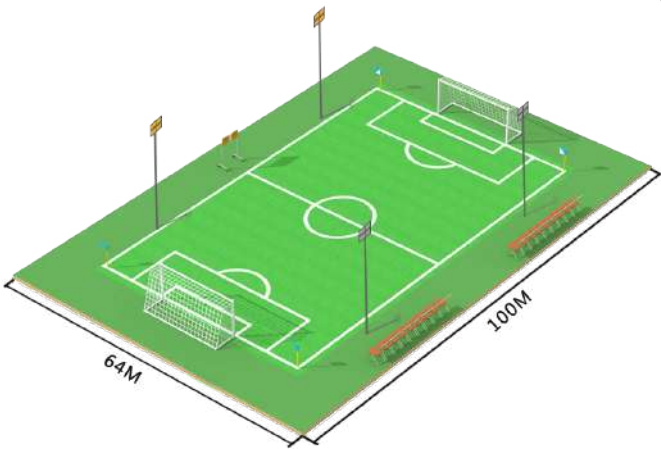
From the community field to the main stadium, TUPEX has the experience to light it all. Some of our clients have seen a net revenue increase per year as a result of selling our luminaires for sports lighting. The high or lower value of lux, uniformity, glare, upward light is so critical to judge the lighting performance is meet the standard or not.

EN12193 Requirements

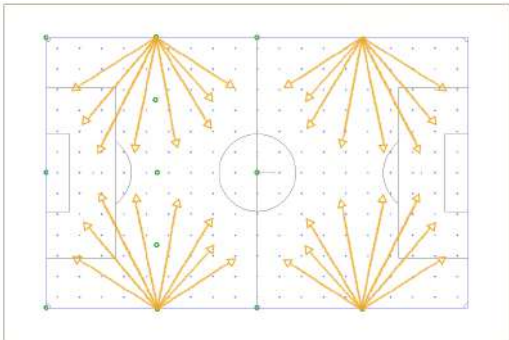
	Class I	Class II	Class III
ILLUMINANCE	500LX	200LX	75LX
UNIFORMITY	0.7	0.6	0.5
GLARE	55	55	55
GRI	70	60	60

Football, Class I

EN12193: Eh ave > 500 lux
FL28

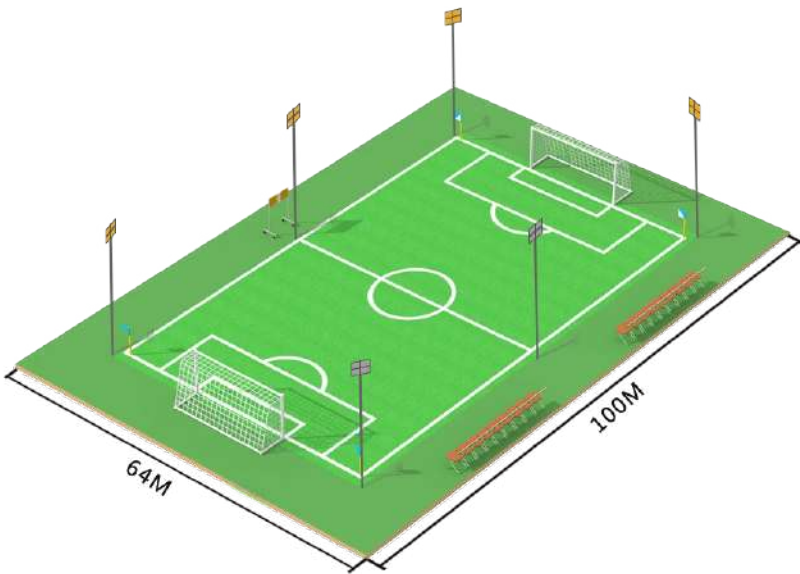


Poles	4x18m
Floodlight	20*FL28 1200W 5000K F19804 16*FL28 1200W 5000K F19808
System Power	43.2kW
Emin/Eave	> 500lux
Eh ave	0.71
Emin/Emax	0.53
Ra	> 70
GR Max	44
ULR	3.5%
MF	0.8

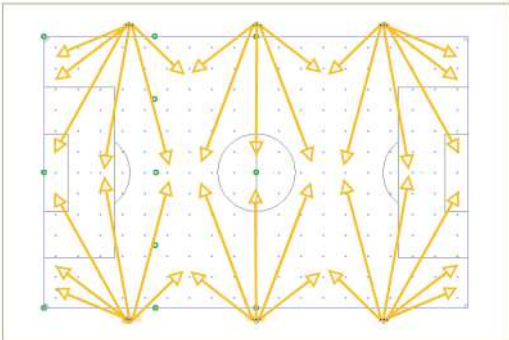


Football, Class I

EN12193: Eh ave > 500 lux
FL28

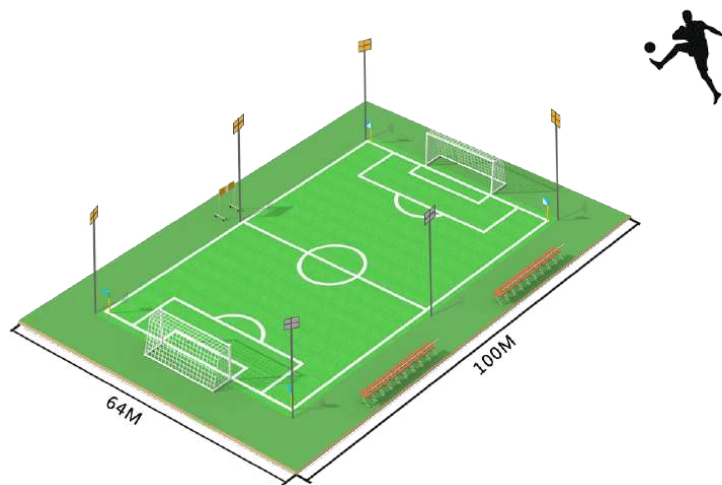
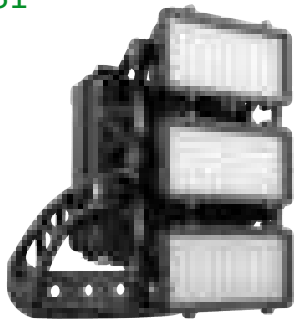


Poles	6x18m
Floodlight	18*FL28 1200W 5000K F19804 16*FL28 1200W 5000K F19802
System Power	40.8KW
Eh ave	> 500lux
Emin/Eave	0.70
Emin/Emax	0.54
Ra	> 70
ULR	3.0%
MF	0.8

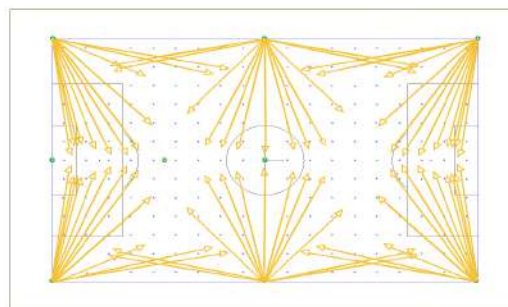


Football, Class I

EN12193: Eh ave > 500 lux
FL31

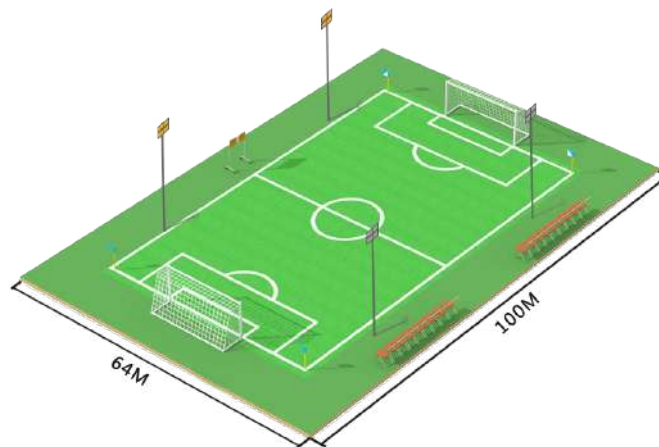


Poles	6x18m
Floodlight	24* FL31-600-5070-F06002 34* FL31-600-5070-F06003 18* FL31-600-5070-F07001
System Power	45.6kW
Eh ave	541 lux
Emin/Emax	0.84
Ra	70
GR Max	50
UWLR	5.5%
MF	0.9

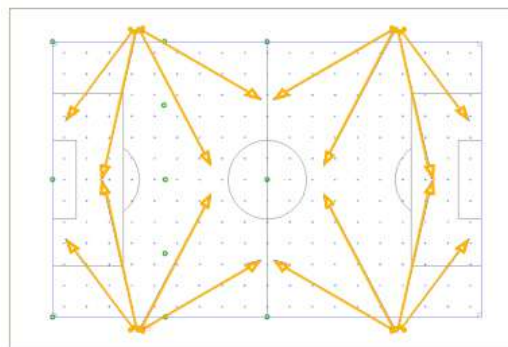


Football, Class II

EN12193: Eh ave > 200 lux
FL28

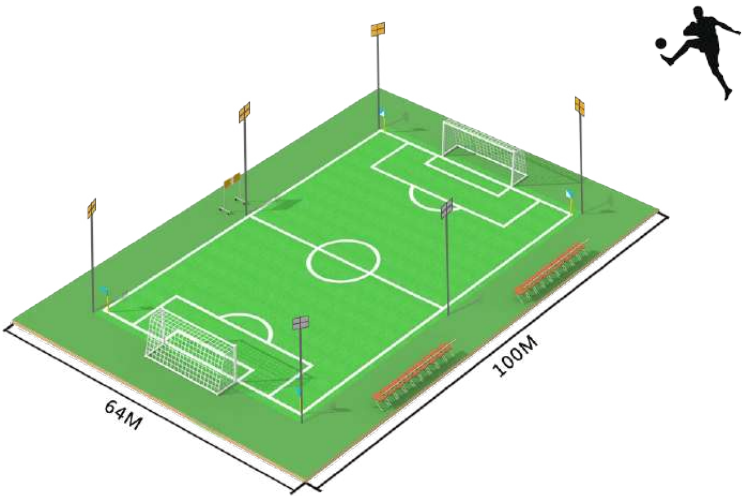


Poles	4x18m
Floodlight	8*FL28 1200W 5000K F19802 4*FL28 1200W 5000K F19808
System Power	19.2kW
Eh ave	> 200lux
Emin/Eave	0.67
Emin/Emax	0.48
Ra	> 70
GR Max	45
ULR	1.0%
MF	0.8

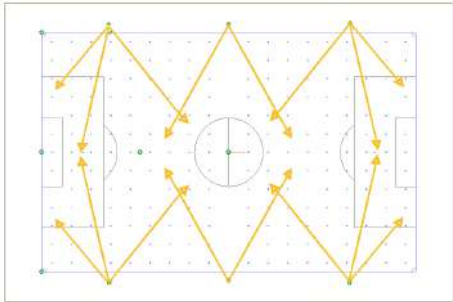


Football, Class II

EN12193: Eh ave > 200 lux
FL28

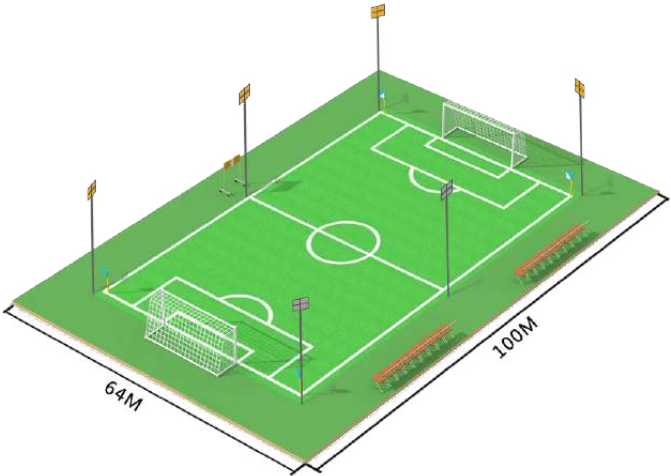
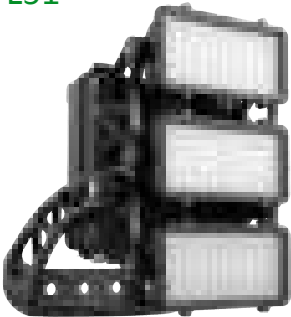


Poles	6x18m
Floodlight	8*FL28 1200W 5000K F19802 8*FL28 1200W 5000K F19808
System Power	19.2 kW
Eh ave	>200lux
Emin/Emax	0.70
Ra	>70
GR Max	43
UWLR	1.0%
MF	0.8

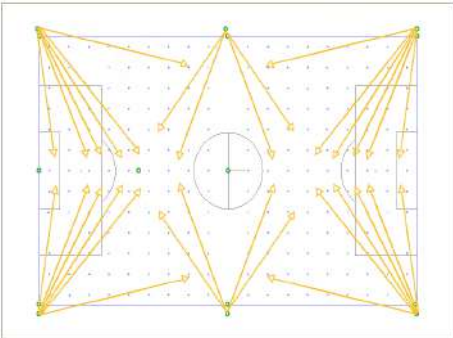


Football, Class II

EN12193: Eh ave > 200 lux
FL31

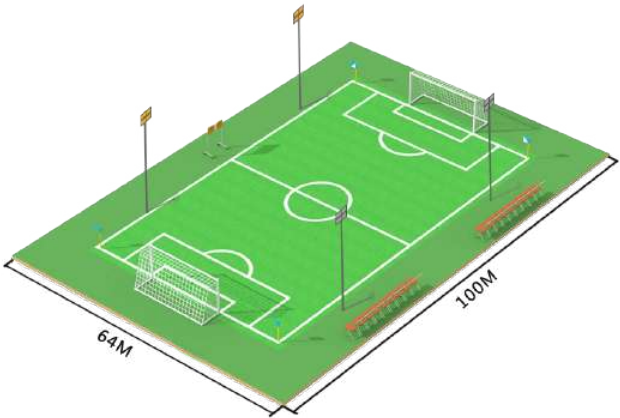


Poles	6x18m
Floodlight	12* FL31-600-5070-F06003 20* FL31-600-5070-F07001
System Power	19.2kW
Eh ave	225 lux
Emin/Emax	0.82
Ra	70
GR Max	50
ULR	4.0%
MF	0.9

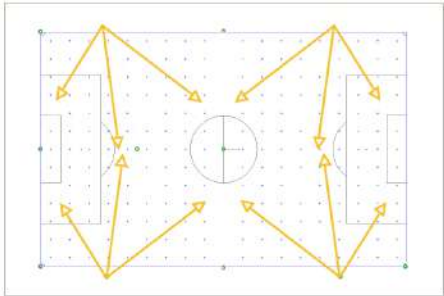


Football, Class III

EN12193: Eh ave > 75 lux
FL28

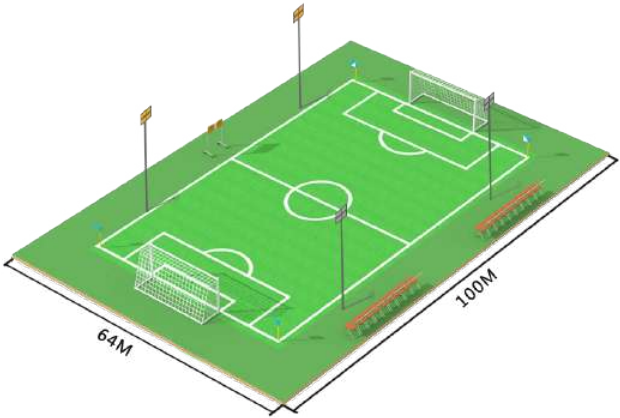
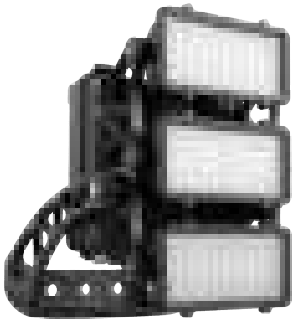


Poles	4x18m
Floodlight	8*FL28 600W 5000K F19808 4*FL28 600W 5000K F19802
System Power	7.2 kW
Eh ave	> 75 lux
Emin/Eave	0.63
Emin/Emax	0.44
Ra	> 70
GR Max	43
ULR	1.0%
MF	0.8

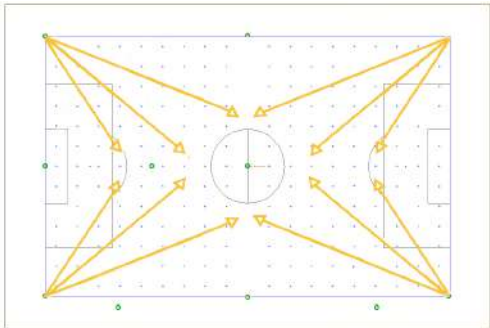


Football, Class III

EN12193: Eh ave > 75 lux
FL31

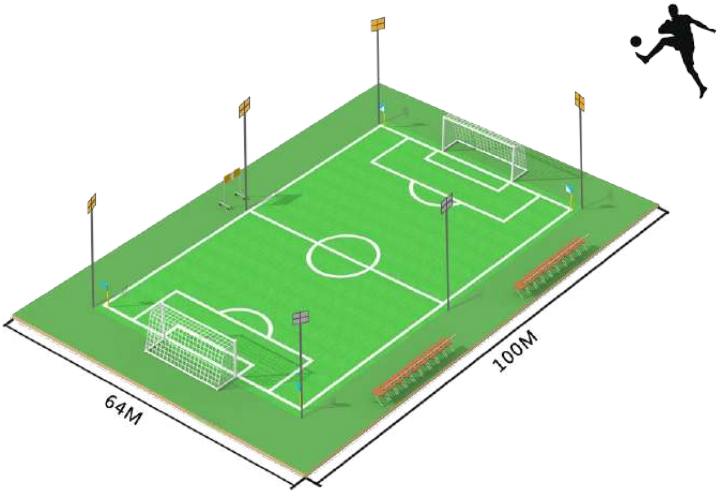


Poles	4x18m
Floodlight	8* FL31-600-5070-F07001 4* FL31-600-5070-F06003
System Power	7.2kW
Eh ave	78 lux
Emin/Eave	0.68
Ra	70
GR Max	50
UWLR	4.5%
MF	0.9

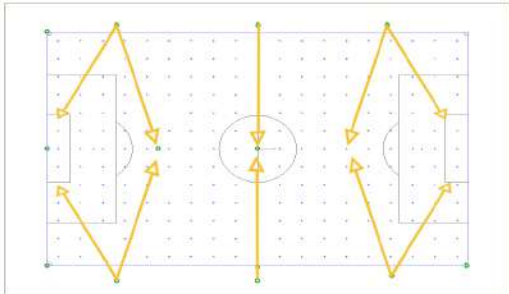


Football, Class III

EN12193: Eh ave > 75 lux
FL28

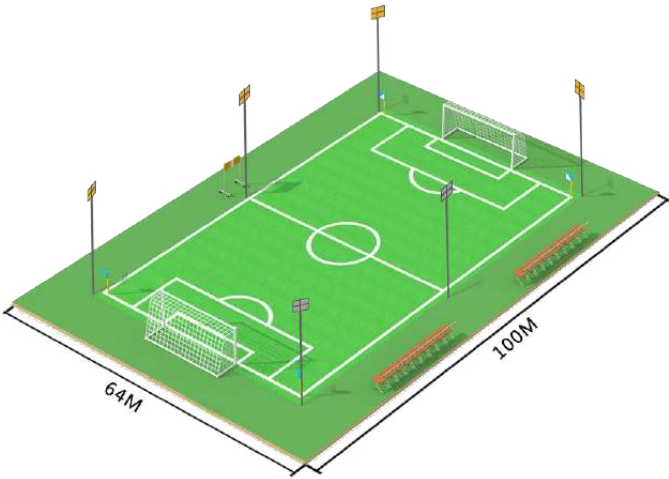
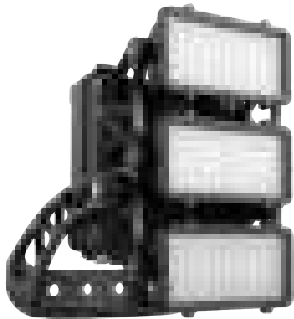


Poles	6x18m
Floodlight	10*FL28 600W 5000K F19802
System Power	6.0 kW
Eh ave	> 75 lux
Emin/Eave	0.52
Emin/Emax	0.40
Ra	> 70
GR Max	41
ULR	1.0%
MF	0.8

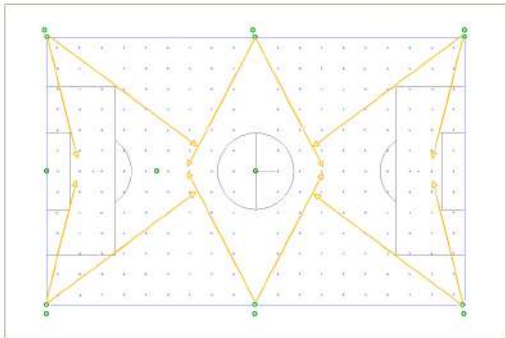


Football, Class III

EN12193: Eh ave > 75 lux
FL31

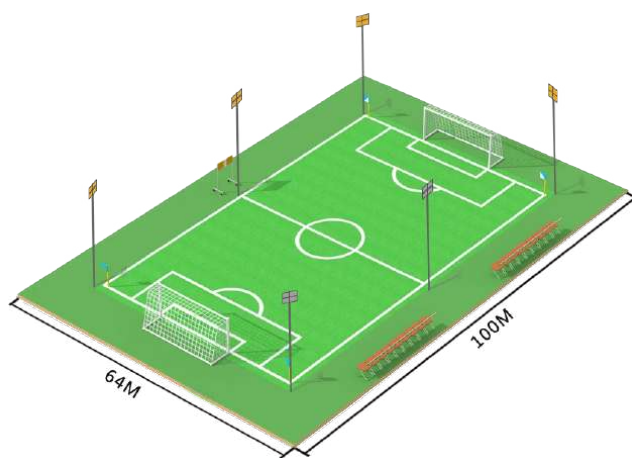


Poles	6x18m
Floodlight	12* FL31-600-5070-F07001
System Power	7.2kW
Eh ave	79 lux
Emin/Emax	0.74
Ra	70
GR Max	40
ULR	1.5%
MF	0.9

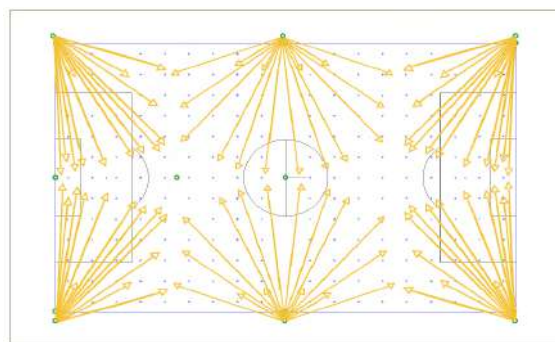


Above are lighting simulations according to the EN12193 standard requirement. Some football fields require a higher lux level and high uniformity to create an outstanding playing experience for the people, here we use FL28 1200W as a demo to check what will happen.

More than 1000lux
and uniformity up to 0.9



Poles	6*23m
Floodlight	76*FL28 1200W 5000K F19804 8*FL28 1200W 5000K F19802
System Power	100.8KW
Eh ave	>1000lux
Emin/Eave	0.90
Emin/Emax	0.81
Ra	>70
GR Max	40
ULR	7.5%
MF	0.8





LIGHTING A TENNIS COURT FIELD

When lighting a tennis court, the objective is to ensure good visibility enabling both participants and spectators to follow the progress of a game. The ball, regardless of its location and speed, should always be clearly visible. Creating good visibility requires sufficient contrast to be created between objects and their background, good illumination levels and even distribution of light across the playing surface.

Outdoor tennis court

	Class I	Class II	Class III
ILLUMINANCE	500LX	300LX	200LX
UNIFORMITY	0.7	0.7	0.6
GLARE	50	50	55
GRI	70	60	60

Indoor tennis court

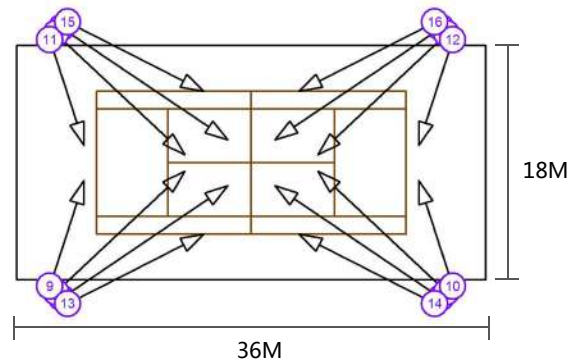
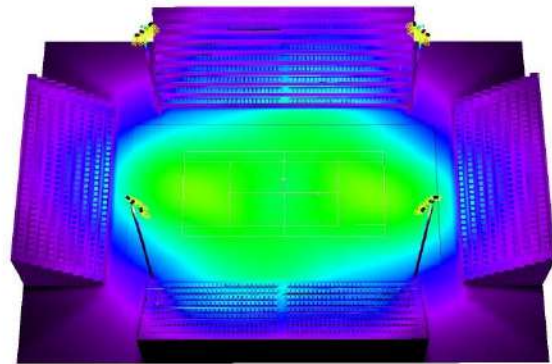
	Class I	Class II	Class III
ILLUMINANCE	750LX	500LX	300LX
UNIFORMITY	0.7	0.7	0.5
GLARE	35	40	40
GRI	80	60	60

Outdoor Tennis Court Class I

EN12193: Eh ave > 500 lux
ST11



Poles	4x20m
Floodlight	8*ST11-450W 5000K R10506 8*ST11-600W 5000K R10506
System Power	8.4kW
PA (Play Area)	Eh ave=505lux U0=0.92 Emin/Emax=0.84
TA (Total area)	Eh ave=464lux U0=0.63 Emin/Emax=0.53
Ra	80
GR Max	29
ULR	0.5%
MF	0.8

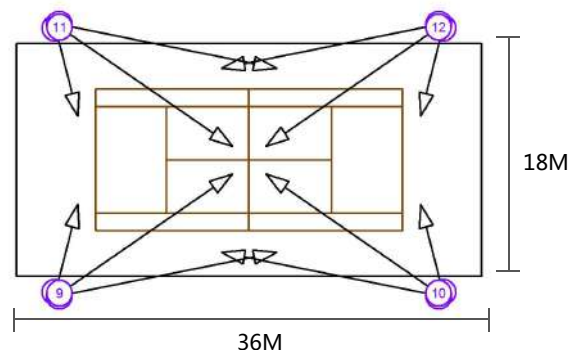
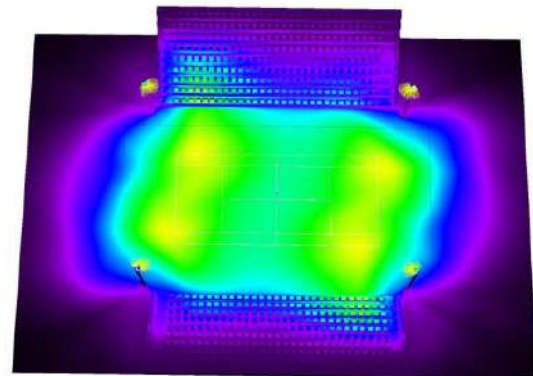


Outdoor Tennis Court Class II

EN12193: Eh ave > 300 lux
ST11



Poles	4x10m
Floodlight	12*ST11-300W 5000K R10506
System Power	3.6 kW
PA (Play Area)	Eh ave=308lux U0=0.84 Emin/Emax=0.70
TA (Total area)	Eh ave=296lux U0=0.66 Emin/Emax=0.53
Ra	70
GR Max	44
ULR	0.5%
MF	0.8

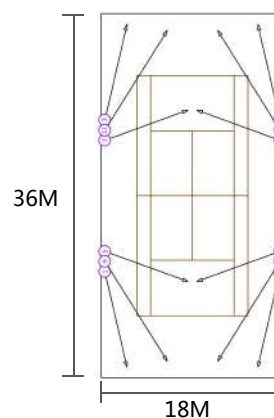
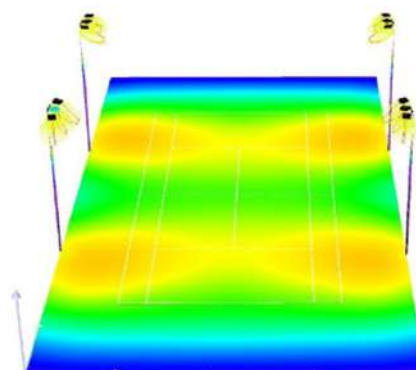


Outdoor Tennis Court Class II

EN12193: $E_h \text{ ave} > 300 \text{ lux}$
FL08



Poles	4*8m
Floodlight	12* FL08-240W 5000K F01613
System Power	2.89kW
PA (Play Area)	$E_h \text{ ave}=310\text{lux}$ $U_0=0.87$ $E_{\min}/E_{\max}=0.77$
TA (Total area)	$E_h \text{ ave}=274\text{lux}$ $U_0=0.53$ $E_{\min}/E_{\max}=0.40$
Ra	70
GR Max	37
ULR	0%
MF	0.8

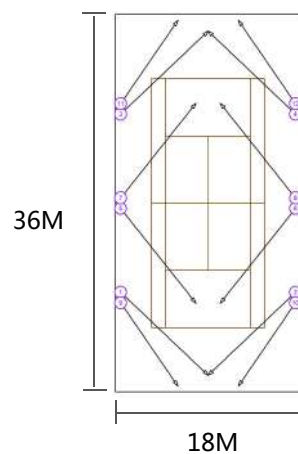
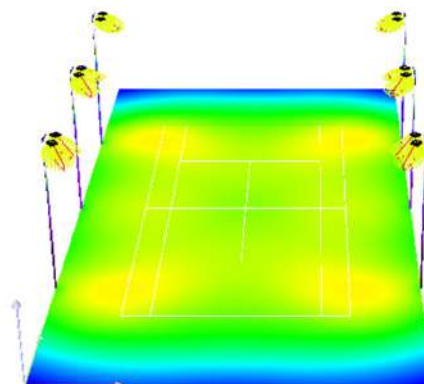


Outdoor Tennis Court Class II

EN12193: $E_h \text{ ave} > 300 \text{ lux}$
FL08

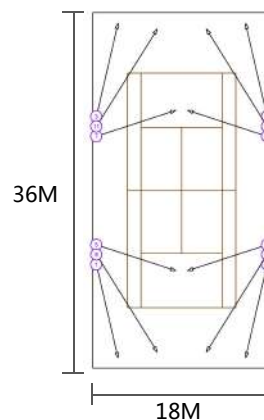
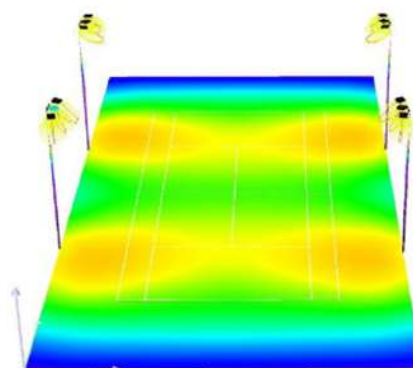


Poles	6*8m
Floodlight	12* FL08-240W 5000K F01613
System Power	2.89kW
PA (Play Area)	$E_h \text{ ave}=309\text{lux}$ $U_0=0.94$ $E_{\min}/E_{\max}=0.89$
TA (Total area)	$E_h \text{ ave}=279\text{lux}$ $U_0=0.58$ $E_{\min}/E_{\max}=0.50$
Ra	70
GR Max	34
ULR	0%
MF	0.8



Outdoor Tennis Court Class III

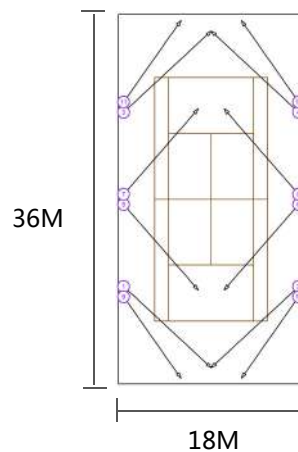
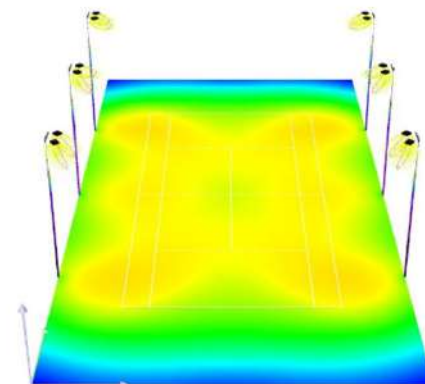
EN12193: $E_h \text{ ave} > 200 \text{ lux}$
FL08



Poles	4*8m
Floodlight	12* FL08-150W 5000K F01613
System Power	1.8kW
PA (Play Area)	$E_h \text{ ave}=200\text{lux}$ $U0=0.88$ $E_{\min}/E_{\max}=0.78$
TA (Total area)	$E_h \text{ ave}=177\text{lux}$ $U0=0.52$ $E_{\min}/E_{\max}=0.40$
Ra	70
GR Max	36
ULR	0%
MF	0.8

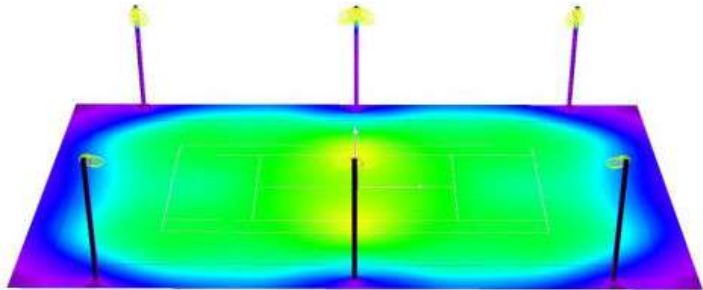
Outdoor Tennis Court Class III

EN12193: $E_h \text{ ave} > 200 \text{ lux}$
FL08

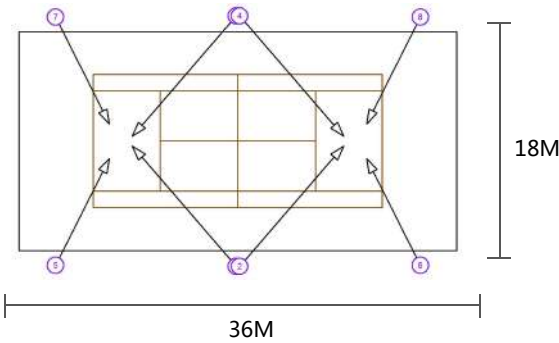


Poles	6*8m
Floodlight	12* FL08-150W 5000K F01613
System Power	1.8kW
PA (Play Area)	$E_h \text{ ave}=201\text{lux}$ $U0=0.93$ $E_{\min}/E_{\max}=0.88$
TA (Total area)	$E_h \text{ ave}=181\text{lux}$ $U0=0.58$ $E_{\min}/E_{\max}=0.49$
Ra	70
GR Max	34
ULR	0%
MF	0.8

Outdoor
Tennis Court Class III
EN12193: Eh ave > 200 lux
ST11



Poles	6*8m
Floodlight	8* ST11-240W 5000K R10506
System Power	1.92kW
PA (Play Area)	Eh ave=203lux U0=0.85 Emin/Emax=0.70
TA (Total area)	Eh ave=184lux U0=0.65 Emin/Emax=0.49
Ra	70
GR Max	39
ULR	1.0%
MF	0.8



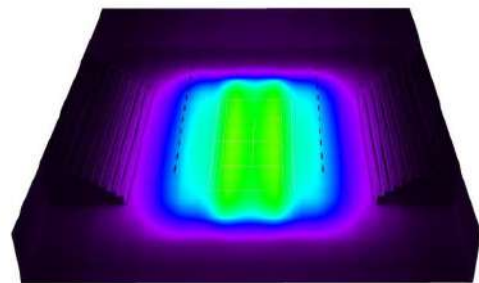


Indoor

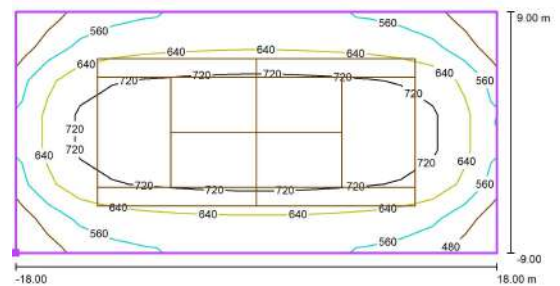
Tennis Court Class I

EN12193: $E_{h\text{ ave}} > 750\text{ lux}$

LHB01



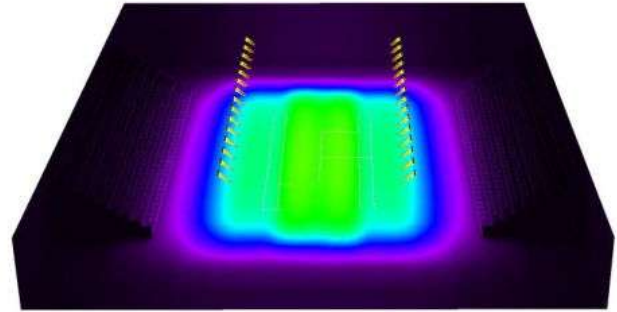
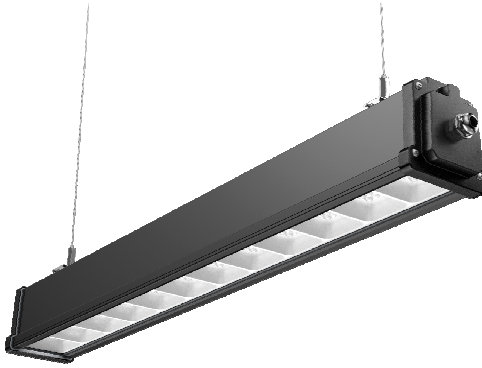
Mounting Height	7m
Linear High Bay	26*LHB01-240-5080-L06406
System Power	6.24KW
PA (Play Area)	$E_{h\text{ ave}}=756\text{lux}$ $U0=0.93$ $E_{\text{min}}/E_{\text{max}}=0.86$
TA (Total area)	$E_{h\text{ ave}}=659\text{lux}$ $U0=0.66$ $E_{\text{min}}/E_{\text{max}}=0.53$
Ra	80
UGR Max	26
MF	0.8



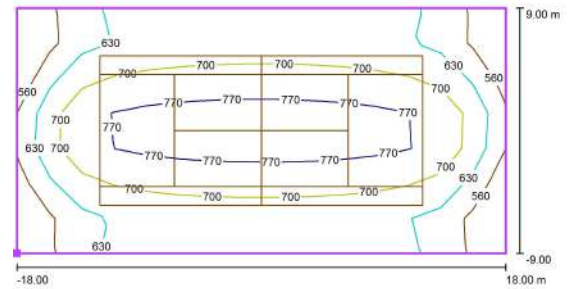
Indoor

Tennis Court Class I

EN12193: $E_h \text{ ave} > 750 \text{ lux}$
LHB16



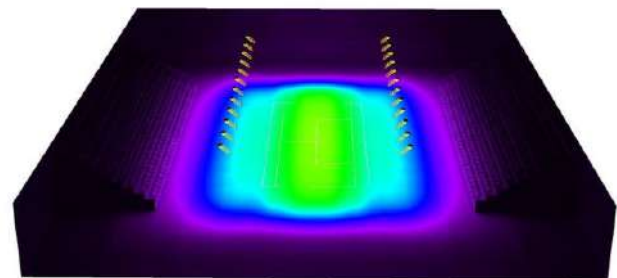
Mounting Height	7m
Linear High Bay	30*LHB16-200-4080-F01610
System Power	6KW
PA (Play Area)	$E_{h\text{ave}}=750\text{lux}$ $U0=0.89$ $E_{\text{min}}/E_{\text{max}}=0.82$
TA (Total area)	$E_{h\text{ave}}=679\text{lux}$ $U0=0.72$ $E_{\text{min}}/E_{\text{max}}=0.61$
Ra	80
UGR Max	24
MF	0.8



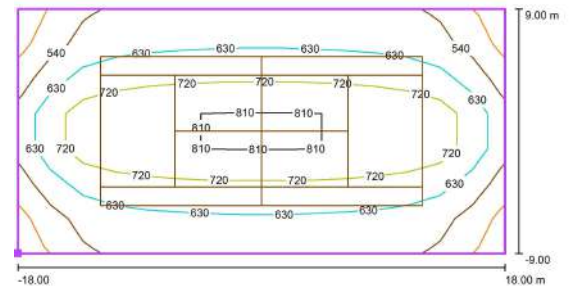
Indoor

Tennis Court Class I

EN12193: $E_h \text{ ave} > 750 \text{ lux}$
FL08

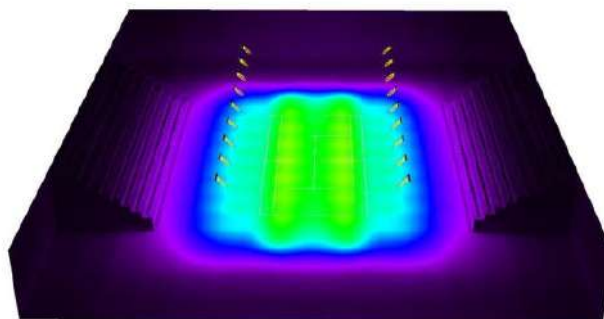


Mounting Height	7m
Linear High Bay	24*FL08-240-5080-F01610
System Power	5.76KW
PA (Play Area)	$E_{h\text{ave}}=761\text{lux}$ $U0=0.88$ $E_{\text{min}}/E_{\text{max}}=0.80$
TA (Total area)	$E_{h\text{ave}}=658\text{lux}$ $U0=0.66$ $E_{\text{min}}/E_{\text{max}}=0.52$
Ra	80
UGR Max	25
MF	0.8

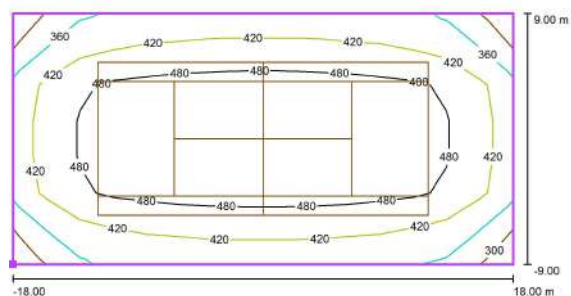


Indoor Tennis Court Class II

EN12193: $E_h \text{ ave} > 500 \text{ lux}$
LHB01

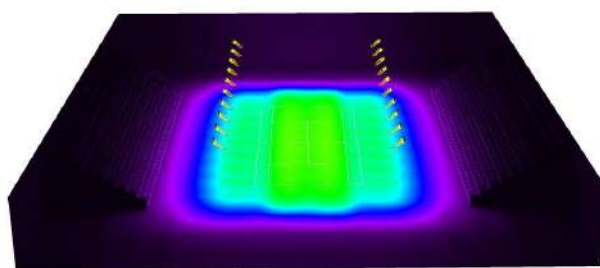
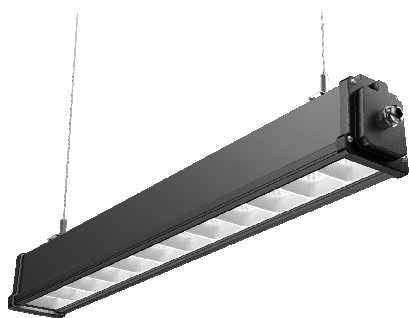


Mounting Height	7m
Linear High Bay	18*LHB01-240-5080-L06406
System Power	4.32KW
PA (Play Area)	$E_{h\text{ave}}=512\text{lux}$ $U_0=0.92$ $E_{\text{min}}/E_{\text{max}}=0.86$
TA (Total area)	$E_{h\text{ave}}=451\text{lux}$ $U_0=0.66$ $E_{\text{min}}/E_{\text{max}}=0.53$
Ra	80
UGR Max	26
MF	0.8

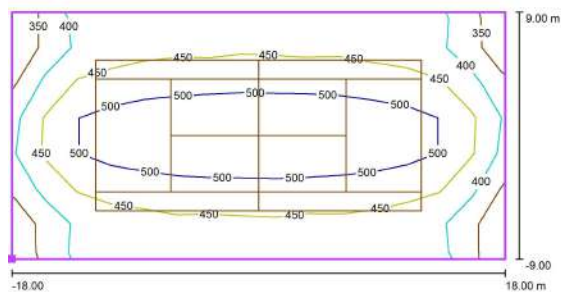


Indoor Tennis Court Class II

EN12193: $E_h \text{ ave} > 500 \text{ lux}$
LHB16

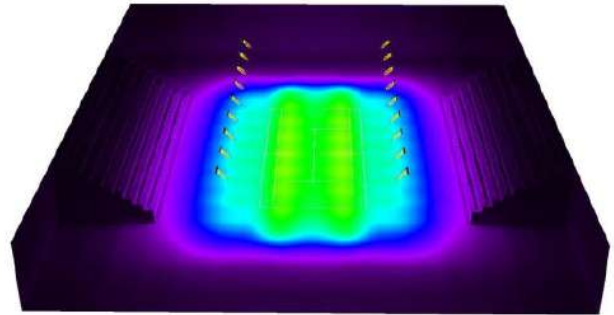


Mounting Height	7m
Linear High Bay	20*LHB16-200-4080-F01610
System Power	4KW
PA (Play Area)	$E_{h\text{ave}}=500\text{lux}$ $U_0=0.89$ $E_{\text{min}}/E_{\text{max}}=0.82$
TA (Total area)	$E_{h\text{ave}}=454\text{lux}$ $U_0=0.72$ $E_{\text{min}}/E_{\text{max}}=0.61$
Ra	80
UGR Max	24
MF	0.8

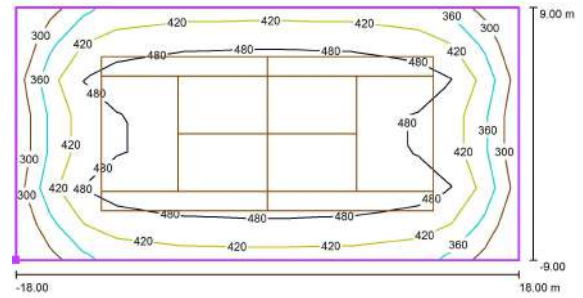


Indoor Tennis Court Class II

EN12193: $E_h \text{ ave} > 500 \text{ lux}$
FL08

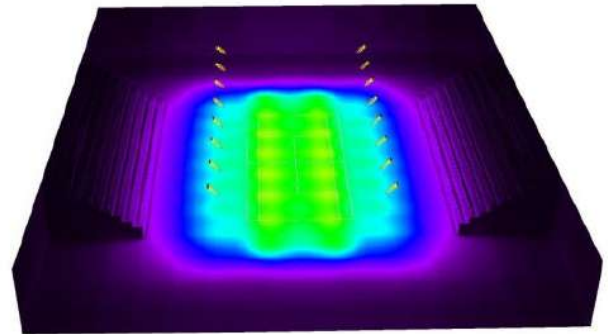


Mounting Height	7m
Linear High Bay	16*FL08-240-5080-F01610
System Power	3.84KW
PA (Play Area)	$E_{h\text{ave}}=508\text{lux}$ $U0=0.82$ $E_{\text{min}}/E_{\text{max}}=0.76$
TA (Total area)	$E_{h\text{ave}}=449\text{lux}$ $U0=0.58$ $E_{\text{min}}/E_{\text{max}}=0.47$
Ra	80
UGR Max	26
MF	0.8

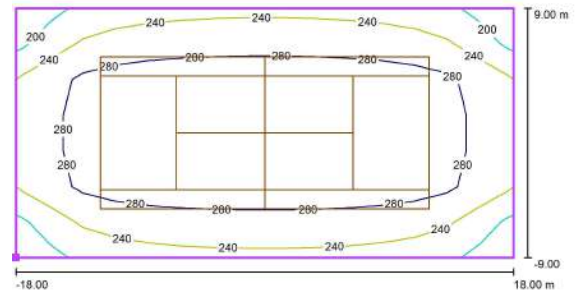


Indoor Tennis Court Class III

EN12193: $E_h \text{ ave} > 300 \text{ lux}$
LHB01



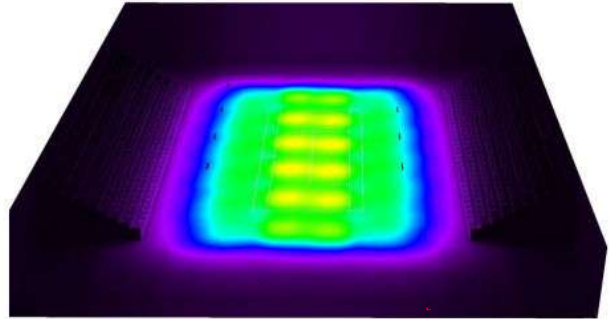
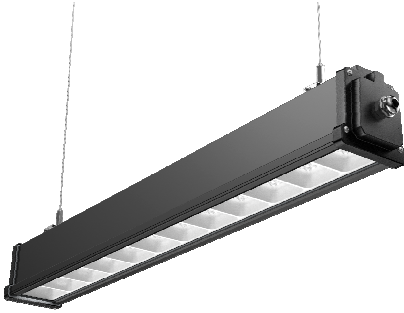
Mounting Height	7m
Linear High Bay	16*LHB01-150-5070-L06406
System Power	2.4KW
PA (Play Area)	$E_{h\text{ave}}=310\text{lux}$ $U0=0.92$ $E_{\text{min}}/E_{\text{max}}=0.86$
TA (Total area)	$E_{h\text{ave}}=274\text{lux}$ $U0=0.66$ $E_{\text{min}}/E_{\text{max}}=0.52$
Ra	70
UGR Max	26
MF	0.8



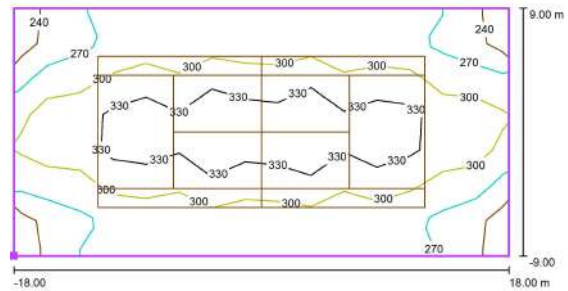
Indoor

Tennis Court Class III

EN12193: $E_h \text{ ave} > 300 \text{ lux}$
LHB16



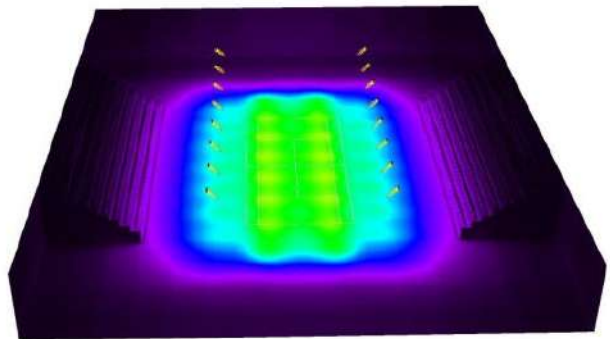
Mounting Height	7m
Linear High Bay	12*LHB16-200-4070-F01610
System Power	2.4KW
PA (Play Area)	$E_{h\text{ave}}=326\text{lux}$ $U_0=0.85$ $E_{\text{min}}/E_{\text{max}}=0.73$
TA (Total area)	$E_{h\text{ave}}=297\text{lux}$ $U_0=0.77$ $E_{\text{min}}/E_{\text{max}}=0.61$
Ra	70
UGR Max	27
MF	0.8



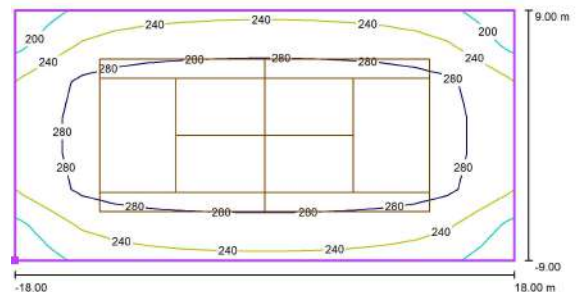
Indoor

Tennis Court Class III

EN12193: $E_h \text{ ave} > 300 \text{ lux}$
FL08



Mounting Height	7m
Linear High Bay	16*FL08-150-5070-F01610
System Power	2.4KW
PA (Play Area)	$E_{h\text{ave}}=325\text{lux}$ $U_0=0.83$ $E_{\text{min}}/E_{\text{max}}=0.79$
TA (Total area)	$E_{h\text{ave}}=296\text{lux}$ $U_0=0.67$ $E_{\text{min}}/E_{\text{max}}=0.56$
Ra	70
UGR Max	24
MF	0.8



PROJECT AT A GLANCE

Football field



TUPex electric



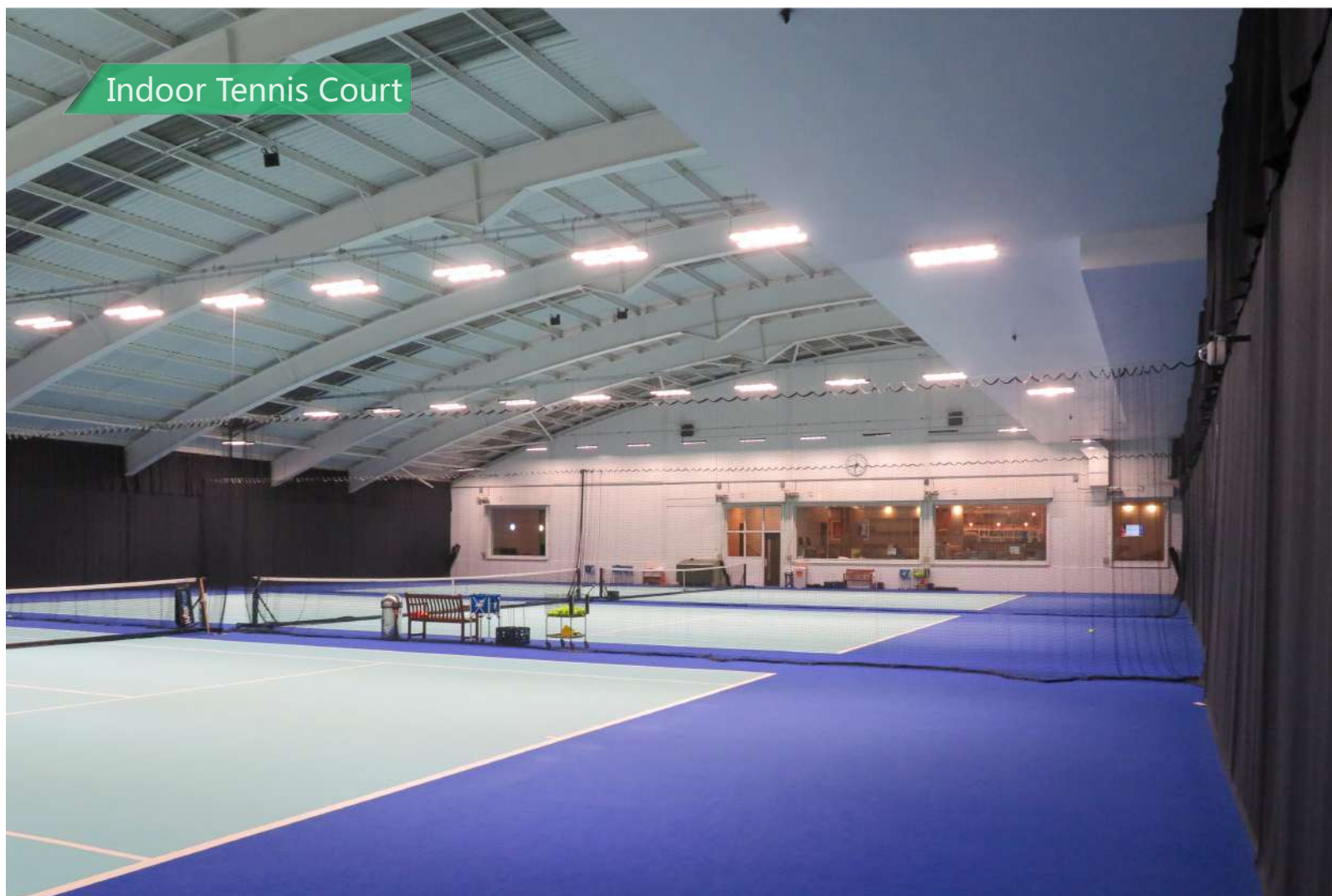


Outdoor Tennis Court



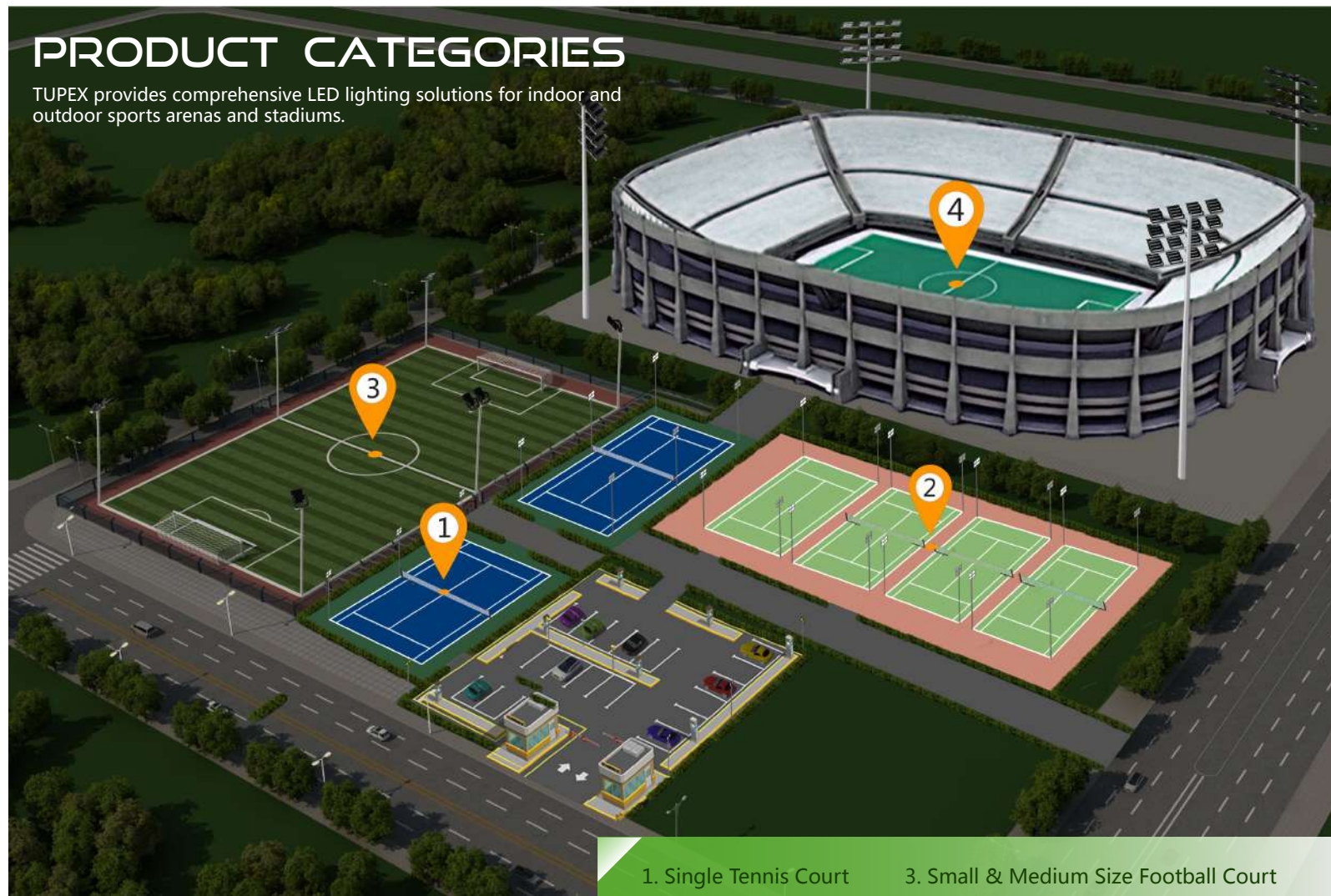


Indoor Tennis Court



PRODUCT CATEGORIES

TUPEX provides comprehensive LED lighting solutions for indoor and outdoor sports arenas and stadiums.



- | | |
|--------------------------|---|
| 1. Single Tennis Court | 3. Small & Medium Size Football Court |
| 2. Multiple Tennis Court | 4. Stadium & Large Scale Football Court |

Outdoor sports lighting products



100-300W



400-600W



800-1200W



1600-2000W

Indoor sports lighting products



40-240W



50-200W



100-300W

**TUPEX, a solution provider that
fits your project needs.**



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