



PHILIPS

Lighting Guide

Tennis Court

Enjoy the
flexibility,
love your
sport

The right lighting for your sports facility

The world is constantly evolving, and so is the way we communicate and interact with each other. The sports industry is no exception.

More than ever, people are finding it harder to interact and keep in touch with team members. As a result, individual sports, such as running, are gaining popularity while teams and the unity they provide are fading.

Social media has impacted how we interact with each other in the world of sports.

Through social platforms such as Twitter, Facebook or apps we can communicate with our teams, share scores, and much more. New technologies like fitness trackers allow us to share our activities and compare results, even with professional athletes.

Whether you play a sport to stay fit, set a personal record, or for socialization, the way we participate in sports is ever changing.

The impact on sports clubs

Understanding how the industry is changing is key for sports clubs to remain afloat financially and socially.

Surprisingly, lighting can play a major role in allowing sports clubs to provide a welcoming and inspiring environment for people to practice whenever they'd like.

Of course, proper illumination when playing sports is a basic necessity. However, the quality of the lighting is crucial not only for the athletes, but for the sports facility owners. At Philips, we can support you with the best-in-class lighting to improve athlete results, while using minimum energy, minimize the impact on the environment and increasing potential revenue streams.

While our lighting systems provide the players and trainers with the flexibility to play whenever they want, they also provide facility operators insight on the status of all lighting in their facility.



Lighting an outdoor tennis court

When lighting a tennis court, the objective is to ensure good visibility enabling both players 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 backgrounds, good illumination levels and even distribution of light across the playing surface (uniformity) and by minimizing glare.

Source: ITF lighting requirements



Tennis

Recreational and residential level

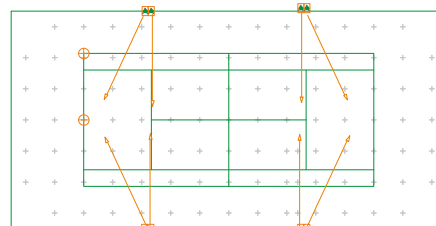
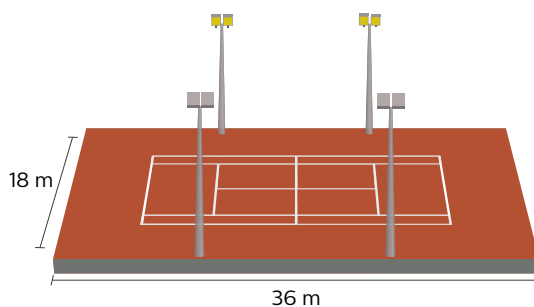
AS2560: Eh ave > PPA 250 lux

Tango LED gen3



Specifications* Tango LED gen3

Poles	4 x 8m
Floodlight	8 x Tango LED gen3 200W
Floodlight Type	BVP382 LED260CW 200W 220-240V AMB
System Power	1.6 kW
Eh ave	TPA > 150lx, PPA > 250lx
Emin/Eave	TPA > 0.35, PPA > 0.75
Ra	> 70
GR Max	27
ULR	2%
MF	0.8



Floodlight aiming

Club competition and commercial

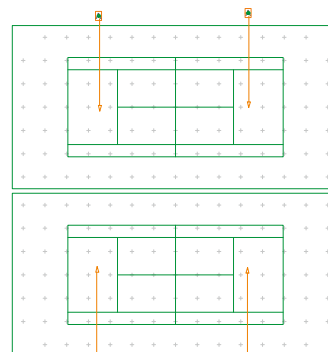
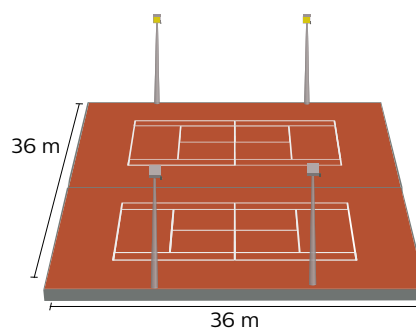
AS2560: Eh ave > PPA 350 lux

OptiVision LED gen2



Specifications* OptiVision LED gen2

Poles	4 x 10 m
Floodlight	8 x OptiVision LED 981W
Floodlight Type	BVP515 OUT T15 50k 1xLED1340 757 DX50
System Power	7.8 kW
Eh ave	TPA > 250lx, PPA > 350lx
Emin/Eave	TPA > 0.60, PPA > 0.75
Ra	> 70
GR Max	30
ULR	1%
MF	0.9



Floodlight aiming



Tennis



Professional level

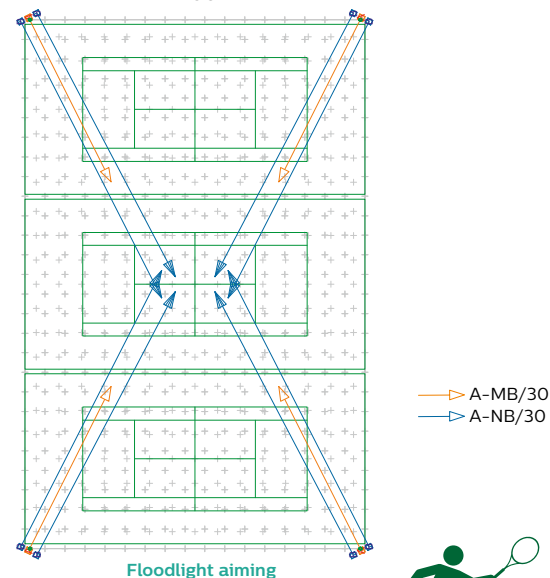
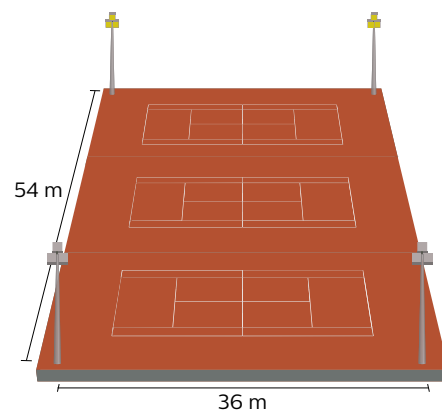
AS2560: Eh ave > PPA 500 lux

OptiVision LED gen2



Specifications* OptiVision LED gen2

Poles	4 x 16 m
Floodlight	12 x OptiVision LED gen2 1471 W
Floodlight Type	8 x BVP525 OUT T25 50K 1xLED1940/757 A-NB/30 4 x BVP525 OUT T25 50K 1xLED1940/757 A-MB/30
System Power	17.65 kW
Eh ave	PPA > 500lx
Emin/Eave	PPA > 0.70
Ra	> 70
GR Max	40.6
ULR	1%
MF	0.9



Tennis

*The lighting technical parameters and design values stated in this document are of a general nature only and is not intended to be relied upon as a substitute for professional advice. Excludes any obtrusive lighting calculations, client due diligence is required. No responsibility will be accepted by Signify for loss occasioned to any person doing anything as a result of any material in this resource. For project specific requirements and professional lighting designs, please contact Signify New Zealand Limited on 0800 4LIGHT (0800 454 448).

Lighting considerations

The main goal when installing a lighting system on a field is to meet specific standards. Usually, the lighting requirements are linked to the sport. In practice, the light level for a training field is lower than a match field. Specific lighting is also needed based on the type of game, speed of action, and viewing distance.

A crucial, yet often overlooked, element of a first-class sports venue is its lighting system. A great lighting system does more than just illuminate the field of play. Among other things, it also makes visitors generally comfortable in their surroundings and ensures a successful game for the players.

But beyond those simple imperatives, sports lighting is a complex business. National, regional, and local competitions all have their different lighting requirements; practice sessions and recreational sports call for different lighting regimes than competitive

and professional events do. A sporting facility's capacity and the distances from which spectators are viewing the action also come into play in lighting. This variety of interests explains why AS Standards are organised into different so-called 'levels of play'.

Given then many factors involved in providing excellent lighting at a sporting venue, it might be useful to define the key considerations that sports lighting professionals need to take into account.

Horizontal illuminance

The illuminated playing surface takes up a major part of the field of view for anyone in a sporting venue, whether players, officials or spectators. Horizontal illuminance (E_h) represents the illuminance on this horizontal plane at ground level. It serves primarily to create a stable visual background against which the eye can discern players and objects.

For Amateur till Professional level, an average horizontal illuminance of between 50 lux and 500 lux is required, depending on the sport in question and on the level of play.

Vertical illuminance

The sporters in any particular sporting event, as well as the ball they're using, can be understood as vertical surfaces. This means that we need to keep vertical illuminance (E_v) primarily in mind when we light them.

To guarantee an optimal view and make it possible for the human eye to identify players from every direction, we should generally measure E_v at a height of 1.5 metres, which corresponds approximately to the faces of the players.

Experience shows that there's an intimate relationship between vertical and horizontal illuminance. For sports with no specific vertical illuminance criteria, vertical illuminance will be sufficient if the required horizontal illuminance is achieved, and if the lighting design rules are followed.

Uniformity

Ensuring uniformity is important in avoiding adaptation problems for both players and spectators. If uniformity is inadequate, certain objects or player details might be difficult to see from certain positions.

Uniformity is expressed as:

- The ratio of the lowest to the highest illuminance ($U1 = E_{min}/E_{max}$)
- The ratio of the lowest to the average illuminance ($U2 = E_{min}/E_{average}$)
- The uniformity of the horizontal illuminance is generally specified as between 0.5 to 0.7 ($E_{min}/E_{average}$) depending on sport and lighting class.

Glare restriction

Glare is a subjective factor for which CIE has, on the basis of extensive field research, developed a practical evaluation system for use in outdoor sports applications (CIE 112 Glare evaluation system for use within outdoor sports and area lighting). A maximum GR value of 50 is generally specified for sports projects.

Modelling and shadows

Modelling refers to lighting's ability to reveal form and texture. Modelling ability is particularly important in providing a pleasant overall impression of the athletes and objects in the field of play, not to mention of the spectators in the stands. An installation where light comes from only one direction will result in harsh shadows and poor modelling.

Controlling spill light

Stray light from outdoor lighting installations can disturb people in the vicinity: drivers on adjacent roads, for example, and inhabitants of nearby houses. Local authorities or municipalities sometimes maintain their own guidelines on such matters. Where no guidelines exist, most New Zealand councils have

defined obtrusive light limits based on CIE recommendations. The key criteria here are vertical illuminance on properties, the luminaire intensity in a potentially obtrusive direction of each light source, the quantity of light emitted above the horizontal plane that passes through the center of the luminaire, and the level of glare that area drivers experience.

Colour properties

The color properties of luminaires have two important aspects:

- The color appearance of the light. This is the color impression of the total environment that the light source creates.
- The color rendering properties of the light source used, or the CIE Color Rendering Index (CRI). This describes how faithfully a light source can reproduce a range of colours.

An indication of a lamp's color appearance can be obtained from its correlated color temperature as measured in degrees Kelvin (K), which vary mainly between 2000 and 6500K. The lower the color temperature, the "warmer" the color impression of the light is; the higher the color temperature, the "cooler" or more bluish the impression of the light is. Sports lighting generally requires a color temperature of between 4000 and 6500 K.

The color rendering properties of a light source can be indicated by its Color Rendering Index, expressed as a numerical value between 0-100. A light source with a CRI of 100 will represent scene colours faithfully, with daylight as the standard of comparison. Color perception is highly relevant in most sports applications.

PerfectPlay system

Philips Lighting offers a fully dedicated end-to-end approach that is optimized for recreational sports.

Starting from a very easy interface for lighting control, PerfectPlay system has a unique set of features to ensure a perfect combination of fulfilling sports lighting norms, players' safety, comfort, operational efficiency and significant energy reduction.





PerfectPlay App



PerfectPlay Remote

The PerfectPlay packages are compatible with Philips LED floodlights, suitable for any type of sports. Moreover, both floodlights and system packages are retrofit, so there is no need for new cabling infrastructure or cabinet's installation, saving on installation costs.

Within our PerfectPlay system offering we address all the lighting needs relevant for the different users in indoor and outdoor sports. The system has three different packages: PerfectPlay Panel, PerfectPlay Tablet, and PerfectPlay Remote.

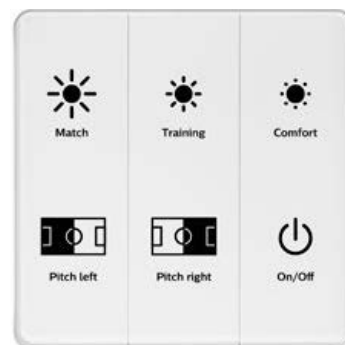
PerfectPlay Panel

With PerfectPlay Panel, the LED field lighting is controlled via a button panel that can be installed in your clubhouse, control room or close to the locker rooms. The panel has 6 buttons and depending on the type of sport, fields can be illuminated through a variety of pre-programmed light settings.

For example:

1. Match
2. Training
3. 1/2 field training left
4. 1/2 field training right
5. Comfort
6. Off

The PerfectPlay Panel results in simple and easy usage of your lighting installation. While securing the required lighting standards for matches and training, you will increase comfort and significantly reduce your energy consumption.





Satisfied customers New Zealand

Blenheim Hockey
Napier (Park Island) Hockey
Association - Turfs 1 & 2
Porritt Park Hockey
Association
Invercargill Hockey
Association
Greymouth Hockey
Association
Wairarapa Hockey
Association
Wanganui Hockey Association
Cromwell
Hockey
Timaru Hockey Association
Mt Roskill Hockey Association
Fraser Park Hockey,
Lower Hutt
North Harbour Hockey -

Turfs 1, 2 & 3
Northland Hockey
Manukau Tennis
McCleans Tennis Club,
Auckland
Clevedon Tennis Club,
Auckland
Mangere Rovers Tennis Club
Levin Tennis Club
Browns Bay Tennis Club
Avanti Velodrome
Eden Park
Trafalgar Park
Forsythe Barr
Prebbleton Rugby
Cashmere Tennis
Alpine Energy Stadium
(Fraser Park)
Rotorua International Stadium

Manawatu Showgrounds
North Harbour Stadium
Carisbrook
North Harbour Indoor Tennis
Stadium
Remuera Rackets
Auckland Netball
Takapuna Tennis
Lynfield Tennis
Akld Grammar Hockey
Lloyd Elsmore Hockey
Mairangi Bay Tennis
Saint Heliers Tennis
Kings College
William Green Football
Leabank Park
Kensington Hockey Park,
Whangarei



OptiVision LED gen2

A new era in smart area and sports lighting

- Innovative floodlight with dedicated optics that ensure maximum optical efficiency and enable accurate light distribution with a minimum of spill light
- Advanced Philips system controls and sensors enable additional energy savings (up to 65%) in area lighting applications
- Minimized maintenance costs thanks to longlasting LEDs and the floodlights thermal management system



ClearFlood Large

The best solution for 1:1 retrofit

- Fast payback and low Total Cost of Ownership with energy savings and minimum maintenance costs
- Multiple control options ensure increased efficiency with intelligent lighting
- Combination of lenses and flux options ensure high level of project flexibility



Tango gen3

Cost effective, light weight solution

- Perfect solution for the budget orientated customer looking to illuminate their recreational sports field/court
- It incorporates the LED light source, optical system, heat sink and driver into one compact and robust housing, that meets the global and local recognized standards
- Powered by LED technology, this luminaire delivers superior performance and a longer lifetime, bring affordable sports lighting to a whole new level



Football



Hockey



Tennis



Rugby



Athletics



Golf course



Playing court



Baseball./
Softball

Why choose Philips?

A lighting partner that fits your business needs

We listen, and understand your needs



Global presence and local experience delivering multi-phased support



One-stop shop: systems, luminaires and services across the lighting value chain in collaboration with partners



World-class innovation capabilities and deep application and system expertise



Proven record of quality and reliability – no unpleasant surprises



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