



Creating Lighting Image
Developing Future ...

 **LED** Generation



We Know Sports Better
Your Lighting Solution



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The Right Lighting for your sports
Gruppe Lighting has the expertise in sports lighting to
support you through every step of your journey...

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**Confidence that matters,
A brand you can trust ... Since 1987**

Gruppe lighting products featuring the latest state of art design that combined the latest LED Lighting Technologies to minimize energy, reduce carbon emission, achieve performance, sustainability and money saving.

Gruppe strongly belief in its policy to continue and develop Futuristic Lighting Products thru our R&D and engage with our customers on their needs. It's our goal to "Create Lighting Image & Developing Future" with our future proof technology, maximising performance and energy efficiency lighting products. Gruppe is focused on improving people's life through timely innovations.



Being a professional lighting solution provider, Gruppe solved many challenges throughout the years. With our experience of overcoming the challenges, we have reckon our experience and expertise into manufacturing Gruppe LED Generation products to the best suit for lighting environment.

LED GENERATION Illuminate your world with long-lasting, economical, reliable and environmental friendly performance products - for a Brighter Future.

Gruppe Lighting Solution Sdn. Bhd.

From a small humble distributor in lighting products since 1987, Gruppe Lighting Solution Sdn Bhd has come a long way and today we are a well known manufacturer and Lighting solution provider based in Malaysia. Over the years, we have secured many major & Iconic projects in Malaysia especially in Sport lighting, Public Lighting, Port Lighting & Industrial lighting projects.

To meet today's demand, we have invested steadily on our manufacturing plant and testing equipments such as Goniophotometer, Automatic Aging Test, IP Test and etc.

Gruppe's mission is to inspire its customer to visually enhance our eco environment, save energy and save cost by switching to Gruppe LED Generation solutions.

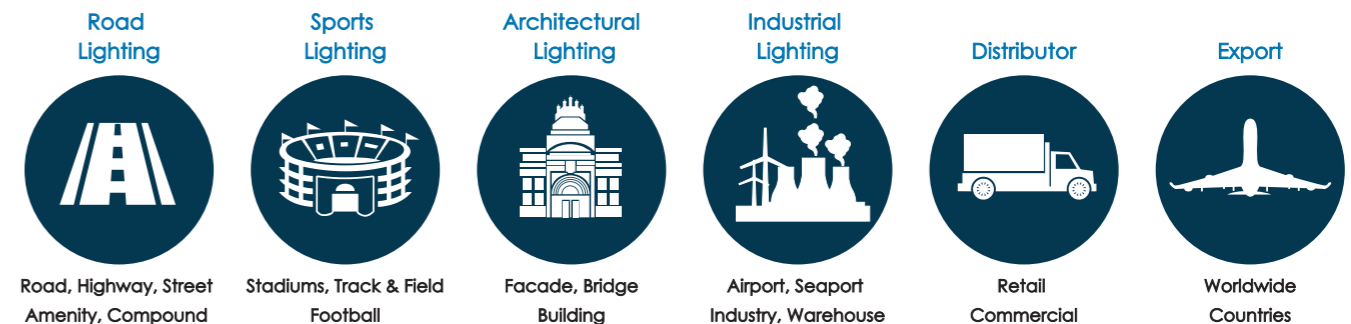
Professional Lighting Solution Provider And Lighting Manufacturer

License & Certification



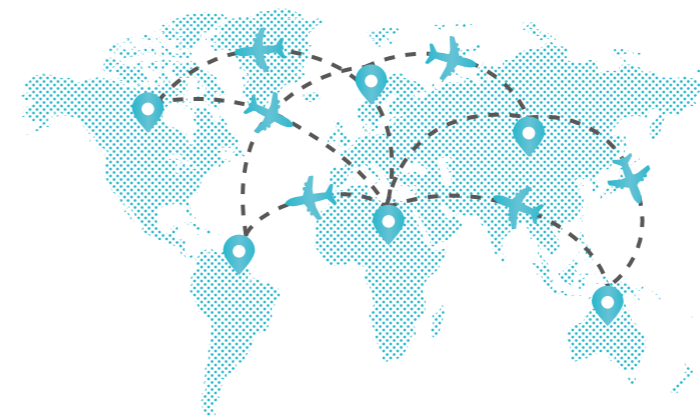
One Stop Lighting Solution

Specialize in 6 Environmental Sector



Our Networking

We continue to grow in existing and new market worldwide with a focus on quality and sustainability lighting Thus we can guarantee you the highest level of quality and service at anytime. Enabling you to adopt the very latest solutions confidently and reliably. Our Associates are from Singapore, Taiwan, Hong Kong, China, Italy, USA



Our Vision

Our vision is to be the lighting solution provider and lighting manufacturer to all leading lighting companies and institution who cares about good lighting environment and to be the globally sought solution company.

Our Mission

Our mission is to inspire customers to visually enhance natural environments through the use of energy efficient lighting. To increase our production capacity and turnover with an active marketing and sales strategy in manufacturing luminaries that most affordable with the international standard requirement by combining past experience with an innovative approach.

GRUPPE Approach

Innovating A Brighter Future At Every Level

For uncompromised performance, you need more than just a fixture. Give your venue a state of the art digital lighting system with maximum flexibility to adapt to your needs. With Gruppe, you can achieve sports lighting that delivers exactly the experience your fans and athletes expect and deserve, both today and tomorrow.

Solution

Our sports lighting solutions are not only future proof and upgradeable, they are at the cutting edge of lighting technology. Eco friendly, energy efficiency, high performance, unique optics system, Crystal OpticLED and Multi OpticLED technology help to reduce both light pollution and energy bills. The optical technology minimizes light pollution and optimizes light distribution ensures that only the targeted areas are illuminated, reducing unwanted light trespass and sky glow.

Innovation

GRUPPE's luminaire employs a highly flexible light module that is designed to not only be aesthetically pleasing but to also be an economic alternative to the conventional High Pressure Sodium and Metal Halide lighting systems. Industry leading optical technology that minimizes light pollution and optimizes light distribution ensures that only the targeted areas are illuminated, reducing unwanted light trespass and sky glow. This characteristic ensures compliance to the Dark Sky requirements.

Sustainability - From Light To Life

Its all about Illuminating your application effectively...



GRUPPE Technology

Key Advantages

Gruppe Sports lighting are manufactured base on the key advantages such as ;

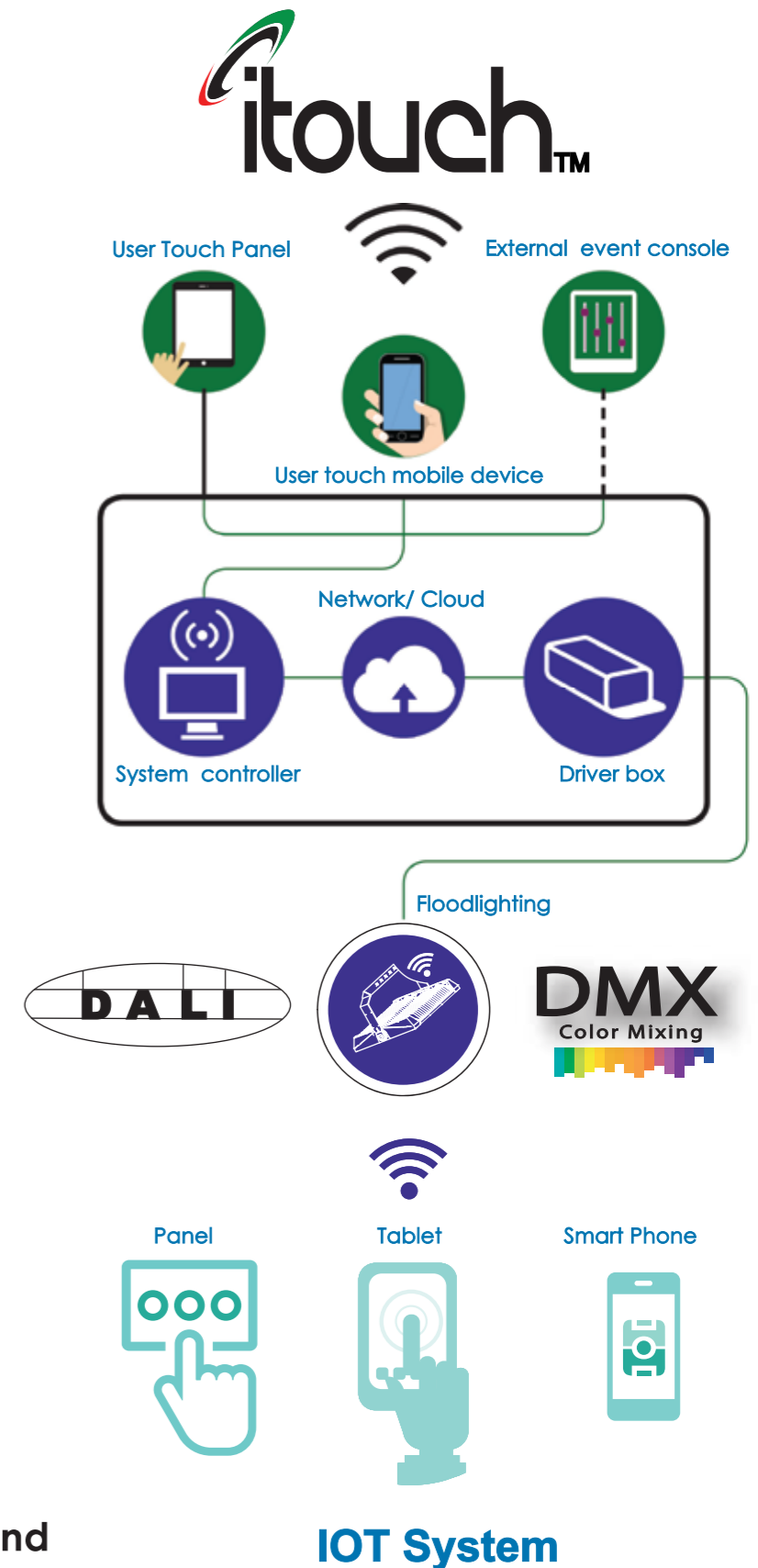
- Anti Glare Reflector - GlareSafe®
- Multi Reflectors (6 Types)
- Symmetrical and Asymmetrical Photometrics
- Multiple Aiming Flexibility
- Multiple Dimming - DALI
- Compact & Light Weight
- Energy Saving and Easy Maintenance
- Long Life Span
- Anti Flickers
- Instant On / Off
- IOT - iTouch SMART Intelligent system
- Dimming DMX Interface
- Anti Drop System
- Certifications approvals

IOT System Smart Intelligent Lighting System

Introducing Gruppe's iTouch smart intelligent lighting system, a system controller with simple useful system management functions that gives you ultimate control over your entire lighting network from an easy to use, programmable touch interface with DALI or DMX through either wireless or wiring connecting system. It incorporates a dedicated control network, connected hardware control components and dedicated software applications that offer system functionality via an intuitive touchscreen user interface.

iTouch SMART lighting system are innovated and incorporated with GEST (Gruppe Embedded System Technology) and (GESS) (Gruppe Embedded Software System) remote controlling which presents a reliable way to :

- Save energy
- Monitoring
- Asset management
- Reduce cost
- Offering flexible, reliable and SMART City solutions to the Sport industries.



GRUPPE

The lighting beyond illumination

More savings

Through iTouch cloud technology, you are able to manage, control and monitor all of this information remotely. Maintenance becomes easier too, as any problems are quickly pinpointed by the technology, allowing you to prioritise callouts, plan ahead and minimise expenditure.



Better flexibility

Gruppe Lighting system is easy to operate and you can change the light settings to fit your needs.



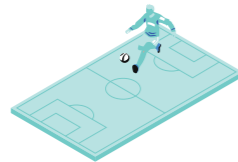
Better vision

Gruppe Crystal opticLED technology provides maximum comfort and minimal glare, so playing is an even better, safer and more enjoyable experience.



Better atmosphere

Lights can be used to enhance the sense of drama and excitement during games and create an atmosphere which improves socialising afterwards.



Better ambience

The right lighting to ensure that members and guests feel safe moving in and around the sports facility



Flicker Free

It is important to consider that light oscillations provoke effects during video broadcasting, where images appear crossed by numerous black lines, making watching impossible.



Flicker Free

Gruppe floodlights are flicker free, designed with a visor for glare and spill light control, were perfect to highlight the event / sport and dark-out the background areas.

Performance

Gruppe Lighting offers a fully dedicated end-to-end approach that is optimized for sports lighting. Starting from a very easy interface for lighting control, Gruppe Sports Lighting 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.

Maintenance Free

Operational expenditure is reduced through lower maintenance costs and more efficient use of energy. With cloud technology, the maintenance company can cut down on costly site visits. If you make use of LED technology, it's easy to see real energy and cost savings.

Key Benefits :

- * Up to 35% additional energy savings
- * Reduced maintenance & operating costs
- * Enhanced lighting quality
- * Modern control capabilities
- * Fixture compatibility
- * Smart city system
- * Future Proof

Quality light without glare for high resolution.

Lighting must meet the needs of international events in terms of efficiency and high-definition TV broadcasting, which require high levels of luminance, light uniformity, excellent colour rendering and greater attention the visual comfort of spectators and athletes with a light without glare. Olympic luminaire meets the criteria of LED fixture with CRI>90. The colour rendering index (CRI) indicates how the colours of an object are reproduced when illuminated by an artificial light source. It is a scale from 0 to 100, where 0 represents the lowest accuracy and 100 is the maximum accuracy.

Fully HDTV Compliance

The latest breakthrough in ultra-high-performance lighting by Gruppe Lighting, with its new and advanced technology and high-precision design, the Gruppe Range of Lighting is the most flexible lighting solution from recreation up to the world class stadium system. GRUPPE Sports Lighting is High performance, compact design and provides precision optical control.

- Energy Efficiency
- High Performance Optics
- Quality Of Light
- Comply to International Standards



The smart sports lighting, a changing world. Technology is transforming our experience of modern sporting events and venues.

Sustainable Sports Arena Sports Lighting

More than 100 sports venues globally are using Renewable Energy. Many sports venues have jumped on the sustainability movement to construct or renovate their structure in a race to minimise their carbon footprint, preserve their green legacy, and take the lead in innovation.

The competition is tough. There are many stadiums which have incorporated some of the most impressive sustainability elements into their operations, raising the bar in what is expected from sustainability in sport. Sports & games are growing bigger with each passing year, and so does its responsibility to promote sustainability and the best interests of its own community and future.

Sports & games are packing stadiums to the brim each passing year, but with it comes an ugly environmental footprint. From generating millions of tonnes of solid wastes to fans consuming and plastic waste that inflate the game's carbon footprint, how can the beautiful game live up to its environmental responsibility?

Sustainable sports arena lighting design and construction often focuses on a number of definable objectives:

Green energy

Reduced water consumption

Greater energy efficiency

Sustainable energy production

Waste management

Reduction in the facility's carbon footprint



Energy

The opportunities for energy conservation are high during design and construction and during operations in the years to come. Even the choice of location can positively impact energy usage requirements.

Energy-efficient LED lighting – Save up to 60%

The evolution of LED lighting can dramatically impact energy usage such lights are deployed where high pressure sodium & metal halide lights were used in the past. Energy savings can often exceed more than 60% with long life and less maintenance.



Renewable Energy

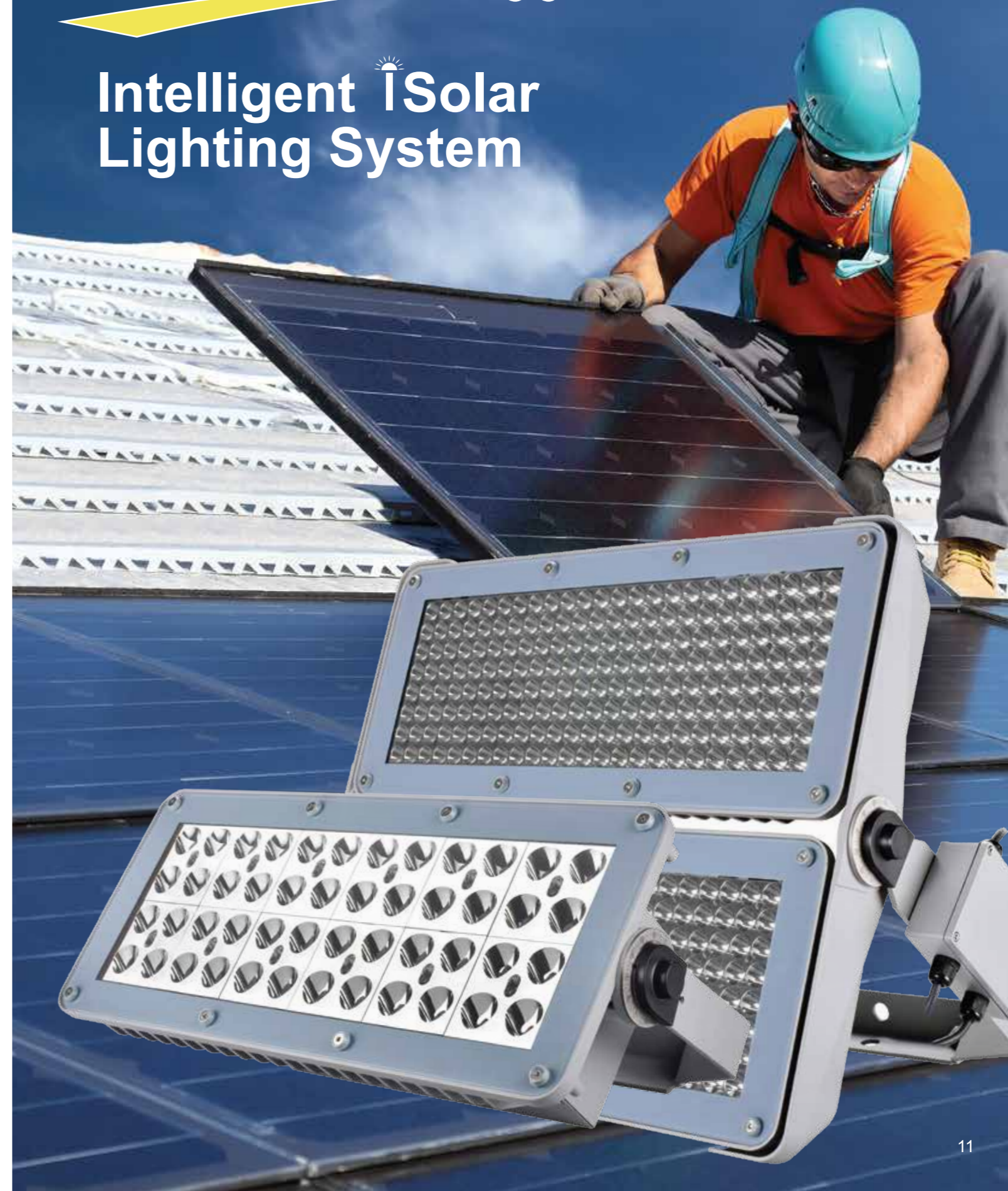
Sports arenas require a huge amount of power, in particular on match-days. Solar power system can be both a clean and affordable energy. Many countries are beginning to embrace solar power system as a solution to many issues they face as they sustain and develop the economic growth, health, education and of course climate change.



Photovoltaic solar panels – Photovoltaic panels now can produce electricity far more efficiently than ever before. Maintenance costs are low, durability is good and no pollution. Large spaces of sports arena is an excellent place on which solar panels can be installed for energy through renewable energy.

Renewable Energy

Intelligent iSolar Lighting System



Lighting Quality

Design flexibility, Multi reflectors & Combination of optics.

A photometric engine that maximize the luminous flux with builds and offered by a selection of optic lenses developed with the goal of creating ambiances and meeting the needs of every application. It also allows numerous types of light distribution by varying the orientation and number of LEDs to meet better the specific needs of each application.

Asymmetric Optic



Symmetric Optic



Symmetric Optic

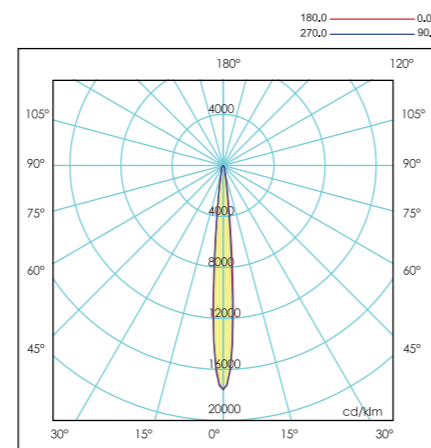
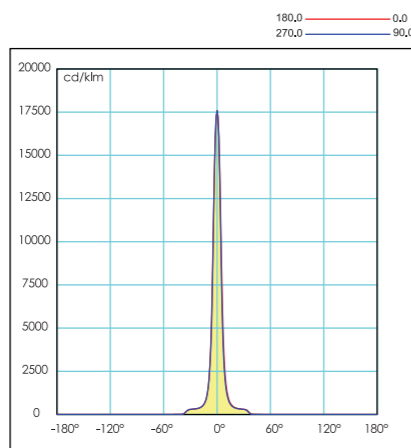
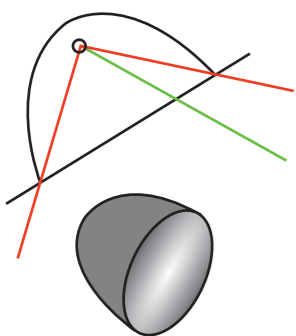


Multiple Photometrics

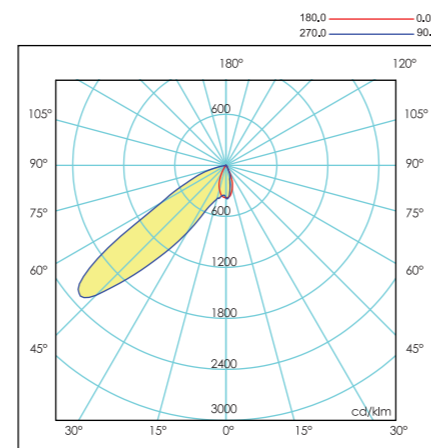
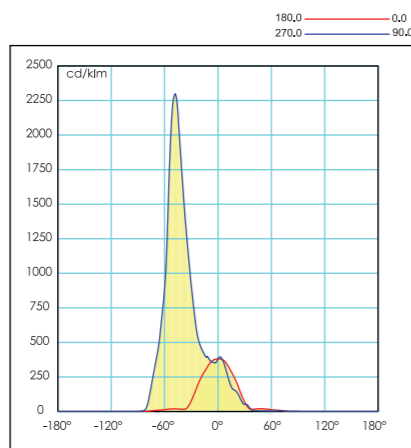
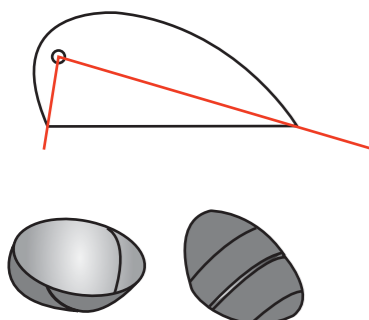
Gruppe Sports system floodlighting has a versatile performance, maximize energy and is compatible with lighting control systems. With its mix and match optics, it delivers the lighting quality and uniformity required with any spill light (Fully Cut off)

- Multi Reflectors
- Asymmetrical and Symmetrical Optics

Symmetrical / Anti Glare



Asymmetrical / Anti Glare



Crystal OpticLED™

Crystal OpticLED™ is builds on a Single High Power LED package with a cutting edge optic innovation with superior optical control, resulting in cut offs, anti light pollution and flexible light distribution. This proven energy saving optimum performance. It improve 98% light output compare to general LED lenses or reflector - 80% lighting output. This flexibility offered by a selection of lenses and reflectors to perfectly meet the needs of each kind of environment and to fulfill the demanding conditions of lighting applications.

Key Terms In Sports Lighting

The following criteria is used to specify, create and measure good lighting. HD cameras, the latest generation in broadcasting, require excellent effective multiple controls which allow a perfect vision of the playing field as well as the spectators.

Quantity of Light (Illuminance)

The amount of light falling on a unit area or surface (measured in lux) that is required for the sport to be played. The faster the sport and the smaller the playing object, the higher the lighting level.

Horizontal Illuminance (Eh)

Horizontal illuminance is a measure of light reaching a horizontal plane, one metre above the playing surface.



Vertical Illumination (Ev)

Vertical lighting at field is the amount of illumination reaching the vertical surface of the players. This illumination helps to show close-up details of players, particularly their faces, at critical moment during match.



Illuminance Uniformity

An adequate level of uniformity is necessary to create balanced lighting conditions so that user's eyes do not continually have to adapt to different light levels.

Football is a high speed sport and maintaining a good uniform illumination across the playing field will enhance player performance and create excellent high definition video and 3D broadcasting.

Beam Spread and Uniformity

When designing lighting for sports facilities it is important to minimize obtrusive, spill light and dark sections of the playing area. Various strategies are used depending on the application and a lot of consideration is given to the design to ensure the playing area will have the proper overlapping beams void of 'hot spots'.



Glare Control

Glare relates to light that causes discomfort or reduces the ability to see because it comes from a source that is too bright compared with its background. Reducing the glare is probably the most critical issue in sports lighting. Fixture louvre's, optics, aiming angles, along with pole height and placement, can minimize the impact of fixture glare.

Surrounding & Environment

Gruppe Sports Lighting are Restriction of Hazardous Substances-compliant, using no hazardous materials in their production. Reduced overspill of light increases system efficiency. All these factors and more, add up to reducing the environmental impact of Gruppe Sports Lighting and help build a brighter, more vibrant and sustainable environment.

CCT - Correlated Color Temperature

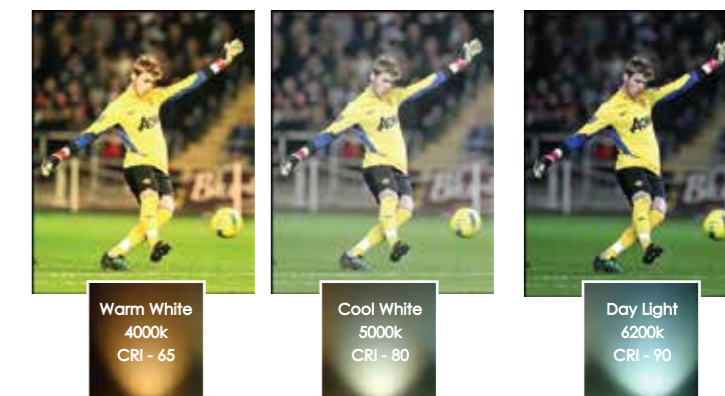
CCT value represents the color of different kinds of light source; standard unit for color temperature is Kelvin (K). You can see the color of yellow stays between 3000 - 4000K and color white between 5000-6000K.

Color Rendering

CRI (Ra) - Color Rendering Index

The color rendering index (CRI) is a quantitative measure of the ability of an artificial light source to reproduce the colors of various objects faithfully in comparison with natural sunlight. Sunlight was defined as an ideal light source and having a CRI of 100.

When making CRI comparison for any kind of light source, suggest choosing the same color for the lights being compared, so it will be easire to determine the results.



GRUPPE

The Sports Lighting Design Process

Whether for an indoor or outdoor venue, each sports lighting project is unique due to the many different organisations that are involved in the process.

Project Definition

The short and long-term objectives for the sports arena should be clearly defined, taking into account the potential use of the arena for other events. Is there going to be television coverage? What sports will the venue be used for? It is important to consult a lighting expert, broadcasting companies and sports specialists at an early stage in the project definition process.

Lighting Study

Once the objectives have been defined, a lighting study needs to be carried out. The lighting study will define the necessary quantities, types and positioning of the luminaires in order to achieve the set objectives. The quality of the lighting study will depend on the standard of information supplied to the designer.

Luminaire Selection

A preliminary decision must be made about the lighting design approach. Essentially there are two possible approaches:

i) Direct lighting

This is the most common approach because the system is likely to be very efficient. If there is to be TV coverage, this is the only option because adequate vertical illuminance is required.

ii) Indirect lighting

In some indoor installations, such as swimming pools, this can be a useful solution because the users will not be able to see the light source. However, the approach relies heavily on the reflective properties of the ceiling, the positioning and the light output ratio of the luminaires chosen and the planned cleaning cycle. TV coverage is not possible with this solution. Only luminaires for direct lighting can be used.

Arrangement of luminaires

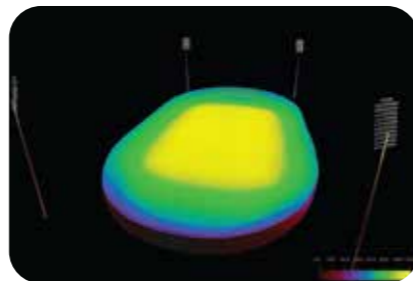
Luminaires must be positioned in such a way as to prevent glare for participants and judges. Consider the sports being played and the various normal viewing angles. For example, when players are serving in tennis, they do not want luminaires at the far end of the court to be in their line of vision when they hit the ball. In larger, multi-purpose halls with fluorescent or discharge lighting it is usual to arrange the lighting in rows between the courts, thus reducing the risk of glare in the players' field of vision.

Artificial Shadow

Artificial shadows on the pitch caused by floodlighting systems detract from visual clarity for both spectators and television broadcasters. The shadows impinge upon the viewing experience and should be eliminated where possible or reduced to soft shadows. During the pitch illuminance design process, it is important to evaluate the production of player shadows and eliminate any hard shadows. This will generally be done by using multiple light sources from various locations for each area of the pitch.

Other considerations include

- All luminaires must conform to EN60598, which is the norm for luminaire electrical safety.
- IP rating. Resistance to dust and water for outdoor application.
- Maximum ambient temperature. This is particularly relevant for indoor venues.
- Luminaire wind drag factor.
- Weight.
- Ease of maintenance & Ease of installation.



Installation

It is important that the luminaires are installed as indicated in the lighting study, and that sufficient space is allowed for the necessary movement and for the luminaires to be aimed in the correct direction. The aiming point could easily be at the other end of the sports area. There must be access to the luminaires for commissioning and maintenance/cleaning and sufficient space must be allowed to accommodate the width of the beam.

MEASURING LIGHTS

Luminance Meter

The Luminance Meter LS-100 is a compact, lightweight meter for measuring the luminance of light sources or reflective surfaces. The TTL (through-the-lens) viewing system enables accurate targeting of the subject.

Illuminance Meter

Illuminance meter T-10A is capable of accurately measuring next generation lamps including Pulse Width Modulation (PWM) controlled lighting. Easy multi-point measurements (2 to 30 points). Simple and accurate illuminance measurements.

Spectrophotometer

Spectrophotometer measures color rendering, CRI, & colour temperature CCT. properties as well as illumination. Displays spectral waveform using CL-S10w software.

Aiming, measuring and commissioning of luminaires

Luminaires should be aimed as indicated in the lighting design. It is recommended that this is done by a sports lighting specialist at the time of commissioning.

It is wise to carry out preliminary measurements before final commissioning to enable last-minute adjustments to be made. At the final stage commissioning measurements should be carried out and signed by the person who took them together with the consultant. Voltage measurements should be taken at the ballast and at the lamp. When measuring the different switching modes, it is advisable to start at the highest level, e.g. 'International TV' and to then work downwards; this prevents the need to let discharge lamps warm up.

Maintenance

A good maintenance plan is essential to ensure a long luminaire life. Dirt collects on the front glass will reduce the output. The performance of lamps diminishes over time. A good lighting study should include information about the replacement and recommended periodic cleaning of the luminaires.



Football Field

From grass roots to international level, you can rely on our unmatched experience of football lighting to give you just the solution you need.

Particularly in the large world championship stadiums and Olympic arenas, it needs to build a bridge: Between the requirements of the athletes and spectators on the one hand and the environmental protection and efficiency on the other. Careful detailed design should be based on the following principles:

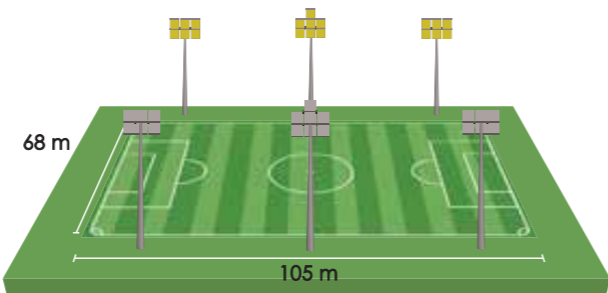
- * Understanding the characteristics of the areas around the site
- * Appropriate levels of illumination for a particular sport(s)
- * A maintenance factor of 0.7 is recommended
- * Energy efficient and Spill Light
- * Wider visibility from surrounding areas
- * Illuminate uniformity shall not exceed 30% every 10m



* Class 1 (Training & Recreation), Class II (Clubs), Class III (Competition),

Description	Class I	Class II	Class III
Eh ave	750	500	200
Emin / Eave	0.7	0.6	0.5
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	< 50	< 50	50

* Refer to Typical Guidelines
* For HDTV & 3D Broadcasting – Refer to the related requirement



Hockey Stadium

Gruppe has lit hockey to every national and international level. Our unrivalled approach to light control has led to recommendations from specifiers, consultants and users

If it is a matter of lighting, the requirements made by hockey field and soccer are basically comparable: It is important to avoid glare and dark shadows being cast on the playing field.

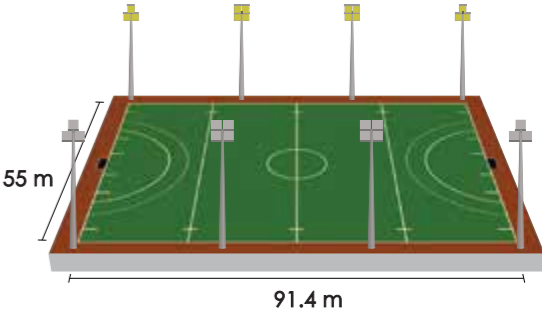
The difference: In hockey the ball is significantly smaller and considerably faster. It can reach up to nearly 150 kilometers per hour. This is why very high horizontal illuminance is required in field hockey. To be able to assess the high speeds correctly and to minimize danger of injury to players, it is also important for the lighting to be extremely even.



* Class 1 (Competition), Class II (Clubs), Class III (Training & Recreation)

Description	Class I	Class II	Class III
Eh ave	750	500	300
Emin / Eave	0.7	0.7	0.7
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	< 50	< 50	< 55

* Refer to Typical Guidelines
* For HDTV & 3D Broadcasting – Refer to the related requirement



Rugby Stadium

Our total sports lighting service is always on the ball. We can support your passion and your progress, whatever level your club plays at.

For rugby pitches the dead-ball zone, which can be up to 22m long, will need to be adequately illuminated. In some instances the spill light from the playing area will be sufficient but only to a depth of 6m. This is in addition to the playing area length of up to 100m between goal lines.

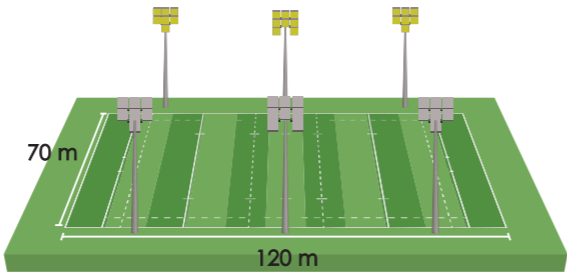
A total area shall include a strip the length of the pitch including the dead ball area of no less than 6m wide on each side of the pitch. Lighting can be positioned on the roofs of adjacent grandstands if they are of sufficient height and location to comply with floodlight positional requirements



* Class 1 (Competition), Class II (Clubs), Class III (Training & Recreation)

Description	Class I	Class II	Class III
Eh ave	500	200	100
Emin / Eave	0.7	0.6	0.5
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	< 50	< 50	< 55

* Refer to Typical Guidelines
* For HDTV & 3D Broadcasting – Refer to the related requirement



Cricket Stadium

Achieving the correct brightness levels has never been more important, and lamp-colour rendition must be closed to daylight to ensure an optimum natural feel.

Cricket lighting should have the suitable luminance and colour contrasts over the playing area in particular the ball, players and umpires. Sufficient light at all parts of the field and throughout the flight of the ball correct distribution of light. Adequate glare control. Control of spill lighting to adjacent areas and neighbours.

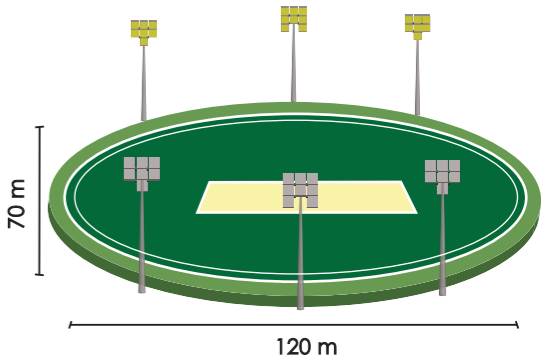
The ball should be adequately illuminated at all times while in play. Adequately illuminating the higher ball flight can usually be achieved by lighting the space above the field from several directions.



* Class 1 (Competition), Class II (Clubs), Class III (Training & Recreation)

Description	Class I	Class II	Class III
Eh ave	500	300	200
Emin / Eave	0.7	0.6	0.5
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	< 50	< 50	< 55

* Refer to Typical Guidelines
* For HDTV & 3D Broadcasting – Refer to the related requirement



Track & Field

Lighting Track & Field sports requires a flexible approach. We can design for track & field to be lit independently both for training and competition.

In considering lighting for athletics, events can be divided into two groups. These are: Those events which take place essentially at ground level – track events, horizontal jumps and shot putt Those events which involve the space significantly above ground level – throwing events (except shot) and vertical jumps.

For events in the first group, it is sufficient to consider horizontal illuminance at ground level. For events in the second group, the full volume within which the event takes place must be considered – for instance, the maximum height of the flight of the javelin or hammer and the maximum height of the pole vault bar.

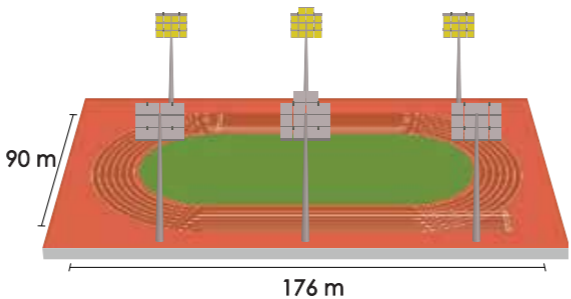


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Description	Class I	Class II	Class III
Eh ave	500	200	100
Emin / Eave	0.7	0.6	0.5
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	< 50	< 50	< 55

* Refer to Typical Guidelines

* For HDTV & 3D Broadcasting – Refer to the related requirement



Velodrome

Important cycling events are usually held on tracks which have lines laid out in a specified arrangement in Velodrome.

Velodrome is an arena for track cycling. Modern velodromes feature steeply banked oval tracks, consisting of two 180-degree circular bends connected by two straights tracks.

The velodrome lighting system measurements are carried out for both vertical and horizontal illuminations and uniformity of illumination to avoid any areas with low lighting or shadowing, anti glare for both cyclists and spectators, which not only meets current standards requirement, but also offers suitable lighting for HDTV for high speed recordings and super slow motion at the finishing line.

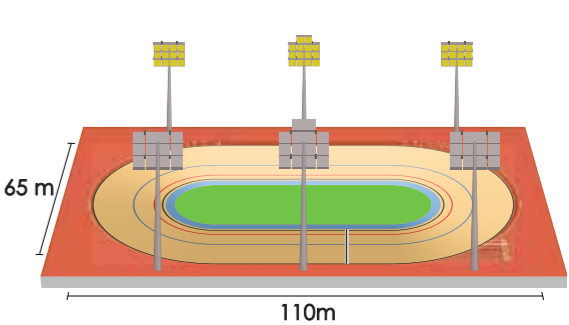


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Eh ave	750	500	300
Emin / Eave	0.7	0.7	0.7
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	< 50	< 50	< 55

* Refer to Typical Guidelines

* For HDTV & 3D Broadcasting – Refer to the related requirement



Tennis Court

Tennis is played on a variety of surfaces and each surface has its own characteristics which affect the playing style of the game

A good level of illumination and contrasting background colours are required for a Tennis Court so that the players, coaches and spectators can follow the flight of the ball. The reflectance values of the floor and wall finishes should be fully coordinated into the design and the selection of the lighting system.

Luminaires should be arranged so that they are not within the clear height zone of the court, above the field of play or within players' normal sight-lines.

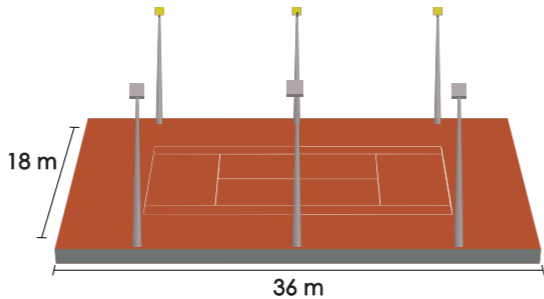


* Class 1 (Competition), Class II (Clubs), Class III (Training & Recreation)

Description	Class I	Class II	Class III
Eh ave	500	300	200
Emin / Eave	0.7	0.7	0.6
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	< 50	< 50	< 50

* Refer to Typical Guidelines

* For HDTV & 3D Broadcasting – Refer to the related requirement

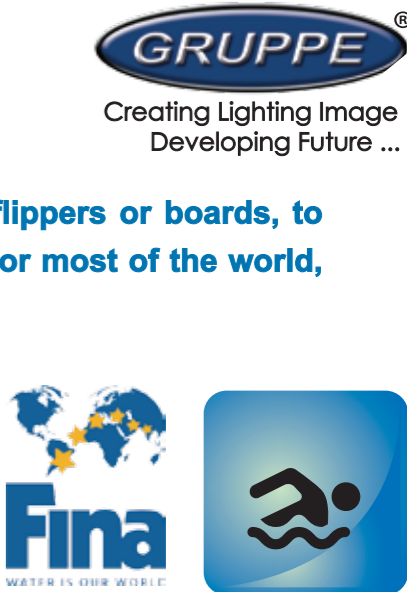


Swimming Pool

Swimming is the use of the body, sometimes with aids such as flippers or boards, to propel the body through the water. It is a popular leisure activity for most of the world, and also a major competition sport in many countries

Usually one or two lines of luminaires are provided along each longitudinal side of the pool.

Primarily, medium beam rectangular flood-lights are recommended. In indoor halls, daylight should be avoided completely, and thus windows should be curtained. Glare and reflection are the most challenge and the main consideration during lighting design and implementation.

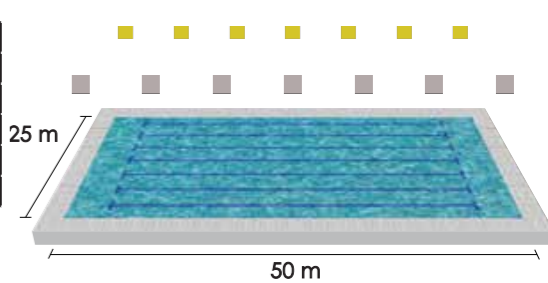


* Class 1 (Competition), Class II (Clubs), Class III (Training & Recreation)

Description	Class I	Class II	Class III
Eh ave	500	300	200
Emin / Eave	0.7	0.7	0.5
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	n/a	n/a	n/a

* Refer to Typical Guidelines

* For HDTV & 3D Broadcasting – Refer to the related requirement



Multi Purpose Hall

A multi-functional hall needs multi-functional lighting. The general lighting should be dimmable and backed by supplementary lighting systems on separate switching circuits with a lighting control system tailored to meet requirements.

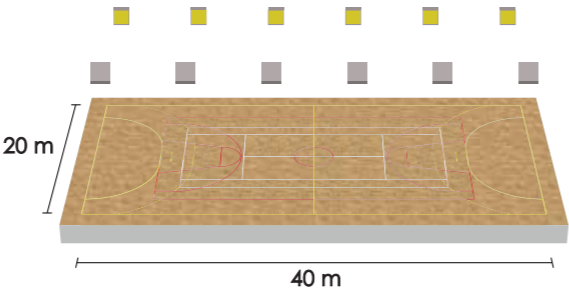
A large variety of multipurpose halls exist with respect to both the dimensions and the activities taking place. Indoor games like badminton, basketball, volleyball, table tennis, indoor soccer, handball can take place in these halls on one or more court at the same time. Larger hall can have provision for indoor athletics including track, gymnastic, indoor cycling and equestrian events. The design for the individual sports as given in the various section should be applied in designing the lighting system for a particular use of the hal



* Class I (Competition), Class II (Clubs), Class III (Training & Recreation)

Description	Class I	Class II	Class III
Eh ave	750	500	300
Emin / Eave	0.7	0.7	0.7
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	n/a	n/a	n/a

* Refer to Typical Guidelines
* For HDTV & 3D Broadcasting – Refer to the related requirement
* Lighting standard will refer to the individual indoor sports



Golf Course

The distance markers must be clearly visible and the player must be able to follow the flight of the ball. While the tee areas will require separate illumination, there should be general illumination of the full length of the golf range surface.

End-range lighting systems have primarily been utilized to illuminate golf ranges. This type of system employs high-powered floodlights behind tee locations with high angles of elevation to achieve adequate vertical illuminance at each target area.

Glare to the surrounding neighborhood is probable from viewing directions towards the tees in the direction of play. Natural screening or careful siting of the golf range will provide the best practical solution to alleviate any direct glare.



* Customization available upon request

Description	Tee Boxes	Fairway	Putting Green
Eh ave	200	100	250
Emin / Eave	0.7	0.5	0.7
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	50	50	50

* Refer to Typical Guidelines
* For HDTV & 3D Broadcasting – Refer to the related requirement
* Customization available upon request



Grand Prix

Your lighting infrastructure is one of your organization’s most valuable and critically important assets, so you’ll want to protect that investment.

With the right maintenance plan and remote assistance, we can help you extend the products’ lifetime and optimize the performance with no interruptions during an ongoing race. With growing urbanization and sedentary city lifestyles, recreational sports facilities are becoming more important in cities everywhere. Improving the experience for both athletes and spectators can help bring communities together and encourage people to be more active. Our energy-efficient LED lighting and remote management systems save on energy costs while enhancing the athletic environment and minimizing light pollution for the surrounding population. Improve visibility, safety, and comfort for athletes and spectators



* Class 1 (Competition), Class II (Clubs), Class III (Training & Recreation)

Description	Track	Pit Lane	Garage	Track including 2m shoulder each side	Run-off area	Official area behind safety fence
Eh ave	2000	2500	1500	1500	1000	500
Emin / Eave	0.7	0.7	0.7	0.5	0.7	0.7
CRI	≥ 70	≥ 70	≥ 70	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	50	55	55	50	55	55

* Refer to Typical Guidelines
* For HDTV & 3D Broadcasting – Refer to the related requirement

Horse Riding

We provide the best selection of both indoor and outdoor arena lights. LED flood lamps for riding arena not only keeps your animals like horses happy but also increases the rider’s riding time throughout the year, which gets more income.

Providing expertise and experience in every aspect of the project engineering, be it lighting, structural, electrical or civil, Gruppe will help you achieve your ambition

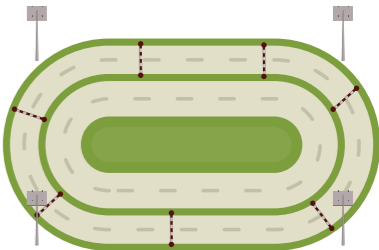
Horse racing is a very exciting and popular sport, the strobing lights greatly affect the user watching the event. Especially when the horse is rushing to the finish line, the high-speed cameras will capture the moment. If the lights flicker, it cannot shoot the critical moment. Is important to have the light flicker free and glare free.



* Class 1 (Competition), Class II (Clubs), Class III (Training & Recreation)

Description	Class I	Class II	Class III
Eh ave	750	500	200
Emin / Eave	0.7	0.7	0.5
CRI	≥ 70	≥ 70	≥ 70
CCT	4000~5700K	4000~5700K	4000~5700K
Glare Rating Max	50	50	55

* Refer to Typical Guidelines
* For HDTV & 3D Broadcasting – Refer to the related requirement



Product Luminaires

Gruppe LED Flood Lighting

	Universal Flood Lighting	Olympic Single Flood Lighting	Olympic Dual Flood Lighting	UniBox Flood Lighting
				
Wattage	100W - 480W	600W	1200W	100 - 480W
Weight	8.2 - 19.4 kg	18 kg	30 kg	7 - 21.5 kg
IP Value	IP 66	IP 66	IP 66	IP 65
Type Of Optics	Crystal OpticLED	Crystal OpticLED	Crystal OpticLED	Crystal OpticLED
Sports Event (*General Lighting Guide For Sport Event)				
Football	*	*	*	
Hockey	*	*	*	
Rugby	*	*	*	
Cricket	*	*	*	
Track & Field	*	*	*	
Tennis Court	*	*	*	*
Swimming	*	*	*	*
Multi Purpose Hall	*	*	*	*
Badminton	*	*	*	*
Volleyball	*	*	*	*
Basketball	*	*	*	*

	Icon Highbay Lighting	UFO-MB Highbay Lighting	Icon Lowbay Lighting	Linear-MB Lowbay Lighting
				
Wattage	80 - 240W	100 - 200W	50 - 200W	100 - 600W
Weight	3.5 - 8.5 kg	3.0 ~ 3.5 kg	2.0 - 4.0 kg	9.0 - 25.0 kg
IP Value	IP 66	IP 65	IP 20	IP 65
Type Of Optics	Crystal OpticLED	Crystal OpticLED	Crystal OpticLED	Crystal OpticLED
Sports Event (*General Lighting Guide For Sport Event)				
Football				
Hockey				
Rugby				
Cricket				
Field & Track				
Tennis Court	*	*	*	*
Swimming	*	*	*	*
Multi Purpose Hall	*	*	*	*
Badminton	*	*	*	*
Volleyball	*	*	*	*
Basketball	*	*	*	*

Recommendation

Reference - Sports Lighting Standard - BS EN 12193-2018

Sports		Illuminance Level						Glare Rating (GR)			Illuminance Level (Em. Vertical) LUX CTV Broadcast ** Maximum camera shooting		
		(Em. Horizontal) LUX*											
		(Non CTV)											
		Class I		Class II		Class III							
		Em Lux	Uo Min/ave	Em Lux	Uo Min/ave	Em Lux	Uo Min/ave				I	II	III
Athletics		500	0.7	200	0.5	50 to 100	0.5	50	55	55	480	640	800
	In Fld	750	0.7	500	0.7	300	0.5	50	50	55	900	1280	1600
Baseball	Out Fld	500	0.5	300	0.5	200	0.3	50	50	55	680	920	1150
Basketball		500	0.7	200	0.6	75	0.5	50	50	55	680	920	1150
Bowls Flat Green		300	0.7	200	0.7	100	0.5	50	50	50	480	640	800
Cricket		750	0.7	500	0.7	300	0.5	50	50	55	900	1280	1600
Ground Field		500	0.5	300	0.5	200	0.3	50	50	55	680	950	1150
Equestrian		500	0.7	200	0.7	100	0.5	50	50	55	480	640	800
Football (soccer)		500	0.7	200	0.6	75	0.5	50	50	55	680	920	1150
Football (American)		500	0.7	200	0.6	75	0.5	50	50	55	680	920	1150
Hockey		500	0.7	300	0.7	200	0.7	50	50	55	680	920	1150
Horse Racing		200	0.6	100	0.4	50	0.2	50	50	55	480	640	800
Netball		500	0.7	200	0.6	75	0.5	50	50	55	680	920	1150
Rugby		500	0.7	200	0.6	75	0.5	50	50	55	680	920	1150
Tennis		500	0.7	300	0.7	200	0.6	50	50	55	680	920	1150
Volleyball		500	0.7	200	0.6	75	0.5	50	50	55	680	920	1150

** Em is the Maintained Illuminance Level (specification level) and is the Design illuminance level, below which the lighting not allowed to fall during the period to planned maintenance

** CTV (Em. vertical) lighting levels Incorporate a multiple of design Illuminance uniformity checks; for further Information see CIE No. 83

Sports Lighting Standard - BS EN 12193-2018

Level of Competition		Lighting Class	
	I	II	III
International & National	✓		
Regional	✓	✓✓	
Local	✓	✓✓	
Training		✓✓	✓✓✓
Recreation /School Sports			✓✓✓
(Physical Education)			✓✓✓

LED Lighting Standard

- 1) IEC 60598-1:2012 : Luminaires - Part 1: General requirements and tests
- 2) IEC 60838-2-2:2008 : Miscellaneous lamp holders - Part 2-2:Particular requirements - Connectors for LED-modules
- 3) IEC 61347-1:2012 : Lamp control gear - Part I: General and safety requirements
- 4) IEC 61347-2-13:2012 : Lamp control gear - Part 2-13: Particular requirements for d.c. or supplied electronic control gear for LED modules
- 5) IEC 62031 :2011 : LED modules for general lighting - Safety specifications
- 6) IEC 62384:2012 : DC or AC supplied electronic control gear for LED modules - Performance requirements
- 7) IEC 62560:2012 : Self-ballasted LED-lamps for general lighting services by voltage> 50 V - safety specifications
- 8) IEC 62504:2012 : General lighting - LEDs and LED modules - Terms and definitions
- 9) IEC 62612:2012 : Self-ballasted LED-lamps for general lighting services - Performance requirements
- 10) IEC 62717:2012 : LED modules for general lighting - Performance requirements
- 11) IEC 62722-1:2012 : Luminaire performance - Part 1: General requirement
- 12) IEC 62722-2-1 : Luminaire performance - Part 2-1: Particular requirements for LED luminaires
- 13) IES LM-79-08 : Electrical and Photometric Measurements of Solid State Lighting Products
- 14) IES LM-80-08 : Measurement Lumen Maintenance of LED Light Source
- 15) IEC 62471 : Photobiology Safety of Lamps and Lamp system

Classes of play

Class I: Top-level competitions, both national and international. There are usually large numbers of spectators and long viewing distances.

Class II: Mid-level competition, matches at regional or local club level with medium-sized groups of spectators and average viewing distances.

Class III: Low-level competition and recreational sport. This normally involves small numbers of spectators and short viewing distances.

One Stop Lighting Solution

Gruppe, we can take care of everything from foundations to final aiming and testing, to ensure 100% accuracy.

Step 1 : Data Collection

Professional Advice, Building plans, Guidelines
& Specifications



Step 2: Simulation

Lighting Design Software Lighting layout &
Lighting effect 3D Visualization



Step 3: Materialization

Comprehensive Products
International Standards Installation & Aiming



Step 4 : Testing & Services

Testing Commissioning Maintenance
After sales services, Follow Up Service



Installation

Gruppe, we can take care of everything from foundations to final aiming and testing, to ensure 100% accuracy.

Total Care Maintenance

With Gruppe the great service doesn't stop with installation. Our fully qualified engineers can also offer you a variety of maintenance packages to suit every requirement. Working at all heights, we will inspect and report on all aspects of your lighting system – including testing your electrical systems and cabling to certify compliance to NICEIC standards.

We can also repair and replace key components and develop a tailored maintenance programme to suit your specific project. For total peace of mind.

One of the greatest benefits of choosing Gruppe is the breadth of our project portfolio. Whether you're a small ground or a world-famous international stadium, our extensive experience at every level makes us ideally placed to offer you the very best advice, design expertise and value for money across our entire product range.

Total Care Warranty

The Gruppe Five-year Total Care Warranty isn't like a normal warranty. It's a straightforward promise by Gruppe Lighting that we will look after your lights and keep them working no matter what.

GRUPPE offers 5 Years WARRANTY & GUARANTEE
Warranty on Product
Warranty on System performance and maintenance
Guarantee on Lighting performance according Standard and requirements.