
THORN
LIGHTING
BRILLIANT PLAYS
SPORTS LIGHTING

BETTER LIGHT BETTER PLAYS

WE MAKE LIGHT WORK

BRILLIANT PLAYS

Sports affect us emotionally, captivate us and significantly contribute to that passion and excitement. The following guide provides an overview of key aspects to consider when planning and designing a lighting installation for brilliant plays in sports venues.

BORUSSIA DORTMUND STADIUM,
SIGNAL IDUNA PARK, GERMANY

NICE TO MEET YOU

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SEE ALL THE ACTION

At professional and recreational sports facilities just as in other areas of life, light affects everything – people, places as well as the environment. Modern lighting technologies take all of these factors into consideration while enabling people to clearly see all the action.

LIGHT FOR PEOPLE

Sports lighting not only provides visibility and clarity. It also enhances the entertainment factor, stimulates enthusiasm and emotions for players, officials and, of course, the fans – those present at the venue, as well as those watching on TV at home.

LIGHT FOR PLACES

Light is an integral part of today's sports venues. From the field of play to dynamic facades and dramatic light shows – good colour rendition, flicker free installations and proper uniformity are key enablers for sporting events.

LIGHT FOR THE ENVIRONMENT

The sheer power of sports lighting is an environmental factor that must be considered carefully. Thorn solutions minimise light pollution to neighbours and wildlife nearby with cutting-edge optics while also saving energy with smart controls.

SIX FACTORS THAT COUNT

IN SPORTS LIGHTING

Advanced lighting technologies can transform venues, creating unforgettable experiences for sports fans. Six factors in particular play a key role.

01

THE RIGHT DESIGN

When designing lighting installations, every sports facility is different. From large arenas to small practice fields, indoor halls to outdoor complexes, every sports venue generally requires an individual lighting solution. To facilitate the design work at stadiums, Thorn developed a digital tool that creates a 3D visualisation of the facility. It enables clients to take a virtual walk through the lit arena prior to installation.

02
LED LIGHTING

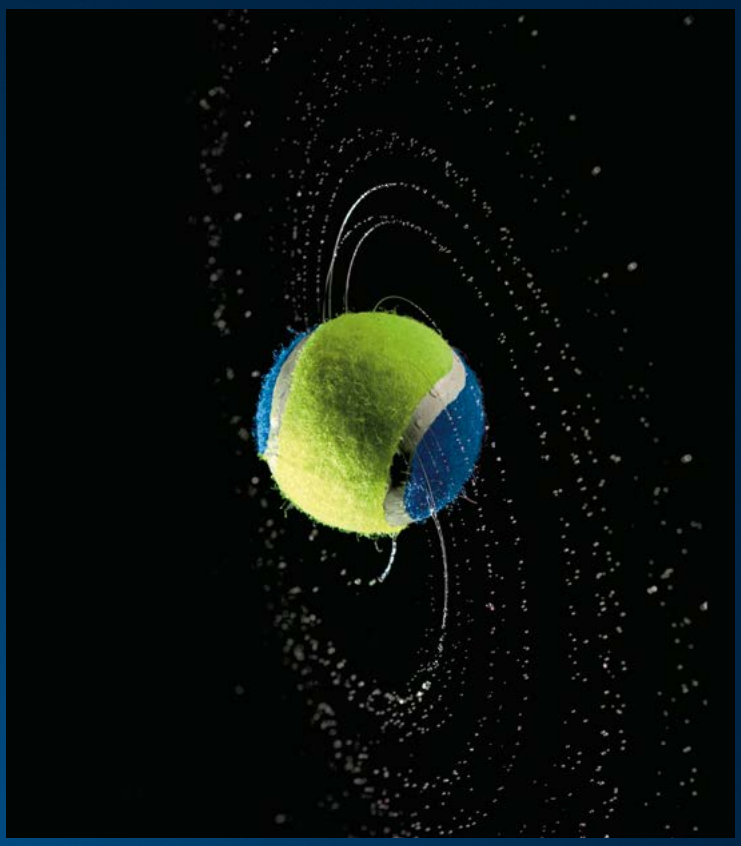
Thanks to their long life, low energy consumption, flexibility and falling prices, LEDs are gradually replacing most lighting applications. LED light quality has seen massive improvements in recent years. At small-scale venues such as tennis courts, sports halls, small municipal projects, they have already become the norm. Large stadiums are also beginning to switch to LED technology. With Altis, Thorn offers a dedicated LED floodlight backed by more than 90 years of lighting experience.

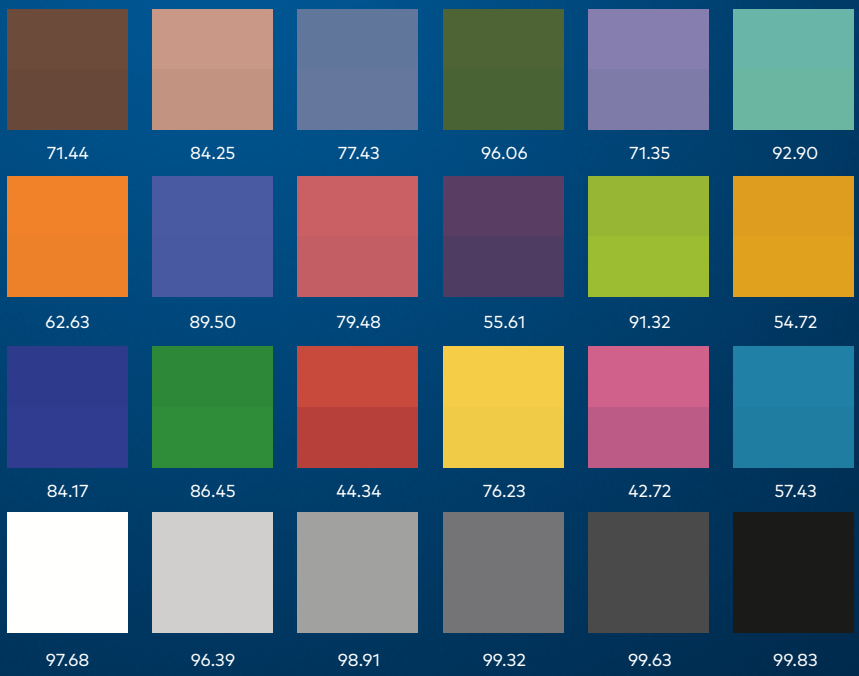
03
REDUCING LIGHT POLLUTION

When illuminating sports venues, it is important to make sure that the light is directed only where it is needed, thereby minimising light pollution and glare for nearby buildings and surrounding areas. Advanced optical controls ensure that the light is precisely directed to the intended location.

04
LIGHT JUST RIGHT FOR TV

For stadiums that host televised events, broadcasting specifications are a key lighting consideration. Developments such as HD and 4K TV, improved colour rendering ratings (TLCI – Television Lighting Consistency Index) and super-slow-motion replays have raised the bar for quality. However, maintaining high light levels with no visible flicker also poses key challenges. Modern LED stadium lighting technologies greatly minimise flicker levels – as well as the concerns of TV camera operators.





TLCI COLOUR CHART

The Television Lighting Consistency Index (TLCI) is used to evaluate light quality. It measures the spectral power distribution of a luminaire using a spectroradiometer, analyses its television performance, and assigns a colour value on a scale from 0 to 100. These are displayed vis-à-vis the reference values.

05
PRECISE CONTROL

With LED technology, lighting installations are up and operating at full power capacity in less than 20 milliseconds or 1/50th of a second. Lighting challenges such as power outages are a thing of the past with LEDs.

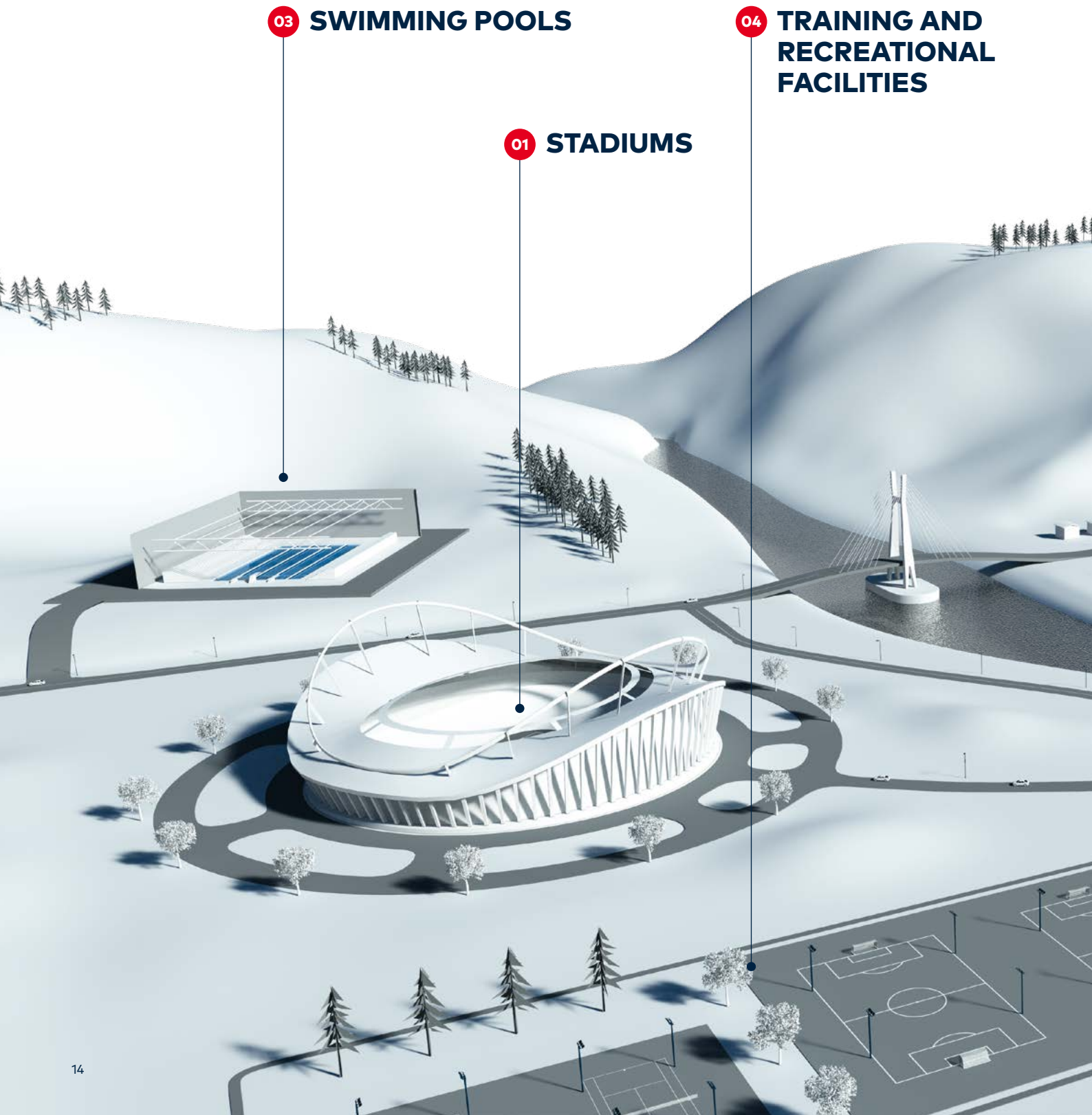
Controlling the light, however, plays an increasingly important role. Whether for training sessions, professional games or large-scale events, light levels and uniformity must be configured precisely for various scenes and scenarios.

06
CREATIVE EFFECTS

Advanced lighting technologies available today have opened up entirely new possibilities for venues. Thanks to LEDs and sophisticated control systems such as the DMX solutions from Thorn, spectacular lighting effects are easy to create. Typically used for theatre lighting, DMX technology allows you to control each point of light individually, and even change colours when used with colour-effect fittings.

THE WHOLE LIGHTING PICTURE

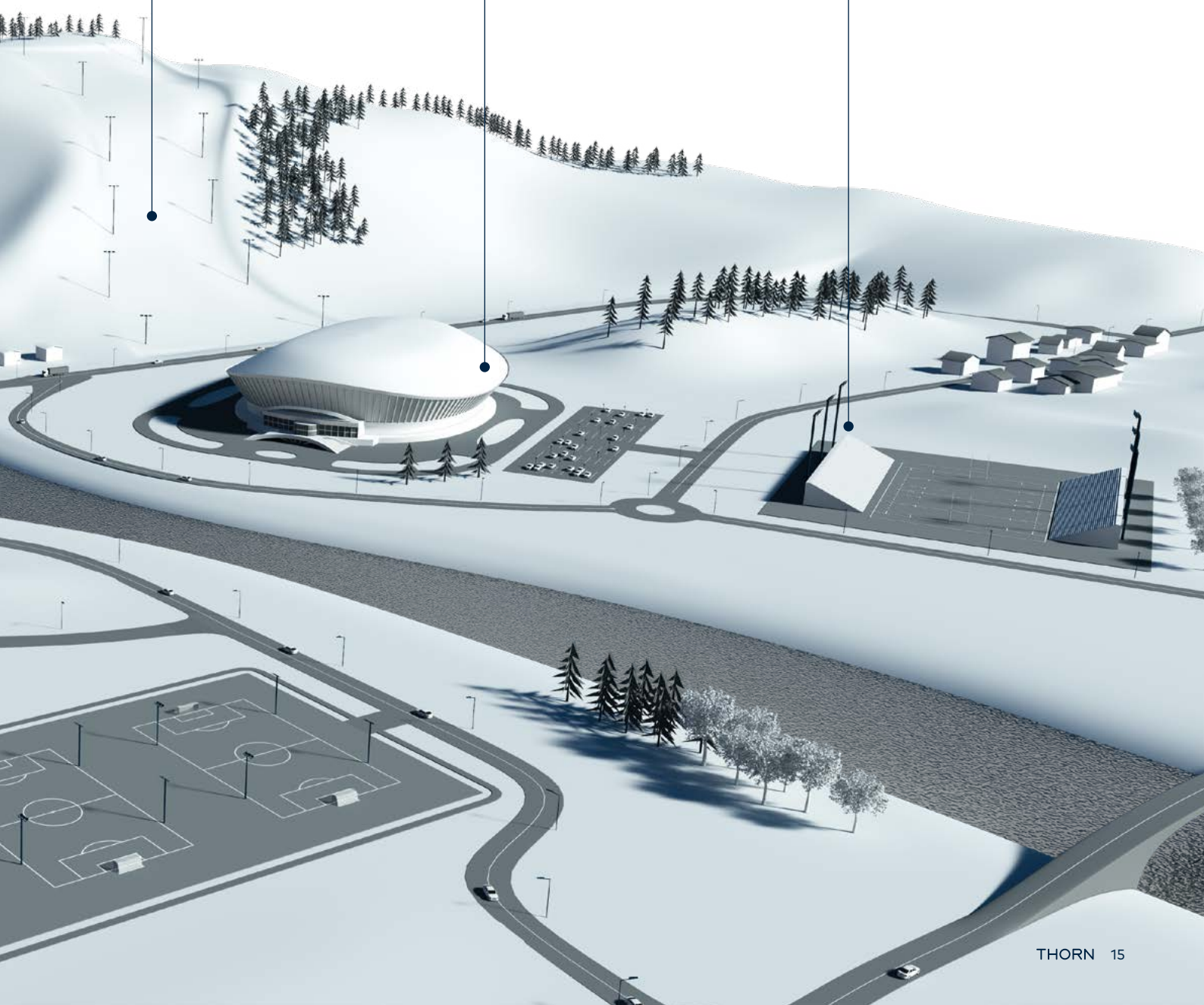
Sports lighting solutions from Thorn can be used for wide-ranging applications – stadium illumination, training areas, ski runs, swimming pools, indoor arenas and many other sport facilities. With every project, our experts always focus on optimising the whole picture – light for people, places and the environment.



02 INDOOR ARENAS

05 WINTER SPORTS

06 OTHER SPORTS



STAD

FSV MAINZ 05, OPEL ARENA, MAINZ, GERMANY

MAKING ARENAS
COME ALIVE

IUMS

OPTIMISING THE EVENT EXPERIENCE

ARCH LIGHTING – WEMBLEY STADIUM, LONDON, UK

Large professional arenas require many different types of precisely controlled illumination technologies. In order to appropriately fulfil various specific illuminance criteria, expert planning and experience are essential. We can assist you in choosing the right products, optics, lumen packages and controls needed to achieve the best lighting experience for your venue.

BOCA JUNIORS STADIUM – LA BOMBONERA, BUENOS AIRES, ARGENTINA

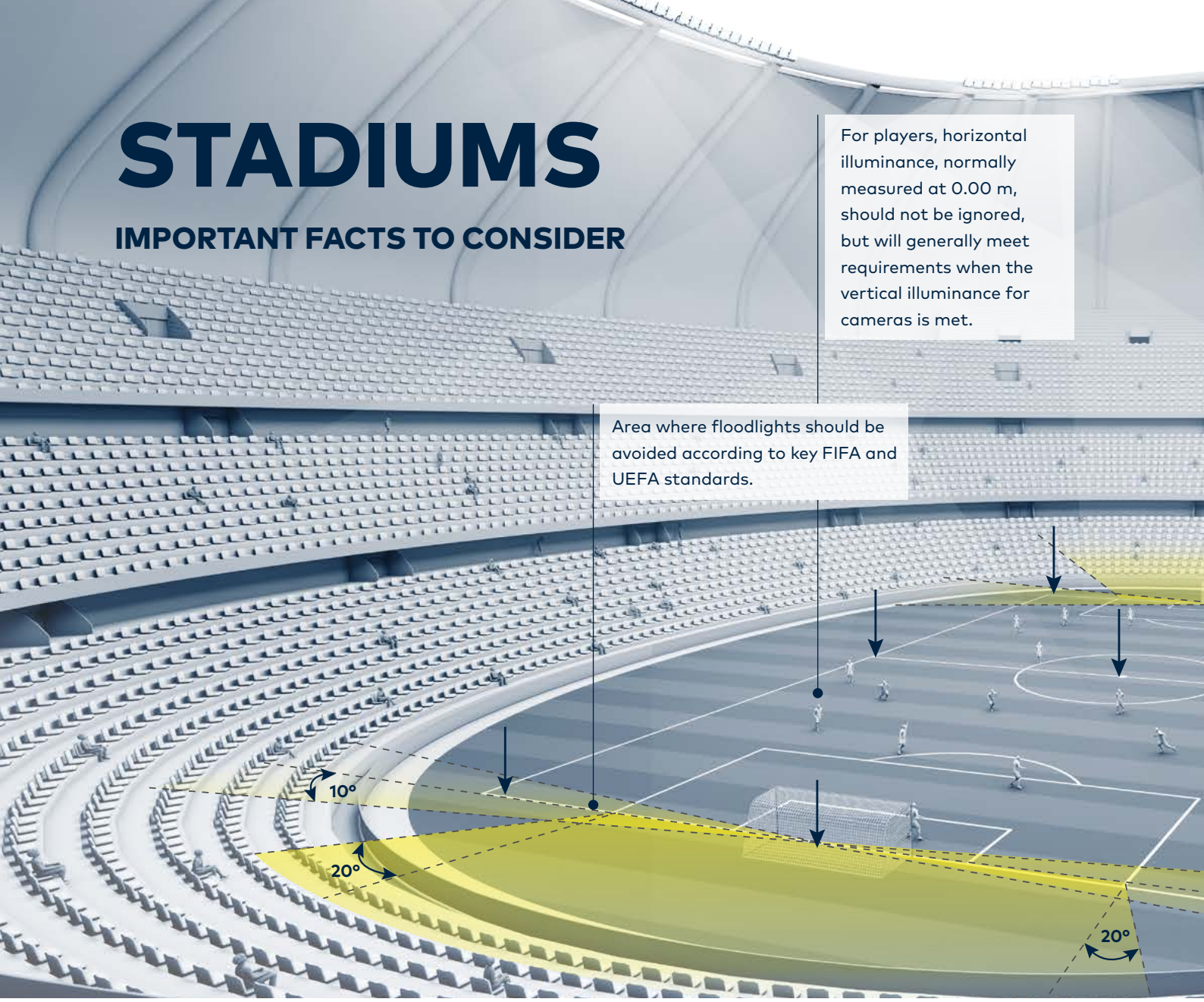
BORUSSIA DORTMUND STADIUM, SIGNAL IDUNA PARK, GERMANY

STADIUMS

IMPORTANT FACTS TO CONSIDER

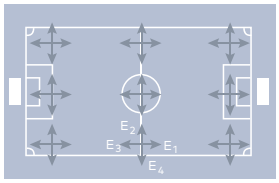
For players, horizontal illuminance, normally measured at 0.00 m, should not be ignored, but will generally meet requirements when the vertical illuminance for cameras is met.

Area where floodlights should be avoided according to key FIFA and UEFA standards.

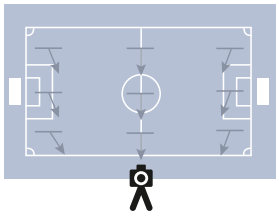


CAMERAS

For hand-held cameras, a vertical illuminance in the four primary directions at either 1 m or 1.5 m is required (vertical Illuminance). For all cameras, recommended vertical illuminance levels require special sports floodlighting with aiming angles (illuminance to camera).



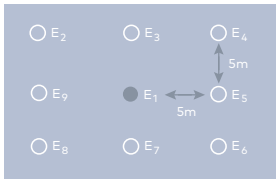
Vertical illuminance



Illuminance to camera

GRADIENT

An illuminance gradient of 20 % change at any 5 m distance is recommended.

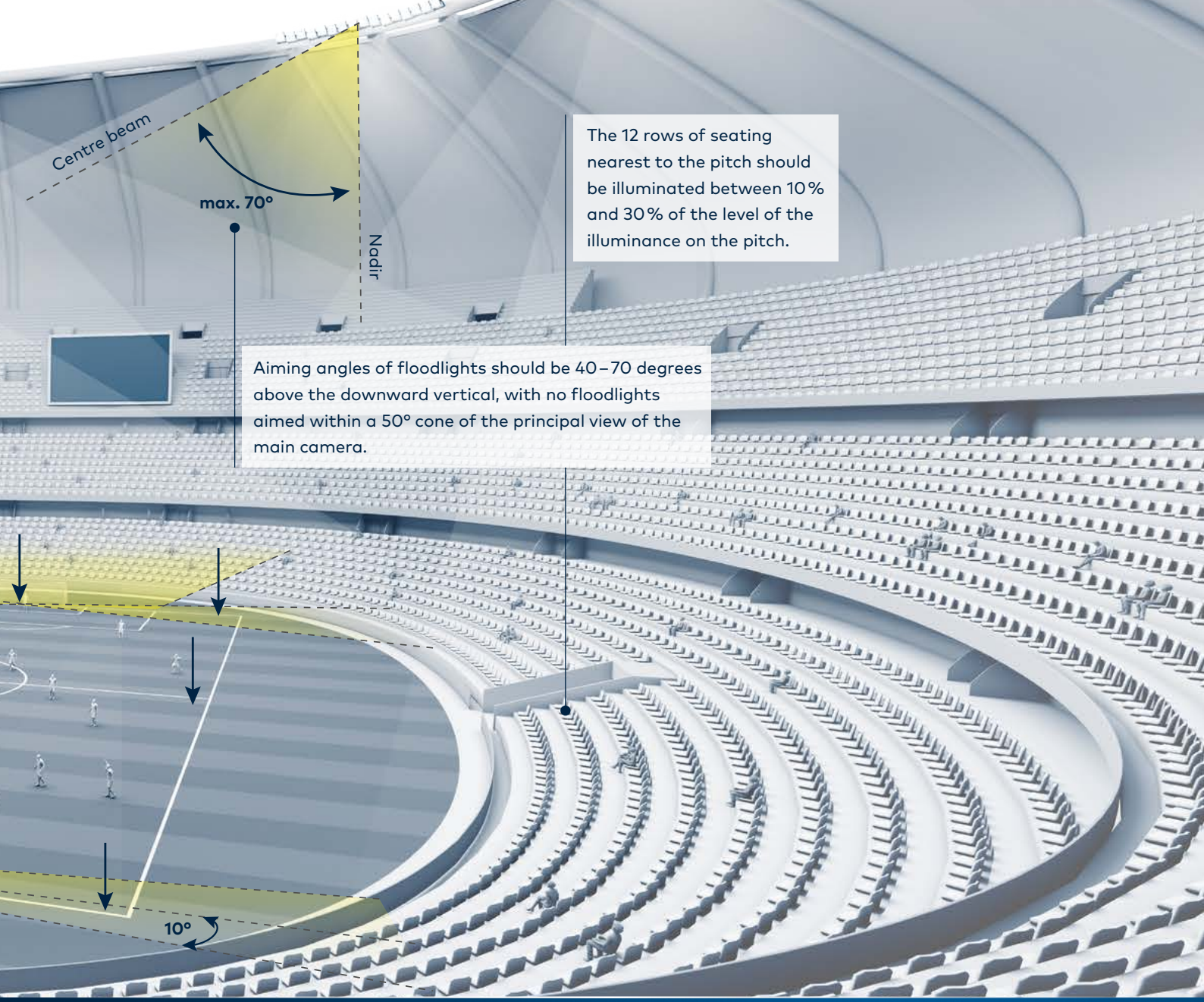


Illuminance gradient

GLARE RATING

To eliminate camera flare, the glare rating is generally GR < 50.

Glare Rating (GR)	Sensation
90	Unbearable
70	Disturbing
50	Acceptable
30	Noticeable
10	Unnoticeable



BEST PRACTICE

TURNKEY SOLUTIONS
Thorn specialises in complete solutions – from planning the lighting design to the installation, controls and commissioning.

LIGHTING FOR TV
Illuminance levels must be configured for each camera position.

LIKE DAYLIGHT
Colour temperatures of outdoor light sources should simulate natural daylight (5000–6000K).

COLOUR RENDITION
We recommend rendering greater than Ra 80 and for cameras, a TLCI rating above 80.

FULL CONTROL
Optimised training, match, maintenance and other illuminance requirements require continuous LED light level adaptation.

AVOIDING FLICKER
A flicker factor under 6%, with LEDs less than 1%, is highly recommended.

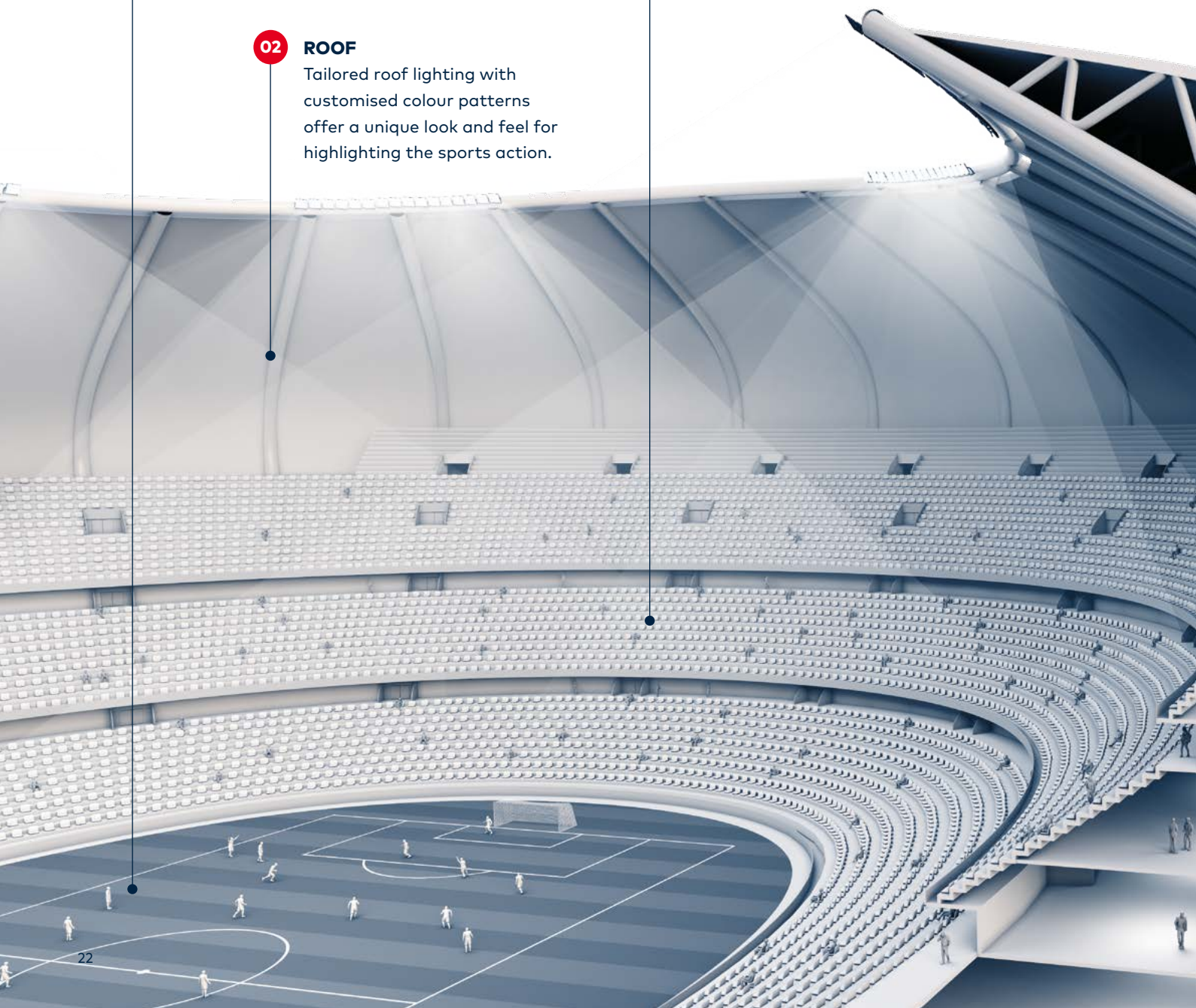
BRINGING IT ALL TO LIFE

Modern stadium lighting goes far beyond the pitch. Bringing it all to life requires a complete solution for all areas in and around the stadium.

01 PITCH
Precision LED pitch lighting installations can be flexibly controlled to create special lighting effects.

02 ROOF
Tailored roof lighting with customised colour patterns offer a unique look and feel for highlighting the sports action.

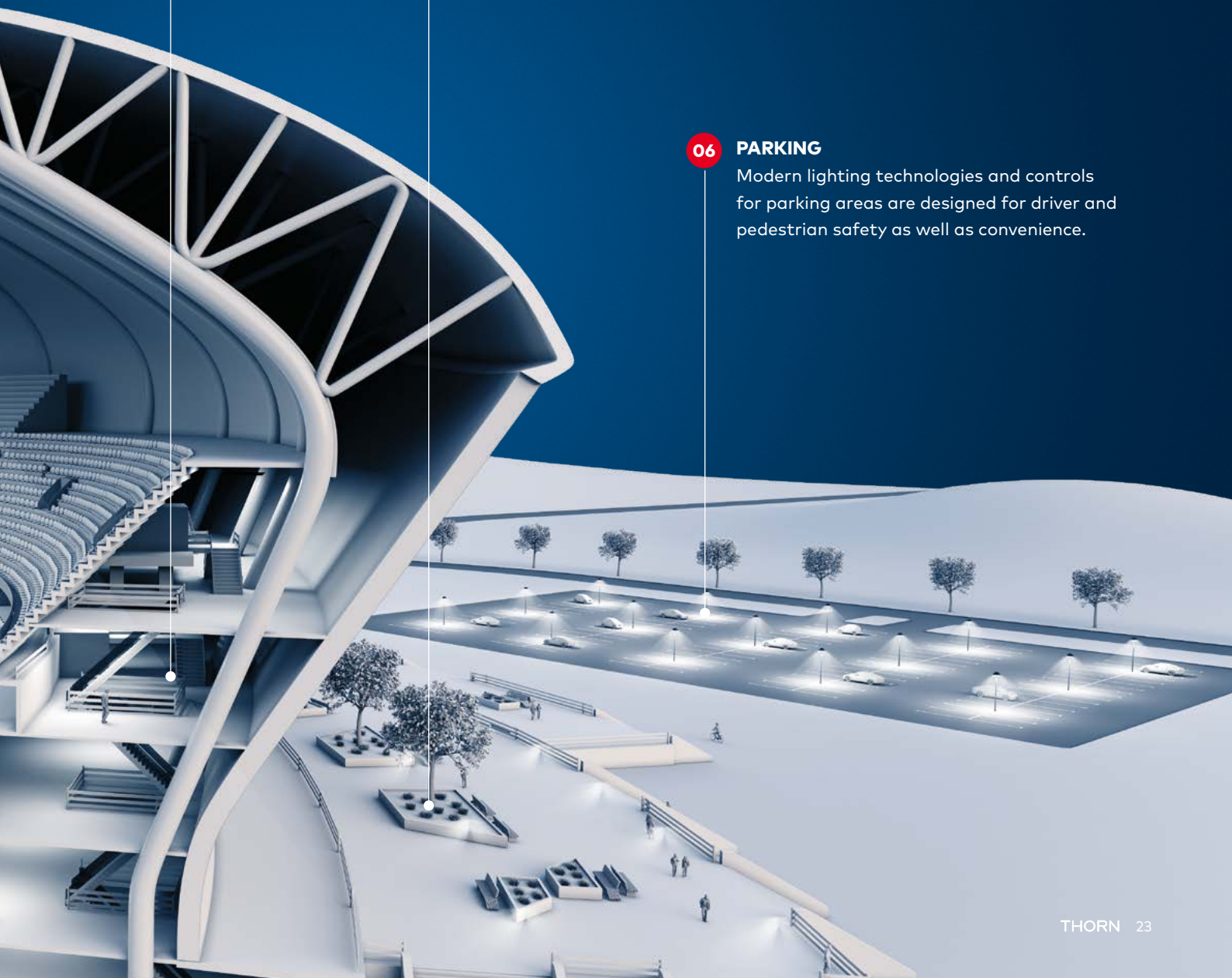
03 SEATING
Balanced stadium lighting maximises visibility for spectators to move about and enjoy the play.



04 **INDOORS**
Whether in changing rooms, hospitality areas, corridors or functional rooms, cutting-edge controls and sensors adjust interior light installations to optimally accommodate peoples' needs.

05 **OUTDOORS**
General and accent lighting solutions for outdoors provide safety first, but can also give sports venues a unique sense of identity.

06 **PARKING**
Modern lighting technologies and controls for parking areas are designed for driver and pedestrian safety as well as convenience.



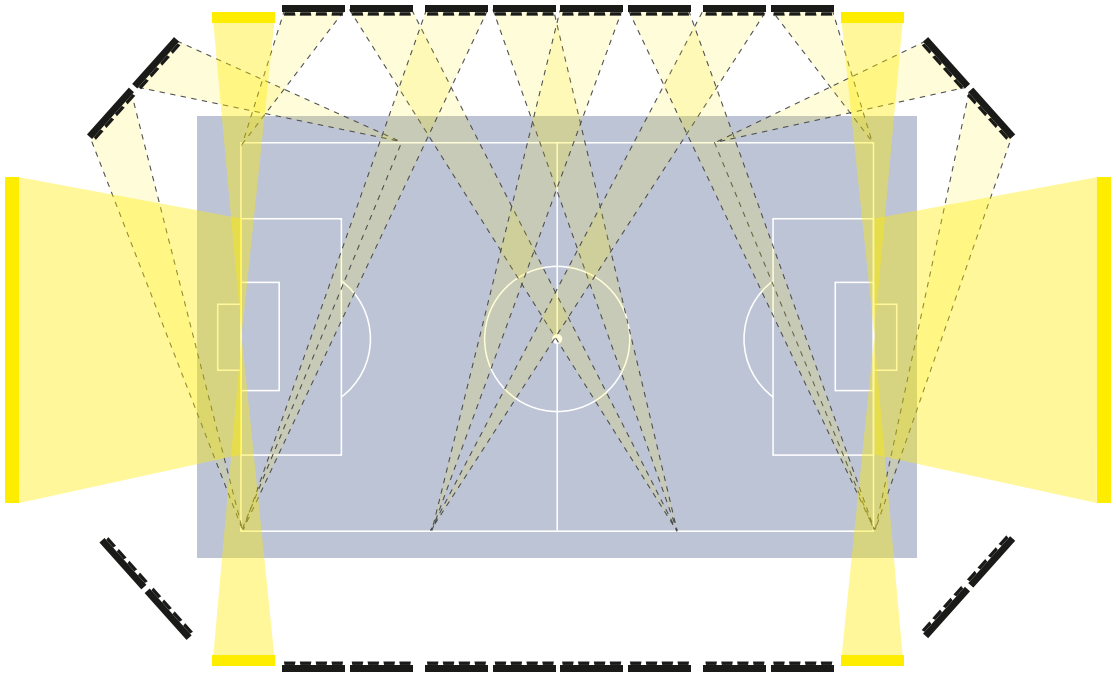
TURNKEY READY

WITH A TRUSTED PARTNER FOR THE ENTIRE LIGHTING PROJECT

01

SPECIFICATIONS AND DESIGN

Thorn experts work hand in hand with clients in finding the best lighting solution. They are well-versed with relevant codes of practice, guidance and standards, also with configuring lux levels, uniformity, glare, floodlight layouts and positioning for the lighting design.



02
INSTALLATION

Our experienced on-site partners can provide safe and reliable installation support regarding windage and floodlight weight, mounting assemblies and gantry access. They also manage control gear rooms and enclosures, regardless of the type of the stadium or pitch (column, roof-mounted, curved roof).

03
COMMISSIONING

Thorn provides support at every step throughout the commissioning process – whether for measurements with calibrated light meters and high level work or for considerations concerning access, floodlight aiming, angular or precision sights, pitch lighting, grid points set ups, horizontal and vertical planes.

04
CALCULATIONS AND MEASUREMENTS

Lots of math goes into designing a stadium lighting installation. To achieve desired results in accordance with norms, precise calculations and measurements are made for vertical, horizontal and camera illuminance, for grid points and glare ratings, flicker and limiting angles.

05
CONTROLS

Modern lighting control technologies are designed to ensure long-term installation performance and easy maintenance. In other words, safeguarding and optimising your return on investment.


FAT PIPE
FAT PIPE
FAT PIPE
0 04:52 0

HCR-TIGERS LANGNAU, AXA ARENA, W+N4 – SWITZERLAND

OUTDOOR ARENAS

ILLUMINATING THE FUN
AND FASCINATION

GIVING EVERYONE A GOOD VIEW

BLM GROUP ARENA, TRENTO, ITALY

Although indoor and outdoor sports arena lighting is similar, they each have their own special requirements. The compactness of indoor venues often creates challenges with respect to luminaire positioning. They can obstruct the spectator's view, especially where ceiling height is limited. Also, indoor playing surfaces often do not diffuse light very well. Care must be taken to prevent reflected glare for players and spectators. Control of heat gain is another important factor to consider within enclosed arenas.

HCR-TIGERS LANGNAU, AXA ARENA, WIN4, SWITZERLAND


PALABARTON, PERUGIA, ITALY
VOLLEYBALL
FIVB
SYLLA
17
MIKASA
SPEDIRE È SE
DHL
VNL
VOLL
NATION

SINGLE SIDELINE MOUNT

LED floodlight solution with asymmetric light distribution positioned along the sidelines of the area of play.

Pitch dimensions: 40 x 20 m		Calculation grid: 15 x 7		Installation height: 10 m	
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	22	750	802	0.70	0.74
Class II	16	500	540	0.70	0.72
Class III	8	200	267	0.50	0.80

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50

PRODUCT USED IN THE SCENE:

Areaflood Pro
4000K Ra 70 – asymmetric 60° (A6)

BEST PRACTICE

INDIVIDUAL REQUIREMENTS

Each indoor sport has its own individual lighting requirements. The European EN 12193 standard and CIE 169 provide guidelines.

DESIGN PLANNING

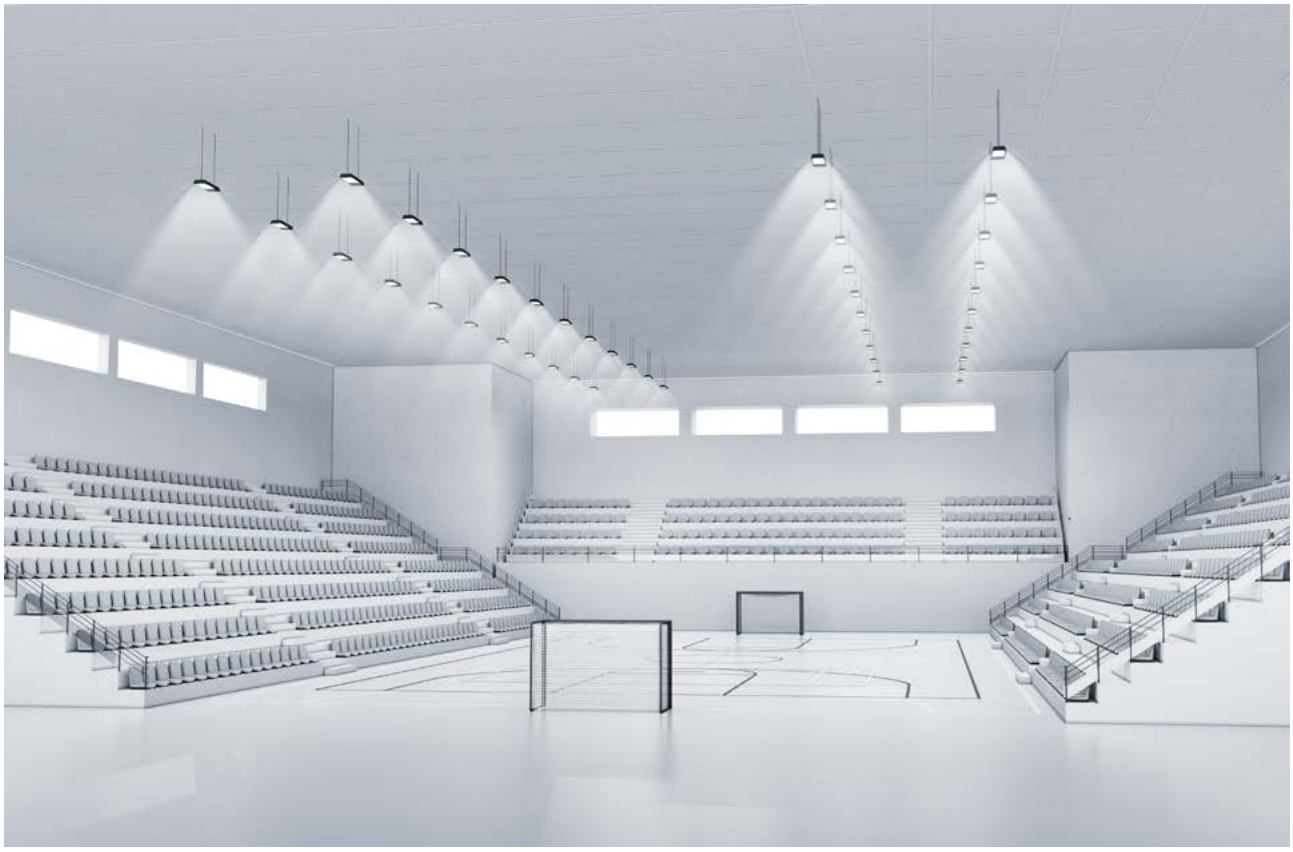
Indoor lighting design requires careful planning to meet requirements whilst minimising glare.

FLOODLIGHT INSTALLATION

Our recommendation: mount floodlights parallel to the sidelines outside of the principal playing area.

DOUBLE SIDELINE MOUNT

Symmetric/asymmetric lighting solution with luminaires mounted in double rows parallel to the sidelines of the area of play.



Pitch dimensions: 40 x 20 m		Calculation grid: 15 x 7		Installation height: 10 m	
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	44	750	820	0.70	0.72
Class II	32	500	575	0.70	0.72
Class III	12	200	222	0.50	0.75

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50

RUGGED EQUIPMENT

Luminaires and fittings must be able to withstand the force of impact of sports objects.

PREVENT FLICKER

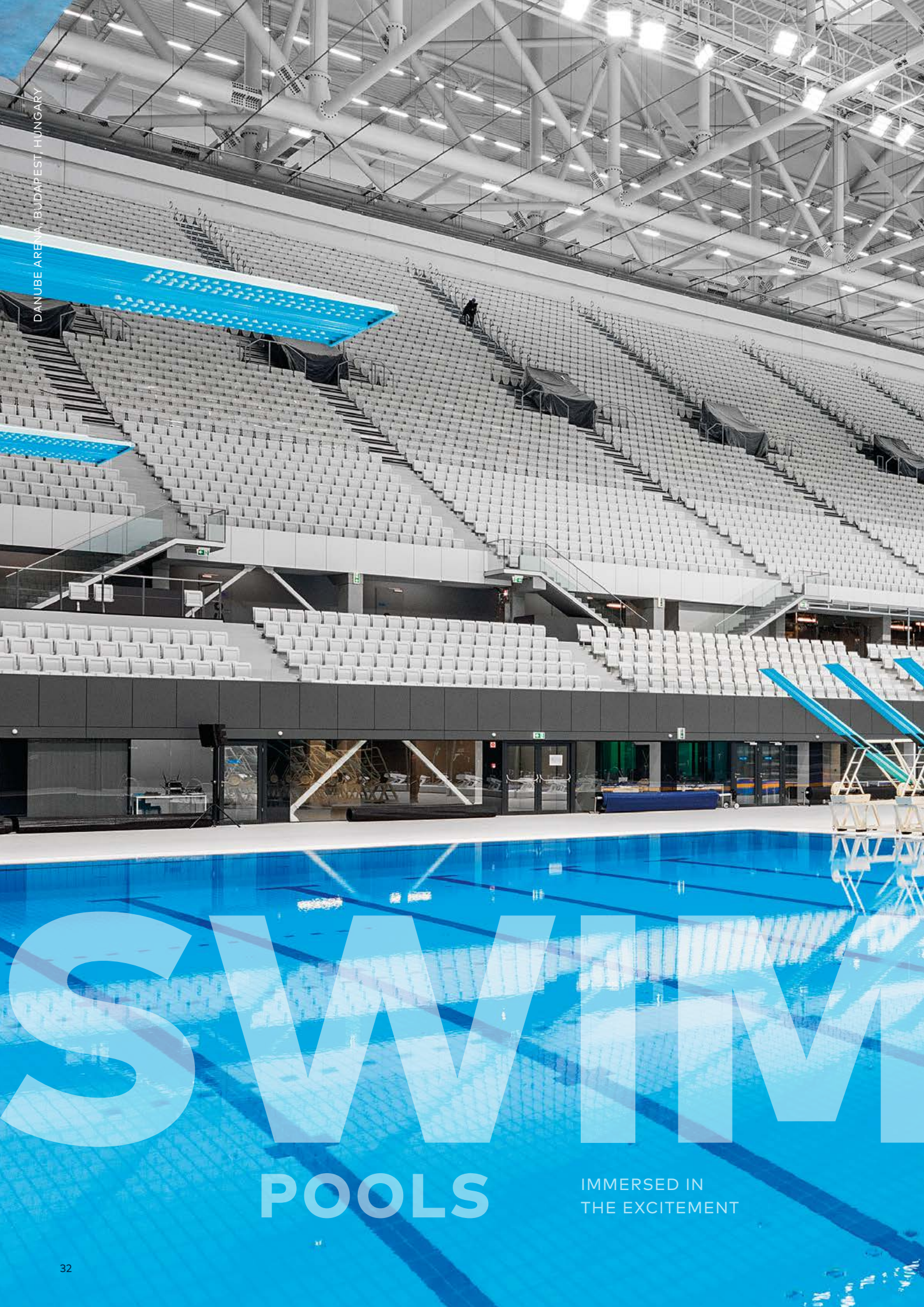
With televised events, care must be taken to prevent flicker from lighting sources.

EMERGENCY LIGHTING

Factors determining emergency lighting needs include spectator seating, and positions of evacuation routes.

PRODUCT USED IN THE SCENE:

HiPak Pro
4000K Ra 80 – asymmetric and wide light distribution



DANUBE ARENA, BUDAPEST, HUNGARY

SWIM

POOLS

IMMERSED IN
THE EXCITEMENT


MING

CREATING A SAFE, PLEASANT ATMOSPHERE

NATIONAL SPORTS VILLAGE, LIMA, PERU

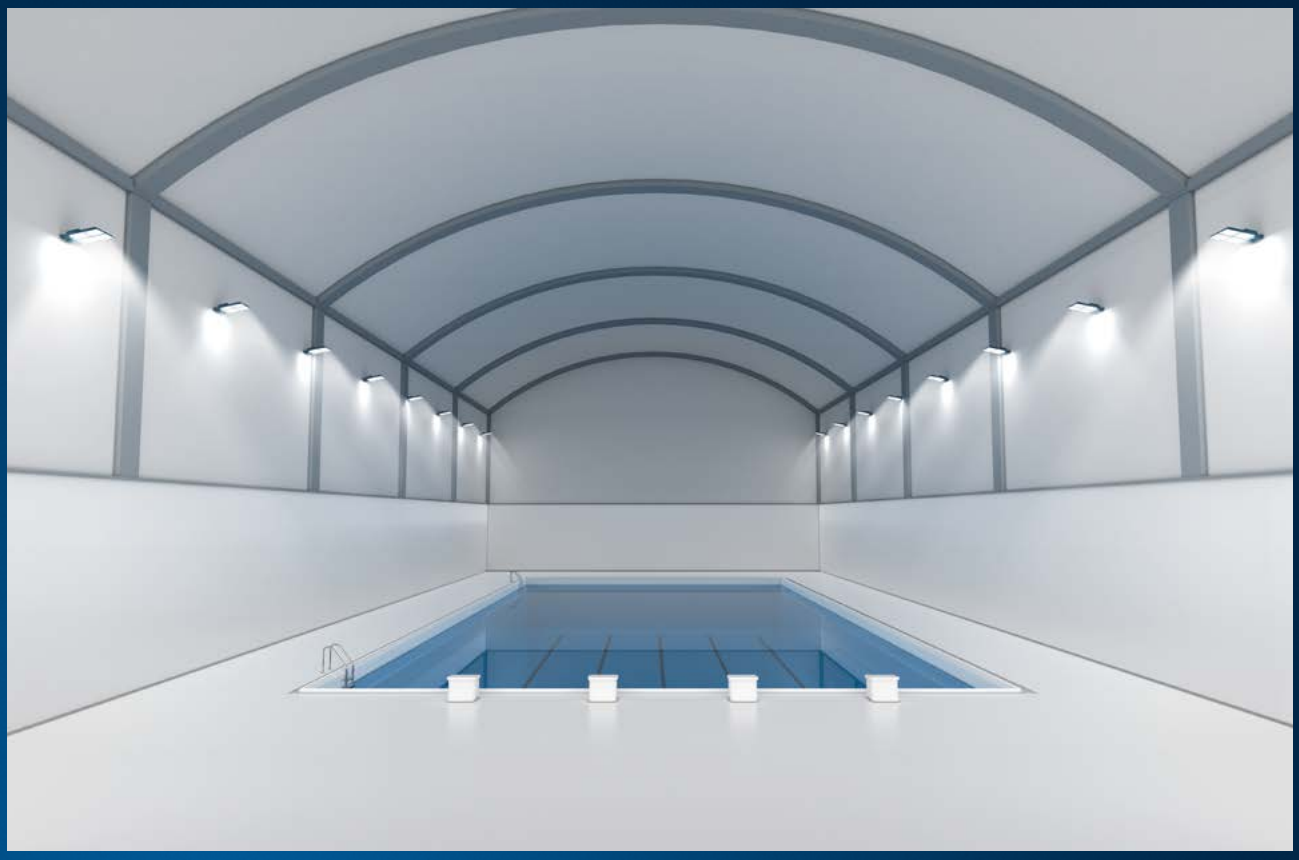
First and foremost, pool lighting must provide safety, enabling attendants to quickly identify swimmers in need of help. Modern pool lighting also creates a pleasant and comfortable atmosphere using different colour temperatures, both in and around the pool. It minimizes glare obscuring the view of lifeguards, spectators and TV cameras. Because indoor pool light is often reflected off the ceiling, lighting installations can usually be mounted in more accessible spaces.

OLYMPIC SWIMMING POOL, KOPER, SLOVENIA

SURREY SPORTS PARK, GUILDFORD SURREY, UK

DOWNWARD LIGHTING SOLUTION

Asymmetric LED floodlights on the pool sides minimise reflections off the water.



Pool dimensions: 50 x 25 m		Calculation grid: 17 x 9		Installation height: 10 m	
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	26	500	547	0.70	0.74
Class II	16	300	339	0.70	0.75
Class III	12	200	256	0.50	0.68

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50

PRODUCT USED IN THE SCENE:

Areaflood Pro
4000K Ra 70 – asymmetric 60° (A6)

BEST PRACTICE

INDIVIDUAL STANDARDS

The standards EN 12193, EN 15288 and CIE 062 provide guidelines for indoor pool lighting.

EDGE LIGHTING

Direct lighting angles in pools are normally below 50°. In many cases, indirect edge lighting using the ceiling as a reflector is safer.

ASYMMETRIC LIGHT DISTRIBUTION

Typically, asymmetrical floodlights are employed and positioned around the pool to reduce unwanted reflections.

UPWARD LIGHTING SOLUTION

Indirect asymmetric lighting creates a soothing atmosphere and prevents undesired reflections and glare.

Pool dimensions: 50 x 25 m		Calculation grid: 17 x 9		Installation height: 10 m	
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	44	500	532	0.70	0.80
Class II	28	300	341	0.70	0.90
Class III	18	200	230	0.50	0.83

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50

HIGH RESISTANCE

Floodlights must have a high degree of protection and resistance against chlorine.

DIVING

Lighting in the diving zone requires a good horizontal to vertical illuminance ratio.

ADDITIONAL LIGHTING

Competitions often require additional lighting over the ends of the pool.

PRODUCT USED IN THE SCENE:

Areaflood Pro
4000K Ra 70 – asymmetric 60° (A6)


TRAI
AND RECREAT
FACILITIES

NING

IONAL

ACCENTUATING
PERSONAL
ACHIEVEMENTS

VFB STUTTGART TRAINING FIELD, STUTTGART, GERMANY

PROVIDING LIGHTING FOR MULTI-PURPOSE VENUES

TENNIS CLUB NAPOLI, NAPLES, ITALY

Focused more on the participant than the spectator, training and recreational facilities are often used for various sports. Light levels are generally measured as horizontal illuminance. Players require a good view of each other or the ball, thus glare must be well controlled. Lighting installations should provide sufficient dimming/switching options to accommodate various sports. Frequently located close to residential areas, obtrusive light is of particular importance.

WALDEGG SPORTS FACILITY, HORGEN, SWITZERLAND

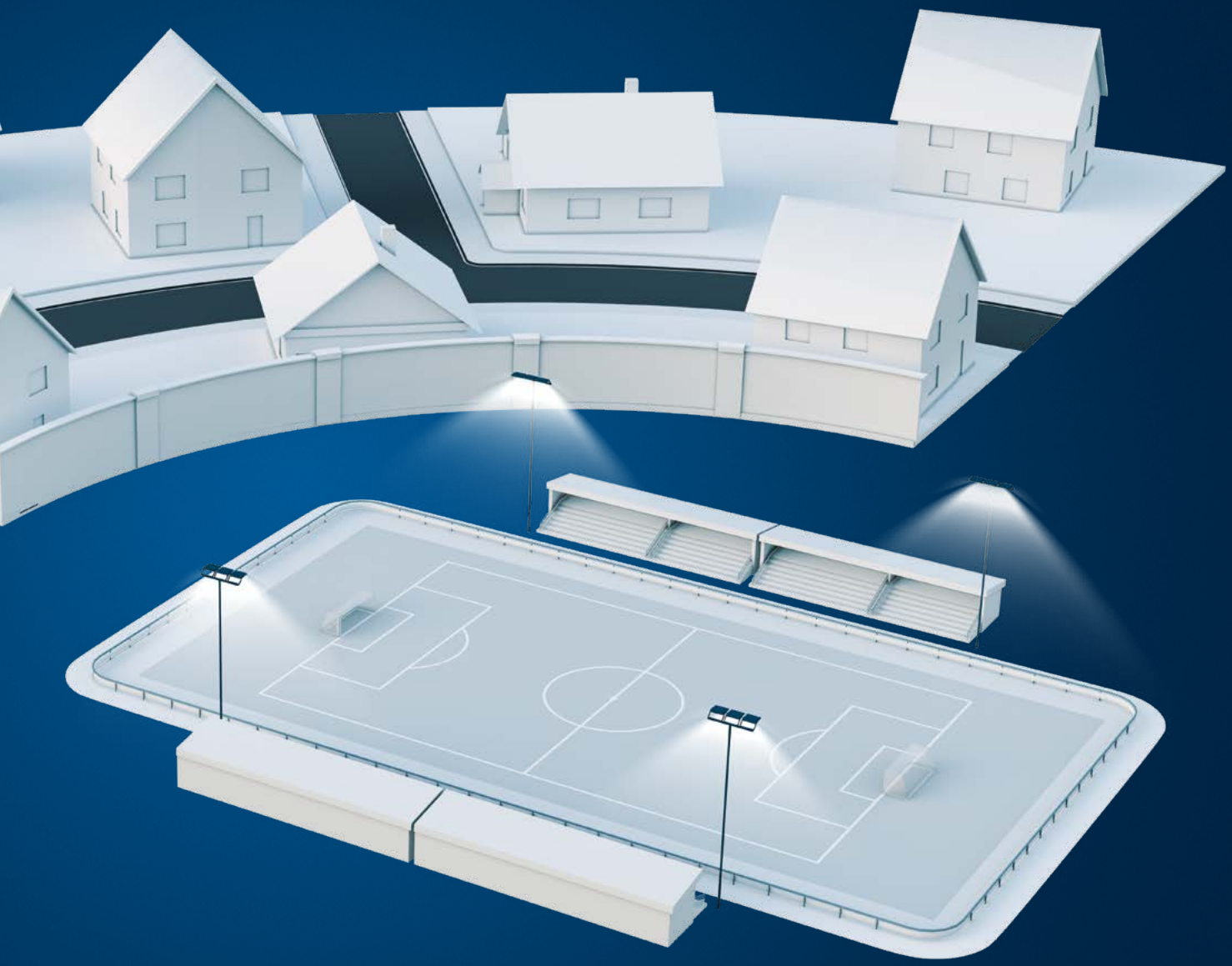
EPSOM GIRLS GRAMMAR SCHOOL, AUCKLAND, NEW ZEALAND

PRODUCTS WITH ASYMMETRIC LIGHT DISTRIBUTION:

Altis

Areaflood Pro

Champion



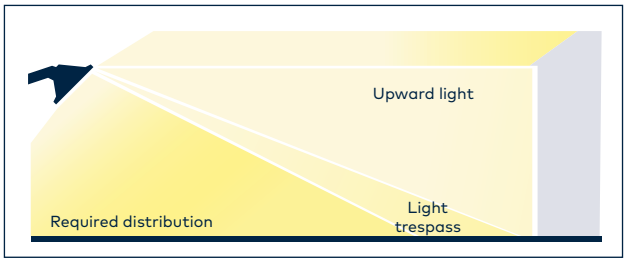
UPWARD LIGHT RATIO (ULR)

The ULR value is used to calculate the maximum permitted percentage of light that may be emitted by a luminaire or lighting installation at or above the horizontal when mounted. It defines sky glow limitations based on four environmental zone categories – E1 to E4.

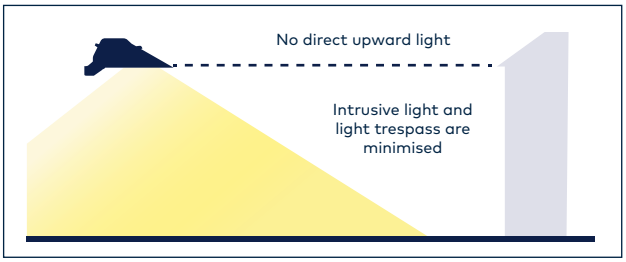
KEEPING LIGHT POLLUTION TO A MINIMUM

Floodlights from Thorn are designed with quality optics that help minimise light pollution. By enabling installation without tilting, they also reduce glare and intrusive light.

Asymmetrical floodlights mounted at 0° tilt focus the light forward with a defined cut-off to prevent intrusive light. If floodlights are tilted, vertical illuminance levels can increase significantly. Thorn solutions require no tilting. However, certain uniformity and value standards require lighting solutions that need tilting. Our lighting designers will help you find the best solution, one that also minimises spill light. The following pages provide an overview of various lighting schemes.



Components of light pollution.



LED products from Thorn provide no direct upward light when not tilted.

BEST PRACTICE

OBTRUSIVE LIGHT
Pitches are particularly suitable for lower column heights and zero uplight lanterns.

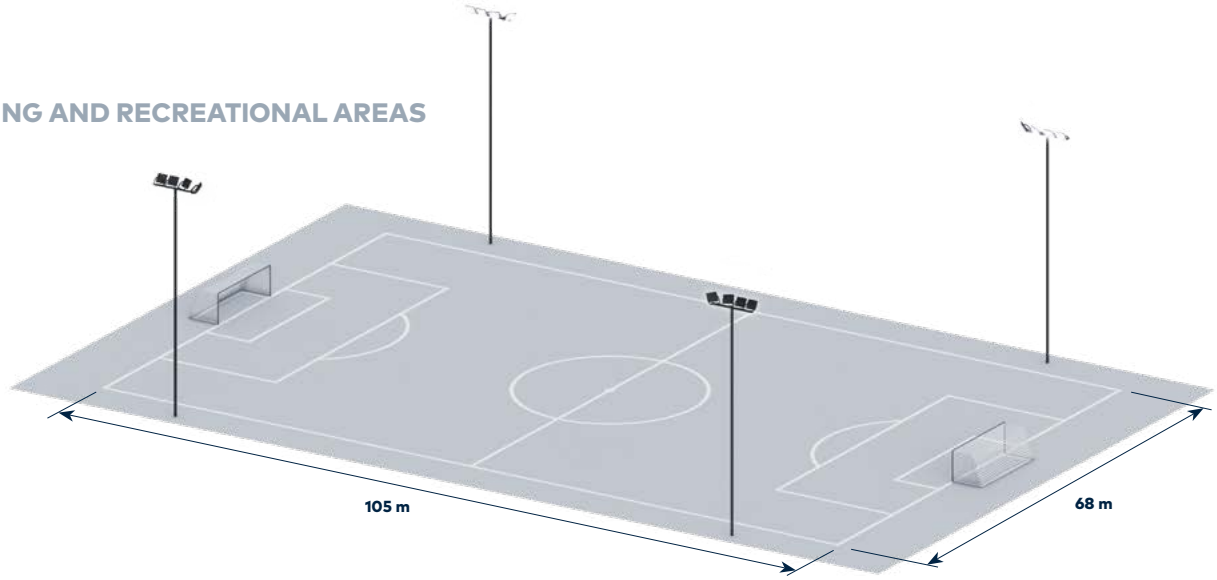
ULR VALUES
Upward light ratio (ULR) values of lighting solutions must conform with EN 12193 environmental zone guidelines

KNOW YOUR NEEDS
Illuminance values on the pitch can vary significantly. It is important to know the right lighting class needed to meet specific standards.

USE CONTROLS
For increased lighting comfort, reduced energy consumption and less maintenance cycles, use controls.

INSTALLATIONS DIFFER
Every sport is different. Every lighting design also.

BEYOND THE PITCH
Pathways, spectator areas, parking and changing rooms are equally important for creating a welcoming atmosphere. At Thorn we offer the complete LED portfolio for this.



FOOTBALL

4 column pitch lighting solution.

Pitch dimensions: 105 x 68 m			Calculation grid: 21 x 13			
Class	Installation height (m)	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	22	36	500	573	0.70	0.83
Class II	20	16	200	215	0.60	0.62
Class III	18	8	75	85	0.50	0.52

Maintenance Factor (MF): 0.90
Glare Rating (GR): ≤ 50
ULR: 1%

Product used in the scene:

Altis
4000K Ra 70 – medium, wide and asymmetric beam

FOOTBALL

6 column pitch lighting solution.

Pitch dimensions: 105 x 68 m			Calculation grid: 21 x 13			
Class	Installation height (m)	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class II	20	20	200	212	0.60	0.62
Class III	18	8	75	101	0.50	0.52

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50
ULR: 0%

Product used in the scene:

Champion
4000K Ra 70

TENNIS

6 column double outdoor court solution.

Pitch dimensions: 36 x 36 m			Calculation grid: 12 x 12			
Class	Installation height (m)	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	12	12	500	550	0.70	0.72
Class II	12	8	300	386	0.70	0.72
Class III	12	6	200	244	0.60	0.69

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50
ULR: 0%

Product used in the scene:

Champion
4000K Ra 70

TENNIS

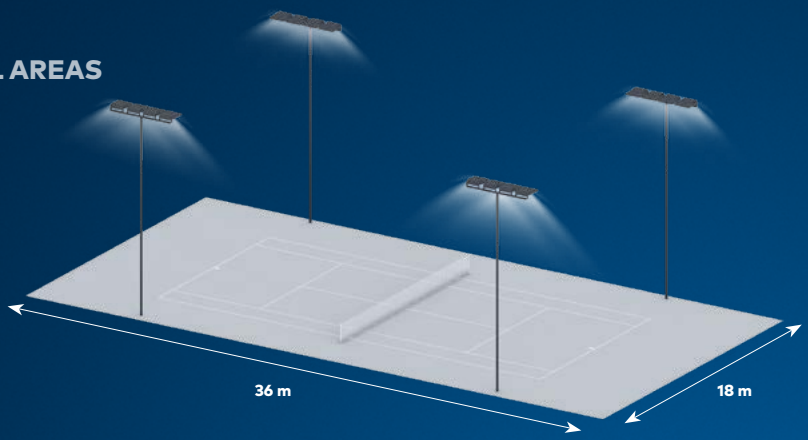
4 column double outdoor court solution.

Pitch dimensions: 36 x 36 m			Calculation grid: 12 x 12			
Class	Installation height (m)	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	12	12	500	514	0.70	0.88
Class II	12	8	300	398	0.70	0.88
Class III	12	6	200	240	0.60	0.72

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50
ULR: 0%

Product used in the scene:

Champion
4000K Ra 70



TENNIS

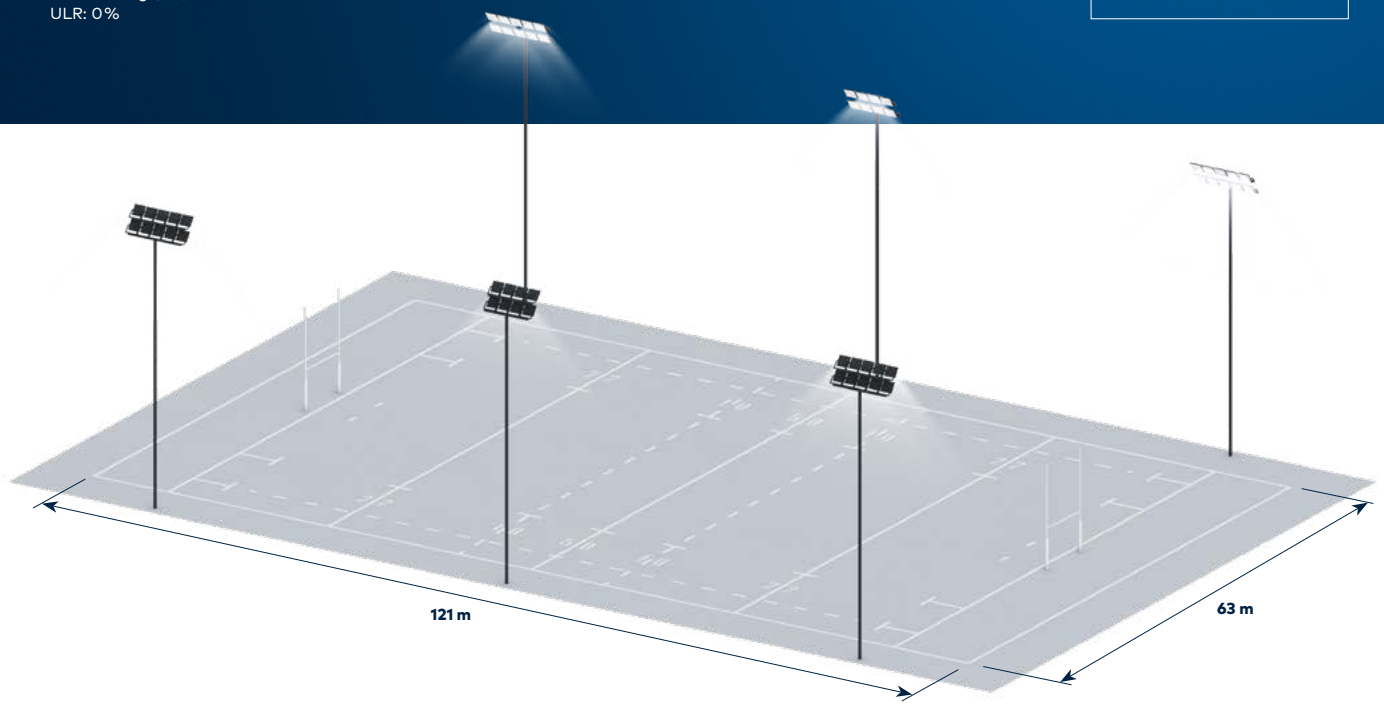
4 column single outdoor court solution.

Field dimensions: 18 x 36 m		Calculation grid: 12 x 6			Installation height: 10 m
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	16	500	531	0.70	0.72
Class II	12	300	315	0.70	0.73
Class III	8	200	242	0.60	0.70

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50
ULR: 0%

Product used in the scene:

Areaflood Pro
4000K Ra 70
asymmetric 60° (A6)



RUGBY

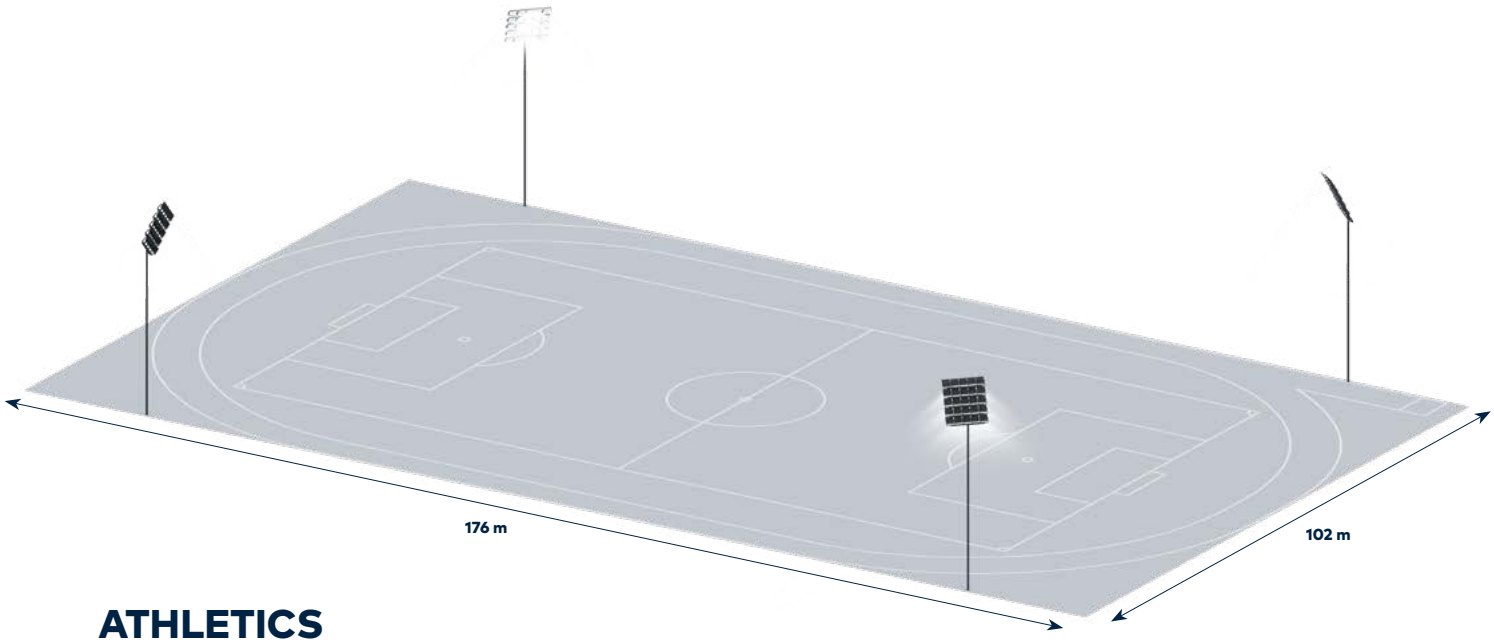
6 column pitch lighting solution.

Field dimensions: 121 x 63 m		Calculation grid: 21 x 11			Installation height: 25 m
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	56	500	546	0.70	0.73
Class II	24	200	226	0.60	0.69
Class III	12	75	111	0.50	0.56

Maintenance Factor (MF): 0.90
Glare Rating (GR): ≤ 50
ULR: 5%

Product used in the scene:

Altis
4000K Ra 70
medium beam



ATHLETICS

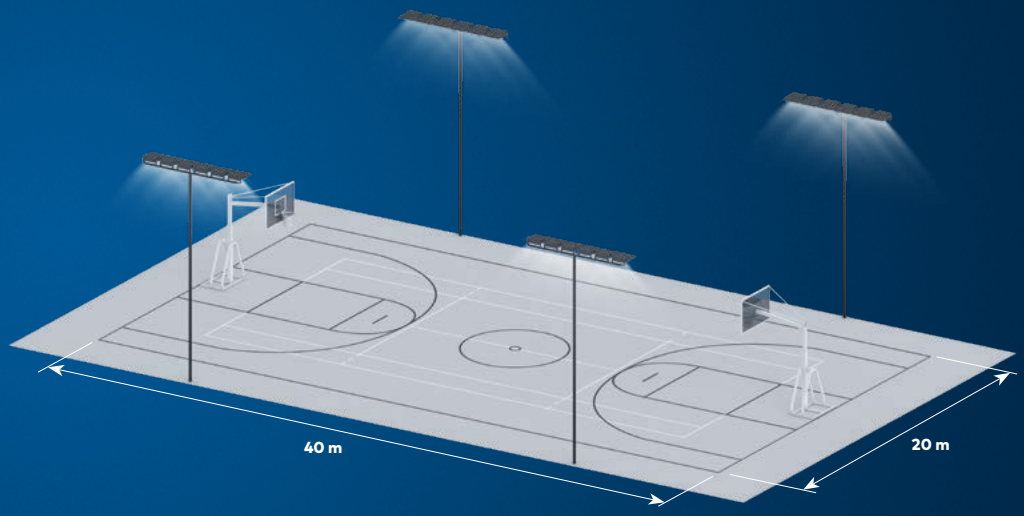
4 column field lighting solution.

Field dimensions: 176 x 102 m		Calculation grid: 23 x 13			Installation height: 35 m
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	68	500	506	0.70	0.80
Class II	32	200	205	0.60	0.80
Class III	16	75	109	0.50	0.72

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50
ULR: max. 6%

Product used in the scene:

Altis
4000K Ra 70 – medium and large beam



MULTI-USE GAMES AREAS

4 column lighting solution.

Field dimensions: 40 x 20 m		Calculation grid: 15 x 7			Installation height: 10 m
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	20	500	545	0.70	0.72
Class II	8	200	204	0.60	0.62
Class III	4	75	106	0.50	0.66

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50
ULR: 0%

Product used in the scene:

Areaflood Pro
4000K Ra 70
asymmetric 40° (A4) / 60° (A6)

REFURBISHMENTS

EXISTING INSTALLATION

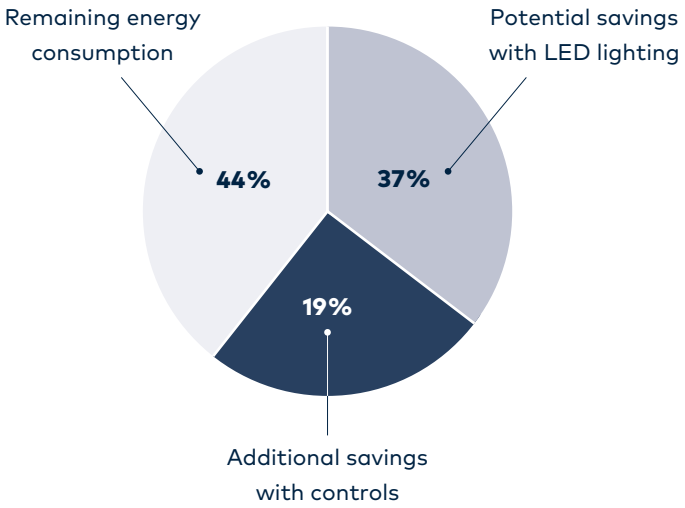
20 x 2 kW HID Floodlights (40 kW)
214 lux
Uo (Emin/Em): 0.76
GR max.: 48
ULR: 0 %
Controls: switching

LED REFURBISHMENT SOLUTION

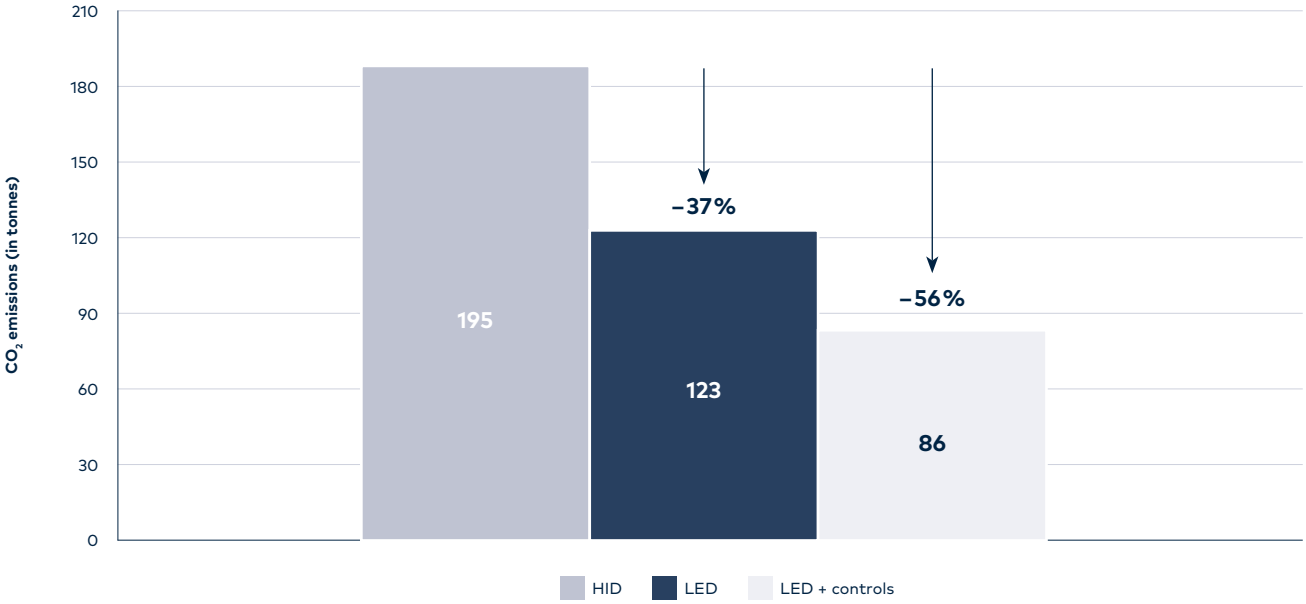
28 x Champion 938 W (26.2 kW)
218 lux
Uo (Emin/Em): 0.72
GR max.: 46
ULR: 0 %
Controls: switching/dimming

ALL-AROUND SAVINGS

Refurbishments using the Champion floodlight enable substantial savings in a number of ways, from energy consumption to CO_2 emissions. Its LED technology offers savings of more than 37% as compared to conventional lighting solutions – even more through the use of appropriate controls.

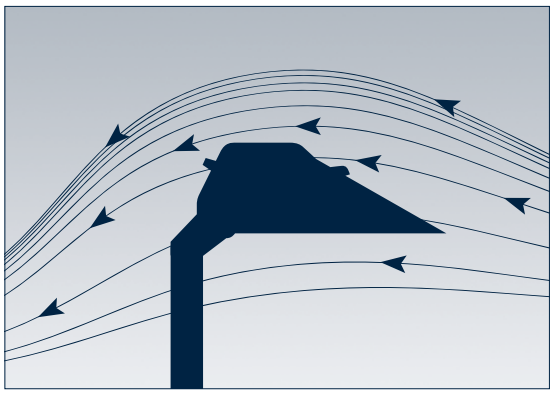


TOTAL CO_2 EMISSIONS OVER A LIFETIME (15 YEARS)



LIGHTING WITH CHAMPION

During a refurbishment project, it is important to consider the weight and windage of selected products and their suitability for existing or proposed mounting structures. Note that a floodlight mounted horizontal to the ground, as with an asymmetric distribution, helps to decrease windage and provides better control of spill light.




WIN

ITER

SPORTS

HIGHLIGHTING
PRISTINE
MOMENTS

SWISSCOM NORDIC ARENA, KANDERSTEG, SWITZERLAND

REDUCING REFLECTIONS, FLICKER & GLARE

SKI JUMP, KANDERSTEG, SWITZERLAND

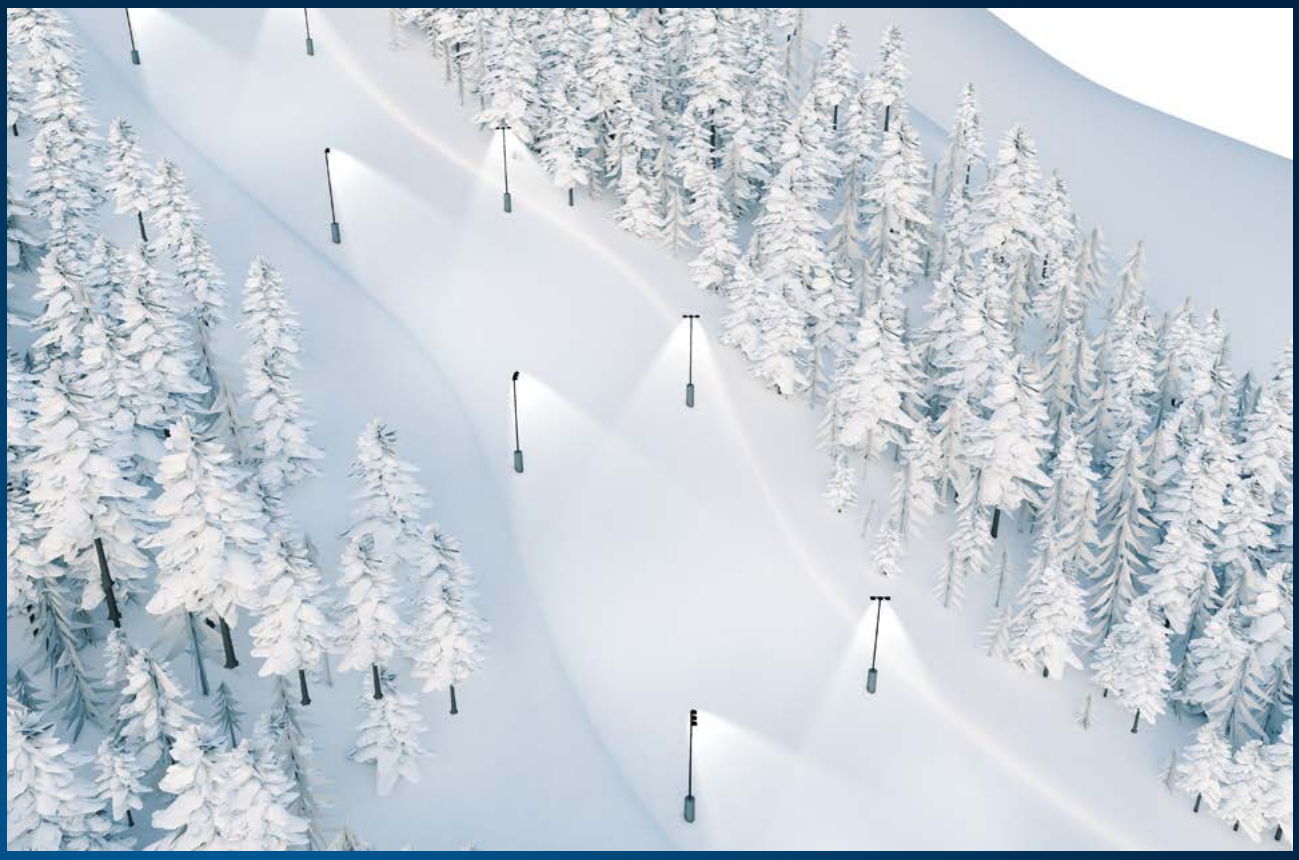
Lighting installations for winter sports facilities aim to ensure that activities can be undertaken safely and skillfully, and that spectators can see the action clearly and comfortably. Given the highly reflective surface, the light direction must be sufficient to create shadows on the downward side of each rise in the snow. If TV cameras are involved, lighting needs to come from more than one source to provide sufficient modelling. Flicker and glare characteristics also need careful consideration.

TITLIS HILL – ENGELBERG, SWITZERLAND

TITLIS HILL – ENGELBERG, SWITZERLAND

SKIING

Double-sided column lighting solution aimed downwards.



Run dimensions: 50 m		Spacing between grid points: 3.5 m		Column positioning: 5 m off of the run, 60 m apart and 15 m height	
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	5 luminaires/column	150	186	0.50	0.52
Class II	3 luminaires/column	100	109	0.40	0.53
Class III	2 luminaires/column	50	66	0.30	0.47

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50
ULR: 0%

PRODUCT USED IN THE SCENE:

Champion
4000K Ra 70

BEST PRACTICE

BACK LIGHTING

Light aimed upwards toward skiers creates glare, making it difficult to see the run. Luminaires should be aimed downwards and in the direction of travel.

ANGLE OF INCIDENCE

Directional lighting angles for ice-based sports should be kept to below 70°.

HIGH UNIFORMITY

Run lighting requires a high level of uniformity from beginning to end.

ICE HOCKEY

Side mounted LED floodlight solution with asymmetric light distribution.

Field dimensions: 61 x 30 m		Calculation grid: 17 x 9		Installation height: 12 m	
Class	Quantity	Em (lux) required	Em (lux) achieved	Uo (Emin/Em) required	Uo (Emin/Em) achieved
Class I	22	750	816	0.70	0.75
Class II	16	500	566	0.70	0.78
Class III	10	300	360	0.70	0.75

Maintenance Factor (MF): 0.90
Glare Rating (GR): < 50

LIGHTING REQUIREMENTS

Requirements are defined by EN 12193 and by sports bodies such as the Fédération Internationale de Ski (FIS) and the International Ice Hockey Federation (IIHF).

LIGHTING COLUMNS

On ski runs to avoid collisions, columns should be positioned outside the run.

OBTRUSIVE LIGHT

Balanced outdoor lighting using luminaires with good optical control helps reduce skyglow.

PRODUCT USED IN THE SCENE:

Altis

4000K Ra 70 – asymmetric 60° (A6)

SPORTS

GIVING BRIGHTNESS TO MANY PHYSICAL ACTIVITIES

DERBY ARENA AND VELODROME, DERBY, UK

INDOOR

PATINOIRE GUY-BOISSIÈRE, ROUEN, FRANCE

OUTDOOR

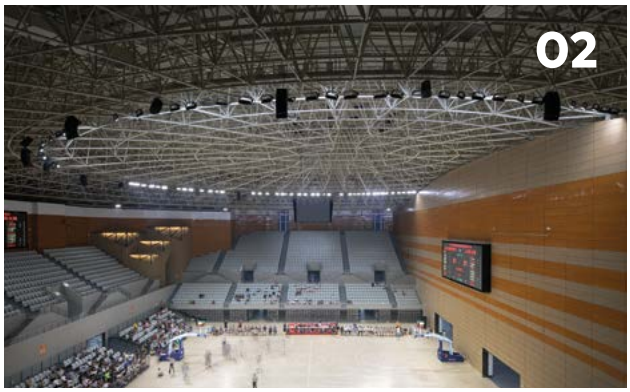
FSV MAINZ 05, OPEL ARENA, MAINZ, GERMANY

LIGHTING FOR EVERY REQUIREMENT

SURREY SPORTS PARK, GUILDFORD SURREY, UK

There are many different types of sports activities around the world, some played indoors, others outdoors, on a variety of different surfaces. Not surprisingly, many sports have very special lighting requirements. Thorn offers a wide array of lighting systems featuring innovative optics, great functionality and optimised adaptive control technologies. Coupled with our extensive experience and expertise, we are able to provide clients with excellent professional and recreational sports lighting solutions.

NATIONAL SPORTS VILLAGE, LIMA, PERU



01 HARROGATE HIGH SCHOOL GYMNASIUM, UK
02 BINJIANG DISTRICT GYMNASIUM, HANGZHOU, CHINA
03 RUGBY STADIUM, CRUAS, FRANCE
04 LORETTO GOLF ACADEMY, MUSSELBURGH, UK
05 ARCHBISHOP LANFRANCE ACADEMY, CROYDON, UK
06 NATIONAL SPORTS VILLAGE, LIMA, PERU


06


06

LIGHTING REQUIREMENTS

When installing a sports lighting system, it is crucial that specific standards are met. Lighting requirements may differ according to the level of competition. EN 12193, the European regulation for sports lighting, defines three different lighting classes.

CLASS I

Top-Level Competition
Generally involves large numbers of spectators and possibly long viewing distances.

CLASS II

Mid-Level Competition
Usually involves a medium number of spectators and medium viewing distances. Professional level training may also be class II.

CLASS III

Low-Level Competition
Local or small matches with few or no spectators. General training and recreation activities also apply to this class.

LEVEL OF COMPETITION

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

Key terms and abbreviations
Em (lux): Average Illuminance
Uo (Emin/Em): Uniformity
Ra: Colour Rendering Index
GR: Glare Rating
ULR: Upward Light Ratio

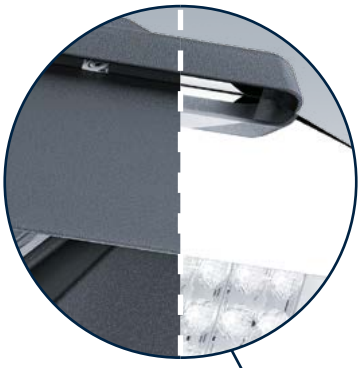
Note that whilst EN 12193 sets out the European norms for sports lighting applications, individual sports federations and national governments will have complementary or additional requirements that will also need to be complied with.

OLYMPIC SWIMMING POOL, KOPER, SLOVENIA

CHAMPION

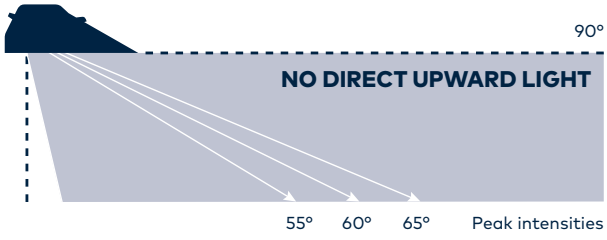
FLOODLIGHT CONTROL AND FLEXIBILITY

True to its name, the new Champion floodlight provides excellent spill light control and project flexibility. Featuring three different light distributions, it is an ideal choice for wide-ranging refurbishments of conventional installations – in sports and other areas.



Champion can be equipped with reflective or painted integrated visors, for total control of glare and obtrusive light.

Different light distributions available for high flexibility in lighting design.



ALTIS

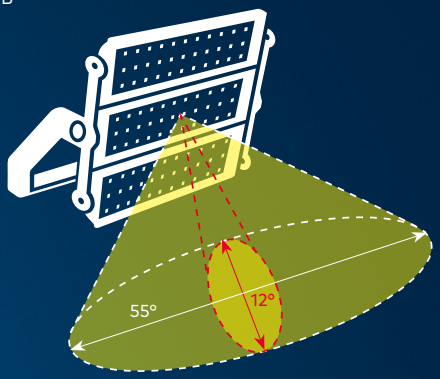
HIGH-POWERED LED FLOODLIGHTING

OUTSTANDING PERFORMANCE

A powerful, flicker-free and flexible LED floodlight – that's Altis. Whether with electronic, DMX/DALI or gear tray control, it immediately delivers 100% light. Separately adjustable LED modules and seamless dimming at various levels allow for optimised lighting design. Its safety features include protection class I, IP66 and IK08 as well as a die-cast aluminium housing, frame and mounting bracket.

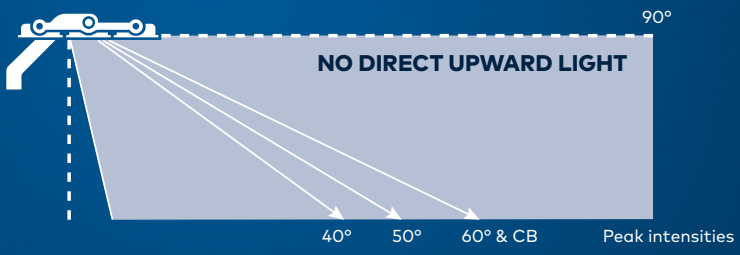
ELLIPTICAL LIGHTING DISTRIBUTION

EB



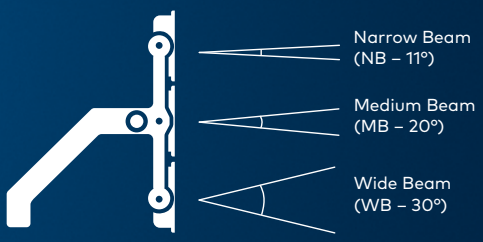
ASYMMETRICAL LIGHTING DISTRIBUTIONS

A4/A5/A6/CB



SYMMETRICAL LIGHTING DISTRIBUTIONS

NB/MB/WB



MODULAR AND HIGHLY FLEXIBLE

3 LED MODULES (396L)

2 LED MODULES (264L)

1 LED MODULE (132L)

CONTROL GEAR TRAY

Installation from local to the floodlight to up to 200m remotely.

AREAFLOOD PRO

GENERAL PURPOSE FLOODLIGHTING WITH GREAT OPTICAL PERFORMANCE

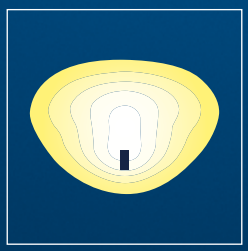
Areaflood Pro is an ideal fit for a number of specific sports and area applications. Its features include a lumen package optimised for three sizes, superb optics and lighting controls, tremendous installation and maintenance flexibility, IP66 and IK08 protection and colour temperatures in 3000K and 4000K.

Areaflood Pro Small

Areaflood Pro Medium

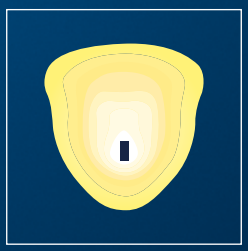
Areaflood Pro Large

WELL-SUITED FOR WIDE RANGING APPLICATIONS, Areaflood Pro OFFERS A CHOICE OF FIVE OPTICS FOR EFFICIENT AND EFFECTIVE LIGHTING.

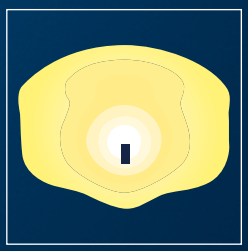


A4 – 40 °
Asymmetric Optic

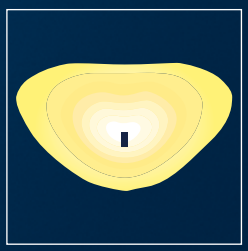
A5 – 50°
Asymmetric Optic



A6 – 60°
Asymmetric Optic



EWR: Extra Wide
Road Optic



WR: Wide Road Optic

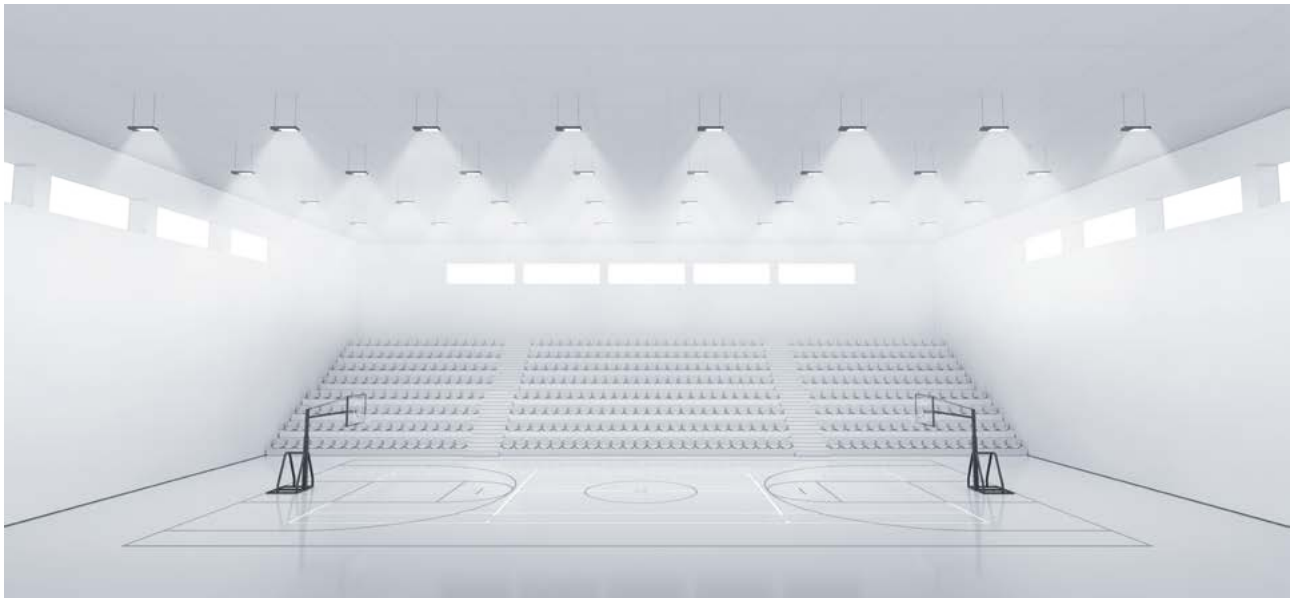
HIPAK PRO

EXTREMELY EFFICIENT, ROBUST AND MAINTENANCE FRIENDLY

This LED high bay ball-proof certified luminaire features a DALI sensor with daylight control for optimised energy savings in sports halls. HiPak Pro is available with wide and asymmetric light distribution. IP43, IK08, 4000K and emergency options are standard. Chain and catenary suspension, also additional brackets for sports halls are available.

PERFECT BALANCE

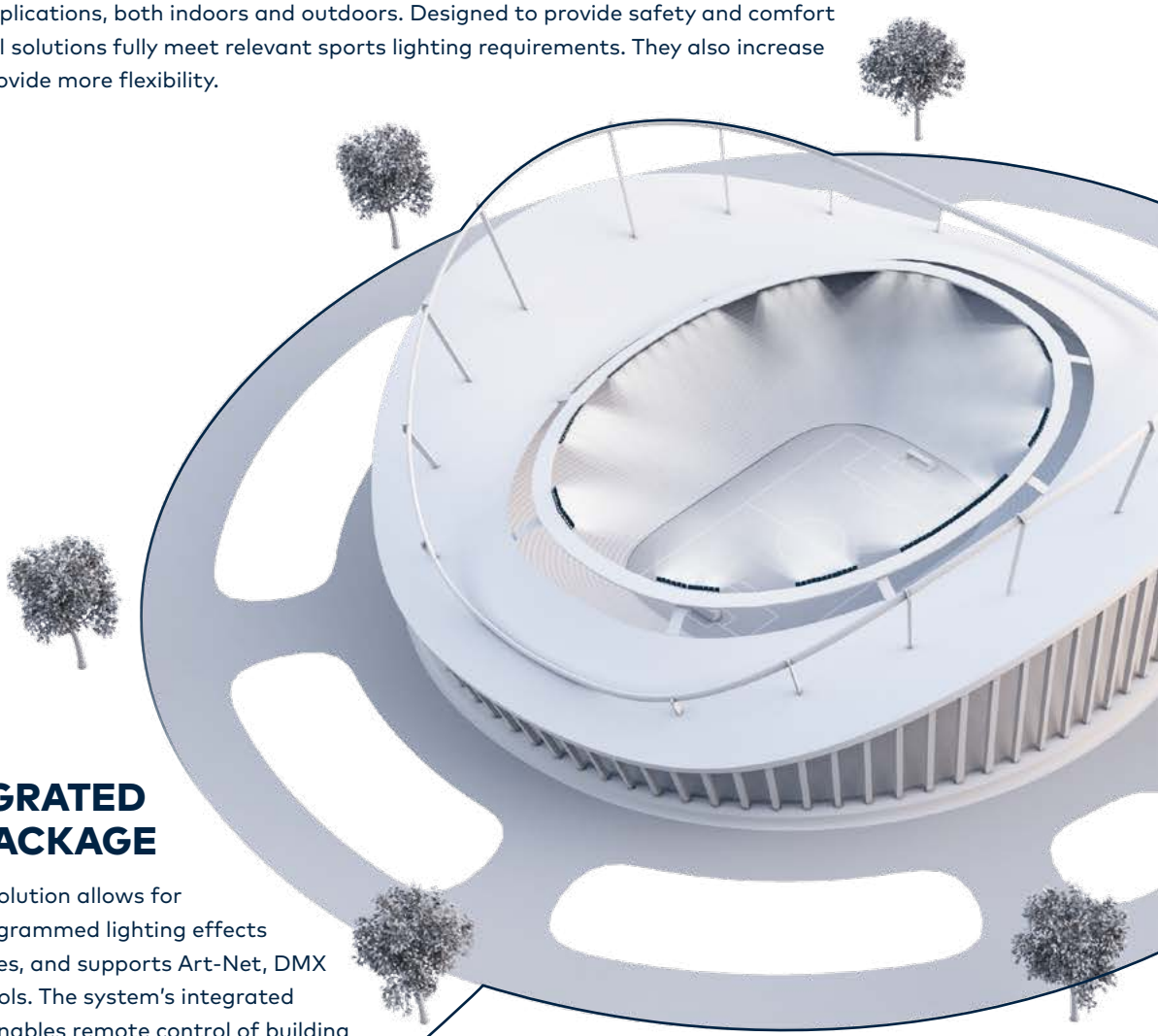
Luminaires at the perimeter of the pitch usually have asymmetrical lighting distribution, those above the pitch symmetrical distribution. This is a typical lighting scheme for sports halls in schools.



CONTROL SOLUTIONS

ADJUSTING LIGHT TO SUIT YOUR NEEDS

Thorn Lighting offers complete lighting management packages for all types of professional and recreational sports applications, both indoors and outdoors. Designed to provide safety and comfort for players, our control solutions fully meet relevant sports lighting requirements. They also increase energy savings and provide more flexibility.



FULLY INTEGRATED CONTROL PACKAGE

This scalable control solution allows for customisable, pre-programmed lighting effects with real-time overrides, and supports Art-Net, DMX RDM and DALI protocols. The system's integrated lighting console also enables remote control of building management, audio and perimeter advertising systems.

Lighting playback controller with touch panel (internal or external)

SERVICES:

- Commissioning and addressing
- Controls programming
- Web page creation with custom user interface design
- Integration of stand lighting control subsystems (DALI, DMX and hybrid)
- On-site technical consultation meetings
- Training of operating personnel
- Technical support
- Control solution for the entire stadium, from the pitch lighting to the facade and interiors

BASIC CONTROL PACKAGE

Using a locally installed control cabinet, this switching and dimming package enables control of a group of lighting points, when needed. The solution offers good energy savings while still providing all of the required lighting on demand. Light settings can also be preprogrammed.

THORN

LIGHTING

GET IN TOUCH

www.thornlighting.com/offices

WE MAKE LIGHT WORK

05/2020