

REGIOLUX



Sports and leisure facilities

Top light for sports and leisure activities

Sports and leisure facilities

Athletes and operators shine in the right light.

Good visibility demands balanced, harmonised lighting and this is especially true for sports centres. In such applications light must satisfy standards relating to illuminance, uniformity, glare limitation and the colour properties of the light sources as specified in the European DIN EN 12193 standard „Sports Lighting“, a directive that specifies lighting requirements for the most popular types of

sports. Such requirements are to be understood as minimum values, a fact that makes lighting tasks even more demanding.

Multi-purpose halls, as well as having to satisfy the conditions specified by DIN EN 12193, must also meet further demands and in addition must be equipped with temporary lighting such as



Lighting class I

- Top performance competitions such as on national and international levels, generally with large numbers of spectators and large visual distances between spectators and athletes.
- High level training

Lighting class II

- Competitions on mid-level such as regional or local competitions, generally with a mid-range quantity of spectators and mid-range visual distances between spectators and athletes
- Performance training

spots for a stage for example.

In order to meet the various requirements of individual uses, DIN EN 12193 assigns photometric criteria to three different lighting classes, and in addition, the lighting demands created by specific visual requirements for the various types of sport are also defined.



Lighting class III

- Basic competitions such as on a local or club-level, generally without spectators
- General training
- School sports
- Leisure sports

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Lighting variety sports- and multi-purpose halls

► P. 18/19



Sports halls
Multi-purpose halls

DIN-EN: 300-750 Lux

Glare-free lighting installations with ball impact resistance for good visibility and avoidance of accident and injury.
Tunable white luminaire.

► P. 20



Tennis hall

DIN-EN: 300-750 Lux

Ball impact-resistant, glare-free, low-shadow lighting system for good visibility and no accidents.

► P. 21



Squash hall

DIN-EN: 300-750 Lux

Ball impact-resistant, glare-free, low-shadow lighting system for good visibility and no accidents.

► P. 23



Riding hall

DIN-EN: 200-500 Lux

Glare-free lighting system with higher degree of protection, insensitive to dust and humidity.

► P. 24



Indoor soccer

DIN-EN: 200-750 Lux

Ball impact-resistant, glare-free lighting system for good visibility and no accidents.

► P. 22



Badminton hall

DIN-EN: 300-750 Lux

Glare-free, low-shadow lighting system for good visibility and no accidents.



▶ P. 25



Bowling alley

DIN-EN: 200/500 Lux

200 Lux suffice in the approach area. 500 Lux are required for the pin set-up area.

▶ P. 26



Shooting range

DIN-EN: 200/1000-2000 Lux

200 Lux suffice for the lanes. 1,000 Lux are required at a distance of 25 metres to the target, 2,000 Lux at a distance of 50 metres.

▶ P. 27



Indoor winter sports

DIN-EN: 200-750 Lux

Depending on the required use, glare-free and/or ball impact-resistant lighting system for good visibility and no accidents.

▶ P. 27



Boulder hall

DIN-EN: 200-500 Lux

Glare-free, low-shadow lighting system for good visibility and no accidents.

▶ P. 28



Go-kart halls

DIN-EN: 200-750 Lux

Glare-free, low-shadow lighting system for good visibility and no accidents.

▶ P. 28



Indoor playground

DIN-EN: 200 Lux

Glare-free, low-shadow lighting system for good visibility and no accidents.

▶ P. 29

Gym,
exercising, yoga

DIN-EN: 300 Lux

Glare-free lighting system for good visibility and no accidents. Lighting should be able to be controlled.

Changing rooms
Ancillary rooms

DIN-EN: 200 Lux

Robust luminaire systems with a high protection rating, impervious to dust and dirt.

Corridors
Staircases

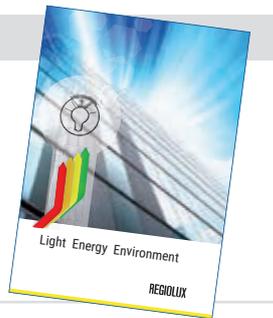
DIN-EN: 100 Lux

Cost efficiency and safety with good general lighting. Accentuation of accident-prone areas.



More information

in the brochure
„Light - energy -
the environment“



Energy efficiency

In these times of rising energy prices, energy efficiency is primarily important to reduce costs, though also to save resources and protect the climate. Several components determine how economical a lighting system is. Over the past few years, LED have established themselves on the market as the most economic form of lighting with what is currently the highest light output. We work

with quality drivers to make luminaires durable and of a high quality. The luminaires are characterised by highly efficient and carefully calculated lighting technology. Last but not least, the maintenance costs also play a role in a complex analysis. LED are better here too, the extra costs for changing the lamps are avoided due to their long service life.

Quality features LED luminaires

Features for the qualitative assessment of LED luminaires

Luminaire output::	P_{sys} [W]
Luminaire luminous flux:	Φ [lm]
Luminaire luminous efficiency:	η [lm/W]
Colour rendering:	CRI or Ra (min. or \geq)
Most similar colour temperature:	CCT or T_{CP} [K]
Spectrum locus tolerance (initial value):	number of SDCM or MacAdam ellipses
Mean rated service life L_x By:	50000 [h] L_{80} B_{10} (the following applies if no B-value is quoted: B_{50})
Ambient temperature for rated service life:	T_q [°C] (the following applies if no B-value is quoted: $T_q=25^\circ\text{C}$)
Luminous intensity distribution	LDT or IES-Data
Risk group RG:	RG (the following applies if no B-value is quoted: RG0 or RG1)

Renovation and funding

Sports and leisure facilities are often in need of renovation. They are generally owned by non-profit clubs or local authorities.

Public funding and intelligent renovation concepts are thus important because there are limits to the amount of funding available.

LED technology - sustainability comes up trumps

These days, changing to LED technology lets you achieve the same lighting level with less than 50 % of the energy consumption required, thus reducing operating costs in the long-term.

The long service lives of the LED also have a positive effect on the CO₂ balance.

Funding - help for investors

Regiolux develops renovation concepts in line with funding guidelines and individual requirements for the respective rooms. Such a concept was developed by the Energy Optimisation team for the Hofheim sports club, and following approval of the 30% grant by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), the renovation work was implemented quickly.

Smart control - everything matches

Smart control technology now lets you not only save energy but also provide the right light for different uses. Contact our Energy Optimisation project team for more detailed information.

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energieoptimierung@regiolux.de

Actual project

Turnverein Hofheim 1861 e. V. Hofheim in Lower Franconia

Project data

Construction authority	TV 1861 Hofheim, DE
Lighting	Regiolux GmbH, Königsberg DE
Electrician	Hümmer Elektrotechnik GmbH + Co KG, Hofheim DE



Light-Control for increasing energy efficiency

Time based lighting systems meet the highest contemporary standards of light quality, ergonomics and safety, design considerations, and regarding energy terms. With modern lighting technology in conjunction with sophisticated electronic components, high-efficiency light guidance, optimal measures for glare reduction and efficient light sources, lighting solutions can be realised that they correspond to all needs, generate much more light and consume less energy than old systems with conventional, sometimes completely outdated technology.

The optionally available technologies for better control and regulation of lighting systems provide even more potential for cost saving and efficiency. In installations where a sensible use of

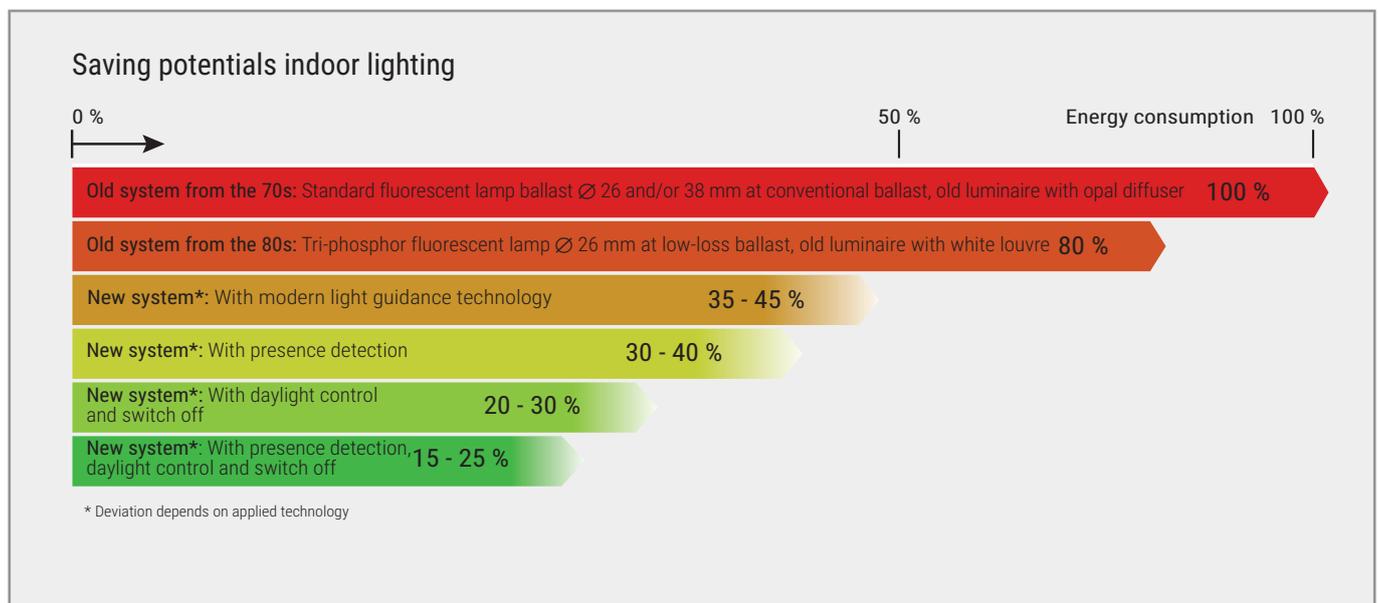
natural daylight is possible, up to 75% of energy saving can be achieved compared to existing systems. There are also savings regarding the use of sensor technology in presence detection.



Energy Optimisation - benefitting from saving potentials in interior lighting

When renovating the lighting system, one should start with a general check-up of its current condition. Only on the basis of this analysis, statements about possible savings are possible. The numbers listed in the chart are to be interpreted as a rough guide. In particular, the savings from

daylight-dependent systems can vary strongly, depending on various conditions (eg, geographic location, window size and position, direction, obstruction, use of time). We recommend to carry out an appropriate cost calculation prior to the renovation.



Light-Control application example sports hall

Frankenhalle Sennfeld

Developer: Gemeinde Sennfeld
 Consultant: Peter Gröger, Regiolux, Königsberg
 Construction: Elektro Volker Stoike, Sennfeld

Wiring example



More information

in application manual
 „SPORTS HALLS“



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Sports hall lighting Regiolux



Ball impact-resistant sports facilities

Room types



sportler



THLA



THLE



Hall lighting

Room types



cake



worker



LED IP20



LED IP40



LED IP54



ilia



Side rooms & circulation areas

Room types



planara



panella



protection



hokal



RE



UE



WL



WQL



protection



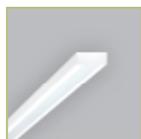
peanut



stail



hokal



procube



cubus



UA



wotek



lens pro



KLKF



doma



relo



loda



rotara



rotara



alvia



visula



smile



persa



Badminton hall with benefits from 50 percent energy savings

The badminton hall at the Fredericia Idrætscenter, a sports and leisure facility has been converted to energy-saving LED lighting technology. The new hall lighting not only benefits the environment, but also saves money. This is due to the obsolete 4x58 W luminaires with conventional lamps being replaced by energy-efficient high bay „sportler“ LED. The new lighting concept saves approximately 6,000 W/h as the lighting solution for the 1.100 m² hall. This reduces energy consumption and electricity costs for the hall lighting by roughly 50 percent.

The old luminaires were replaced one for one during the retrofit and the „sportler“ solution was simply mounted on the existing mounting rails. 56 LED luminaires positioned along the slanted roof provide the hall with light in a manner that is both efficient



as well as highly effective in providing a wide light distribution. In the relevant working plane, i. e. on the court, they achieve a mean illuminance of 580 lx. A presence-dependent control system also ensures that lights are only turned on when needed and thereby increases savings even further. Due to the high shuttlecock strokes played during badminton matches, it was particularly important to reduce any glare. This was achieved with a UGR value of 19, making this solution ideal when it comes to top athletic performance.

Project data

Construction authority	Fredericia Idrætscenter, DK
Lighting	es-light aps., Fredensgade 35, DK-5000 Odense C
Electrician	Lindpro a/s, Brovadvej 51, DK-7000 Fredericia

Planing

SOHTB/1000 LED 22200 840
Average illuminance: utilization plane 580lx
UGR=19







Multi-purpose hall

Planning of a multi-purpose hall

It is not just different sports that make different demands on hall lighting. Different types of use in particular make it worth giving the lighting system a bit more thought.

Alongside the usual criteria such as lighting level and homogeneity, vertical illuminances and mechanical loads such as ball impact can be taken into consideration.



RGBW - colours things up

The luminaires should be equipped with RGBW technology for coloured light, such as is required e.g. for dances. Thanks to the compact LED technology, this requirement can also be fulfilled in addition to the respective control system.

- guaranteed to make the best use of the hall capacity



Tunable White technology for the right lighting scene

If the hall is required for events such as gala evenings or theatre performances, warmer coloured light and lower illuminances are preferred. Luminaires with Tunable White technology can be an adequate solution in connection with additional luminaires in this case. With these luminaires, the light colour can be varied typically between 3,000 Kelvin (warm-white light), through 4,000 Kelvin (neutral white light) to 6,000 Kelvin (light colour similar to daylight white).



Light management - it's in your hands

Sophisticated control technology tailored to requirements makes it possible to provide the right light in the required illuminance quickly and easily for every requirement in the hall. The integration of a corresponding sensor system makes further potential savings possible.



Good planning is the key

The lighting system will only meet your demands if all the requirements are thought through from the word go. We will support you on your way to better light. lichtplanung@regiolux.de

Planning example sports-/multi-purpose hall

Calculation basis

Gymnasium

In the case of an inclined roof surface an individual lighting calculation is recommended.

Mounting height MH = 7 m

Lamps

LED LF 840

Calculation basis/legend

E = Nominal illuminance

E_m = Average illuminance (hall)

$E_{m1/3}$ = Average illuminance (1/3 hall)

Utilization plane = 0,0 m

Reflection values

$\rho = 0,7$ (ceiling)

0,5 (wall)

0,3 (floor)

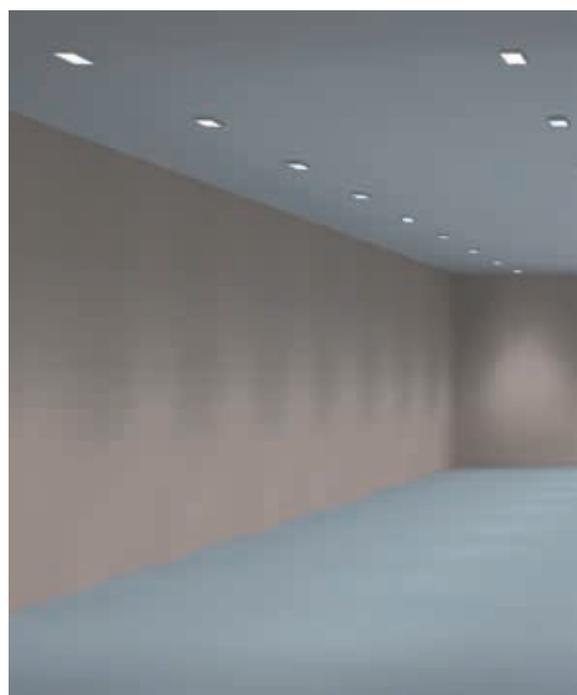
$a_1 / a_2 / a_3$ = Longitudinal spacing

b_1 / b_2 = Transverse spacing

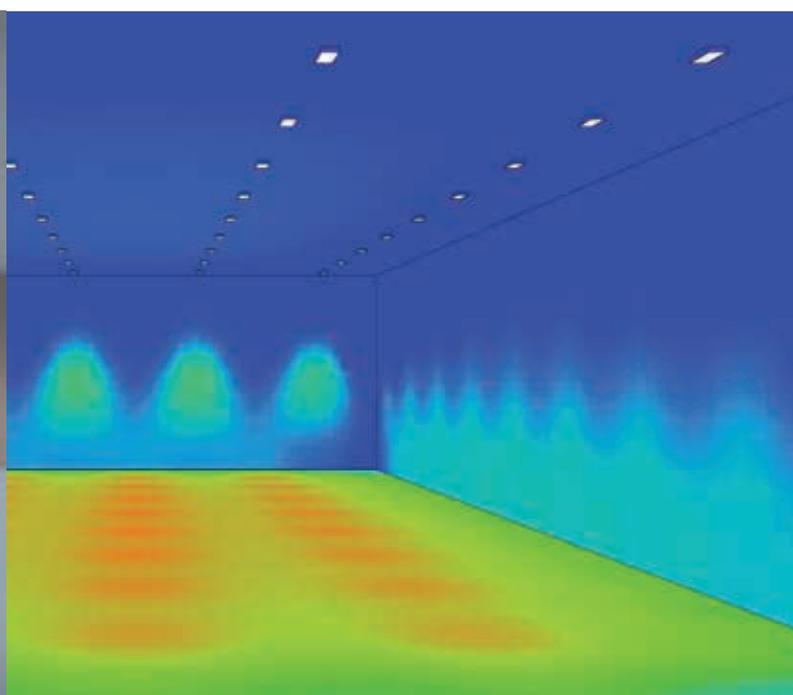
$G_1 = E_{min} : E_m$

Type	lamps	E	no. of luminaires	Total power consumption (incl. ED)	a_1	a_2	a_3	b_1	b_2	G_1	E_m	$E_{m1/3}$
SOHB/700	LED 14600	300 lx	4 x 9 = 36	3,525 kW	2,50 m	5,00 m	5,00 m	2,25 m	7,50 m	1 : 1,3	360 lx	320 lx
SOHB/700	LED 14600	500 lx	4 x 12 = 48	4,700 kW	1,88 m	3,75 m	3,75 m	2,25 m	7,50 m	1 : 1,3	500 lx	420 lx
SOHB/1000	LED 21900	300 lx	4 x 6 = 24	3,526 kW	3,75 m	7,50 m	7,50 m	2,25 m	7,50 m	1 : 1,3	360 lx	320 lx
SOHB/1000	LED 21900	500 lx	4 x 9 = 36	5,289 kW	2,50 m	5,00 m	5,00 m	2,25 m	7,50 m	1 : 1,3	540 lx	470 lx
SOHB/1300	LED 29100	300 lx	3 x 6 = 18	3,525 kW	3,75 m	7,50 m	7,50 m	4,50 m	9,00 m	1 : 1,3	370 lx	320 lx
SOHB/1300	LED 29100	500 lx	4 x 6 = 24	4,700 kW	3,75 m	7,50 m	7,50 m	2,25 m	7,50 m	1 : 1,3	500 lx	430 lx
SOHTB/700	LED 14600	300 lx	4 x 9 = 36	3,525 kW	2,50 m	5,00 m	5,00 m	2,25 m	7,50 m	1 : 1,3	380 lx	340 lx
SOHTB/700	LED 14600	500 lx	4 x 12 = 48	4,700 kW	1,88 m	3,75 m	3,75 m	2,25 m	7,50 m	1 : 1,3	500 lx	450 lx
SOHTB/1000	LED 21900	300 lx	4 x 6 = 24	3,526 kW	3,75 m	7,50 m	7,50 m	2,25 m	7,50 m	1 : 1,3	380 lx	350 lx
SOHTB/1000	LED 21900	500 lx	4 x 9 = 36	5,289 kW	2,50 m	5,00 m	5,00 m	2,25 m	7,50 m	1 : 1,3	560 lx	510 lx
SOHTB/1300	LED 29200	300 lx	3 x 6 = 18	3,525 kW	3,75 m	7,50 m	7,50 m	4,50 m	9,00 m	1 : 1,3	390 lx	350 lx
SOHTB/1300	LED 29200	500 lx	4 x 6 = 24	4,700 kW	3,75 m	7,50 m	7,50 m	2,25 m	7,50 m	1 : 1,3	510 lx	460 lx
THLA/1500-1	LED 4900	300 lx	4 x 24 = 96	5,280 kW	0,94 m	1,88 m	1,88 m	2,25 m	7,50 m	1 : 1,3	310 lx	270 lx
THLA/THLE/1500-2	LED 9700	500 lx	4 x 21 = 84	9,156 kW	1,07 m	2,15 m	2,15 m	2,25 m	7,50 m	1 : 1,3	550 lx	470 lx
THLA/THLE/1500-2	LED 9700	300 lx	4 x 12 = 48	5,232 kW	1,88 m	3,75 m	3,75 m	2,25 m	7,50 m	1 : 1,3	310 lx	270 lx
THLA/THLE/1500-3	LED 14600	500 lx	4 x 15 = 60	9,840 kW	1,50 m	3,00 m	3,00 m	2,25 m	7,50 m	1 : 1,3	590 lx	510 lx
THLA/THLE/1500-3	LED 14600	300 lx	4 x 9 = 36	5,904 kW	2,50 m	5,00 m	5,00 m	2,25 m	7,50 m	1 : 1,3	350 lx	310 lx

Light density



Illuminance

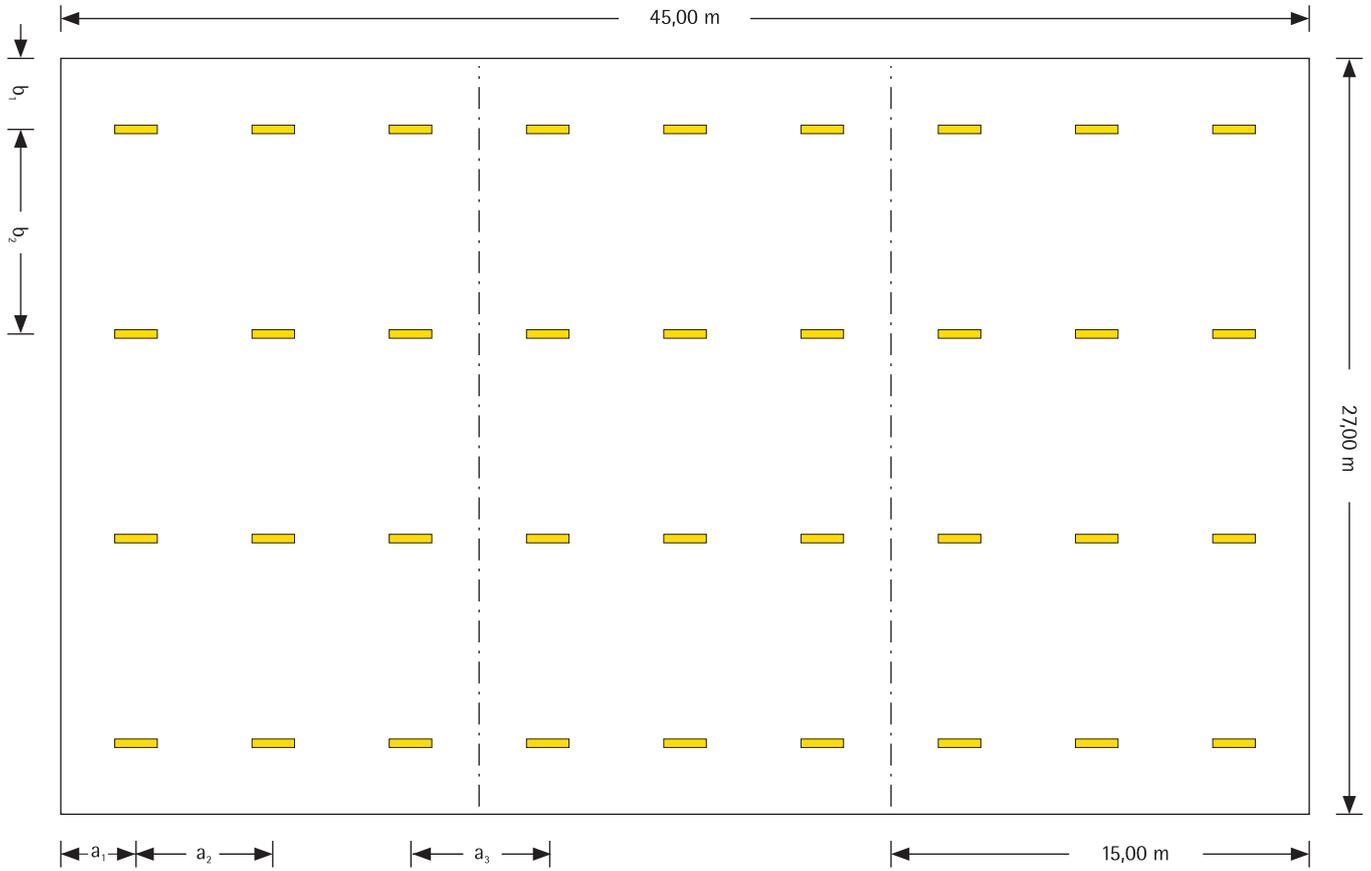


Illuminance (lx)



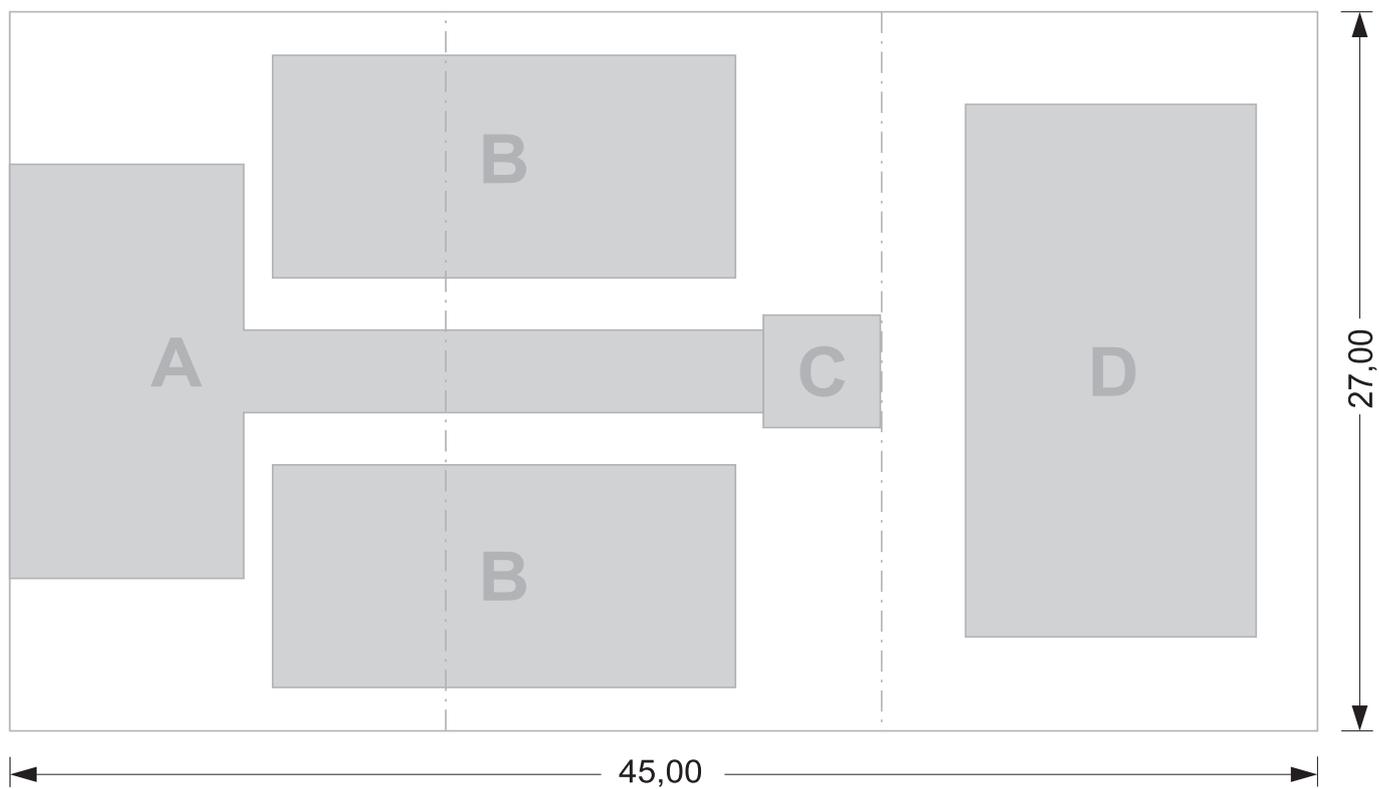


Three-bay sports hall and multi-purpose hall



Example fashion show

Legend A = Stage / B = Seating / C = Technics / D = Catering



Planning example tennis hall



Calculation basis

Tennis hall

In the case of an inclined roof surface an individual lighting calculation is recommended.

Calculation basis/legend

Average illuminance (playing field)

$E_m = 587 \text{ lx}$

Utilization plane = 0,0 m

Mounting height = 5 m

Maintenance factor = 0,8

Reflection values

$\rho = 0,5$ (ceiling)/ $0,3$ (end cap)/

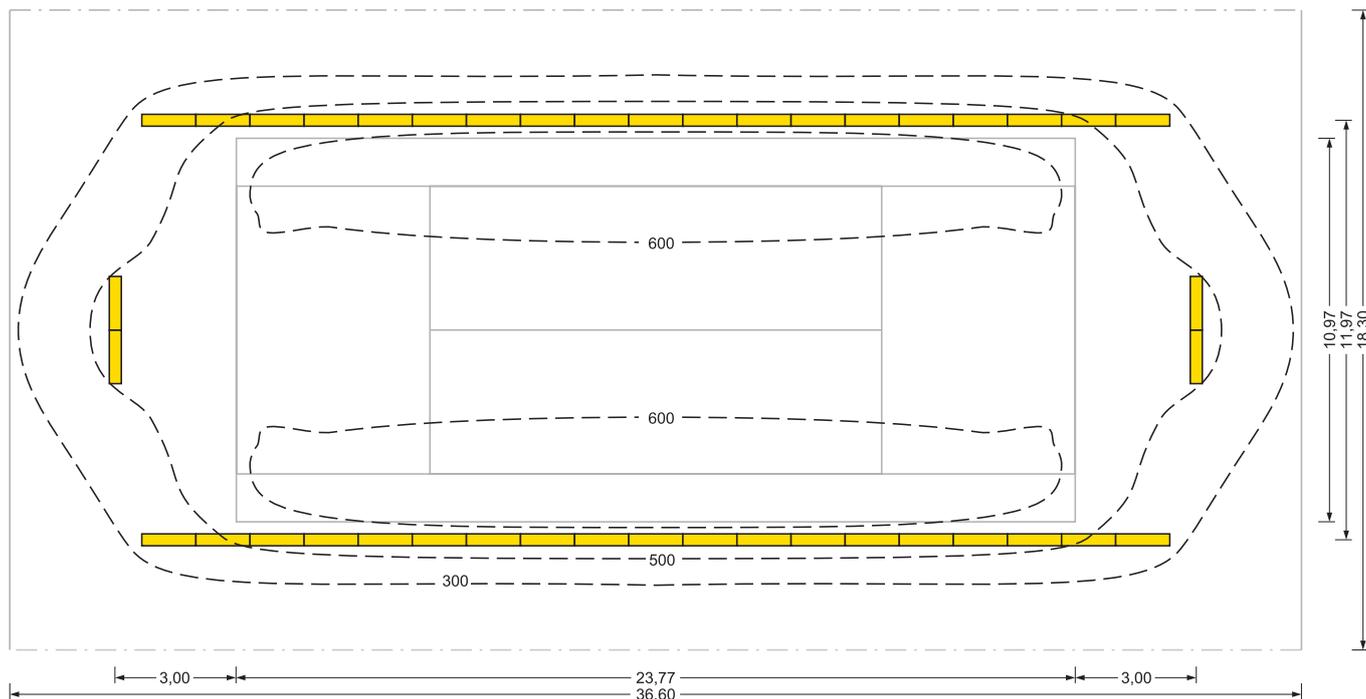
$0,0$ (side walls)/ $0,1$ (floor)

In tennis halls with several courts no reflection surfaces on the lateral playing sides.

Lighting class	I	II	III
Average illuminance (lx)	750	500	300
Uniformity	0,7	0,7	0,5

Type	no. of luminaires	E_m	$E_{m2/3}$	$E_{m1/3}$	G
THLA/1500-2 LED 9700	$2 \times 19 + 2 \times 2 = 42$	587 lx			0,85
THLA/1500-3 LED 14600	$2 \times 19 + 2 \times 2 = 42$	881 lx	587 lx	294 lx	0,85

THLA/1500-2 LED 9700



Planning example squash hall



Calculation basis

Squash hall

Calculation basis/legend

Average illuminance (playing field)

$E_m = 543 \text{ lux}$

Utilization plane = 0,0 m

Mounting height = 6 m

Maintenance factor = 0,8

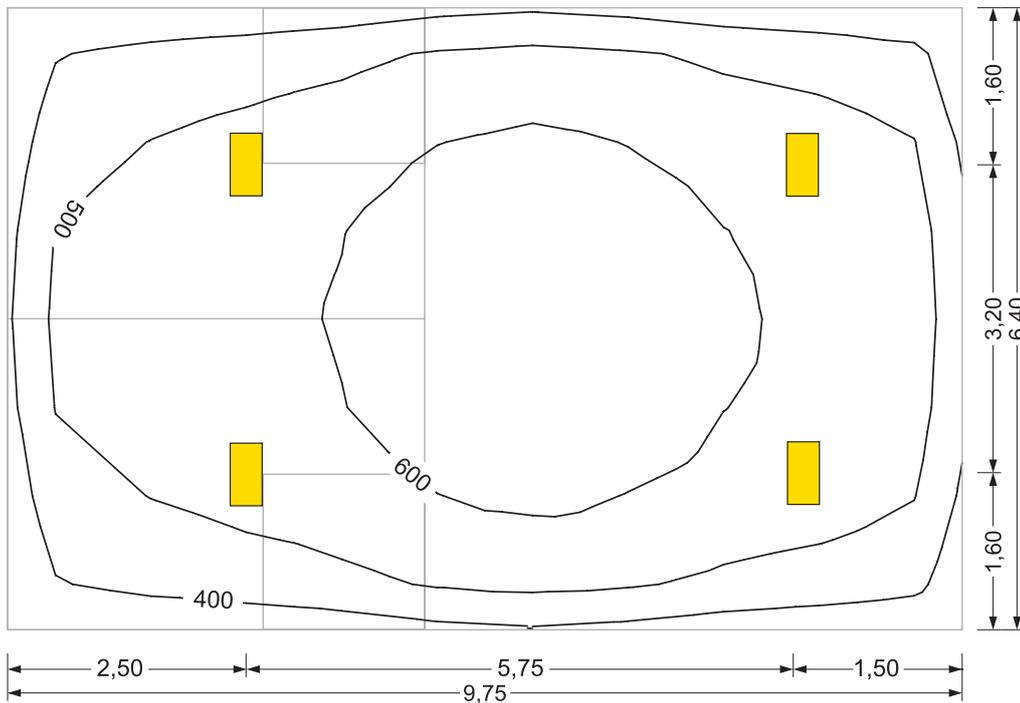
Reflection values

$\rho = 0,7$ (ceiling)/ $0,7$ (walls)/ $0,3$ (floor)

Lighting class	I	II	III
Average illuminance (lx)	750	500	300
Uniformity	0,7	0,7	0,5

Type	no. of luminaires	E_m
SOHTB/0700 LED 14600	2 x 2 = 4	543 lx

SOHTB/0700 LED 14600



Planning example badminton hall



Calculation basis

Badminton hall

Calculation basis/legend

Average illuminance (playing field)

$E_m = 473 \text{ lux}$

Utilization plane = 0,0 m

Mounting height = 6 m

Maintenance factor = 0,8

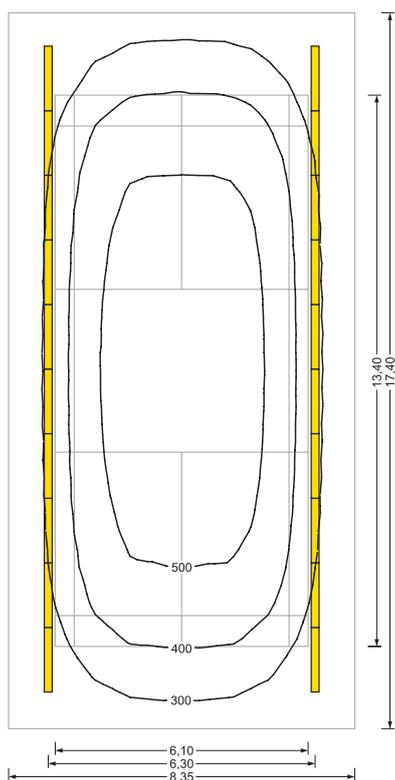
Reflection values

$\rho = 0,7$ (ceiling)/ $0,5$ (walls)/ $0,2$ (floor)

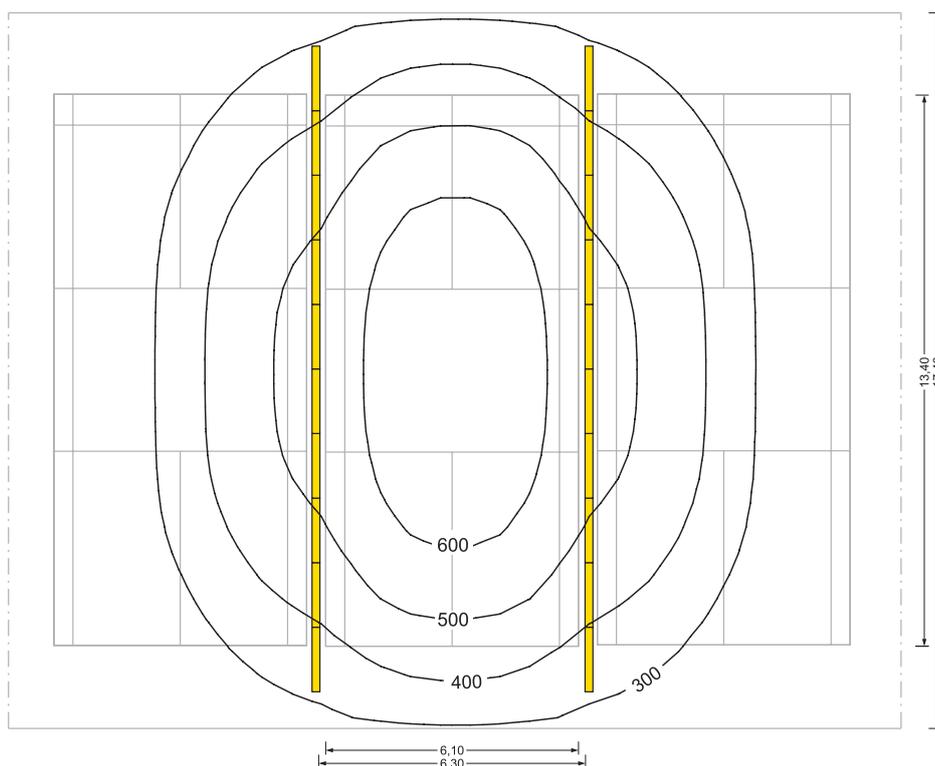
Lighting class	I	II	III
Average illuminance (lx)	750	500	300
Uniformity	0,7	0,7	0,7

Type	no. of luminaires	E_m
SDT + SDGVOA/1500 LED 4000	2 x 10 =20	473 lx
SDT + SDGOB/1500 LED 8000	2 x 10 =20	570 lx

SDT + SDGVOA/1500 LED 4000



SDT + SDGOB/1500 LED 8000





Planning example riding hall



Calculation basis

Riding hall

Calculation basis/legend

Average illuminance $E_m = 315$ lux

Utilization plane = 0,0 m

Mounting height = 4,5 m

Maintenance factor = 0,8

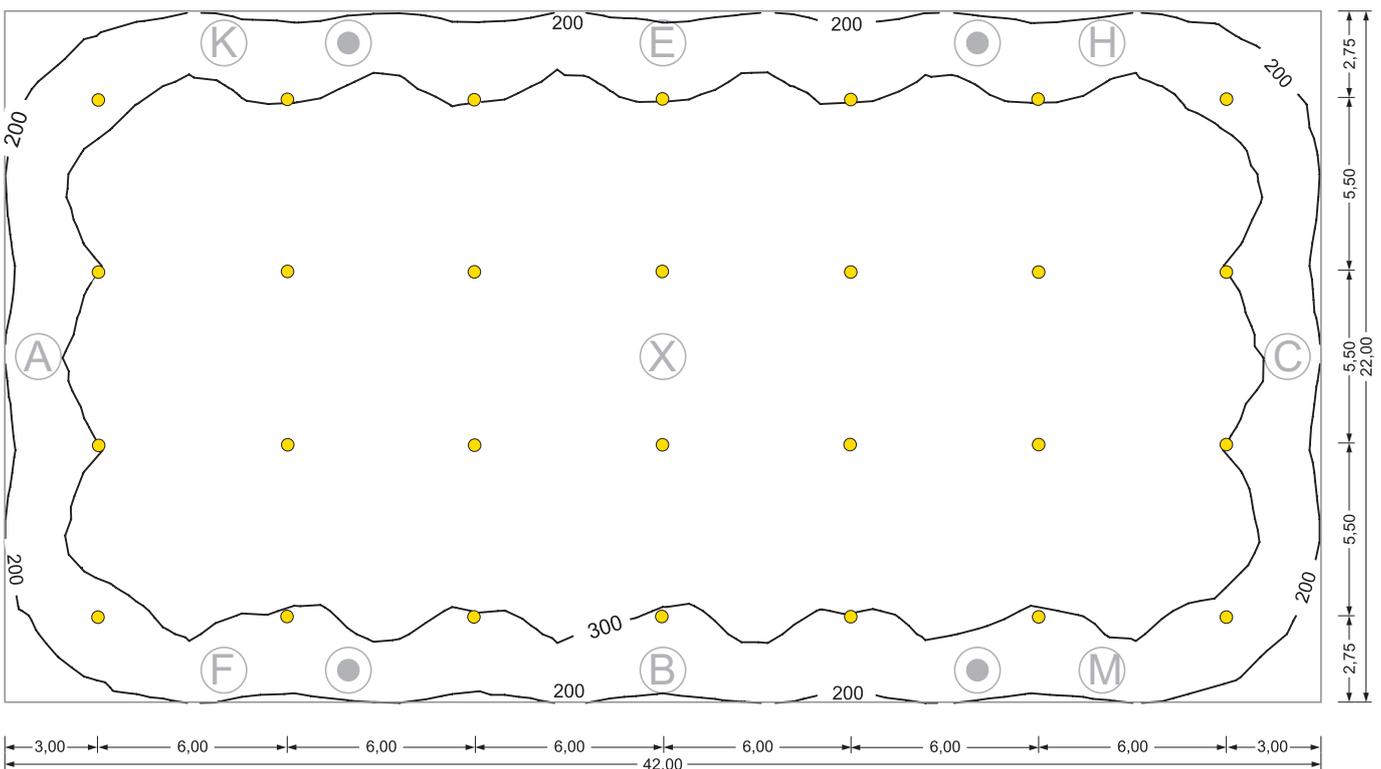
Reflection values

$\rho = 0,5$ (ceiling)/ $0,3$ (walls)/ $0,1$ (floor)

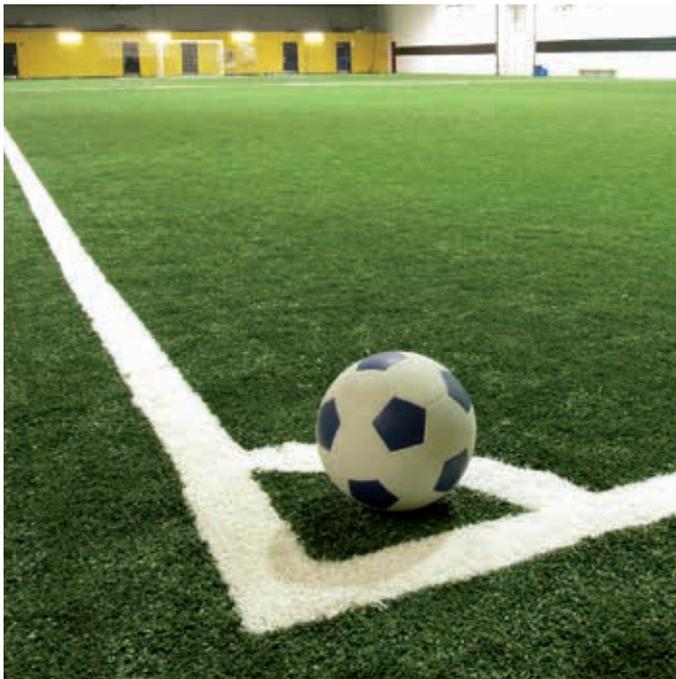
Lighting class	I	II	III
Average illuminance (lx)	500	300	200
Uniformity	0,7	0,6	0,5

Type	no. of luminaires	E_m
cake-CKHLTB LED 14000	4 x 7 = 28	315 lx

cake-CKHLTB LED 14000



Planning example indoor soccer



Calculation basis

Indoor soccer, golf and other sports

Calculation basis/legend

Average illuminance (playing field)

$E_m = 235 \text{ lx}$

Utilization plane = 0,0 m

Mounting height = 6 m

Maintenance factor = 0,8

Reflection values

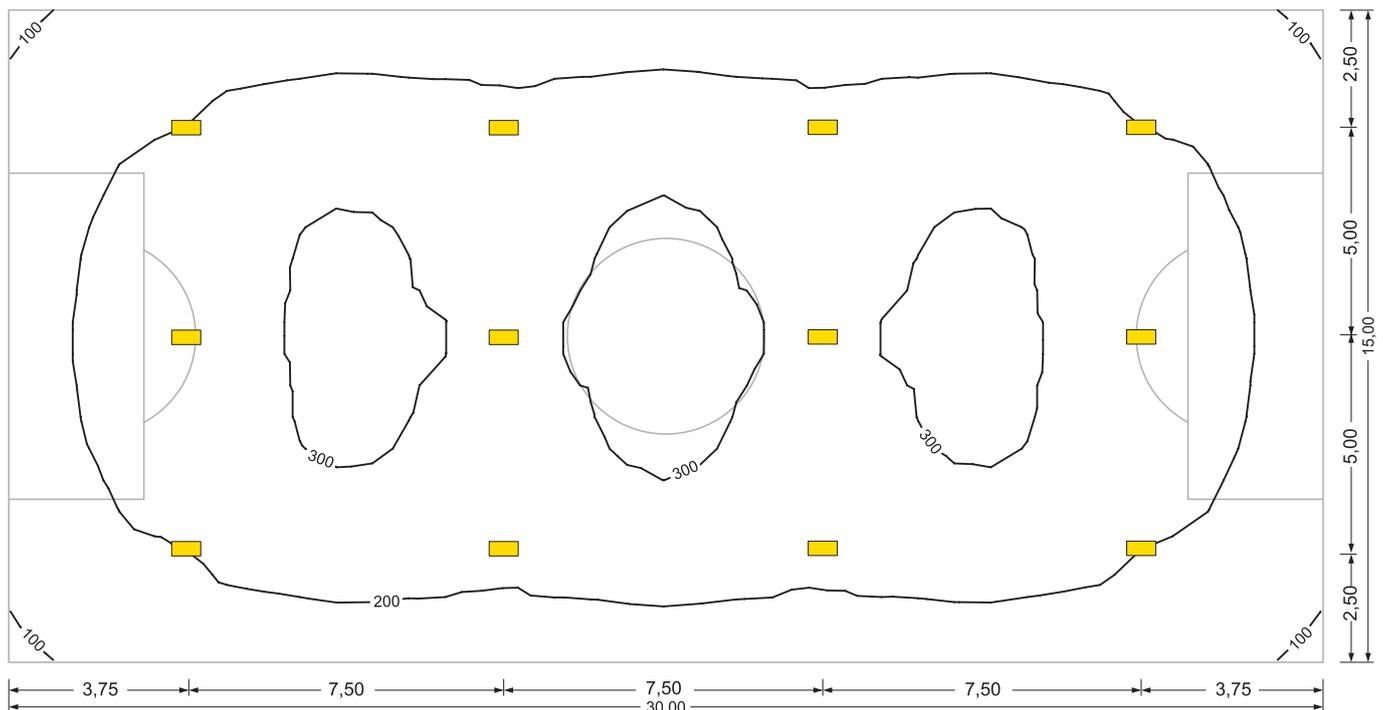
$\rho = 0,5$ (ceiling)/ $0,0$ (walls)/ $0,1$ (floor)

Partly no reflective wall surfaces but nets to the adjacent court

Lighting class	I	II	III
Average illuminance (lx)	750	500	200
Uniformity	0,7	0,7	0,5

Type	no. of luminaires	E_m
sportler-SOHB/0700 LED 14600	3 x 4 = 12	235 lx

sportler-SOHB/0700 LED 14600



Planning example bowling alley



Calculation basis

Bowling

Calculation basis/legend

Average illuminance (alley/target)

$E_m = 251$ lux (alley)

$E_m = 620$ lux (target)

Utilization plane = 0,0 m (alley)

Mounting height = 3 m

Maintenance factor = 0,8

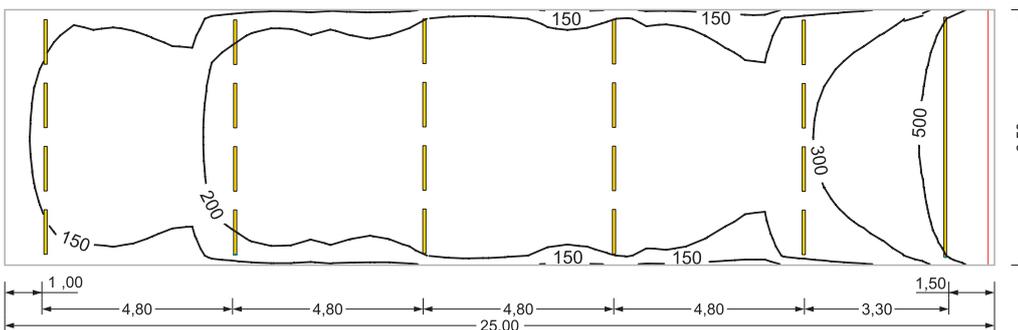
Reflection values

$\rho = 0,7$ (ceiling)/ 0,5 (walls, target wall 0,2)/ 0,2 (floor)

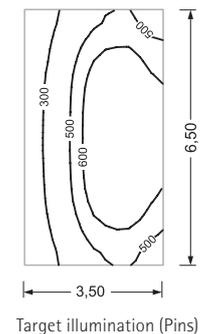
Lighting class	I	II	III
Average illuminance (lx)	200	200	200
Uniformity	0,5	0,5	0,5
Average illuminance (lx)	500	500	500
Uniformity	0,8	0,8	0,8

	Type	no. of luminaires	E_m
Alley illumination	ilia-ILG/1200 4000	4 x 5 = 20	251 lx
Target illumination	SDT + SDGOT 4000	4	620 lx

ilia-ILG/1200 4000lm



SDT + SDGOT 4000lm



Target illumination (Pins)

Planning example shooting range



Calculation basis

Shooting range

Calculation basis/legend

Average illuminance (alley/target)

$E_m = 268$ lux (alley)

$E_m = 1480$ lux (target)

Utilization plane = 0,0 m (alley)

Mounting height = 3 m

Maintenance factor = 0,8

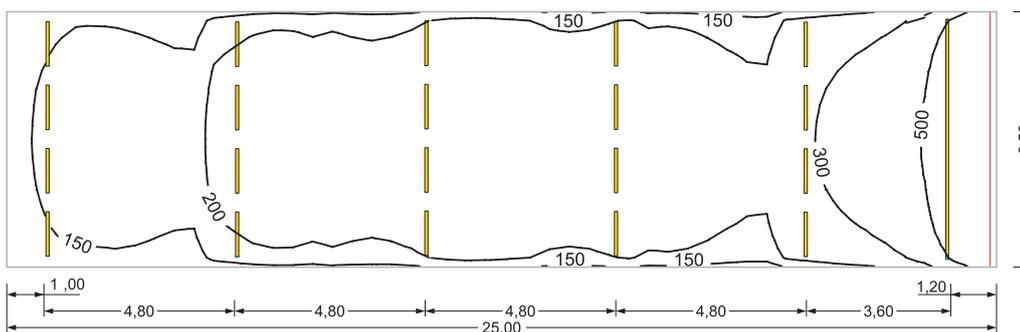
Reflection values

$\rho = 0,7$ (ceiling) / $0,5$ (walls, target wall 0,2) / $0,2$ (floor)

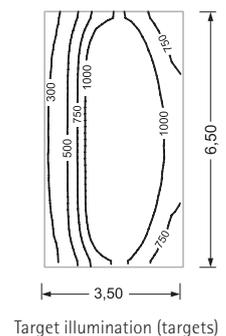
Lighting class	I	II	III
Average illuminance (lx)	200	200	200
Uniformity	0,5	0,5	0,5
Vertical illuminance (lx) 25m	1000	1000	1000
Vertical illuminance (lx) 50m	2000	2000	2000
Uniformity	0,8	0,8	0,8

	Type	no. of luminaires	E_m
Alley illumination	ilia-ILG/1200 4000	4 x 5 = 20	268 lx
Target illumination	SDT + SDGOT 8000	4	1480 lx

ilia-ILG/1200 4000



SDT + SDGOT 8000



Target illumination (targets)

Indoor winter sports

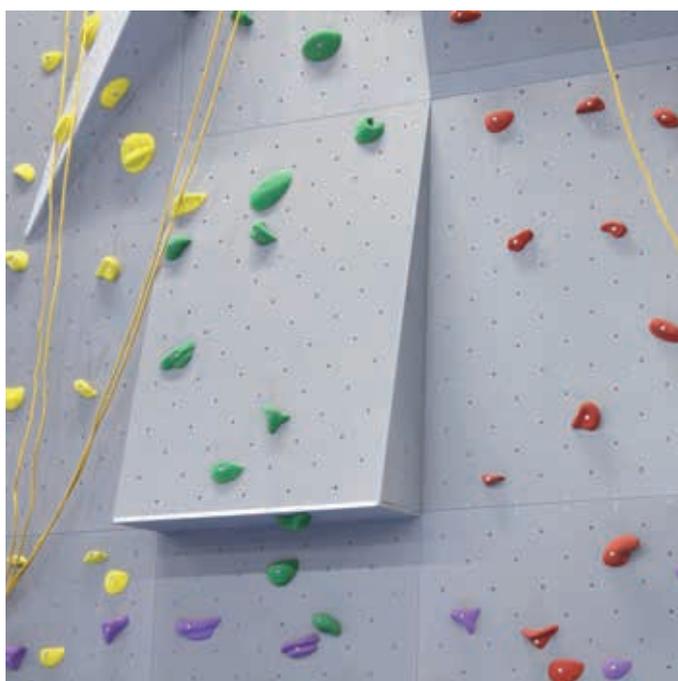


Basis for planning

The requirements placed on lighting are as diverse as the types of winter sport themselves.

Different levels of illumination are required. Depending on the type of sport, greater illuminances are required at the finish, and vertical illuminances may even be necessary. For this reason, the requirements are often similar to those for multi-purpose halls. Additional considerations are the reduction of reflections on the shiny surface of the ice and the low ambient temperatures, of course. Many winter sports halls such as ski halls have individual dimensions so that detailed planning is necessary. We will be pleased to be of help.

Climbing and bouldering halls



Basis for planning

The lighting in a climbing hall poses a particular challenge. Every climbing wall needs a homogeneous lighting level.

The wall structure as well as all of the holds and steps must be clearly visible. To achieve this, boulder halls are ideally illuminated with a mixture of diffuse and focussed light. The light incidence (at the side or from the top) must be selected to avoid any in such a way that no shadows are cast if possible and that the climber is not dazzled. Climbing is only fun when all of these points have been taken into consideration.

Go-kart halls



Basis for planning

With requirements of approx. 200 Lux of homogeneous lighting, motor sports halls do not make particularly high demands on lighting technology. Nevertheless, care still has to be taken to ensure that the drivers are not dazzled as far as possible.

In many cases, requirements with respect to dust caused by abrasion and chemical resistances (caused by exhaust gases and/or vapours) must be taken into account so that there is no long-term damage to the lighting system. So take the right precautions.

Indoor playground



Basis for planning

Indoor playgrounds are becoming more and more popular, not just in holiday regions – and special attention must be paid to the lighting system here too, of course. Homogeneous lighting of 200 Lux is required in accordance with lighting class III for leisure sports. Special attention has to be paid to the shade cast by the equipment as well as any mechanical loads which may occur. In addition, higher anti-glare requirements are in place where screen-supported playground equipment is involved. Our specialist advisers will be happy to help.

Gym, exercising, yoga



Basis for planning

Fitness has never been more topical, but anyone who wants to be successful has to think long and hard about the lighting system. Homogeneous lighting at 300 Lux horizontally is only the beginning. When gym equipment is used, care must be taken that the screens and displays are neither shaded nor dazzle so as to ensure the safe use of the equipment.

Any relaxation zones should have a separate light intensity and light colour concept to support the relaxation process through light. In addition, it makes particular sense to make sure there is a continuous lighting concept for all side rooms. We will be pleased to provide advice.



Bouldering hall Nordwand, Erfurt

Actual project

Project data

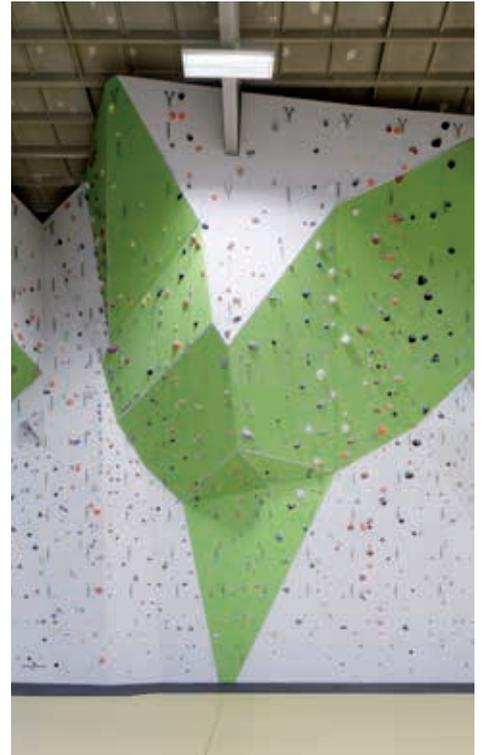
Construction authority
Lighting
Electrician

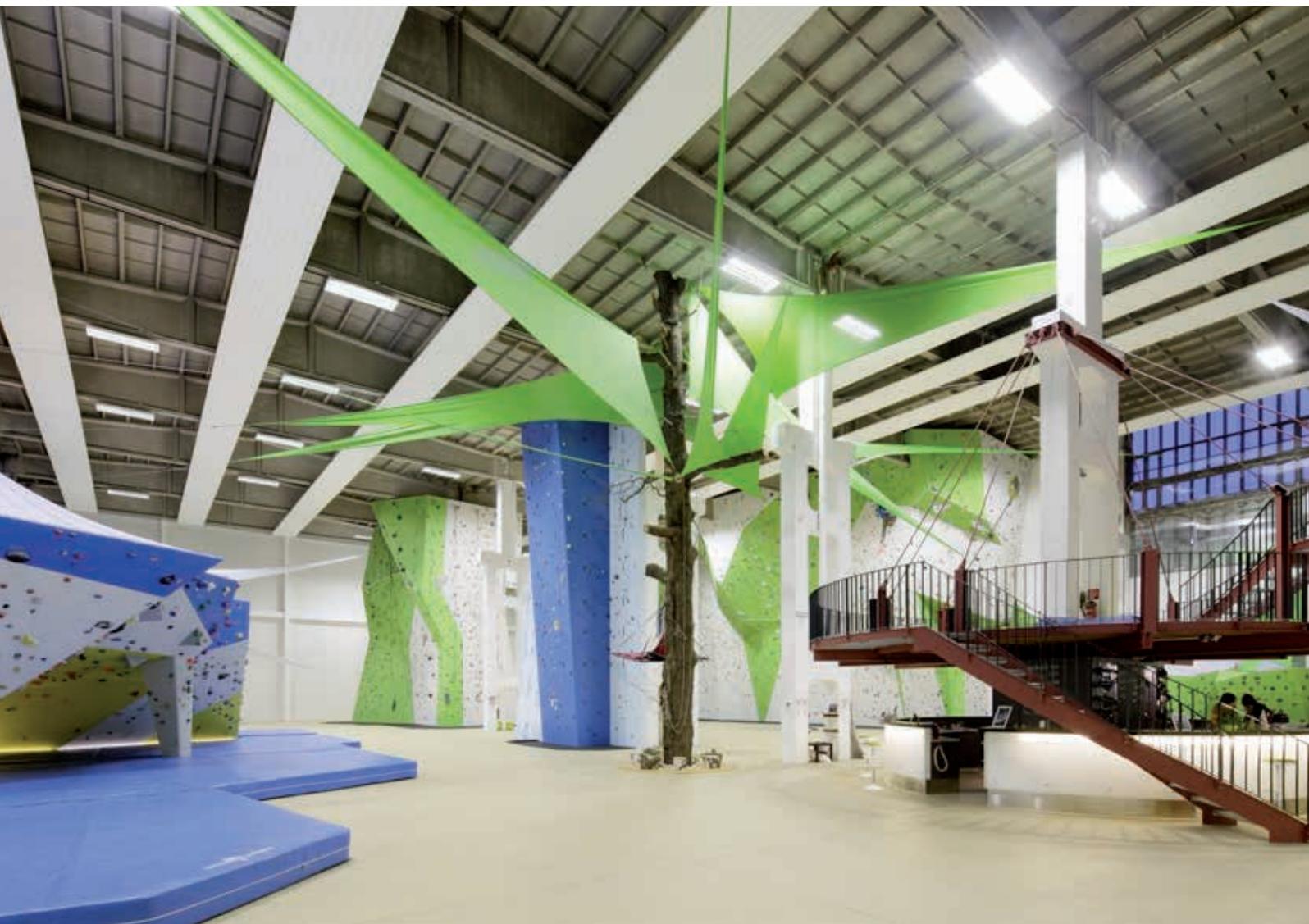
Nordwand Bouldering GmbH, Erfurt
Regiolux GmbH, Königsberg
EAB GmbH, Waltershausen

To allow climbers to have fun in even the worst weather, the climbing hall „Nordwand“ in Erfurt has approx. 120 climbing routes between grades 3 and 10 on a climbing area of 1100 m². Due to the height of the hall walls of up to 13 metres, the Regiolux luminaires from the hall lighting range with a wide light distribution were ideal because they allowed the vertical illuminances to be achieved easily as well.

The lower 350 m² boulder area could also be covered perfectly with this lighting concept. All in all, this resulted in an impressively pleasant atmosphere at the facility that does justice to all uses and design issues. Thanks to zone switching options, the lighting can even be used cost efficiently when there are few people using the hall.

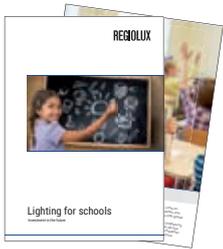
A project that leaves nothing to be desired.





Other special applications

Our brochures and information on the subject:



Lighting for schools



Tunable white
Luminaires for Human
Centric Lighting

Our application manuals on the topic:



Sports halls



Tunable White

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