

SPORT | BASKETBALL



PERFORMANCE  LIGHTING

PERFORMANCE LIGHTING

PERFORMANCE iN LIGHTING is specialised in professional lighting for indoor and outdoor, in several countries around the world. Thanks to decades of experience in the field, obtained through dedicated luminaires for both new sports centres and renovation work on existing centres.

PERFORMANCE iN LIGHTING provides right attention to overall design systems, to comply with regulations for all sports, and to assure total glare control in both indoor and outdoor settings.

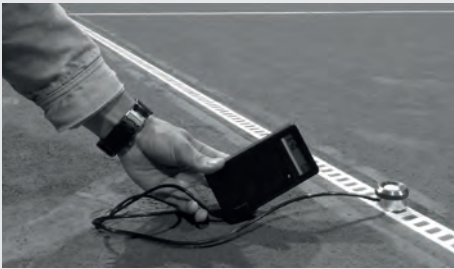
Constant improvement in applications linked with competitive and professional sports environments, with the use of more efficient technical solutions, allow PERFORMANCE iN LIGHTING to offer solutions with high energy savings, resulting in significant reductions in running costs, for safe, comfortable and efficient facilities, available to athletes and spectators alike.

The purpose of this monograph is to provide examples of lighting calculations that involve only horizontal lighting values that usually represents about ninety per cent of all lighting engineering design work.

Therefore, we will not provide examples here of lighting verification that requires vertical values or vertical values in the direction of TV cameras. For this kind of professional applications, please consult the pre-sales support of PERFORMANCE iN LIGHTING.

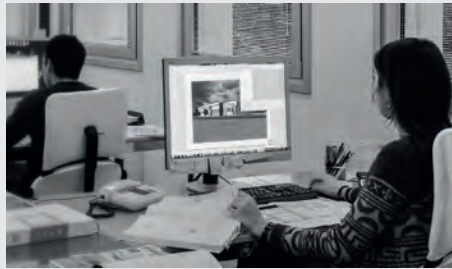
PRE-AFTER SALES SERVICES

The PERFORMANCE iN LIGHTING sales service includes direct and personal project management consultancy at 360 degrees, from the study of the lighting concept and technical feasibility to the evaluation of the financial return of investments to the support on-site during the installation phase through the sampling service.



ON-SITE TECHNICAL OVERWATCHES AND LIGHTING RELIEFS

PERFORMANCE iN LIGHTING provides a team of qualified specialists during all phases of the project: from the design stage, through on-site technical oversight and lighting reliefs, verification and lighting calculation. Our professional support team is available for essential projects to ensure not to lose even detail in compliance with current regulations providing certainty to all those who choose PERFORMANCE iN LIGHTING as a technical partner.



DESIGN AND LIGHTING PLANNING AIDS

The culture of light and lighting planning is being diffused more and more worldwide, and the sensibility of both public administrations and private users is growing to enhance urban areas, artistic and architectural assets, sports and recreational areas, in respect of the place and the environment. PERFORMANCE iN LIGHTING offers accurate advice and assist with lighting verification to grant the best solution possible through the analysis of all our solutions for every peculiar design. PERFORMANCE iN LIGHTING provides lighting solutions for "the space for people", worldwide, and not only as a necessary instrument for life but also as a powerful expressive means for the quality of the environment.



INSTALLATION AIMING AND SETTING SERVICES

PERFORMANCE iN LIGHTING provides a team of qualified specialists to design and elaborate the calculations on-site during the installation phase. The team joins the installation phase for the product aiming, light level testing and settings for big plants, arenas, industries, airports, and large infrastructures to ensure compliance with the current regulations. Choosing these paid services, all actors will have an extra certainty of having chosen PERFORMANCE iN LIGHTING as the right technical partner.



AFTER-SALES SERVICES

The warranty extension proposed by PERFORMANCE IN LIGHTING comes into practice thanks to continuous investments aimed at customer satisfaction. A team of specialised post-sales technicians is always present for an immediate solution to any problem. They are available for issues related to spare parts and after-sales assistance, where there were the conditions dictated by the group policy, to honour the promise made at the time of purchase and set in to solve the problem immediately. Our customers know that whenever they need a replacement part or service, both come directly from PERFORMANCE IN LIGHTING —ensuring compatibility, performance, timeliness, and the highest level of expertise.



BESPOKEN LIGHTING SOLUTIONS

One of the significant values that PERFORMANCE IN LIGHTING provides to customers is the ability to design and develop tailor-made products and lighting solutions, based on the needs of a specific project. Products variants such as un-standard painting colour finishes, different LED light colour temperature, un-catalogued electrical options, custom-made accessories for a peculiar installation are some typical examples. To suit the specific needs of professionals, PERFORMANCE IN LIGHTING can develop product solutions “Ex-Novo” (from scratch in Latin) not included in the standard portfolio. This capability allows PERFORMANCE IN LIGHTING luminaires to achieve a total integration of light in the context of use.



PROJECT LEASING

Sometimes, the initial investment cost for a lighting system frightens off, but, several sports facilities and large municipalities pay substantial electricity fees monthly. The habit that these amounts are being paid nevertheless does not spur people to analyse the subject correctly. The LED technology is an outstanding investment that allows in the short-to-medium time to amortise the initial investment, to save significantly on electric energy and to improve the usability of the installations. Furthermore, outstanding agreements are underway with credit institutions specialised in financial operations to support essential investments of big lighting plants in the most important countries of the European Union. In some countries, PERFORMANCE IN LIGHTING provides the option of an Operating Rental Service (subject to the approval of the Lending Body).




BASKETBALL



 EN 12193:2018 14



 CONI 22



 FIP 26



 BASKETBAL VLAANDEREN 32



 INFRASPORTS 34

BASKETBALL

Unlike almost all other sports, we can attribute the invention of basketball and its birth date with absolute certainty.

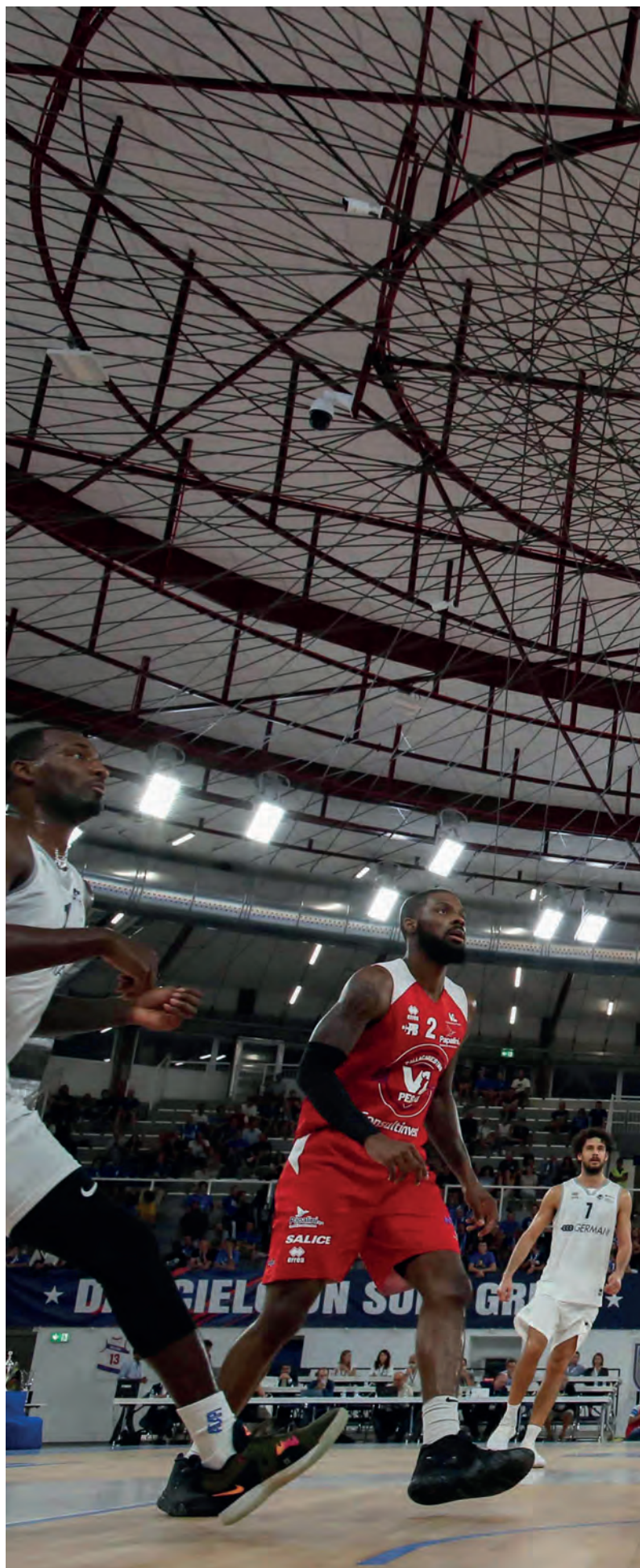
Basketball was invented on December 15 1891 in Springfield, Massachusetts, when Dr James Naismith, a PE teacher in a sport centre belonging to the YMCA (Young Men's Christian Association), an ecumenical organisation that supports youth and their activities, was tasked with finding a sport to keep his pupils also fit during the winter, as an alternative to the usual gymnastics exercises.

On January 15 1892, Naismith published thirteen rules that laid the foundations of his new game marking the official birth of basketball in which two teams of nine players faced off on a playing area about half the size of today's basketball court.

Basketball spread quickly all over the world and required the creation of an international body that could coordinate the national federations. As a result, FIBA (Fédération Internationale de Basketball) was founded in Geneva and 1932 and is still basketball's world governing body today.

In 1934 FIBA was recognised by the International Olympic Committee which made it an Olympic sport for the 1936 Berlin Games.

The spread of basketball in Europe began in the 1910s and during the First World War with the arrival of American soldiers.







BASKETBALL in the World

IOC - The International Olympic Committee, also known as CIO (from the initials of the original French name: Comité International Olympique), is a Swiss non-governmental organization created by Pierre de Coubertin in 1894 to revive the Olympic Games of ancient Greece through a four-year sporting event where athletes from all countries could compete against each other. It's the highest world sports organism comprises three main constituents: the IOC itself is the supreme authority of the Movement; the International Federations (IFs) and the National Olympic Committees (NOCs). The first two are international non-governmental organisations administering one or several sports at world level and encompassing organisations regulating such sports on a national level. Their mission is to develop, promote and protect the Olympic Movement in their respective countries.



GAISF - Global Association of International Sports Federations includes all sixty-nine CIO recognized federations (twenty-eight from ASOIF, seven from AIOWF and thirty-four from ARISF).



FIBA - The Fédération Internationale de Basketball is the governing body of world Basketball. FIBA establishes the official rules for basketball, the specifications for the equipment and all the administrative regulations applicable to all international and Olympics, for which FIBA creates the competition system.

Five different confederations head FIBA that is responsible for organising and supervising basketball in the various continents of the world:

- FIBA Africa
- FIBA Americas
- FIBA Asia
- FIBA Oceania
- FIBA Europe.





BASKETBALL in Europe



FIBA EUROPE - is the governing body of basketball in Europe and one of the five zones of the International Basketball Federation (along with Africa, America, Asia and Oceania). It currently brings together fifty-one national basketball federations from Europe.



CEN - The European Committee for Standardization (Comite European de Normalisation in French), better known by the acronym CEN, is a regulatory body that aims to harmonise and produce technical standards (EN) in Europe in collaboration with national and supranational regulatory agencies such as ISO.

The CEN seeks to facilitate the exchange of goods and services between member countries, harmonising the respective national standards and cooperating with European political, economic and scientific organisations interested in standardisation.

The European standards produced by CEN are usually harmonized and adapted by the individual countries that receive them, such as the UNI in Italy.



EUROPEAN LIGHTING STANDARDS

Lighting guidelines or the principal regulations are laid down by FIBA and the ECS (European Committee for Standardisation).

The guidelines mainly provide indications on how basketball competitions organised by FIBA at the international level should be lit. The hints in these guidelines are very exhaustive and primarily regard lighting elements, uniformity, glare and the temperature and colour rendering characteristics that the lighting system must guarantee to light the playing area correctly and to ensure TV cameras the right level of vertical lighting.

Consistent with the goals stated at the start of this monograph, the lighting examples that follow are all compliant with the EN 12193:2018 standard. The examples are provided solely for the evaluation of horizontal lighting elements and are divided into INDOOR and OUTDOOR solutions in order to highlight the differences between the two types of tennis lighting systems.

In force by CEN members national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

The Lighting Class describes the lighting parameters for the best possible illumination of a playing area. The following table establishes the level of competition and technical parameters.

EN 12193:2018 (indoor - outdoor)

Competition level	Lighting class		
	I	II	III
Local Competition and Training			✓
Regional Competition		✓	
International and National Competition	✓		



EN 12193:2018 (indoor)



Reference Area	Class	Lighting Horizontal PA		Lighting Horizontal TA		Gr	Colour Rendering	
		Eave	Uniformity Emin/Eave	Eave	Uniformity Emin/Eave		CRI	
PA 28x15 m TA 32x19 m	III	200 lux	0,50	-	-	40	60	
	II	500 lux	0,70	-	-	40	60	
	I	750 lux	0,70	-	-	35	80	

EN 12193:2018 (outdoor)

Reference Area	Class	Lighting Horizontal PA		Lighting Horizontal TA		Gr	Colour Rendering	
		Eave	Uniformity Emin/Eave	Eave	Uniformity Emin/Eave		CRI	
PA 28x15 m PA 32x19 m	III	75 lux	0,50	-	-	55	60	
	II	200 lux	0,60	-	-	55	60	
	I	500 lux	0,70	-	-	55	70	



	GUELL 2	GUELL 2.5	GUELL 3	GUELL 4	SQUARE PRO	LAMA+ MINI	LAMA+	consult factory
								
		p. 14				p. 14		
			p. 15					
				p. 15				

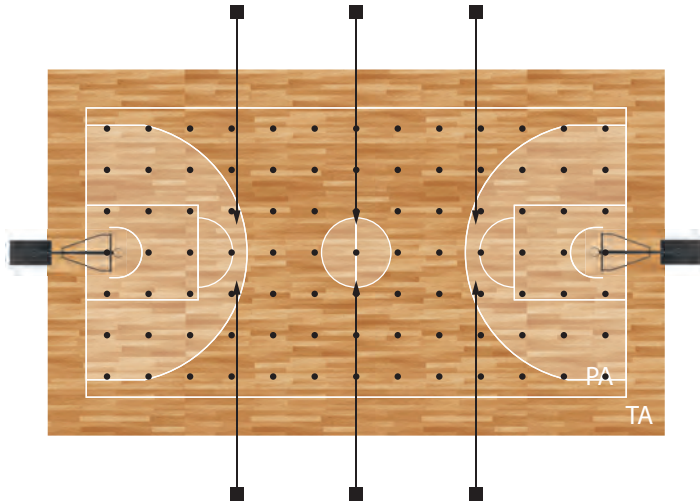
	GUELL 2	GUELL 2.5	GUELL 3	GUELL 4	SQUARE PRO	LAMA+ MINI	LAMA+	consult factory
								
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		p. 16						
			p. 17					

EN 12193 | 200 lux

CLASS III

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	13 x 7
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	15 x 9
Eave (PA)	200 lux	Emin/Eave (PA)	0,50
Colour Rendering Index (CRI)	60	Glare Rating (Rg)	40



GUELL 2.5

1,43 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306202	A40/W	4000	238 W	6

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

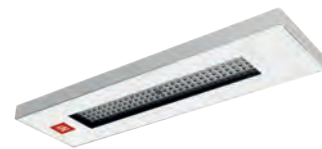
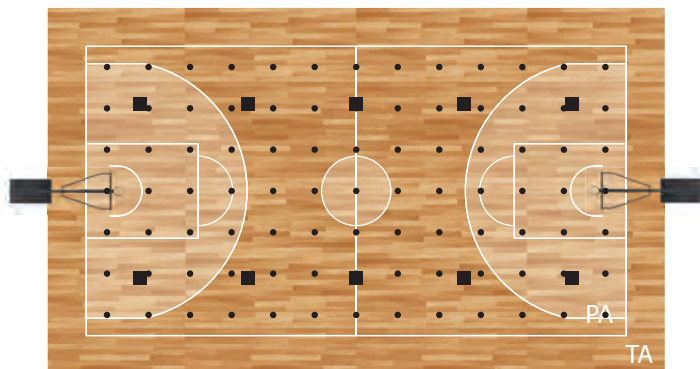
Eave (PA)	200 lux
Uniformity Emin/Eave (PA)	0,50
Glare Rating (Rg)	34

EN 12193 | 200 lux

CLASS III

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	13 x 7
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	15 x 9
Eave (PA)	200 lux	Emin/Eave (PA)	0,50
Colour Rendering Index (CRI)	60	Glare Rating (Rg)	40



LAMA+ MINI

1,01 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
3101188	S/EW	4000	101 W	10

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

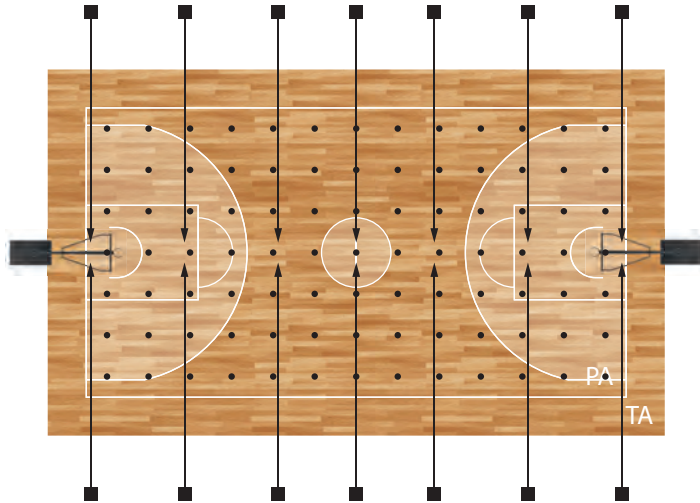
Eave (PA)	203 lux
Uniformity Emin/Eave (PA)	0,61
Glare Rating (Rg)	18

EN 12193 | 500 lux

CLASS II

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	13 x 7
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	15 x 9
Eave (PA)	500 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	60	Glare Rating (Rg)	40



GUELL 3

4,27 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306114	A50/W	4000	305 W	14

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

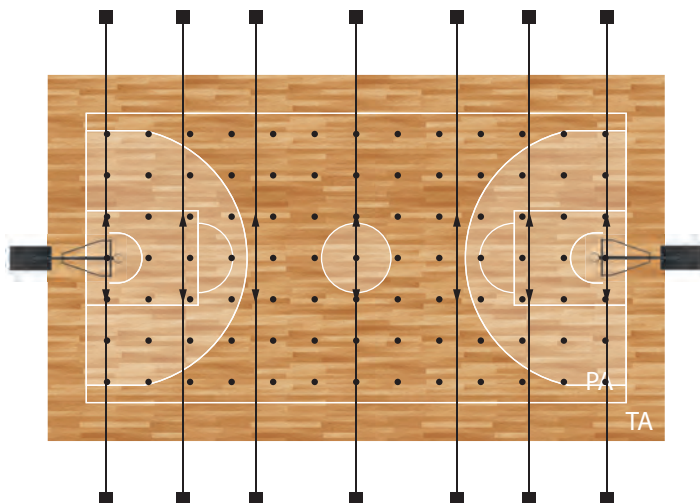
Eave (PA)	524 lux
Uniformity Emin/Eave (PA)	0,75
Glare Rating (Rg)	35

EN 12193 | 750 lux

CLASS I

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	13 x 7
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	15 x 9
Eave (PA)	750 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	80	Glare Rating (Rg)	35



GUELL 4

6,27 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306128	A50/W	4000	448 W	14

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

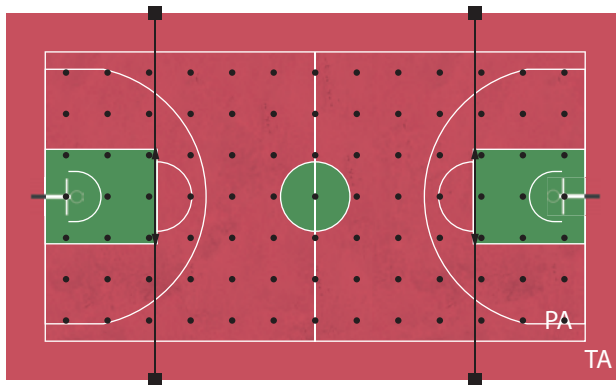
Eave (PA)	789 lux
Uniformity Emin/Eave (PA)	0,77
Glare Rating (Rg)	35

**EN 12193 | 75 lux**

CLASS III

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	13 x 7
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	15 x 9
Eave (PA)	75 lux	Emin/Eave (PA)	0,50
Colour Rendering Index (CRI)	60	Glare Rating (Rg)	55



Lighting calculation at zero light pollution.

**GUELL 2.5****0,62 kW total power consumption**

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306204	A50/W	4000	156 W	4

INSTALLATION SUMMARY:

Poles / Lines	4
Installation height	8 m
Maintenance factor	0,90

RESULTS OVERVIEW:

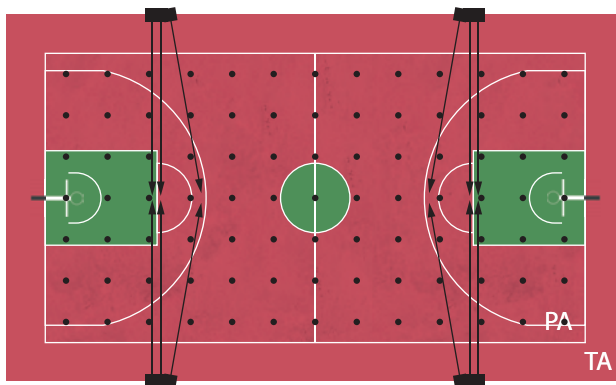
Eave (PA)	91 lux
Uniformity Emin/Eave (PA)	0,71
Glare Rating (Rg)	31

EN 12193 | 200 lux

CLASS II

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	13 x 7
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	15 x 9
Eave (PA)	200 lux	Emin/Eave (PA)	0,60
Colour Rendering Index (CRI)	60	Glare Rating (Rg)	55



Lighting calculation at zero light pollution.

**GUELL 2.5****1,42 kW total power consumption**

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306205	A50/W	4000	118 W	12

INSTALLATION SUMMARY:

Poles / Lines	4
Installation height	8 m
Maintenance factor	0,90

RESULTS OVERVIEW:

Eave (PA)	208 lux
Uniformity Emin/Eave (PA)	0,72
Glare Rating (Rg)	31

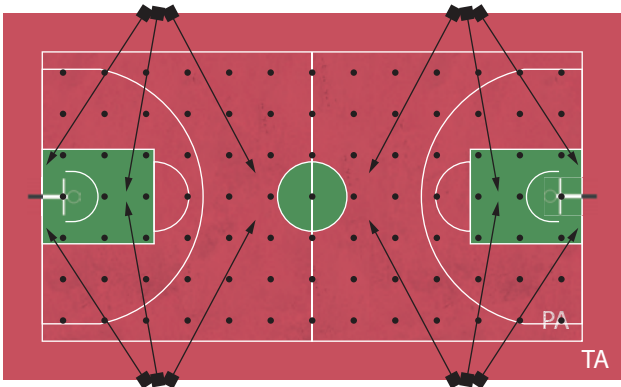
EN 12193

| 500 lux

CLASS I

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	13 x 7
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	15 x 9
Eave (PA)	500 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	70	Glare Rating (Rg)	55



Lighting calculation at zero light pollution.



GUELL 3

3,66 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306114	A50/W	4000	305 W	12

INSTALLATION SUMMARY:

Poles / Lines	4
Installation height	8 m
Maintenance factor	0,90

RESULTS OVERVIEW:

Eave (PA)	505 lux
Uniformity Emin/Eave (PA)	0,74
Glare Rating (Rg)	34



BASKETBALL in Italy

CONI - issue of the International Olympic Committee (IOC), is the authority for regulating and managing territorial sports activities. The Italian National Olympic Committee, a public body responsible for organizing and strengthening national sport, promotes the maximum diffusion of sporting practice.

CONI - emanazione del Comitato Olimpico Internazionale (CIO), è autorità di disciplina regolazione e gestione delle attività sportive nazionali. Il Comitato Olimpico Nazionale Italiano, Ente pubblico cui è demandata l'organizzazione e il potenziamento dello sport nazionale, promuove la massima diffusione della pratica sportiva.



FIP - (Federazione Italiana Basket / The Italian Basketball Federation) established in 1921, is based in Rome and is affiliated with CONI. At an international level, FIP is a member of FIBA and represents for world and continental competitions by its national men's and women's teams.

On a national level, FIP organises the professional men's A Division championships and the non-professional A2 and B Divisions' championships, together with the non-professional A1 and A2 women's divisions' championships.

FIP - (Federazione Italiana Pallacanestro) costituitasi nel 1921, ha sede a Roma ed è affiliata al CONI. A livello internazionale è membro della FIBA, nelle cui competizioni mondiali e continentali è rappresentata dalle proprie squadre nazionali maschile e femminile. FIP organizza su scala nazionale i campionati maschili professionistici di Serie A e quelli non professionistici di Serie A2 e B, ma anche quelli non professionistici di serie A1 e A2 femminili.



The Lighting Class describes the lighting parameters for the best possible illumination of a playing area. The following table establishes the level of competition and technical parameters.

Le classi di illuminamento descrivono i parametri illuminotecnici per la migliore illuminazione possibile dell'area da gioco. Le seguenti tavole stabiliscono i parametri tecnici richiesti per i vari livelli di competizione.

CONI:2008 (indoor - outdoor)

Competition level	Lighting class		
	I	II	III
Local Competition and Training	✓		
Regional Competition		✓	
International and National Competition			✓

FIP (indoor)

Competition level	Lighting class			
	I	II	III	IV
FIP fino a 200 spettatori				✓
FIP tra 201 e 1000 spettatori (TVcam facoltative)			✓	
FIP tra 1001 e 3499 spettatori (TVcam almeno 1 tribuna princ.)		✓		
FIP superiore a 3500 spettatori (TVcam almeno 1 tribuna princ.)	✓			

FIP (outdoor)

Competition level	Lighting class			
	I	II	III	IV
FIP attività agonistica a carattere locale fino a 200 spettatori	✓			



CONI:2008 (indoor)

Reference Area	Class	Lighting Horizontal PA		Lighting Horizontal TA		Gr	Colour Rendering	
		Eave	Uniformity Emin/Eave	Eave	Uniformity Emin/Eave		CRI	
PA 28x15 m TA 32x19 m	I	200 lux	0,50	-	-	(40)	(60)	
	II	500 lux	0,70	-	-	(40)	(60)	
	III	750 lux	0,70	-	-	(35)	(80)	

CONI:2008 (outdoor)

Reference Area	Class	Lighting Horizontal PA		Lighting Horizontal TA		Gr	Colour Rendering	
		Eave	Uniformity Emin/Eave	Eave	Uniformity Emin/Eave		CRI	
PA 28x15 m TA 32x19 m	I	100 lux	0,50	-	-	(55)	(60)	
	II	200 lux	0,60	-	-	(55)	(60)	
	III	500 lux	0,70	-	-	(55)	(70)	



FIP (indoor)


Reference Area	Class	Lighting Horizontal PA		Lighting Horizontal TA		Gr	Colour Rendering	
		Eave	Uniformity Emin/Eave	Eave	Uniformity Emin/Eave		CRI	
PA 28x15 m TA 32x19 m	IV	500 lux	0,70	-	-	(40)	(60)	
	III	750 lux	0,70	-	-	(35)	(80)	
	II	1000 lux	0,70	-	-	-	-	
	I	1500 lux	0,70	-	-	-	-	


FIP (outdoor)

Reference Area	Class	Lighting Horizontal PA		Lighting Horizontal TA		Gr	Colour Rendering	
		Eave	Uniformity Emin/Eave	Eave	Uniformity Emin/Eave		CRI	
PA 28x15 m TA 32x19 m	I	500 lux	0,70	-	-	(55)	(70)	



GUELL 2	GUELL 2.5	GUELL 3	GUELL 4	SQUARE PRO	LAMA+ MINI	LAMA+	consult factory
							
	p. 22				p. 22		
		p. 23					
			p. 23				

GUELL 2	GUELL 2.5	GUELL 3	GUELL 4	SQUARE PRO	LAMA+ MINI	LAMA+	consult factory
							
p. 24							
	p. 24						
		p. 25					

GUELL 2	GUELL 2.5	GUELL 3	GUELL 4	SQUARE PRO	LAMA+ MINI	LAMA+	consult factory
							
		p. 26					
			p. 26				
							✓
							✓

GUELL 2	GUELL 2.5	GUELL 3	GUELL 4	SQUARE PRO	LAMA+ MINI	LAMA+	consult factory
							
		p. 27					

The lighting values in brackets are taken by PERFORMANCE IN LIGHTING as a reference from other regulations in case the rule in question does not expressly declare them.

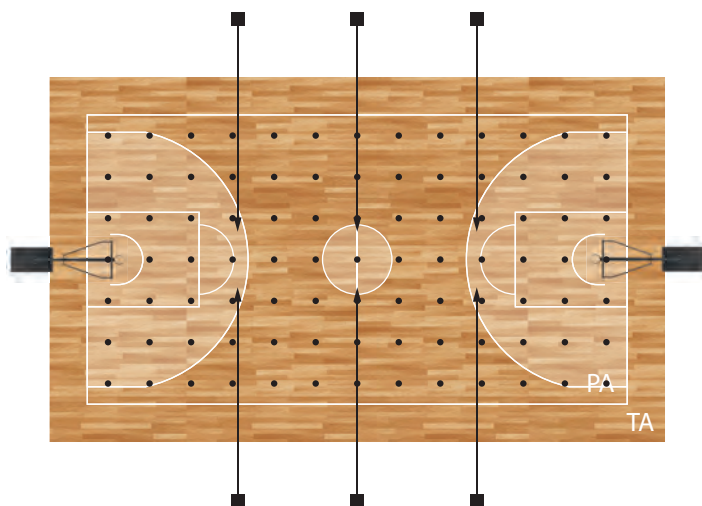
PERFORMANCE IN LIGHTING prende come riferimento da altre normative i valori illuminotecnici espressi tra parentesi qualora non espressamente dichiarati dalla normativa in esame.

CONI | 200 lux

CLASS I

REQUIREMENTS:

PLAY AREA (PA)	(28 x 15) m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	(32 x 19) m	Grid Points (TA)	(15 x 9)
Eave (PA)	200 lux	Emin/Eave (PA)	0,50
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(40)



GUELL 2.5

1,43 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306202	A40/W	4000	238 W	6

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

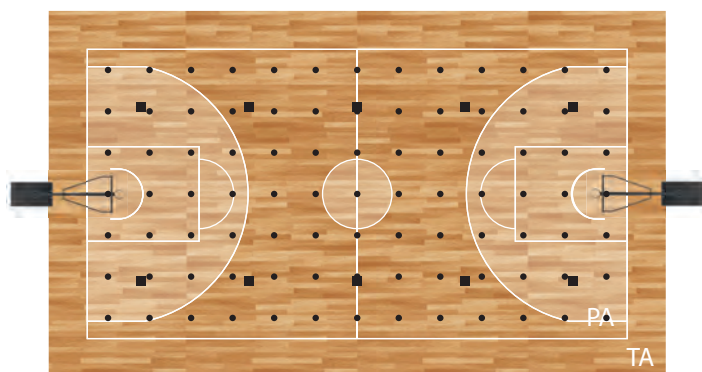
Eave (PA)	200 lux
Uniformity Emin/Eave (PA)	0,50
Glare Rating (Rg)	34

CONI | 200 lux

CLASS I

REQUIREMENTS:

PLAY AREA (PA)	(28 x 15) m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	(32 x 19) m	Grid Points (TA)	(15 x 9)
Eave (PA)	200 lux	Emin/Eave (PA)	0,50
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(40)



LAMA+ MINI

1,01 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
3101188	S/EW	4000	101 W	10

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

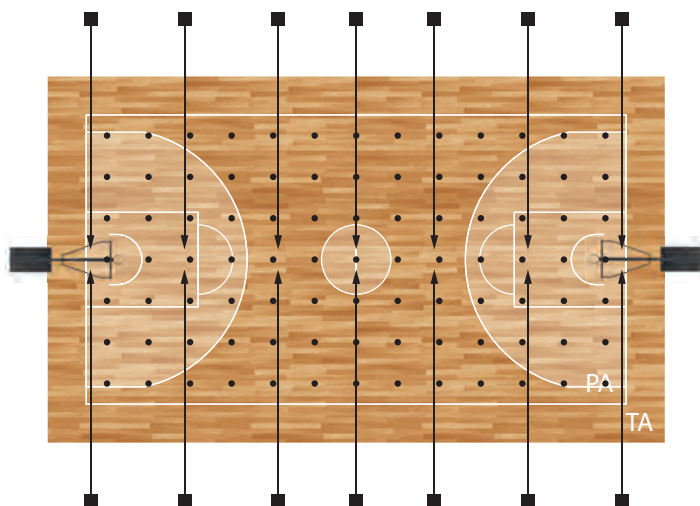
Eave (PA)	203 lux
Uniformity Emin/Eave (PA)	0,61
Glare Rating (Rg)	18

CONI | 500 lux

CLASS II

REQUIREMENTS:

PLAY AREA (PA)	(28 x 15) m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	(32 x 19) m	Grid Points (TA)	(15 x 9)
Eave (PA)	500 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(40)



GUELL 3

4,27 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306114	A50/W	4000	305 W	14

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

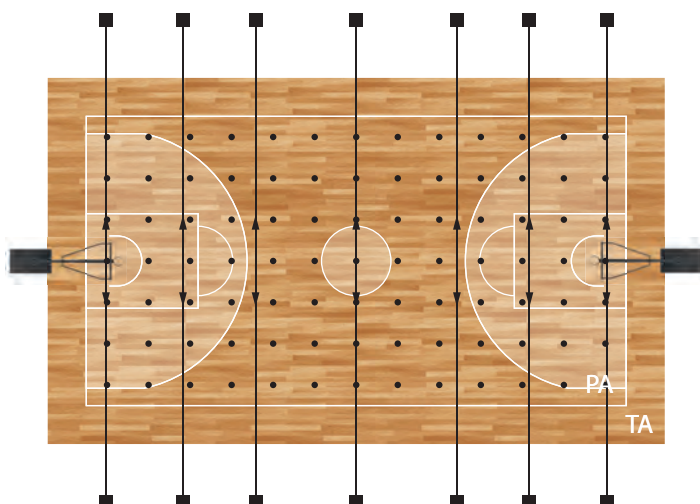
Eave (PA)	524 lux
Uniformity Emin/Eave (PA)	0,75
Glare Rating (Rg)	35

CONI | 750 lux

CLASS III

REQUIREMENTS:

PLAY AREA (PA)	(28 x 15) m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	(32 x 19) m	Grid Points (TA)	(15 x 9)
Eave (PA)	750 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(80)	Glare Rating (Rg)	(35)



GUELL 4

6,27 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306128	A50/W	4000	448 W	14

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

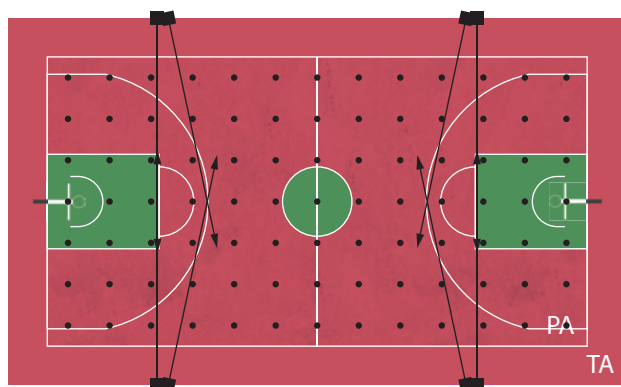
Eave (PA)	789 lux
Uniformity Emin/Eave (PA)	0,77
Glare Rating (Rg)	35

CONI | 100 lux

CLASS I

REQUIREMENTS:

PLAY AREA (PA)	(28 x 15) m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	(32 x 19) m	Grid Points (TA)	(15 x 9)
Eave (PA)	100 lux	Emin/Eave (PA)	0,50
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(55)



Lighting calculation at zero light pollution.



GUELL 2

0,84 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
06094494	A40/W	4000	105 W	8

ACCESSORY PART NUMBER	DESCRIPTION	Q.TY
14173694	Louvre	8

INSTALLATION SUMMARY:

Poles / Lines	4
Installation height	8 m
Maintenance factor	0,90

RESULTS OVERVIEW:

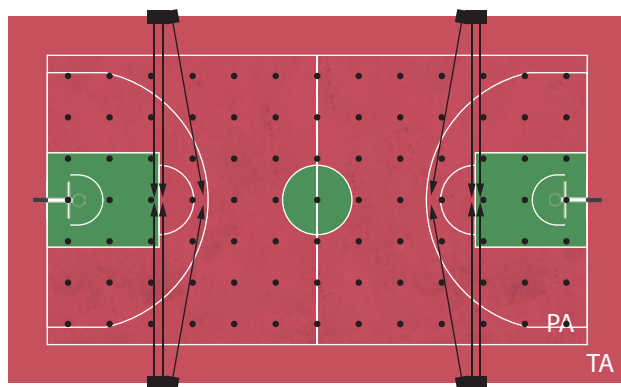
Eave (PA)	110 lux
Uniformity Emin/Eave (PA)	0,70
Glare Rating (Rg)	34

CONI | 200 lux

CLASS II

REQUIREMENTS:

PLAY AREA (PA)	(28 x 15) m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	(32 x 19) m	Grid Points (TA)	(15 x 9)
Eave (PA)	200 lux	Emin/Eave (PA)	0,60
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(55)



Lighting calculation at zero light pollution.



GUELL 2.5

1,42 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306205	A50/W	4000	118 W	12

INSTALLATION SUMMARY:

Poles / Lines	4
Installation height	8 m
Maintenance factor	0,90

RESULTS OVERVIEW:

Eave (PA)	208 lux
Uniformity Emin/Eave (PA)	0,72
Glare Rating (Rg)	31

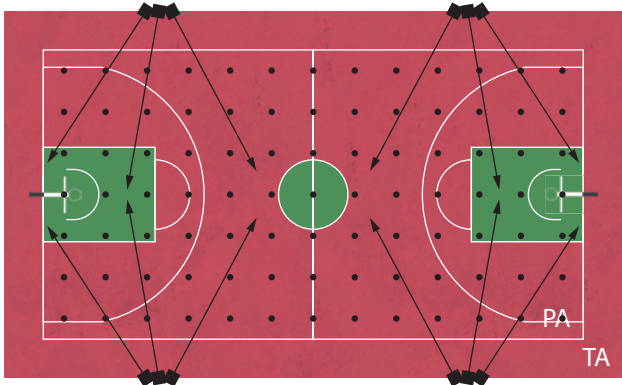
CONI

| 500 lux

CLASS III

REQUIREMENTS:

PLAY AREA (PA)	(28 x 15) m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	(32 x 19) m	Grid Points (TA)	(15 x 9)
Eave (PA)	500 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(70)	Glare Rating (Rg)	(55)



Lighting calculation at zero light pollution.



GUELL 3

3,66 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306114	A50/W	4000	305 W	12

INSTALLATION SUMMARY:

Poles / Lines	4
Installation height	8 m
Maintenance factor	0,90

RESULTS OVERVIEW:

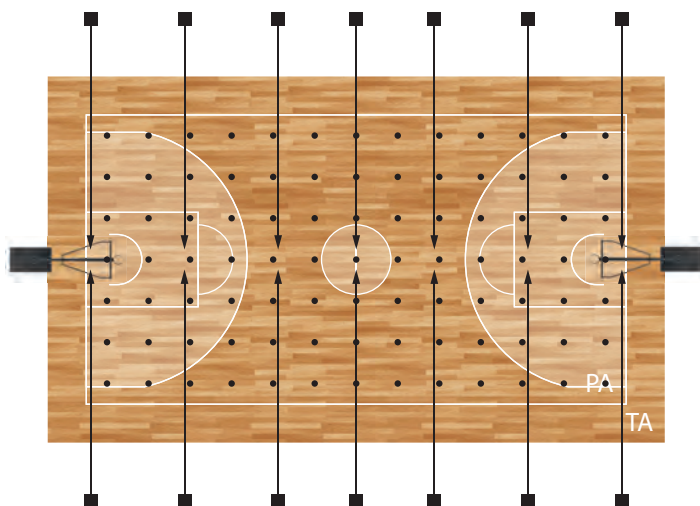
Eave (PA)	505 lux
Uniformity Emin/Eave (PA)	0,74
Glare Rating (Rg)	34

FIP | 500 lux

CLASS IV

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	(15 x 9)
Eave (PA)	500 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(40)



GUELL 3

4,27 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306114	A50/W	4000	305 W	14

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

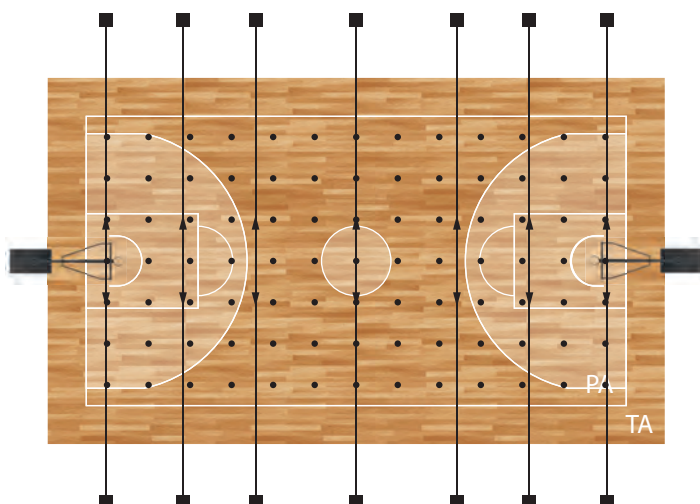
Eave (PA)	524 lux
Uniformity Emin/Eave (PA)	0,75
Glare Rating (Rg)	35

FIP | 750 lux

CLASS III

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	(15 x 9)
Eave (PA)	750 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(80)	Glare Rating (Rg)	(35)



GUELL 4

6,27 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306128	A50/W	4000	448 W	14

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

Eave (PA)	789 lux
Uniformity Emin/Eave (PA)	0,77
Glare Rating (Rg)	35

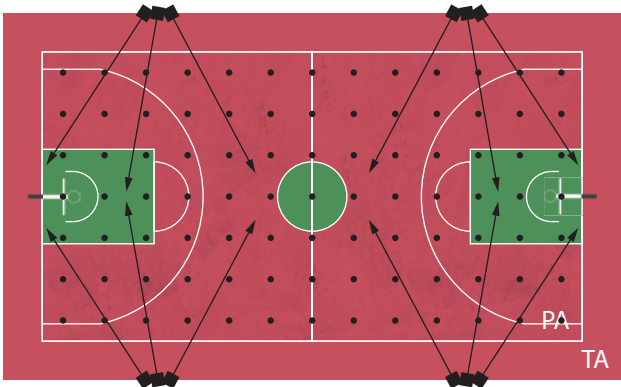
FIP

| 500 lux

CLASS I

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	(15 x 9)
Eave (PA)	500 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(70)	Glare Rating (Rg)	(55)



Lighting calculation at zero light pollution.



GUELL 3

3,66 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306114	A50/W	4000	305 W	12

INSTALLATION SUMMARY:

Poles / Lines	4
Installation height	8 m
Maintenance factor	0,90

RESULTS OVERVIEW:

Eave (PA)	505 lux
Uniformity Emin/Eave (PA)	0,74
Glare Rating (Rg)	34



BASKETBALL in Belgium



BASKETBALL BELGIUM - (Dutch: Basketbal België, French: Basketball Belgique, German: Basketball Belgien) founded in 1933 is the governing body of basketball in Belgium.

KBBB - De Koninklijke Belgische Basketball Bond, (Frans: Fédération Royale Belge Basketball (FRBB), Duits: Basketball België) is het bestuursorgaan van basketball in België. De bond werd opgericht in 1933 en werd datzelfde jaar lid van FIBA.

FRBB - La Fédération Royale Belge Basket-ball (Anglais: Basketball Belgium, Néerlandais: Koninklijke Belgische Basketball Bond (KBBB), Allemand: Basketball Belgien) est l'organe directeur du basket-ball en Belgique. Fondée en 1933, elle est devenue membre de la FIBA la même année.



BASKETBAL VLAANDEREN - The "Vlaamse Basketballiga", founded in 2001, change names in 2017 to Basketbal Vlaanderen. Basketball Vlaanderen is the Flemish sports association that is responsible for the organisation and promotion of basketball sport in Flanders.

BASKETBAL VLAANDEREN - De "Vlaamse Basketballiga", opgericht in 2001, verandert in 2017 van naam in Basketbal Vlaanderen. Het is de Vlaamse sportvereniging die verantwoordelijk is voor de organisatie en promotie van basketbalsport in Vlaanderen.

BASKETBALL FLANDERS - La « Vlaamse Basketballiga », fondée en 2001, change de nom en 2017 pour devenir Basketball Vlaanderen. C'est l'association sportive flamande qui est responsable de l'organisation et de la promotion du sport de basketball en Flandre.



AWBB - The Wallonia-Brussels Basketball Association is the reference sports federation that organises and promotes the practice of basketball at the level of the French Community and contributes to its development on a national and international level.

AWBB - De basketbalvereniging Wallonië-Brussel is de referentiesportfederatie die de basketbalpraktijk op het niveau van de Franse Gemeenschap organiseert en bevordert en bijdraagt tot haar ontwikkeling op nationaal en internationaal niveau.

AWBB - L'Association Wallonie Bruxelles de basketball est la fédération sportive de référence qui organise, assure la promotion de la pratique du basketball au niveau de la Communauté française et collabore à son développement au niveau national et international.



INFRASPORTS - Since 1 January 1994, the SPW (Service Public Wallonie) has seen its competences expand by transferring the responsibility for the subsidized sports infrastructure that has operated from the French Community to the Walloon and Brussels Regions.

INFRASPORTS - Sinds 1 januari 1994 heeft de SPW (Service Public de Wallonie) haar competenties zien groeien door de verantwoordelijkheid voor de gesubsidieerde sportinfrastructuur beheerd vanuit de Franse Gemeenschap over te dragen naar het Waalse en het Brusselse Gewest.

INFRASPORTS - Depuis le 1er janvier 1994, le SPW (Service Public Wallonie) a vu ses compétences s'élargir par le transfert de la responsabilité des infrastructures sportives subsidiées qui s'est opéré de la Communauté française aux Régions wallonne et bruxelloise.



The Lighting Class describes the lighting parameters for the best possible illumination of a playing area. The following table establishes the level of competition and technical parameters.

De verlichtingsparameters voor de best mogelijke verlichting van een speelruimte worden beschreven door de verlichtingsklasse. Elk niveau van competitie (regionaal, provinciaal) wordt door een passende verlichtingsklasse en specifieke na te komen verlichtingswaarden beheerd overeenkomend met de volgende tabel.

Les paramètres d'éclairage qui permettent d'obtenir le meilleur éclairage possible d'une zone de jeu sont décrits par la Classe Éclairage. Chaque niveau de compétition (régional, provincial) est géré par une classe d'éclairage et des valeurs d'éclairage spécifiques à respecter selon le tableau suivant.

BASKETBAL VLAANDEREN (indoor)

Competition level	Lighting class	
	I	II
Provinciaal spelende clubs		✓
Nationaal en Landelijk spelende clubs	✓	

INFRASPORTS (indoor)

Competition level	Lighting class			
	I	II	III	IV
CLUB - Entrainement				✓
CLUB - Competition			✓	
NATIONAL 2 ET 3 HOMMES ET 1 FEMMES		✓		
INTERNATIONAL ET NATIONAL 1 HOMMES	✓			



BASKETBAL VLAANDEREN (indoor)

Reference Area	Class	Lighting Horizontal PA		Lighting Horizontal TA		Gr	Colour Rendering	
		Eave	Uniformity Emin/Eave	Eave	Uniformity Emin/Eave		CRI	
PA 28x15 m TA 29x16 m	II	300 lux	min. 250 lux	-	-	(40)	(60)	
PA 28x15 m TA 32x19 m	I	350 lux	min. 300 lux	-	-	(40)	(80)	







INFRASPORTS (indoor)

Reference Area	Class	Lighting Horizontal PA		Lighting Horizontal TA		Gr	Colour Rendering	
		Eave	Uniformity Emin/Eave	Eave	Uniformity Emin/Eave		CRI	
PA 28x15 m TA 32x19 m	IV	300 lux	0,70	-	-	(40)	(60)	
	III	600 lux	0,70	-	-	(35)	(80)	
	II	800 lux	0,70	-	-	(35)	(80)	
	I	1500 lux	0,70	-	-	-	-	





	GUELL 2	GUELL 2.5	GUELL 3	GUELL 4	SQUARE PRO	LAMA+ MINI	LAMA+	consult factory
								
			p. 32				p. 32	
			p. 33					

	GUELL 2	GUELL 2.5	GUELL 3	GUELL 4	SQUARE PRO	LAMA+ MINI	LAMA+	consult factory
								
			p. 34	p. 35			p. 34	
				p. 35				
								✓

The lighting values in brackets are taken by PERFORMANCE iN LIGHTING as a reference from other regulations in case the rule in question does not expressly declare them.

De verlichtingswaarden tussen haakjes zijn waarden die PERFORMANCE iN LIGHTING als referenties overneemt van andere reglementen in het geval zij niet uitdrukkelijk aangehaald worden door het reglement in kwestie.

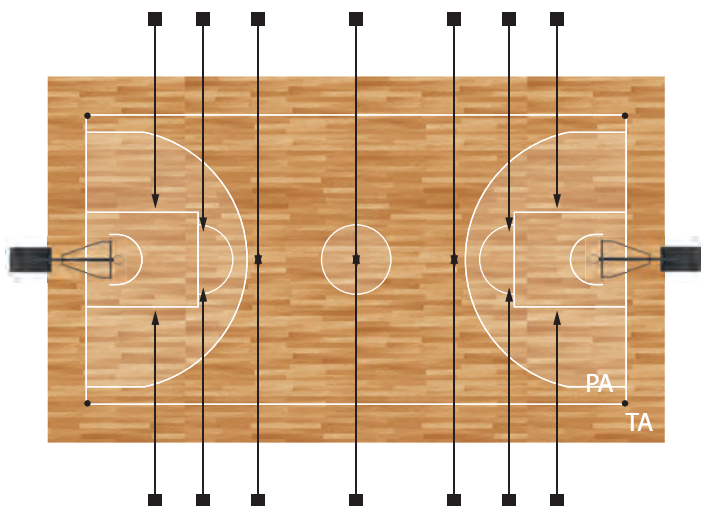
Les valeurs d'éclairage entre parenthèses sont prises par PERFORMANCE iN LIGHTING comme référence à partir d'autres règlements au cas où elles n'étaient pas expressément déclarées par le règlement en question.

BASKETBAL VLAANDEREN | 300 lux

CLASS II

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	5 points
TOTAL AREA (TA)	29 x 16 m	Grid Points (TA)	-
Eave (PA)	300 lux	Emin/Eave (PA)	min. 250 lux
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(40)



GUELL 3

3,23 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306116	A50/W	4000	231 W	14

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

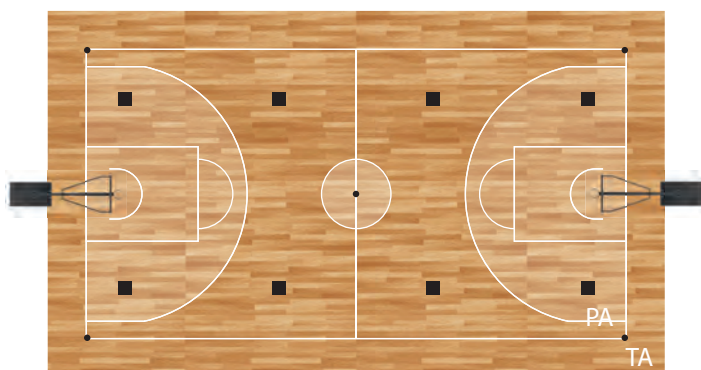
Eave (PA)	318 lux
Uniformity Emin/Eave (PA)	min. 310
Glare Rating (Rg)	32

BASKETBAL VLAANDEREN | 300 lux

CLASS II

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	5 points
TOTAL AREA (TA)	29 x 16 m	Grid Points (TA)	-
Eave (PA)	300 lux	Emin/Eave (PA)	min. 250 lux
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(40)



LAMA+

1,64 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
06271887	S/EW	4000	205 W	8

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

Eave (PA)	300 lux
Uniformity Emin/Eave (PA)	min. 287
Glare Rating (Rg)	21

BASKETBAL VLAANDEREN | 350 lux

CLASS I

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	5 points
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	-
Eave (PA)	350 lux	Emin/Eave (PA)	min. 300 lux
Colour Rendering Index (CRI)	(80)	Glare Rating (Rg)	(40)



GUILL 3

3,66 kW total power consumption

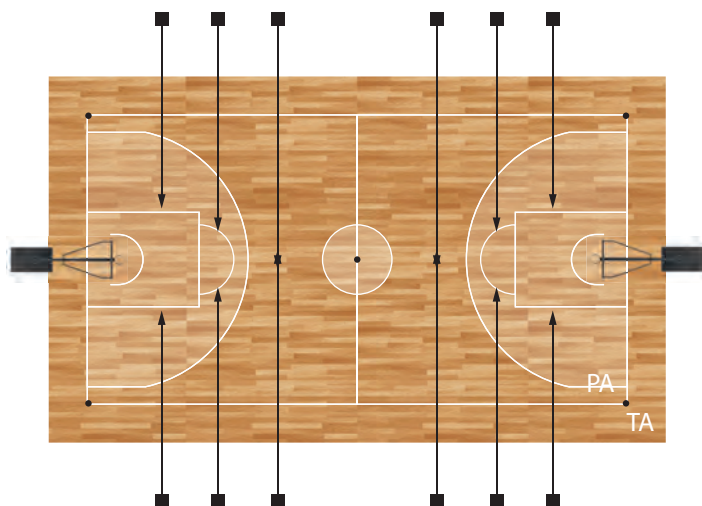
PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306114	A50/W	4000	305 W	12

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

Eave (PA)	352 lux
Uniformity Emin/Eave (PA)	min. 346
Glare Rating (Rg)	32

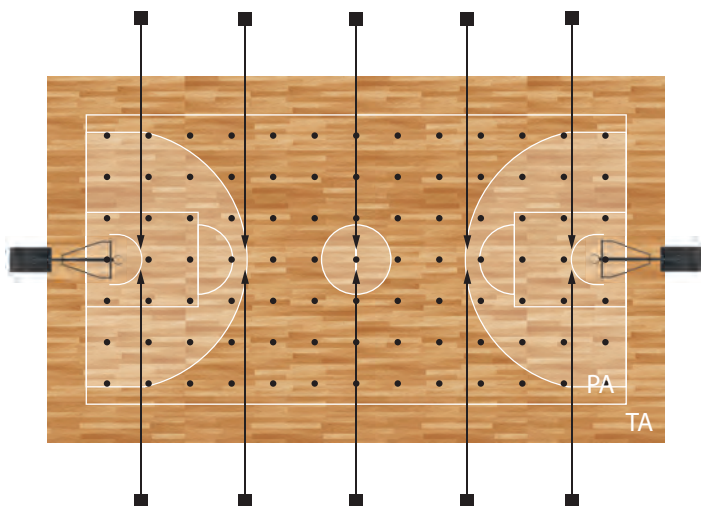


INFRASPORTS | 300 lux

CLASS IV

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	29 x 16 m	Grid Points (TA)	(15 x 9)
Eave (PA)	300 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(40)



GUELL 3

2,31 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306116	A50/W	4000	231 W	10

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

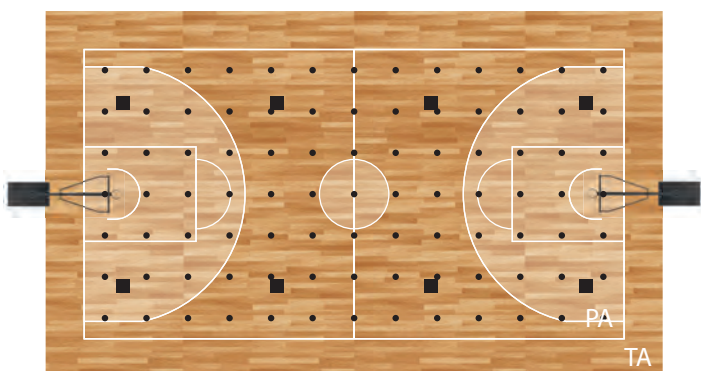
Eave (PA)	301 lux
Uniformity Emin/Eave (PA)	0,70
Glare Rating (Rg)	35

INFRASPORTS | 300 lux

CLASS IV

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	29 x 16 m	Grid Points (TA)	(15 x 9)
Eave (PA)	300 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(60)	Glare Rating (Rg)	(40)



LAMA+

1,64 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
06271887	S/EW	4000	205 W	8

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

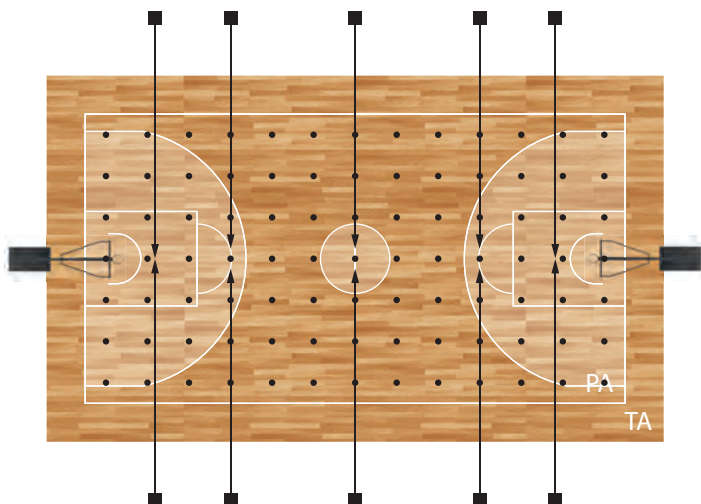
Eave (PA)	335 lux
Uniformity Emin/Eave (PA)	0,80
Glare Rating (Rg)	23

INFRASPORTS | 600 lux

CLASS III

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	(15 x 9)
Eave (PA)	600 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(80)	Glare Rating (Rg)	(35)



GUELL 4

4,48 kW total power consumption

PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306128	A50/W	4000	448 W	10

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

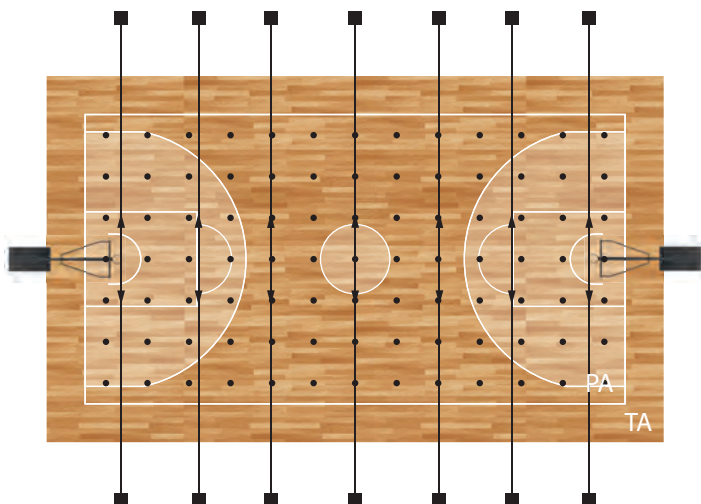
Eave (PA)	600 lux
Uniformity Emin/Eave (PA)	0,70
Glare Rating (Rg)	35

INFRASPORTS | 800 lux

CLASS II

REQUIREMENTS:

PLAY AREA (PA)	28 x 15 m	Grid Points (PA)	(13 x 7)
TOTAL AREA (TA)	32 x 19 m	Grid Points (TA)	(15 x 9)
Eave (PA)	800 lux	Emin/Eave (PA)	0,70
Colour Rendering Index (CRI)	(80)	Glare Rating (Rg)	(35)



GUELL 4

6,27 kW total power consumption

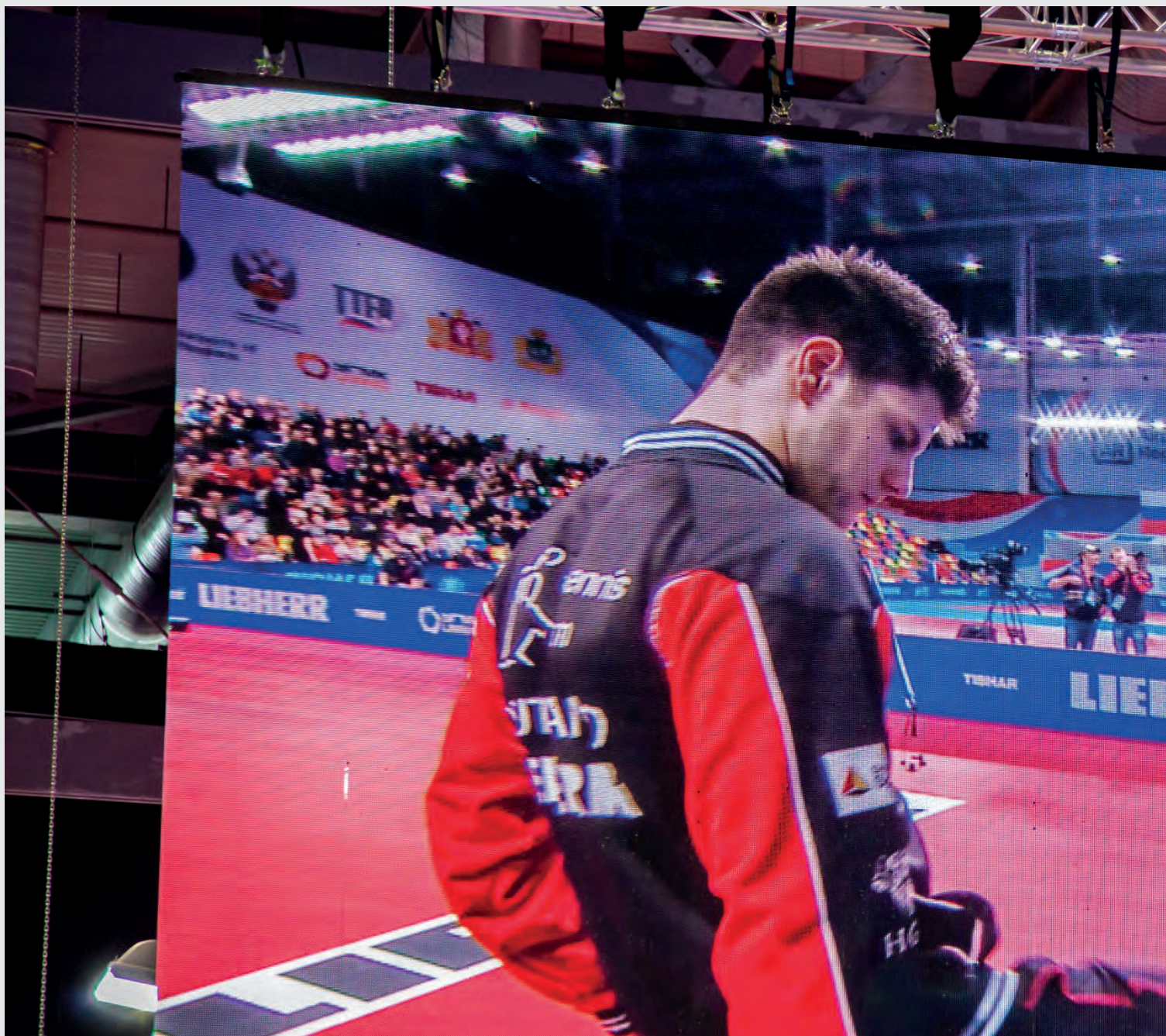
PART NUMBER	OPTIC	KELVIN	WATTAGE	Q.TY
306128	A50/W	4000	448 W	14

INSTALLATION SUMMARY:

Poles / Lines	2
Installation height	7 m
Maintenance factor	0,90

RESULTS OVERVIEW:

Eave (PA)	814 lux
Uniformity Emin/Eave (PA)	0,73
Glare Rating (Rg)	35



TLCI - TLMF

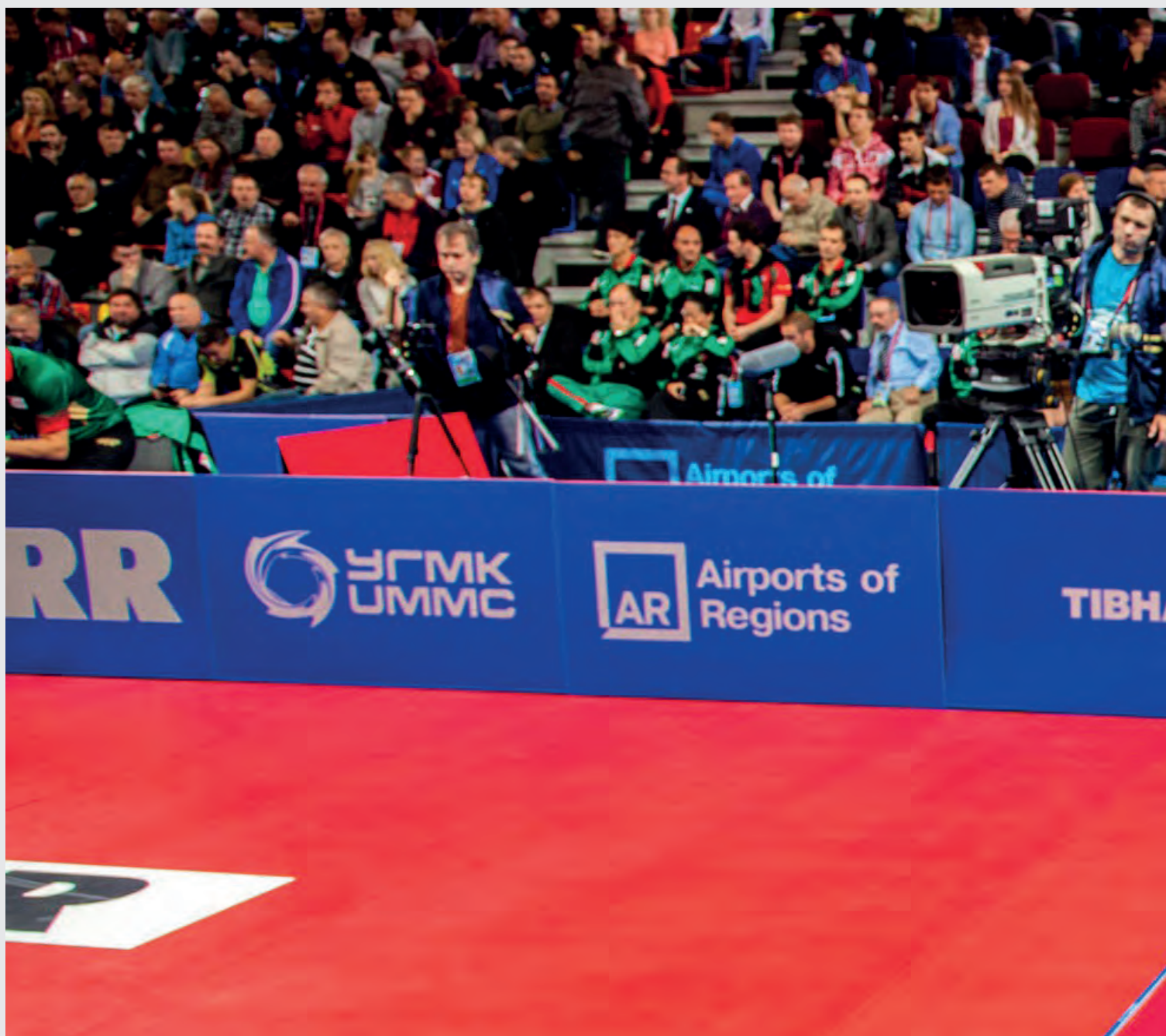
For many years the Color Rendering Index (also called CRI, colour rendering index, or Ra, average rendering) has been used to describe the ability of a light source to faithfully return the colours of an object concerning a reference source. Several measurement systems are available today, under definition or already approved internationally: Color Render Index (CRI), Color Quality Scale (CQS), Gamut Area Index (GAI), TM-30, American method of IES (Illuminating Engineering Society), CIE 224: 2017 Color Fidelity Index. All these metric systems speak about the human



perceptive system directly and not through a television camera. The Television Lighting Consistency Index (TLCI) tries to solve these problems by providing a specific colour rendering metric for video cameras like how the CRI or TM-30 works with human vision. Alongside the positive aspects of long life and energy savings, LED light sources, due to their spectral emission, can produce a different representation of the colours for the reality of the cameras, thus forcing the television producers to devote a lot of time and money in post-production. In 2012 EBU

(European Broadcasting Union) released TLCI-2012 protocol which, although not yet an international standard, has already been adopted and used by all the primary video camera and display manufacturers and by the significant producers of film and television content in the world. The TLCI is a useful tool for lighting equipment manufacturers who want to design luminaires compatible with television demands. The Television Luminaire Matching Factor (TLMF) is instead a valid tool for professionals who wish to understand how different

sources mate and mix before they even carry out lighting designs when it would be too late to remedy any problems. The EBU guidelines define, in the TLMF-2013 protocol, a single scale of evaluation of the chromatic quality of cinematographic images, to which a different weight is attributed depending on whether it is material intended for a television production. Consult PERFORMANCE iN LIGHTING pre-sales service for specific information on your project.



FLICKER FACTOR (FF)

The circumstances that produce the “flicker” phenomenon vary according to the modulations of the light source and derivatives, the frequency of alternating voltage and the frame rate of the camera. The flicker distracts and damages the viewer’s experience. Therefore, it needs to be eliminated where possible. Many institutions try to understand and synthesise this concept. Today in the definition of the TEMPORAL LIGHTING ARTIFACTS (TLA) in which they are defined, through CIE TN (Technical Note) IEC / TR 61547-1 the concept of



flicker, stroboscopic and “phantom array”. Accordingly, the flicker effect is a visible optical stimulus in the absence of eye movement in a static environment. The Flicker Factor (FF) refers specifically to the number of light modulations expressed as a percentage deriving as a ratio multiplied by 100 per cent between the maximum illumination (E_{max}) subtracted from the minimum illuminance (E_{min}) and the sum between the same E_{max} and E_{min} . Therefore, FF is a percentage number derived from a real measurement on the lighting system. UEFA 2016 standards

define FF in three levels of competition to be verified at a standardised height and degrees plan. When testing professional illumination for stadiums and arenas, it is necessary to establish the type of operating lighting system. Especially LED lighting devices, where FF depends on the type of LED power supply used, not intrinsically produce FF but reproduce faithfully the shape of the wave that arrives from the supply compartment which in this case derives from the type of current driving. A Light Flicker Meter, available on the market, is necessary to

measure this parameter after luminaires installation and aiming.



To meet the customer's needs, PERFORMANCE IN LIGHTING has over the years established a vast and structured commercial network through subsidiary companies and distributors.

The Group now exports to more than 100 countries worldwide.

PERFORMANCE IN LIGHTING S.p.A.

Viale del Lavoro 9/11
37030 Colognola ai Colli
Verona - Italy
Tel. +39 045 61 59 211
Fax +39 045 61 59 292
info.it@pil.lighting

SBP S.p.A.

Via Provinciale 57
24050 Ghisalba
Bergamo - Italy
Tel. +39 0363 94 06 11
Fax +39 0363 94 06 90
info.it@pil.lighting

**PERFORMANCE IN LIGHTING GmbH
Headquarters**

Stapelner Str. 1+3
38644 Goslar - Germany
Tel. +49 (0) 5321 3777 0
Fax +49 (0) 5321 3777 99
info.de@pil.lighting

**PERFORMANCE IN LIGHTING GmbH
München business unit**

Hauptstraße 27
82008 Unterhaching - Germany
Tel. +49 (0) 89/66 54 76 87 230
Fax +49 (0) 89/66 54 76 87 19
info.de@pil.lighting

**PERFORMANCE IN LIGHTING GmbH
Düsseldorf business unit**

Leichlinger Str. 14
40764 Langenfeld - Germany
Tel. +49 (0) 21 73/2 71 99 10
Fax +49 (0) 21 73/2 71 99 29
info.de@pil.lighting

PERFORMANCE IN LIGHTING BE

Chaussée de Haecht, 1880
Haachtsesteenweg, 1880
1130 Bruxelles / Brussels - Belgium
Tel. + 32 2 705 51 51
Fax + 32 2 705 12 87
info.be@pil.lighting

PERFORMANCE IN LIGHTING NEDERLAND

Ronde Tocht 1 C
1507 CC Zaandam - The Netherlands
Tel. + 31 75 6708 706
info.nl@pil.lighting

PERFORMANCE IN LIGHTING FRANCE S.A.S.

Paris business unit
Parc d'Activités de la Couronne des Prés
107 Avenue des Pâtis - CS 50608 Epône
78417 Aubergenville Cedex - France
Tel. +33 1 3090 5360
Fax +33 1 3090 1681
info.fr@pil.lighting

PERFORMANCE IN LIGHTING FRANCE S.A.S.

Strasbourg business unit
Impasse des Imprimeurs - ZI du Forlen
67118 Geispolsheim - France
Tel. +33 (0) 388 770777
Fax +33 (0) 388 773699
info.fr@pil.lighting

PERFORMANCE IN LIGHTING UK Ltd

Unit 4, Hepworth Park,
Brook Street, Lakeside,
Redditch, Worcestershire B98 8NZ - UK
Tel. +44 (0) 1527 58 49 26
Fax +44 (0) 1527 66 933
info.uk@pil.lighting

PERFORMANCE IN LIGHTING ESPAÑA S.A.

Pol. Industrial "La Llana"
c/Pont de Can Claverí, 58
08191 Rubí (Barcelona) - Spain
Tel. +34 93 699 5554
Fax +34 93 699 5045
info.es@pil.lighting

PERFORMANCE IN LIGHTING PORTUGAL

Estrada da Circunvalação 3558 / 3560
4435-186 Porto - Portugal
Tel. +351 229 770 624
Fax +351 229 770 699
info.pt@pil.lighting

PERFORMANCE IN LIGHTING FINLAND Oy

Tikkurikuja 1
00750 Helsinki - Finland
Tel. +358 10422 1860
Fax +358 10422 1861
info.fi@pil.lighting

PERFORMANCE IN LIGHTING USA, Inc.

2621 Keys Pointe
Conyers GA 30013 - USA
Phone +1 770 822 2115
info.usa@pil.lighting

PERFORMANCE IN LIGHTING AUSTRALASIA Pty

15 Industrial Avenue,
4076 Wacol
Brisbane - Australia
Tel. +61 (0) 7 3335 3555
Fax +61 (0) 7 3335 3522
info@performanceinlighting.com.au

PERFORMANCE IN LIGHTING - ISRAEL

Moshav Hagor Meshek 401, P.O.B. 9102 PT.
Tel. +972 3 93 40 350
Fax +972 3 93 40 350
Mob +972 53 2280477

PERFORMANCE IN LIGHTING MIDDLE EAST

Dubai Airport Free Zone
P.O.Box. 371818, Dubai, U.A.E.
Tel. +971 4 2395146
info.mea@pil.lighting

OOO PERFORMANCE IN LIGHTING RUSSIA

Reg. Office: Bolshoy Zlatoustinsky pereulok, 1,
building 1
101000 Moscow - Russian Federation
Tel. +7 (906) 0926330
info.ru@pil.lighting



PERFORMANCE iN LIGHTING S.p.A
Viale del Lavoro 9/11
37030 Colognola ai Colli (VR) - Italy
T +39 045 61 59 211
F +39 045 61 59 393

www.performanceinlighting.com