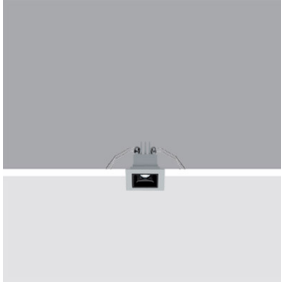# Laser Blade

Last information update: October 2024

Product configuration: MU89
MU89: Square Recessed luminaire - LED - Warm white - Flood optic

Product code
MU89: Square Recessed luminaire - LED - Warm white - Flood optic

Technical description
square miniaturised recessed luminaire for single LED - fixed optic - flood beam angle. Main body with die-cast aluminium radiant surface, version with perimeter surface frame. Metallised thermoplastic high definition optic, integrated in a rear position in the black anti-glare screen. Connecting cable supplied. Ballast not included, available with separate code. Warm white high colour rendering LED

Installation
recessed with steel wire springs for false ceilings from 1 to 20 mm thick - preparation hole 35 x 35

Colour
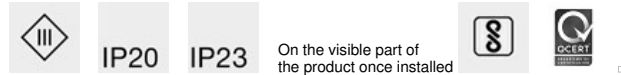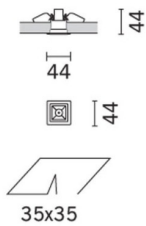White (01) | Black / Black (43) | Black / White (47)

Mounting
wall recessed|ceiling recessed

Wiring
direct current ballasts to be ordered separately: electronic (MXF9) for max. 7 LEDs; 0-10V dimmable (Y360) for max. 18 LEDs; DALI dimmable (BZM4) for max. 20 LEDs (check instructions leaflet for compatible lengths of cables to be used)
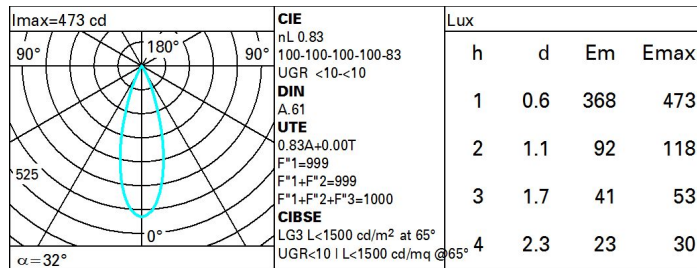
Complies with EN60598-1 and pertinent regulations

IP20   IP23   On the visible part of the product once installed

Technical data

lm system:	141	CRI (typical):	97
W system:	2.1	Colour temperature [K]:	2700
lm source:	170	MacAdam Step:	3
W source:	2.1	Life Time LED 1:	50,000h - L90 - B10 (Ta 25°C)
Luminous efficiency (lm/W, real value):	67.1	Lamp code:	LED
lm in emergency mode:	-	Number of lamps for optical assembly:	1
Total light flux at or above an angle of 90° [Lm]:	0	ZVEI Code:	LED
Light Output Ratio (L.O.R.) [%]:	83	Number of optical assemblies:	1
Beam angle [°]:	32°	LED current [mA]:	700
CRI (minimum):	95		

Polar

CIE			
nL 0.83			
100-100-100-100-83			
UGR <10-<10			
DIN			
A.61			
UTE			
0.83A+0.00T			
F"1=999			
F"1+F"2=999			
F"1+F"2+F"3=1000			
CIBSE			
LG3 L<1500 cd/m² at 65°			
UGR<10	L<1500 cd/mq @65°			

Imax=473 cd
α=32°

h	d	Em	Emax
1	0.6	368	473
2	1.1	92	118
3	1.7	41	53
4	2.3	23	30

Utilisation factors

R	77	75	73	71	55	53	33	00	DRR
K0.8	75	71	68	66	70	68	68	65	78
1.0	78	75	72	70	74	72	71	69	83
1.5	82	79	77	76	78	77	76	73	89
2.0	84	83	81	80	81	80	79	77	93
2.5	86	85	84	83	83	82	82	79	96
3.0	87	86	85	85	85	84	83	81	98
4.0	88	87	87	86	86	86	84	82	99
5.0	89	88	88	87	87	86	85	83	100

Luminance curve limit

QC	A	G	1.15	2000	1000	500		<=300		
	B		1.50		2000	1000	750	500	<=300	
	C		1.85			2000		1000	500	<=300

C0-180   C90-270
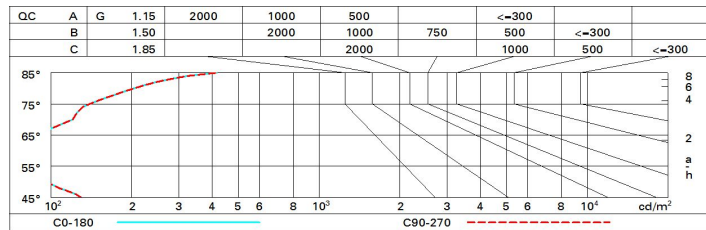
UGR diagram

Corrected UGR values (at 170 lm bare lamp luminous flux)

Riflect.: ceil/cav	walls	work pl.	0.70 0.50 0.20	0.70 0.30 0.20	0.50 0.50 0.20	0.50 0.30 0.20	0.30 0.30 0.20	0.70 0.50 0.20	0.70 0.30 0.20	0.50 0.50 0.20	0.50 0.30 0.20	0.30 0.30 0.20
Room dim x	y		viewed crosswise					viewed endwise				
2H	2H		-3.3	-2.7	-3.0	-2.5	-2.3	-3.3	-2.7	-3.0	-2.5	-2.3
	3H		-3.3	-2.9	-3.0	-2.6	-2.3	-3.4	-2.9	-3.1	-2.6	-2.4
	4H		-3.3	-2.9	-3.0	-2.6	-2.3	-3.4	-3.0	-3.1	-2.7	-2.4
	6H		-3.3	-2.9	-3.0	-2.6	-2.3	-3.5	-3.1	-3.2	-2.8	-2.5
	8H		-3.3	-2.9	-2.9	-2.6	-2.2	-3.5	-3.2	-3.2	-2.8	-2.5
	12H		-3.2	-2.8	-2.8	-2.5	-2.1	-3.6	-3.2	-3.2	-2.9	-2.5
4H	2H		-3.4	-3.0	-3.1	-2.7	-2.4	-3.3	-2.9	-3.0	-2.6	-2.3
	3H		-3.5	-3.1	-3.1	-2.8	-2.4	-3.4	-3.1	-3.1	-2.7	-2.4
	4H		-3.5	-3.2	-3.1	-2.8	-2.4	-3.5	-3.2	-3.1	-2.8	-2.4
	6H		-3.4	-3.1	-3.0	-2.7	-2.3	-3.5	-3.3	-3.1	-2.9	-2.4
	8H		-3.3	-3.0	-2.8	-2.6	-2.2	-3.6	-3.3	-3.1	-2.9	-2.5
	12H		-3.1	-2.8	-2.6	-2.4	-2.0	-3.6	-3.4	-3.1	-2.9	-2.5
8H	4H		-3.6	-3.3	-3.1	-2.9	-2.5	-3.3	-3.0	-2.8	-2.6	-2.2
	6H		-3.4	-3.2	-2.9	-2.7	-2.2	-3.2	-3.0	-2.8	-2.6	-2.1
	8H		-3.2	-3.0	-2.7	-2.5	-2.0	-3.2	-3.0	-2.7	-2.5	-2.0
	12H		-2.8	-2.7	-2.3	-2.2	-1.7	-3.1	-3.0	-2.6	-2.5	-2.0
12H	4H		-3.6	-3.4	-3.1	-2.9	-2.5	-3.1	-2.8	-2.6	-2.4	-2.0
	6H		-3.4	-3.2	-2.9	-2.7	-2.2	-2.9	-2.8	-2.5	-2.3	-1.8
	8H		-3.1	-3.0	-2.6	-2.5	-2.0	-2.8	-2.7	-2.3	-2.2	-1.7

Variations with the observer position at spacing:

S =	1.0H	5.6 / -3.8	5.6 / -3.8
	1.5H	8.3 / -4.0	8.3 / -4.0
	2.0H	10.3 / -4.1	10.3 / -4.1