

customer:

date: 25.08.2021

Harman Professional Denmark ApS.  
Olof Plames Allé 14

8200 Aarhus N  
Denmark

project No: 21000131-7

inspection order: Photometric measurement according DIN EN 13032-1,  
EN 13032-4:2015 and IES LM-79-08

- measurement of intensity distribution
- measurement of luminous flux

measurement procedure: - measurement with goniophotometer according DIN EN 13032

test sample specification:

luminaire: LED fixture for stage and studio, direct beam

description: MAC Ultra Wash - medium

Serial No.: 15064036359

power supply: Electronics, integrated

DMX settings: zoom: 18943  
focus: 32768  
Fans: Constant Fan Full

test sample dimensions:

luminaire dimensions:

length:	300 mm
width:	450 mm
height:	855 mm
diameter:	- mm

dimensions of luminant areas:

length:	- mm
width:	- mm
height:	- mm
diameter:	220 mm

measurement configuration:

	area	step size
C- planes	0 - 360°	1°
γ- angle	0 - 90°	2.5°

luminaire position: hanging, light beam vertical

light center: central, bottom of light output

test results:

stabilization time: 30 min.

stability of luminous flux: &lt; 1%

luminous flux:

upper half space	lower half space	overall
-	65668,09 lm	65668,09 lm
-	100 %	100 %

max. luminous intensity: 367327,9 cd @ ( $\gamma=0^\circ/C=0^\circ$ )

beam angles:

half beam 50 % : 27,2°

field angle 10% : 37,7°

cutoff angel 3% : 39,6°

symmetry condition: rotational symmetric

luminous efficiency: 49,24 lm/W

electrical operating conditions:

voltage: 230,0 V (const. < 0.1%)

current: 5,838 A

system power: 1333,6 W

power factor: 0,993

ambient temperature:

T= 25° C ± 1° C

The company ILUmetriX insures that all statements are made by the best of knowledge, according to European standards.

Meschede, 25.08.2021



F. Siepe (Management Board)



annex: page 3-9 testreport  
 page 10 testsample  
 page 11 testequipment

## PHOTOMETRIC RESULTS

Manufacturer:	Harman Professional ApS	Voltage:	230,03 V
Name:	MAC Ultra Wash - medium	Current:	5,837 A
Report:	21000131-7	Power:	1333,6 W
Date:	24.08.2021 10:24:56		
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## Cones (C0-359-1, G0-90-2,5, S7)

LiTG-class:	A60		
UTE-class:	Not available		
IES-class:	100 - 100 - 100 - 100 - 100		
TM5-class:	BZ1		
Divergences in the plane through maximum intensity:			
	Horizontal	Vertical	
One half peak divergence:	27,2°	27,2°	
Half peak side angle (left):	-13,6°	-13,6°	
Half peak side angle (right):	13,6°	13,6°	
One tenth peak divergence:	37,7°	37,7°	
Tenth peak side angle (left):	-18,8°	-18,8°	
Tenth peak side angle (right):	18,8°	18,8°	

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### Intensity [cd] MAC Ultra Wash - medium

G/C [cd]	0,0
0,0	367327,9
2,5	357368,6
5,0	331627,1
7,5	295808,7
10,0	254938,4
12,5	209200,2
15,0	150204,4
17,5	73552,8
20,0	4983,7
22,5	189,5
25,0	73,7
27,5	46,4
30,0	32,3
32,5	24,0
35,0	19,4
37,5	16,6
40,0	14,2
42,5	11,9
45,0	10,0
47,5	8,6
50,0	7,5
52,5	6,6
55,0	5,8
57,5	5,1
60,0	4,4
62,5	3,8
65,0	3,3
67,5	2,8
70,0	2,4
72,5	2,0
75,0	1,5
77,5	1,2
80,0	0,9
82,5	0,7
85,0	0,5
87,5	0,3
90,0	0,1

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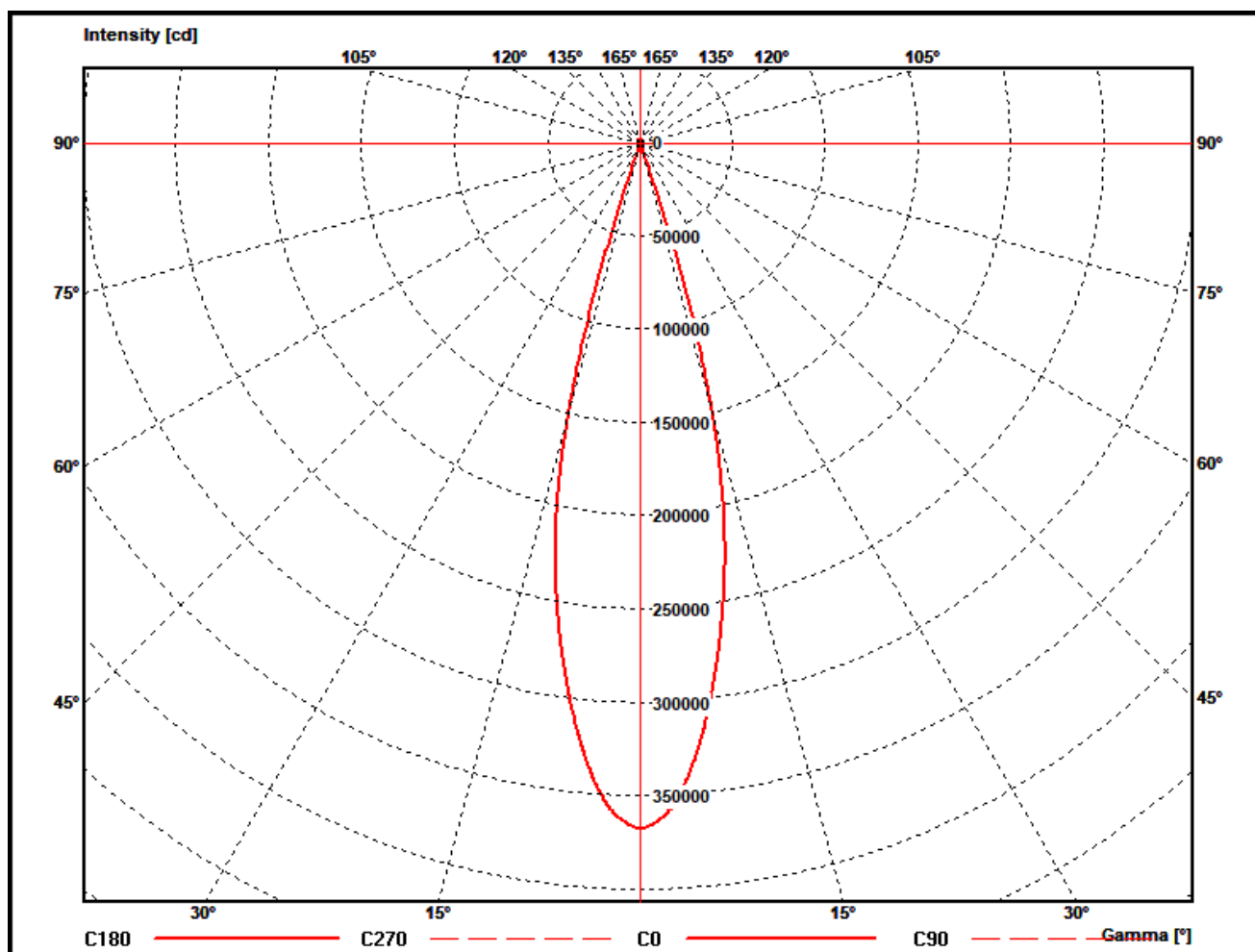
### Zonal flux MAC Ultra Wash - medium

Gamma [°]	Imin [cd/klm]	Imax [cd/klm]	Imean [cd/klm]	Zonal flux [lm]	Sum. zonal flux [lm]	Rel. zonal flux [%]	Sum. rel. zonal flux [%]
0,0	5593,7	5593,7	5593,7	0,00	0,00	0,00	0,00
2,5	5442,0	5442,0	5442,0	2166,92	2166,92	3,30	3,30
5,0	5050,0	5050,0	5050,0	6176,58	8343,49	9,41	12,71
7,5	4504,6	4504,6	4504,6	9362,63	17706,12	14,26	26,96
10,0	3882,2	3882,2	3882,2	11483,68	29189,80	17,49	44,45
12,5	3185,7	3185,7	3185,7	12411,27	41601,07	18,90	63,35
15,0	2287,3	2287,3	2287,3	11709,00	53310,07	17,83	81,18
17,5	1120,1	1120,1	1120,1	8582,28	61892,34	13,07	94,25
20,0	75,9	75,9	75,9	3460,22	65352,56	5,27	99,52
22,5	2,9	2,9	2,9	256,99	65609,55	0,39	99,91
25,0	1,1	1,1	1,1	14,53	65624,09	0,02	99,93
27,5	0,7	0,7	0,7	7,28	65631,37	0,01	99,94
30,0	0,5	0,5	0,5	5,19	65636,55	0,01	99,95
32,5	0,4	0,4	0,4	4,00	65640,56	0,01	99,96
35,0	0,3	0,3	0,3	3,31	65643,87	0,01	99,96
37,5	0,3	0,3	0,3	2,92	65646,79	0,00	99,97
40,0	0,2	0,2	0,2	2,64	65649,43	0,00	99,97
42,5	0,2	0,2	0,2	2,37	65651,79	0,00	99,98
45,0	0,2	0,2	0,2	2,08	65653,88	0,00	99,98
47,5	0,1	0,1	0,1	1,85	65655,72	0,00	99,98
50,0	0,1	0,1	0,1	1,66	65657,38	0,00	99,98
52,5	0,1	0,1	0,1	1,51	65658,89	0,00	99,99
55,0	0,1	0,1	0,1	1,37	65660,27	0,00	99,99
57,5	0,1	0,1	0,1	1,24	65661,51	0,00	99,99
60,0	0,1	0,1	0,1	1,11	65662,61	0,00	99,99
62,5	0,1	0,1	0,1	0,99	65663,60	0,00	99,99
65,0	0,1	0,1	0,1	0,87	65664,47	0,00	99,99
67,5	0,0	0,0	0,0	0,77	65665,24	0,00	100,00
70,0	0,0	0,0	0,0	0,67	65665,91	0,00	100,00
72,5	0,0	0,0	0,0	0,57	65666,48	0,00	100,00
75,0	0,0	0,0	0,0	0,45	65666,94	0,00	100,00
77,5	0,0	0,0	0,0	0,35	65667,29	0,00	100,00
80,0	0,0	0,0	0,0	0,28	65667,56	0,00	100,00
82,5	0,0	0,0	0,0	0,21	65667,78	0,00	100,00
85,0	0,0	0,0	0,0	0,16	65667,93	0,00	100,00
87,5	0,0	0,0	0,0	0,10	65668,03	0,00	100,00
90,0	0,0	0,0	0,0	0,05	65668,09	0,00	100,00

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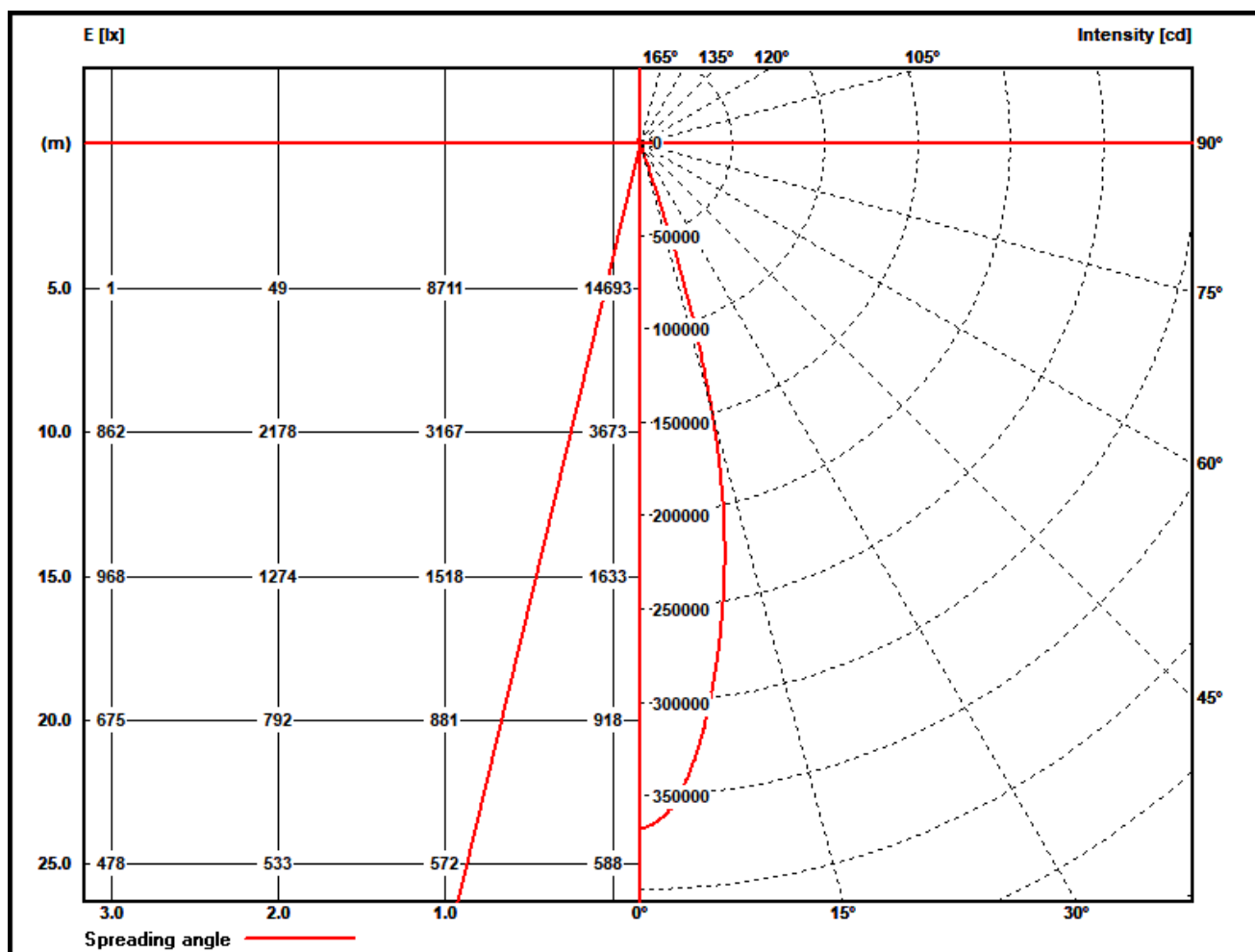
### Polar diagram MAC Ultra Wash - medium



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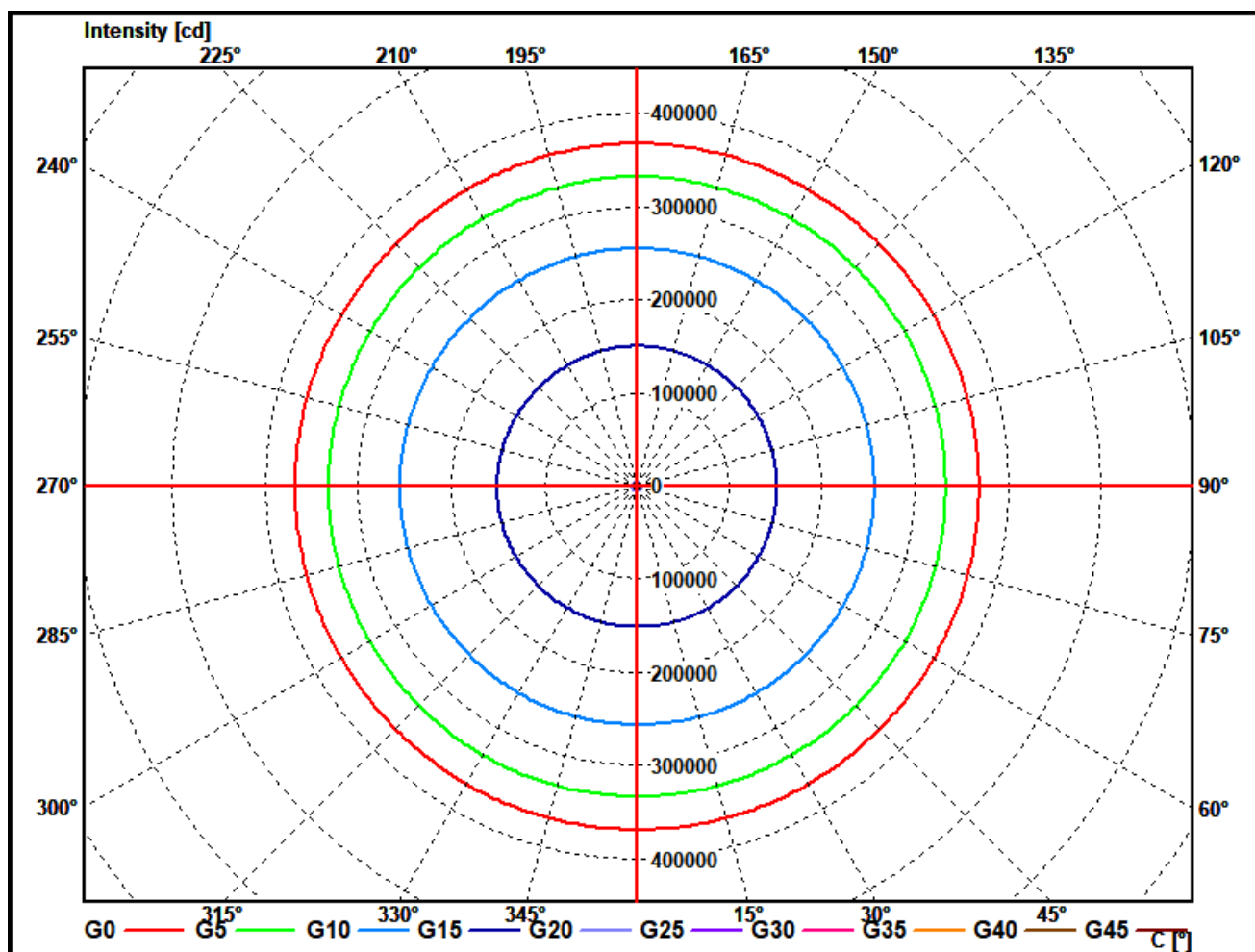
### Illuminance and Intensity diagram MAC Ultra Wash - medium



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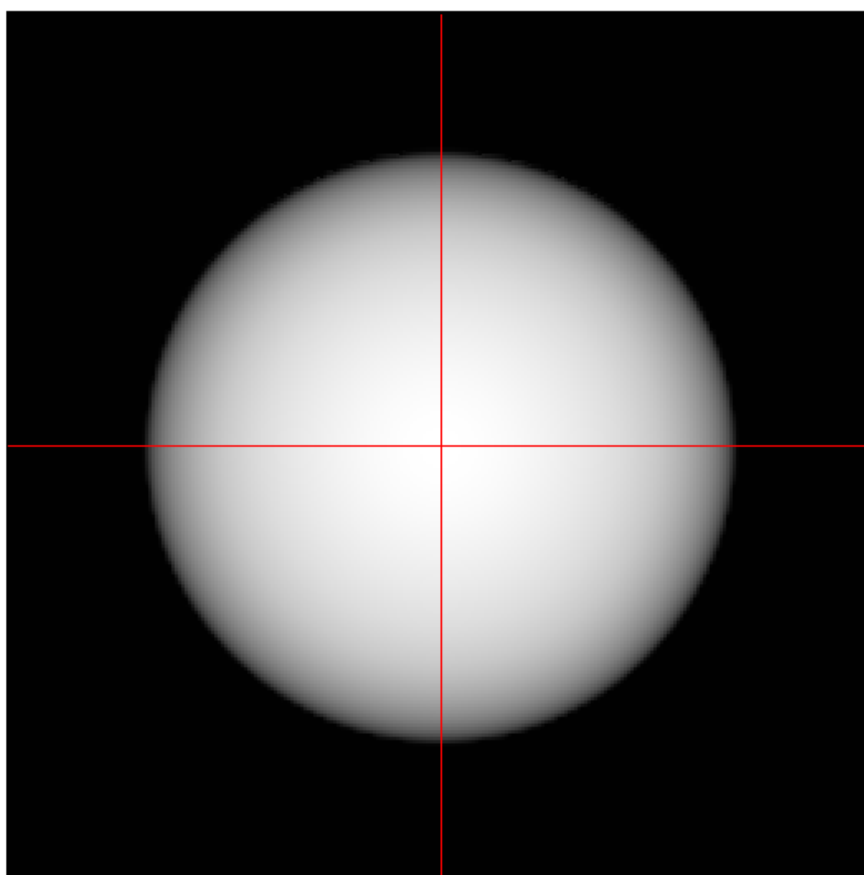




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### Isoline diagram MAC Ultra Wash - medium



Luminaire mounting height above ground: 15 m  
Luminaire rotation angle: 0 °

testsample:

dimensions [L x W x H]: 300 x 450 x 855 mm



*test equipment - ILUmetriX GmbH*

- goniophotometer with mirror arrangement GO-DS 2000 No.: 09A84831	Manufacturer: LMT GmbH, Berlin
- Photometer head GO-DS 2000, Nr.: 09A84812	Manufacturer: LMT GmbH, Berlin
- integrating sphere UL 1650/2250, Nr.: 09A8482	Manufacturer: LMT GmbH, Berlin
- colormeter C 1210 with colorimeterhead CH60	Manufacturer: LMT GmbH, Berlin
- power supply, Chroma 6415	Manufacturer: Chroma ATE INC.
- powermeter, Yokogawa WT 2010	Manufacturer: Yokogawa, Japan

*calibration data:*

*goniophotometer with mirror arrangement*

photometer unit with photometer head SP30S0T-GODS Serial No.: 09A84811 mit 09A84812	October 2018
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*integrating sphere*

colormeter with colorimeterhead Type: C 1210 with CH 60 serial No. 09A84831 mit 09A84832	October 2018
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