



HERCULUX
恒坤光电

Chengdu HercuLux Photoelectric
Technology Co.,Ltd
Product Approval

Approval number :

Customer :

Manufacturer : Chengdu HercuLux Photoelectric Technology Co.,Ltd

PN	Code	Product
HK-DX-62@30-15-D12-21-1g-1	1.01.02566	HK low glare 62@30-15 degree lens
HK-DX-62@30-24-D12-21-1g-1	1.01.02548	HK low glare 62@30-24 degree lens
HK-DX-62@30-36-D12-21-1g-1	1.01.02573	HK low glare 62@30-36 degree lens
HK-DX-62@30-60-D12-21-1g-1	1.01.12805	HK low glare 62@30-60 degree lens



Supplier confirmation				Client confirmation			
Proposed		DATE		Qualified <input type="checkbox"/>		DATE	
Project manager		DATE		Unqualified <input type="checkbox"/>		DATE	
Audit		DATE		Audit		DATE	
Approved		DATE		Approved		DATE	
Stamp		DATE		Stamp		DATE	

(Confirmation of acceptance by both parties must be signed and sealed)

Factory: Chengdu Shuangliu District, Iot industrial park 2 road HercuLux Photoelectric Park

Phone : 028-85887727 (801) 028-85887990 (801)

Fax : 028-85887730

<http://www.herculux.cn/>

Sales Dept: Shenzhen Nanshan District Nanshan Cloud Valley Innovation Industrial Park Comprehensive Service Building, 501-505

TEL: 0755-2937 1541

FAX: 0755-2907 5140

*Approval In duplicate , for both supplier and customer.

Disclaimer

Please use this product within the permitted range and environment according to the structure and material of the product. If the usage exceeds the recommended value, please test and verify by yourself. If the product is damaged due to out-of-range use, our company will not be responsible for the warranty.

Product material:

Customized products: The specifications and models of materials used are subject to the agreement between the two parties.

Conventional products: As a product that we continuously research and improve, under the premise of ensuring the quality and availability of the product, our company reserves the right to change the material. If the material specification and model change, without prior notice.

product data:

The measurement data and dimensional tolerances of the 2D drawings in the product data sheet of this acknowledgement are for reference only, and the final size shall prevail in kind.

The measurement data presented in this acknowledgment is a performance test of the product based on our company's internal test conditions and quality requirements, and the reported data is a typical value of the average results of multiple measurements. Therefore, in some cases, the actual product may deviate from the data provided. We reserve the right to notify you in advance of this data.

Product changes and improvements:

Changes and improvements of customized products are subject to the agreement between the two parties in the contract or technical documents.

As the conventional products that we continue to research and improve, our company reserves the right to make technical changes to its products, and reserves the right to make changes to data resulting from improvements without prior notice.

Operation cautions:

1. Please wear clean gloves during product assembly to prevent product surface contamination.
2. Try to avoid touching the optical surface of the lens when taking the lens.
3. When the surface of the product is polluted, please wipe it gently with a soft cotton cloth dipped in analytically pure neutral solvent. It is forbidden to use industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA monomer, etc.) wipe.
4. The lens made of PC should not be exposed to direct sunlight in the storage and use environment. If the lens turns yellow or cracks due to long-term sunlight exposure, our company will not be responsible for the warranty.



HERCULUX
恒坤光电

Product Approval

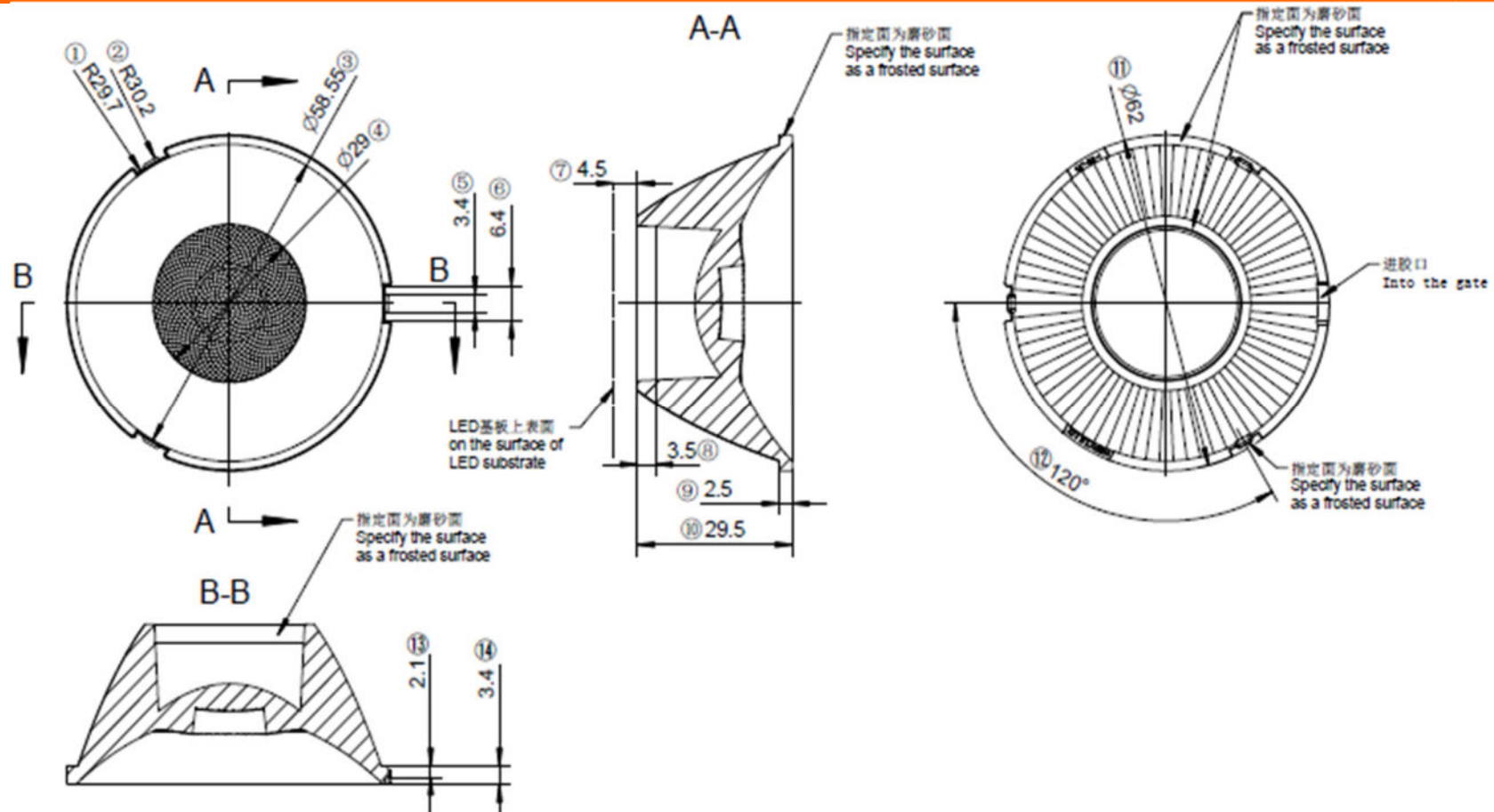
TEL: 0755-2937 1541

FAX: 0755-2907 5140

<http://www.herculux.cn/>

Date updated: 2023/8/26

Product Picture:	
PN:	HK-DX-62@30-15-D12-21-1g-1
Size(L*W*H/Φ*H):	Φ:62mm; H:30mm
Material:	PC
Efficiency:	\
Temperature(Topr):	Material extreme temperature resistance : -40°C to +120°C long-term use temperature : -40°C to +90°C
FWHM:	15°、24°、36°、60°
Matched LES:	CREE 1820
Recommended MAX power:	30W

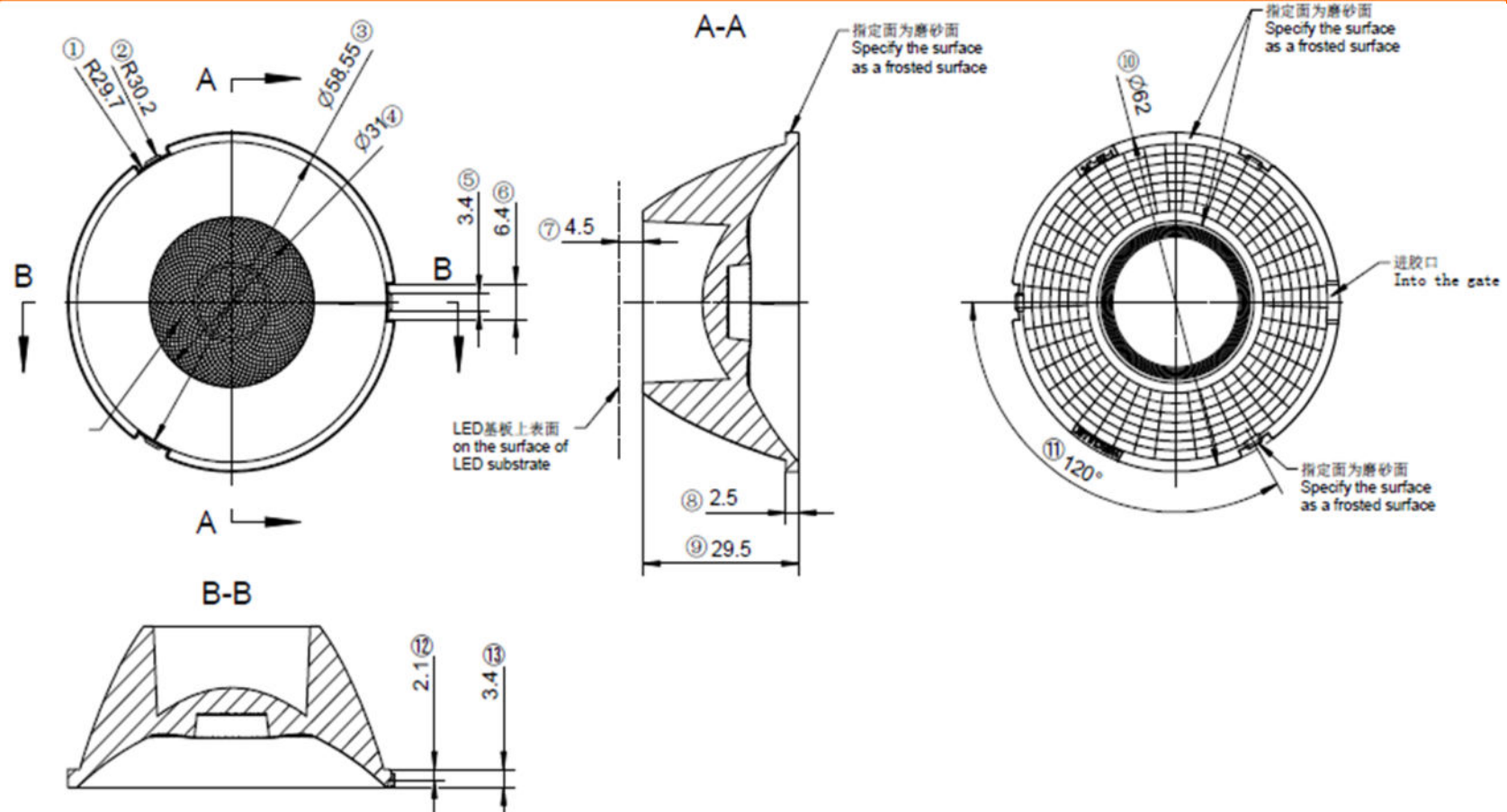


Technical remark:

1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design				HK-DX-62@30-15-D12-21-1g-1		
Structure design				HK low glare 62@30-15 degree lens		
Review				Number of drawing	qty	weight
Validation				CDHK		
				Material:	PC	

MT5 Tolerance table (mm)	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
	Tolerance value	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0

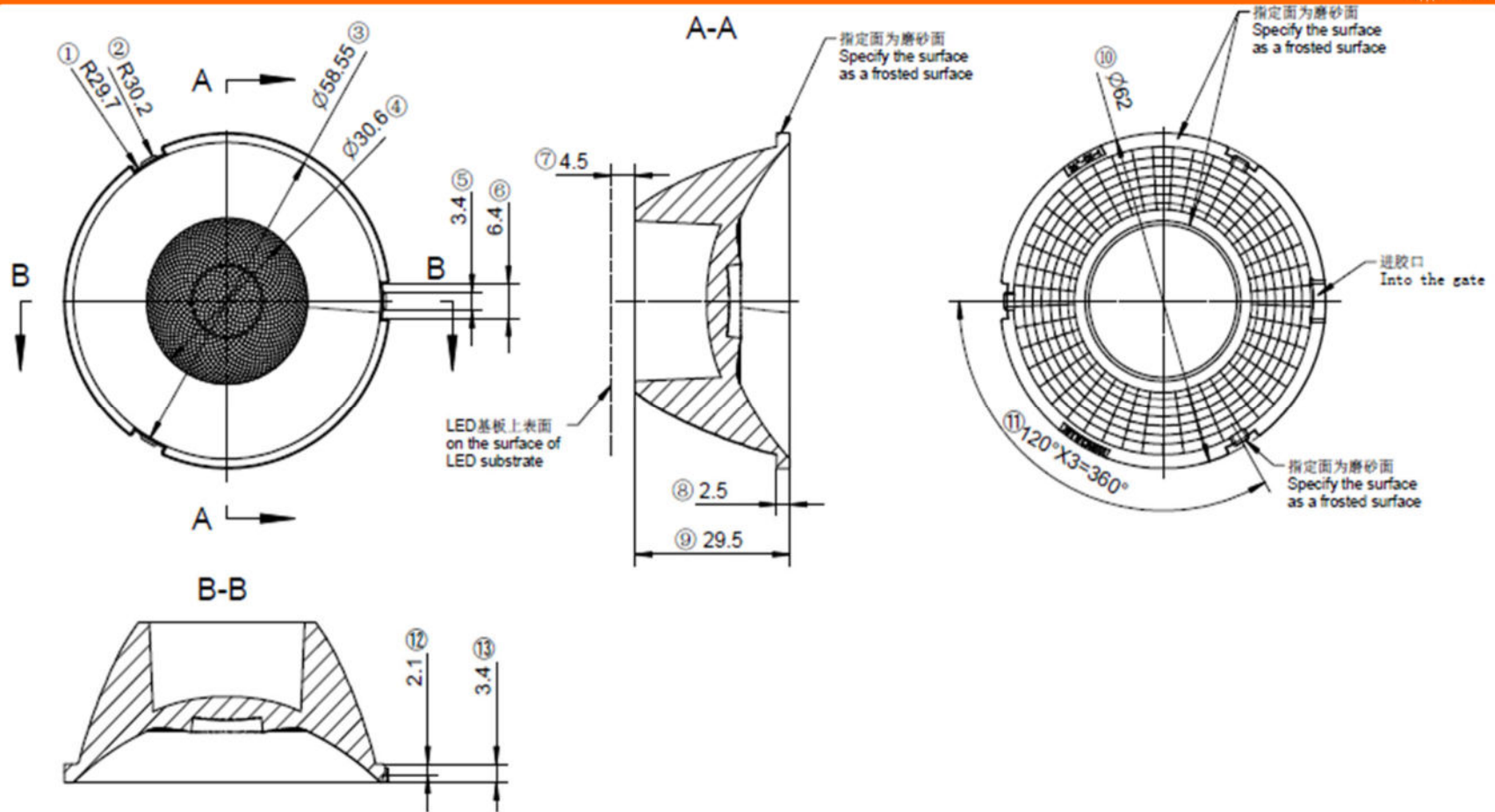


Technical remark:

1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design				HK-DX-62@30-24-D12-21-1g-1		
Structure design				HK low glare 62@30-24 degree lens		
Review				Number of drawing	qty	weight
Validation				CDHK		
				Material:	PC	

MT5 Tolerance table (mm)	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
	Tolerance value	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0

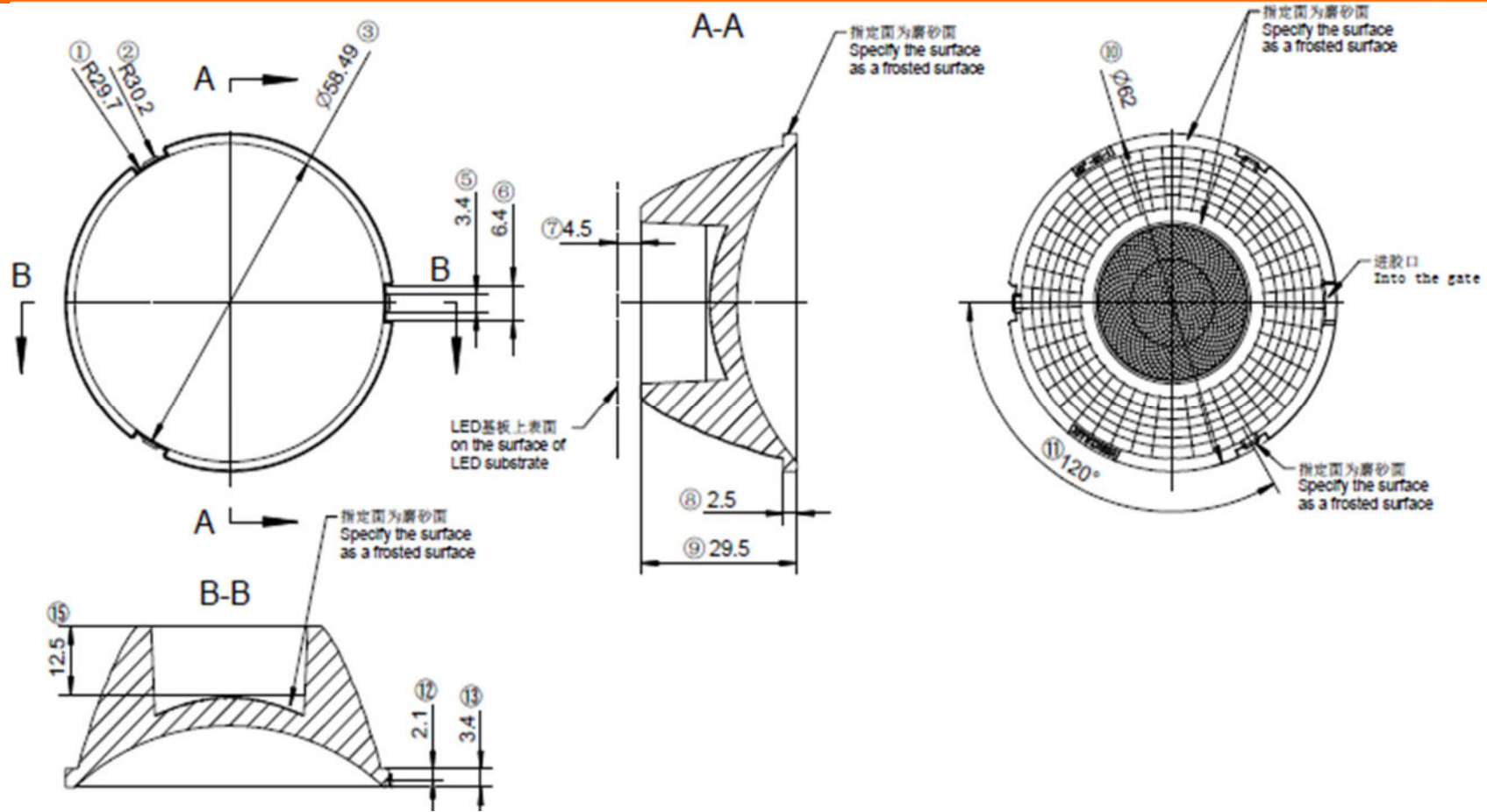


Technical remark:

1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design				HK-DX-62@30-36-D12-21-1g-1		
Structure design				HK low glare 62@30-36 degree lens		
Review				number of drawing	qty	weight
Validation				CDHK		
				Material:	PC	

MT5 Tolerance table (mm)	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
	tolerance value	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0

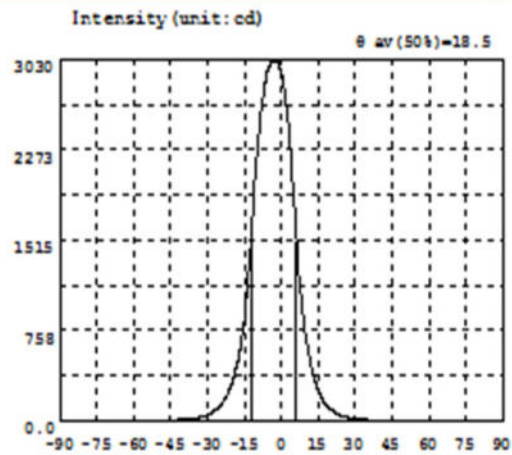
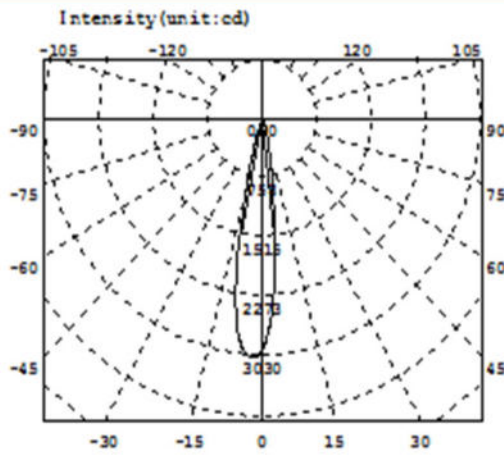


Technical remark:

1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design				HK-DX-62@30-60-D12-21-1g-1		
Structure design				HK low glare 62@30-60 degree lens		
Review				Number of drawing	qty	weight
Validation				CDHK		
				Material:	PC	

MT5 Tolerance table (mm)	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
	olerance value		± 0.1	± 0.15	± 0.35	± 0.50	± 0.80	± 1.2



Intensity data: (deg , cd) C0-180

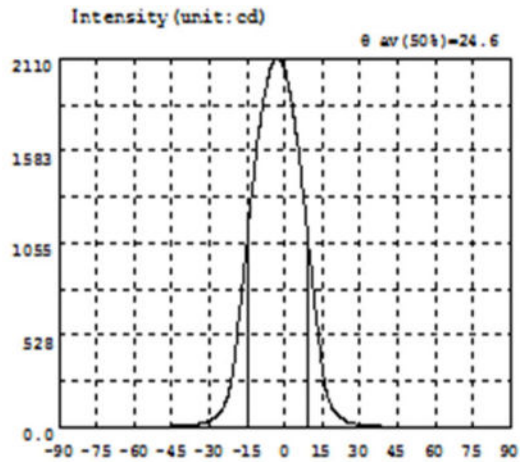
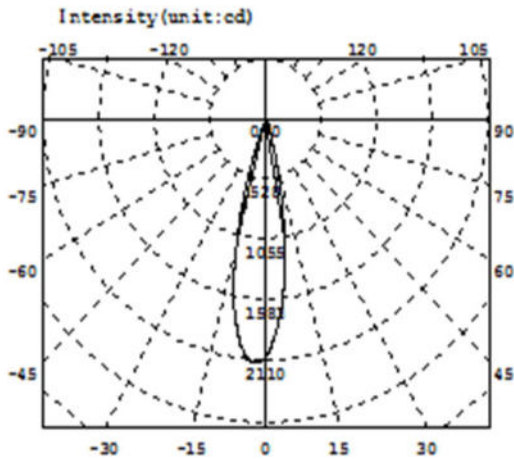
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.5197	-58.5	3.862	-27.0	90.39	4.5	2060	36.0	9.512	67.5	1.092
-88.5	0.6224	-57.0	4.193	-25.5	116.3	6.0	1599	37.5	8.405	69.0	1.021
-87.0	0.6658	-55.5	4.563	-24.0	151.6	7.5	1169	39.0	7.619	70.5	0.9832
-85.5	0.6427	-54.0	4.943	-22.5	198.9	9.0	862.7	40.5	6.968	72.0	1.062
-84.0	0.6749	-52.5	5.305	-21.0	263.1	10.5	640.5	42.0	6.418	73.5	0.8218
-82.5	0.6975	-51.0	5.666	-19.5	350.7	12.0	480.8	43.5	5.897	75.0	0.7737
-81.0	0.7221	-49.5	6.128	-18.0	467.7	13.5	360.0	45.0	5.520	76.5	0.6722
-79.5	0.7475	-48.0	6.655	-16.5	629.6	15.0	262.0	46.5	5.115	78.0	0.6208
-78.0	0.8542	-46.5	7.313	-15.0	854.5	16.5	196.7	48.0	4.714	79.5	0.5593
-76.5	0.9575	-45.0	8.072	-13.5	1181	18.0	148.0	49.5	4.316	81.0	0.5230
-75.0	1.037	-43.5	9.017	-12.0	1612	19.5	112.7	51.0	3.999	82.5	0.5460
-73.5	1.171	-42.0	10.22	-10.5	2058	21.0	87.40	52.5	3.694	84.0	0.5522
-72.0	1.327	-40.5	11.82	-9.0	2423	22.5	66.84	54.0	3.437	85.5	0.5270
-70.5	1.536	-39.0	13.89	-7.5	2704	24.0	50.98	55.5	3.184	87.0	0.5447
-69.0	1.819	-37.5	16.74	-6.0	2890	25.5	39.03	57.0	2.926	88.5	0.5756
-67.5	2.081	-36.0	20.53	-4.5	2992	27.0	30.43	58.5	2.640	90.0	0.5933
-66.0	2.368	-34.5	25.69	-3.0	3019	28.5	23.82	60.0	2.335		
-64.5	2.669	-33.0	32.41	-1.5	3014	30.0	18.93	61.5	1.958		
-63.0	2.950	-31.5	41.18	0.0	2921	31.5	15.39	63.0	1.686		
-61.5	3.237	-30.0	53.25	1.5	2731	33.0	12.78	64.5	1.353		
-60.0	3.539	-28.5	69.56	3.0	2449	34.5	10.92	66.0	1.184		

Electricity Parameter:

Current I: 0.1000A Power: 3.279W
Voltage V: 32.79V PF: 1.000

Optical Parameter (Distance=2.410m) :

Equivalent Luminous flux: $\phi_{eff} = 434.3lm$ Efficiency: $Eff = 132.46lm/W$
Diffuse angle: @ (25%): 25.1deg @ (50%): 18.5deg @ (75%): 13.3deg @ (50%): 18.5deg
Diffuse angle: @ (25%): 25.5deg @ (50%): 18.9deg @ (75%): 13.9deg @ (50%): 18.9deg
Imax=3024cd (C=0.0deg, G=-2.0deg) C0-180Plane Imax= 3024cd (G=-2.0deg)
C0-180Plane IO= 2921cd



Intensity data:(deg , cd) C0-180

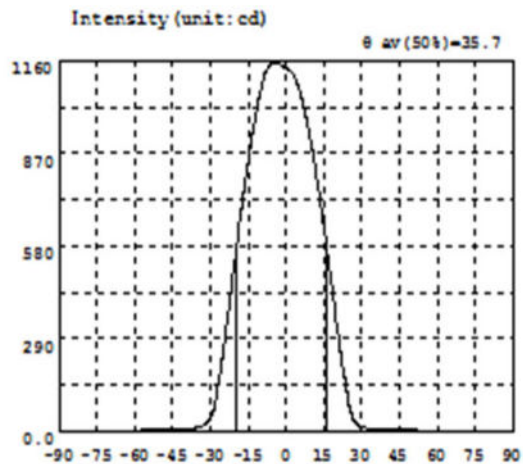
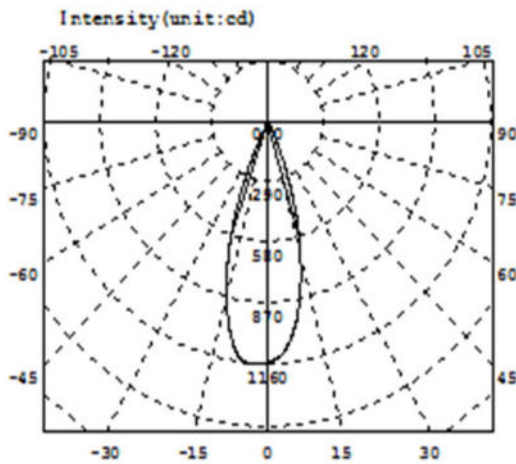
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.4519	-58.5	3.666	-27.0	71.48	4.5	1698	36.0	8.994	67.5	1.133
-88.5	0.4296	-57.0	4.199	-25.5	94.95	6.0	1531	37.5	7.846	69.0	1.019
-87.0	0.4197	-55.5	4.522	-24.0	129.0	7.5	1335	39.0	6.994	70.5	0.8967
-85.5	0.4324	-54.0	4.861	-22.5	186.4	9.0	1130	40.5	6.390	72.0	0.7733
-84.0	0.4773	-52.5	5.191	-21.0	283.8	10.5	919.0	42.0	5.951	73.5	0.5575
-82.5	0.5545	-51.0	5.441	-19.5	455.0	12.0	714.8	43.5	5.596	75.0	0.5054
-81.0	0.5757	-49.5	5.651	-18.0	649.0	13.5	525.3	45.0	5.395	76.5	0.4952
-79.5	0.6280	-48.0	5.918	-16.5	854.4	15.0	346.1	46.5	5.195	78.0	0.5013
-78.0	0.8108	-46.5	6.395	-15.0	1070	16.5	219.0	48.0	4.924	79.5	0.5123
-76.5	0.8880	-45.0	6.919	-13.5	1282	18.0	145.5	49.5	4.636	81.0	0.5230
-75.0	0.9265	-43.5	7.668	-12.0	1483	19.5	104.5	51.0	4.392	82.5	0.5301
-73.5	0.9989	-42.0	8.858	-10.5	1663	21.0	77.40	52.5	4.070	84.0	0.4760
-72.0	1.095	-40.5	10.41	-9.0	1815	22.5	57.46	54.0	3.792	85.5	0.5536
-70.5	1.321	-39.0	12.44	-7.5	1938	24.0	43.19	55.5	3.445	87.0	0.4572
-69.0	1.700	-37.5	14.76	-6.0	2034	25.5	33.15	57.0	3.149	88.5	0.3984
-67.5	2.005	-36.0	17.58	-4.5	2092	27.0	26.24	58.5	2.834	90.0	0.4858
-66.0	2.372	-34.5	21.20	-3.0	2110	28.5	21.34	60.0	2.448		
-64.5	2.737	-33.0	25.59	-1.5	2096	30.0	17.80	61.5	2.108		
-63.0	3.058	-31.5	31.86	0.0	2049	31.5	14.87	63.0	1.800		
-61.5	3.318	-30.0	40.92	1.5	1961	33.0	12.46	64.5	1.482		
-60.0	3.569	-28.5	53.97	3.0	1839	34.5	10.61	66.0	1.236		

Electricity Parameter:

Current I: 0.1000A Power: 3.279W
 Voltage V: 32.79V PF: 1.000

Optical Parameter (Distance=2.410m) :

Equivalent Luminous flux: Φ_{eff} = 414.9lm Efficiency: $Eff = 126.55lm/W$
 Diffuse angle: @ (25%) : 32.3deg @ (50%) : 24.6deg @ (75%) : 16.6deg @ (50%) : 24.6deg
 Diffuse angle: @ (25%) : 32.6deg @ (50%) : 25.0deg @ (75%) : 17.4deg @ (50%) : 25.0deg
 Imax=2110cd (C=0.0deg, G=-3.0deg) C0-180Plane Imax= 2110cd(G=-3.0deg)
 C0-180Plane I0= 2049cd



Intensity data:(deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.2373	-58.5	3.848	-27.0	143.4	4.5	1091	36.0	7.324	67.5	1.314
-88.5	0.3952	-57.0	4.020	-25.5	218.8	6.0	1051	37.5	6.632	69.0	1.012
-87.0	0.5184	-55.5	4.232	-24.0	302.0	7.5	1001	39.0	6.083	70.5	0.9311
-85.5	0.3985	-54.0	4.243	-22.5	395.5	9.0	943.1	40.5	5.661	72.0	0.8304
-84.0	0.3914	-52.5	4.564	-21.0	490.7	10.5	878.9	42.0	5.273	73.5	0.6881
-82.5	0.4649	-51.0	4.774	-19.5	584.3	12.0	806.8	43.5	4.971	75.0	0.5871
-81.0	0.4766	-49.5	4.971	-18.0	675.7	13.5	727.5	45.0	4.745	76.5	0.5009
-79.5	0.6226	-48.0	5.142	-16.5	762.6	15.0	644.1	46.5	4.588	78.0	0.4436
-78.0	0.6280	-46.5	5.395	-15.0	843.1	16.5	556.3	48.0	4.501	79.5	0.4152
-76.5	0.8053	-45.0	5.777	-13.5	919.1	18.0	469.0	49.5	4.328	81.0	0.3793
-75.0	0.9270	-43.5	6.170	-12.0	986.5	19.5	379.6	51.0	4.168	82.5	0.3903
-73.5	1.065	-42.0	6.619	-10.5	1048	21.0	283.8	52.5	3.952	84.0	0.3954
-72.0	1.141	-40.5	7.303	-9.0	1097	22.5	206.3	54.0	3.771	85.5	0.4112
-70.5	1.393	-39.0	8.182	-7.5	1133	24.0	132.3	55.5	3.587	87.0	0.3765
-69.0	1.765	-37.5	9.626	-6.0	1150	25.5	68.41	57.0	3.368	88.5	0.5120
-67.5	2.071	-36.0	11.81	-4.5	1154	27.0	36.90	58.5	3.175	90.0	0.0
-66.0	2.395	-34.5	15.06	-3.0	1150	28.5	23.20	60.0	2.858		
-64.5	2.834	-33.0	20.11	-1.5	1145	30.0	16.63	61.5	2.512		
-63.0	3.097	-31.5	28.92	0.0	1138	31.5	12.66	63.0	2.223		
-61.5	3.418	-30.0	44.74	1.5	1131	33.0	10.00	64.5	1.901		
-60.0	3.668	-28.5	77.99	3.0	1115	34.5	8.422	66.0	1.580		

Electricity Parameter:

Current I: 0.1000A Power: 3.279W
 Voltage V: 32.79V PF: 1.000

Optical Parameter (Distance=2.410m) :

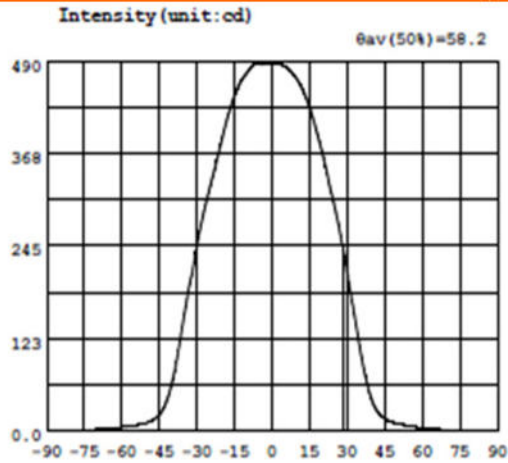
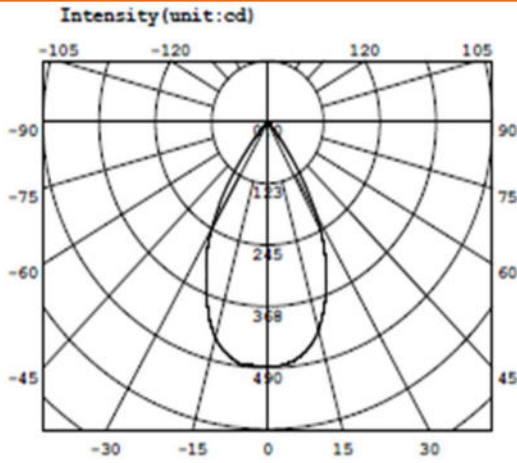
Equivalent Luminous flux: $\Phi_{eff}=404.61m$ Efficiency: $Eff=123.40lm/W$

Diffuse angle: @ (25%): 45.1deg @ (50%): 35.7deg @ (75%): 25.2deg @ (50%): 35.7deg

Diffuse angle: @ (25%): 45.2deg @ (50%): 35.9deg @ (75%): 25.7deg @ (50%): 35.9deg

$I_{max}=1154cd$ (C=0.0deg, G=-4.5deg) C0-180Plane $I_{max}=1154cd$ (G=-4.5deg)

C0-180Plane $I_0=1138cd$



Intensity data:(deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.4858	-58.5	5.696	-27.0	292.9	4.5	482.7	36.0	92.59	67.5	2.068
-88.5	0.5201	-57.0	6.302	-25.5	313.0	6.0	481.2	37.5	69.96	69.0	1.626
-87.0	0.5428	-55.5	7.018	-24.0	332.8	7.5	476.5	39.0	50.85	70.5	1.212
-85.5	0.5762	-54.0	7.851	-22.5	352.3	9.0	470.5	40.5	36.13	72.0	0.9661
-84.0	0.5988	-52.5	8.871	-21.0	372.5	10.5	463.2	42.0	26.56	73.5	0.8442
-82.5	0.6406	-51.0	10.06	-19.5	392.3	12.0	453.7	43.5	20.59	75.0	0.7555
-81.0	0.6764	-49.5	11.60	-18.0	412.2	13.5	442.9	45.0	16.63	76.5	0.6948
-79.5	0.7225	-48.0	13.70	-16.5	429.1	15.0	429.3	46.5	13.87	78.0	0.6440
-78.0	0.7584	-46.5	16.81	-15.0	443.7	16.5	412.9	48.0	11.90	79.5	0.6214
-76.5	0.8166	-45.0	21.46	-13.5	455.8	18.0	394.9	49.5	10.34	81.0	0.6166
-75.0	0.9324	-43.5	28.77	-12.0	465.0	19.5	375.9	51.0	9.089	82.5	0.5860
-73.5	1.118	-42.0	40.30	-10.5	472.2	21.0	355.9	52.5	8.021	84.0	0.5649
-72.0	1.472	-40.5	57.00	-9.0	478.8	22.5	334.0	54.0	7.080	85.5	0.5663
-70.5	1.968	-39.0	77.64	-7.5	484.5	24.0	312.1	55.5	6.264	87.0	0.5449
-69.0	2.361	-37.5	103.4	-6.0	486.6	25.5	290.2	57.0	5.537	88.5	0.5132
-67.5	2.735	-36.0	134.0	-4.5	485.8	27.0	265.9	58.5	4.704	90.0	0.4993
-66.0	3.109	-34.5	164.0	-3.0	485.5	28.5	239.1	60.0	4.095		
-64.5	3.515	-33.0	192.3	-1.5	485.4	30.0	211.4	61.5	3.639		
-63.0	3.926	-31.5	216.9	0.0	485.5	31.5	182.2	63.0	3.243		
-61.5	4.348	-30.0	244.4	1.5	485.5	33.0	152.6	64.5	2.850		
-60.0	4.973	-28.5	270.1	3.0	485.5	34.5	122.7	66.0	2.460		

Electricity Parameter:

Current I: 0.1000A Power: 3.608W
 Voltage V: 36.09V PF: 1.000

Optical Parameter(Distance=2.410m):

Equivalent Luminous flux: $\Phi_{eff} = 417.5lm$ Efficiency: $Eff=115.73lm/W$
 Diffuse angle: @(25%): 71.1deg @(50%): 58.2deg @(75%): 41.8deg
 Diffuse angle: @(25%): 71.1deg @(50%): 58.3deg @(75%): 41.9deg
 I_{max}=486.6cd (C=0.0deg,G=-6.0deg) C0-180Plane I_{max}= 486.6cd(G=-6.0deg)
 C0-180Plane I₀= 485.5cd

	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	highly	29.5	/	29.46	29.46	29.46	29.44	/	
	The diameter of	62	/	61.89	61.9	61.87	61.87	/	Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.
	The thickness of the	2.5	/	2.54	2.6	2.54	2.52	/	
Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"									

2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PC	Color	Transparent	OK
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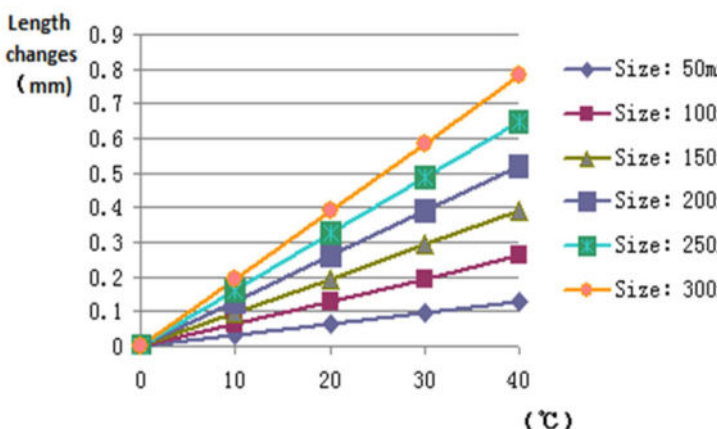
4.Optical index	Testing LED	CREE 1820			
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.				
	FWHM	See light distribution curve			
	K-value	6.9	6.8	7	6.9
	angle	18.5°	18.7°	18.3°	18.5°
	Efficiency	83.10%	82.50%	81.70%	82.00%
Facula	See the signature sample				

Comprehensive judgment	Qualified
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Remarks:

- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

PC product size changes with temperature table



Temperature (°C)	Size: 50mm	Size: 100mm	Size: 150mm	Size: 200mm	Size: 250mm	Size: 300mm
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.05	0.08	0.12	0.15	0.20	0.25
20	0.08	0.12	0.18	0.25	0.35	0.45
30	0.10	0.15	0.25	0.35	0.50	0.65
40	0.12	0.20	0.35	0.50	0.70	0.85

- Precautions:
- Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
 - Try to avoid touching the total reflection surface when taking the lens.
 - The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
 - The working temperature of the lens should be within the temperature resistance limit of the lens material. Exceeding the temperature resistance limit will cause the lens to crack or melt and affect the service life of the lens. It is recommended that

	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	highly	29.5		29.52	29.58	29.48	29.48		Test environment: In 20℃ -25℃ environment to achieve thermal equilibrium after the test.
	The diameter of	62		61.88	61.89	61.85	61.87		
	The thickness of the	2.5		2.62	2.64	2.53	2.56		
Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"									

2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PC	Color	Transparent	OK
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4.Optical index	Testing LED	CREE 1820				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.					
	FWHM	See light distribution curve				
	K-value		5	5.1	5.1	5.2
	angle		24.6°	24.5°	24.5°	24.3°
	Efficiency		85.10%	85.50%	86.00%	84.30%
Facula	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:

- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

PC product size changes with temperature table

Temperature (°C)	50mm	100mm	150mm	200mm	250mm	300mm
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.05	0.08	0.12	0.15	0.18	0.22
20	0.10	0.15	0.20	0.25	0.30	0.38
30	0.15	0.20	0.25	0.30	0.35	0.45
40	0.20	0.25	0.30	0.35	0.40	0.50

- Precautions:
- Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
 - Try to avoid touching the total reflection surface when taking the lens.
 - The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
 - The working temperature of the lens should be within the temperature resistance limit of the lens material. Exceeding the temperature resistance limit will cause the lens to crack or melt and affect the service life of the lens. It is recommended that

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	highly	29.5	/	/	29.5	29.51	29.42	29.42	/	
	The diameter of	62	/	/	61.88	61.85	61.9	61.86	/	Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.
	The thickness of the	2.5	/	/	2.5	2.46	2.48	2.46	/	
	Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"										

2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PC	Color	Transparent	OK
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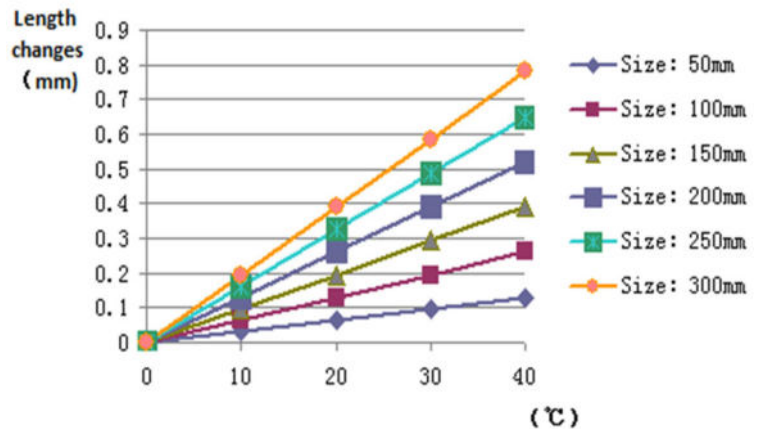
4.Optical index	Testing LED	CREE 1820				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.					
	FWHM	See light distribution curve				
	K-value		2.8	2.9	3	3.1
	angle		35.7°	35°	34.7°	34.5°
	Efficiency		84.70%	83.70%	84.10%	84.50%
Facula	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:

- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

PC product size changes with temperature table



Temperature (°C)	50mm	100mm	150mm	200mm	250mm	300mm
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.02	0.04	0.06	0.08	0.10	0.12
20	0.04	0.08	0.12	0.16	0.20	0.24
30	0.06	0.12	0.18	0.24	0.30	0.36
40	0.08	0.16	0.24	0.32	0.40	0.48

- Precautions:
- Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
 - Try to avoid touching the total reflection surface when taking the lens.
 - The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
 - The working temperature of the lens should be within the temperature resistance limit of the lens material. Exceeding the temperature resistance limit will cause the lens to crack or melt and affect the service life of the lens. It is recommended that

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	highly	29.5	/	/	29.59	29.62	29.61	29.61	/	
	The diameter of	62	/	/	61.84	61.86	61.86	61.86	/	Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.
	The thickness of the	2.5	/	/	2.53	2.54	2.56	2.57	/	
	Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"										

2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PC	Color	Transparent	OK
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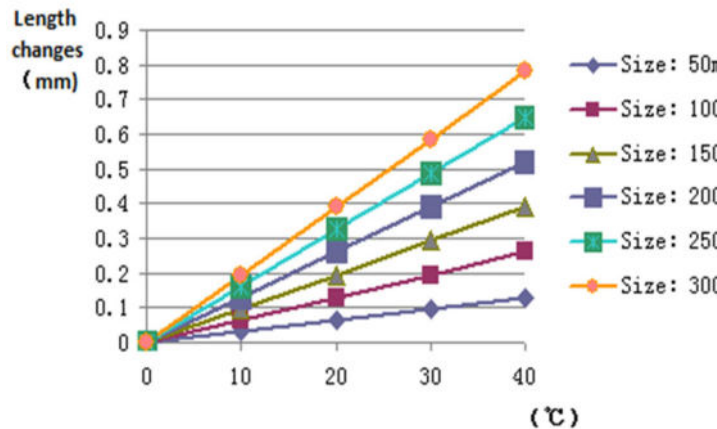
4.Optical index	Testing LED	CREE 1820				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.					
	FWHM	See light distribution curve				
	K-value	/	/	/	/	
	angle	/	56°	57°	58°	57.5°
	Efficiency	/	85.00%	85.30%	86.00%	84.50%
Facula	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:

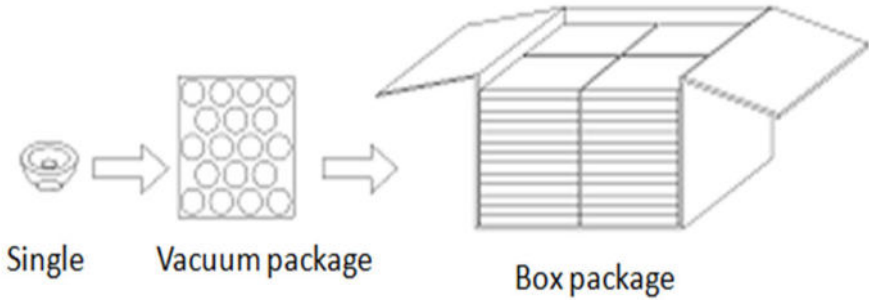
- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

PC product size changes with temperature table



Temperature (°C)	50mm	100mm	150mm	200mm	250mm	300mm
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.05	0.08	0.12	0.15	0.20	0.25
20	0.10	0.15	0.22	0.28	0.35	0.42
30	0.15	0.22	0.30	0.38	0.48	0.58
40	0.20	0.28	0.38	0.48	0.60	0.72

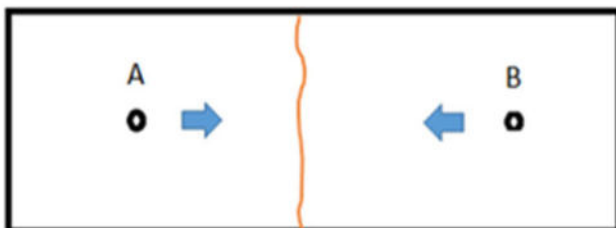
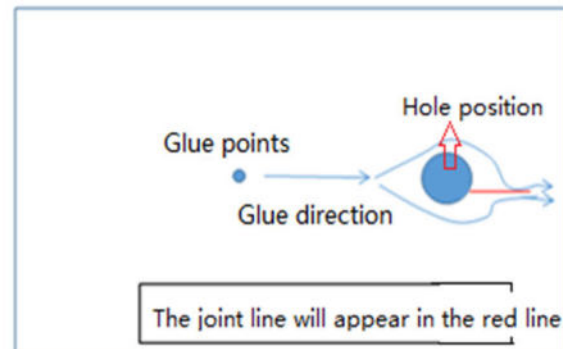
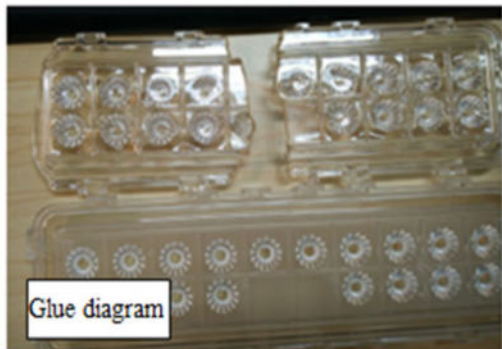
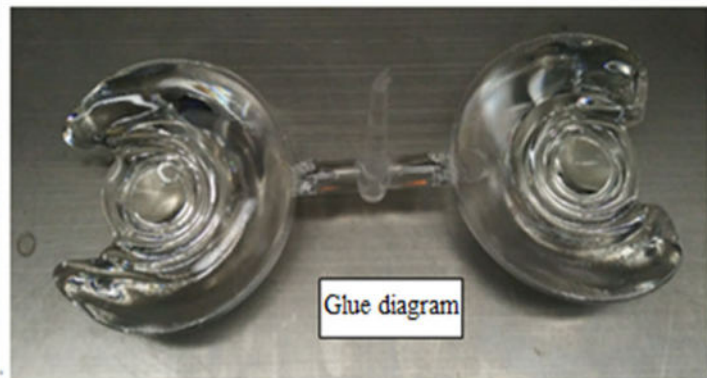
- Precautions:
- Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
 - Try to avoid touching the total reflection surface when taking the lens.
 - The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
 - The working temperature of the lens should be within the temperature resistance limit of the lens material. Exceeding the temperature resistance limit will cause the lens to crack or melt and affect the service life of the lens. It is recommended that

PN		HK-DX-62@30-15-D12-21-1g-1		Product Name	HK low glare 62@30-15 degree lens		
Product material		PC		Customer			
Package diagram		 <p style="text-align: center;"> Single Vacuum package Box package </p>					
Product packing		9	A/ Box	4	pcs/Layer		
		9	Layer/Box	324	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2. 07. 0078	Blister box	23cm*21cm	36	BAG	
	2	2. 08. 0001	PE film	25cm*27cm	36	PCS	
	3	2. 06. 0005	Reel label paper	62mm*42mm	36	PCS	
	4	2. 06. 0005	Box label paper	62mm*70mm	1	PCS	
	5	2. 06. 0003	big plate	46cm*42cm	10	PCS	
	6	2. 06. 0011	big flat carton	48cm*44cm*37cm	1	PCS	
Remarks	Scattered packaging is not restricted by this specification, the customer has the requirements of the customer shall prevail						

Special notice

When glue pass through holes, columns and other structures, or part of the thin structure, will form a weld line. The product which uses multi-point injection welding line will appear because of the combination of sol, as shown below:

Symmetry



The joint line will appear in the red line

Please note :

The appearance of lines in the structure of the product as well as at the screw hole is a normal phenomenon, will not affect the actual use of the product, and can not be avoided at this stage.

Appearance inspection standards

1 Operating procedures

1.1.1 Sampling standards, sampling plan and AQL

Test level : GB/T2828.1-2012 The first part is according to the acceptance quality limit (AQL) retrieval batch inspection sampling plan, general inspection level II level, CR class defect coefficient 0, MA defect rejection level AQL = 0.65, MI class defect rejection level AQL = 1.0; defect level please see 5.4.

2 Code table

Code	Code description	Unit	Code		Code description	Unit
N	Amount/pcs	pcs	D		Diameter	mm
L	Length	mm	H		Depth	mm
W	Width	mm	DS		Distance	mm
S	Proportion	mm ²	SS		Offset	mm

3 Test conditions

3.1 Sight distance and working hours: Sight distance should be 30-35cm, each side of the inspection time does not exceed 12s, the visual angle of 45-135 degrees;

3.2 Light: 2x40w cool white fluorescent lamp, the light source is 500-550mm away from the lens surface; in order to make the appearance defect can be correctly recognized, the illumination should be 500-1000Lux, and the observation time is 10 seconds.

3.3 Visual inspection staff should be 1.0 (including corrected visual acuity) above, no color blindness, color weakness.

4 Appearance inspection standards

Test items	Judging standard	Inspection equipment	Defect level		
		Testing method	MI	MA	CR
Check the sample	When start the machine and process, all products have to check the appearance of the sample, the appearance of the sample is divided into qualified samples and limited samples.	Sample comparison , visual			
	1: Qualified sample refers to the appearance and structure standard of the product which recognized by the client, the sample size should be confirmed before mass production;				

	2: The limited sample refers to the limit of a particular exceptionally developed sample. Limit the sample only for its specific point of exception to confirm; The priority is higher than the other criteria in this table. When there is a limited sample, the limit sample shall prevail.				
Raw edge	Not allowed to affect the size and assembly	Visual, point card		√	
Scratch	1: Non-optical surface and non-exposed surface scratches should be visually insignificant and the length is less than 1/10 of the maximum surface size.	Visual, point card, calipers		√	
Fingerprint	Fingerprints are not allowed on all products	Visual		√	
Foreign objects, black spots, white spots	The product may not be attached to foreign objects, including oil, fiber, dregs of water gap and so on				√
Deformation	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces.	Visual, feeler			√
Poor ejection	Products may not appear bad ejection, including no convex top, thimble printed on the assembly surface shall not be higher than the product surface, non-assembled surface thimble height should not exceed the product size tolerances; thimble printing should be less than the product surface and no more than 0.3; thimble surface treatment should be consistent with the product side.	Visual, point card		√	
	Ejection strain: the optical surface and the appearance of the exposed surface after assembly are not allowed to have a strain, and the structural surface does not allow visual obvious strain.				
Insufficient filling	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces , The signature sample shall prevail.	Visual, point card		√	
Shrink	When the entire surface of the product shrinks, the optical properties and dimensions must meet the requirements, and the visual will not significantly affect the appearance.Part shrink reference point defects	Visual, point card		√	
Flow marks、Welding line	1 : Product does not allow the presence of flow marks and welding lines unless the structure can not be avoided;	Visual		√	
	2: The remaining flow marks shall not appear in the optical surface, a single L ≤ 10mm, no more than two				

Bubble	No bubbles are allowed	Visual		√	
Foreign objects, black spots, white spots	Not obvious or $D \leq 0.3\text{mm}$ black spots and foreign bodies in the area of 100x100mm not more than 1; Exceeded foreign matter black spots is judged bad.	Visual, point card	√		
Damaged	No damage is allowed	Visual			√
Cold glue	Optical surface may not have cold glue, non-optical surface cold glue should meet the visual is not obvious.	Visual	√		
Bad incision	1: Do not affect the product size, shall not penetrate the optical surface, the cut should be smooth;	Visual			√
	2: Laser cutting products, the optical surface burns shall not occur after the processing is completed. Beading must not affect product installation				
	3: Three molds and hot runner gate shall not appear residue.				
Scrub	Scrub surface should be uniform, off the scrub phenomenon should not be obvious , A single off scrub imprint requires $D \leq 1\text{ mm}$ and no more than 1 area within a 50x50 mm area	Visual		√	

Approval number :

Customer :

Manufacturer : Chengdu HercuLux Photoelectric Technology Co.,Ltd

PN	Code	Product
HK-DX-62@30-15-D12-21-1g-1_PMMA	1. 01. 02566_PMMA	HK low glare 62@30-15 degree lens
HK-DX-62@30-24-D12-21-1g-1_PMMA	1. 01. 02548_PMMA	HK low glare 62@30-24 degree lens
HK-DX-62@30-36-D12-21-1g-1_PMMA	1. 01. 02573_PMMA	HK low glare 62@30-36 degree lens
HK-DX-62@30-60-D12-21-1g-1_PMMA	1. 01. 12805_PMMA	HK low glare 62@30-60 degree lens



Supplier confirmation				Client confirmation			
Proposed		DATE		Qualified <input type="checkbox"/>		DATE	
Project manager		DATE		Unqualified <input type="checkbox"/>		DATE	
Audit		DATE		Audit		DATE	
Approved		DATE		Approved		DATE	
Stamp		DATE		Stamp		DATE	

(Confirmation of acceptance by both parties must be signed and sealed)

Factory: Chengdu Shuangliu District, Iot industrial park 2 road HercuLux Photoelectric Park

Phone : 028-85887727 (801) 028-85887990 (801)

Fax : 028-85887730

<http://www.herculux.cn/>

Sales Dept: Shenzhen Nanshan District Nanshan Cloud Valley Innovation Industrial Park Comprehensive Service Building, 501-505

TEL: 0755-2937 1541

FAX: 0755-2907 5140

 *Approval In duplicate , for both supplier and customer.

Disclaimer

Please use this product within the permitted range and environment according to the structure and material of the product. If the usage exceeds the recommended value, please test and verify by yourself. If the product is damaged due to out-of-range use, our company will not be responsible for the warranty.

Product material:

Customized products: The specifications and models of materials used are subject to the agreement between the two parties.

Conventional products: As a product that we continuously research and improve, under the premise of ensuring the quality and availability of the product, our company reserves the right to change the material. If the material specification and model change, without prior notice.

product data:

The measurement data and dimensional tolerances of the 2D drawings in the product data sheet of this acknowledgement are for reference only, and the final size shall prevail in kind.

The measurement data presented in this acknowledgment is a performance test of the product based on our company's internal test conditions and quality requirements, and the reported data is a typical value of the average results of multiple measurements. Therefore, in some cases, the actual product may deviate from the data provided. We reserve the right to notify you in advance of this data.

Product changes and improvements:

Changes and improvements of customized products are subject to the agreement between the two parties in the contract or technical documents.

As the conventional products that we continue to research and improve, our company reserves the right to make technical changes to its products, and reserves the right to make changes to data resulting from improvements without prior notice.

Operation cautions:

1. Please wear clean gloves during product assembly to prevent product surface contamination.
2. Try to avoid touching the optical surface of the lens when taking the lens.
3. When the surface of the product is polluted, please wipe it gently with a soft cotton cloth dipped in analytically pure neutral solvent. It is forbidden to use industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA monomer, etc.) wipe.
4. The lens made of PC should not be exposed to direct sunlight in the storage and use environment. If the lens turns yellow or cracks due to long-term sunlight exposure, our company will not be responsible for the warranty.



HERCULUX
恒坤光电

Product Approval

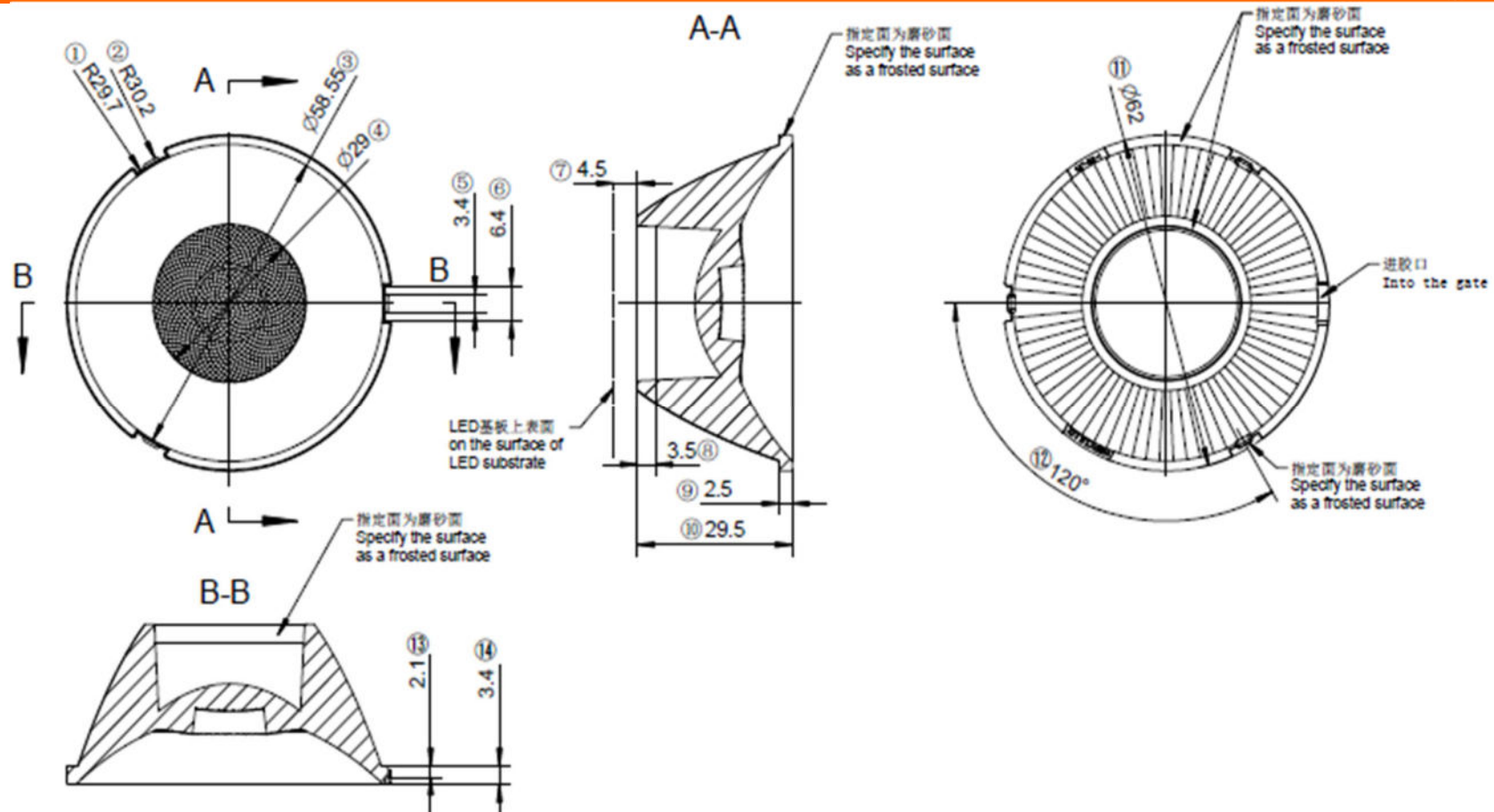
TEL: 0755-2937 1541

FAX: 0755-2907 5140

<http://www.herculux.cn/>

Date updated: 2023/8/29

Product Picture:	
PN:	HK-DX-62@30-15-D12-21-1g-1_PMMA
Size(L*W*H/Φ*H):	Φ:62mm; H:30mm
Material:	PMMA
Efficiency:	\
Temperature(Topr):	Material extreme temperature resistance : -40°C to +100°C long-term use temperature : -40°C to +80°C
FWHM:	15°、24°、36°、60°
Matched LES:	CREE 1820
Recommended MAX power:	30W

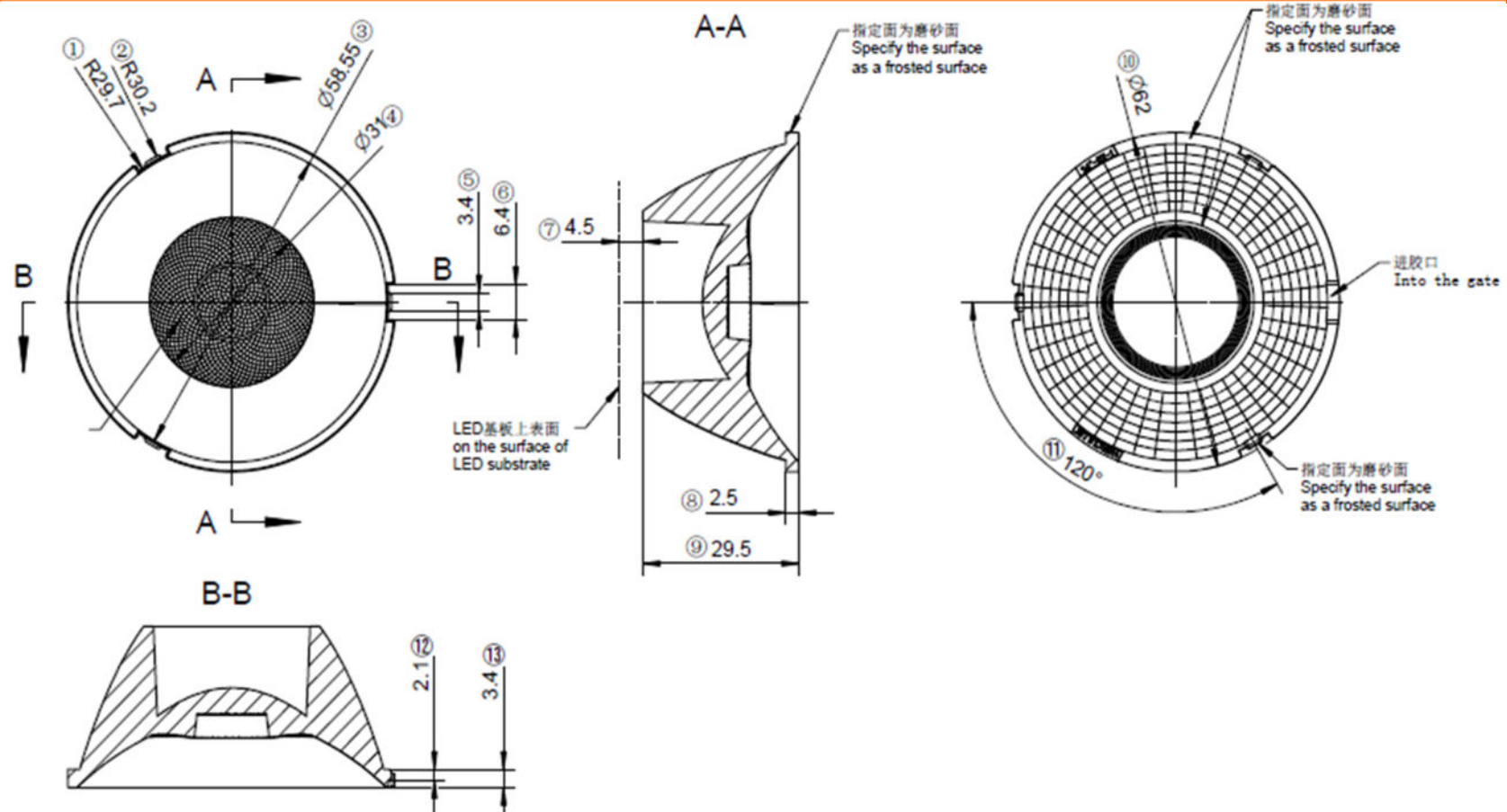


Technical remark:

1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design			HK-DX-62@30-15-D12-21-1g-1_PMMA		
Structure design			HK low glare 62@30-15 degree lens		
Review			Number of drawing	qty	weight
Validation			Material: PMMA CDHK		

MT5 Tolerance table (mm)	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
	tolerance value	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0

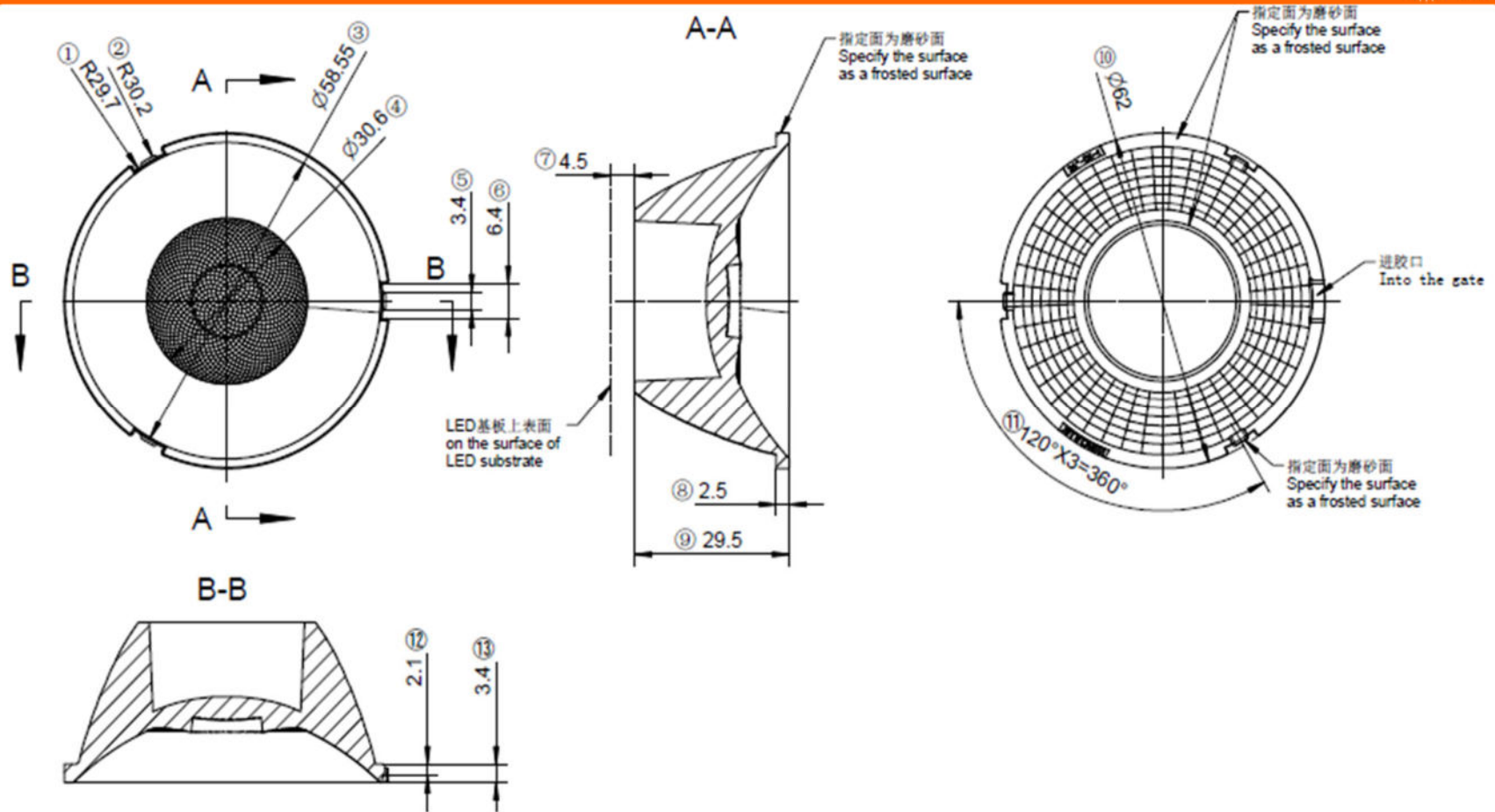


Technical remark:

1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design				HK-DX-62@30-24-D12-21-1g-1_PMMA		
Structure design				HK low glare 62@30-24 degree lens		
Review				Number of drawing	qty	weight
Validation				CDHK		
				Material:	PMMA	

MT5 Tolerance table (mm)	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
	olerance valu	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0

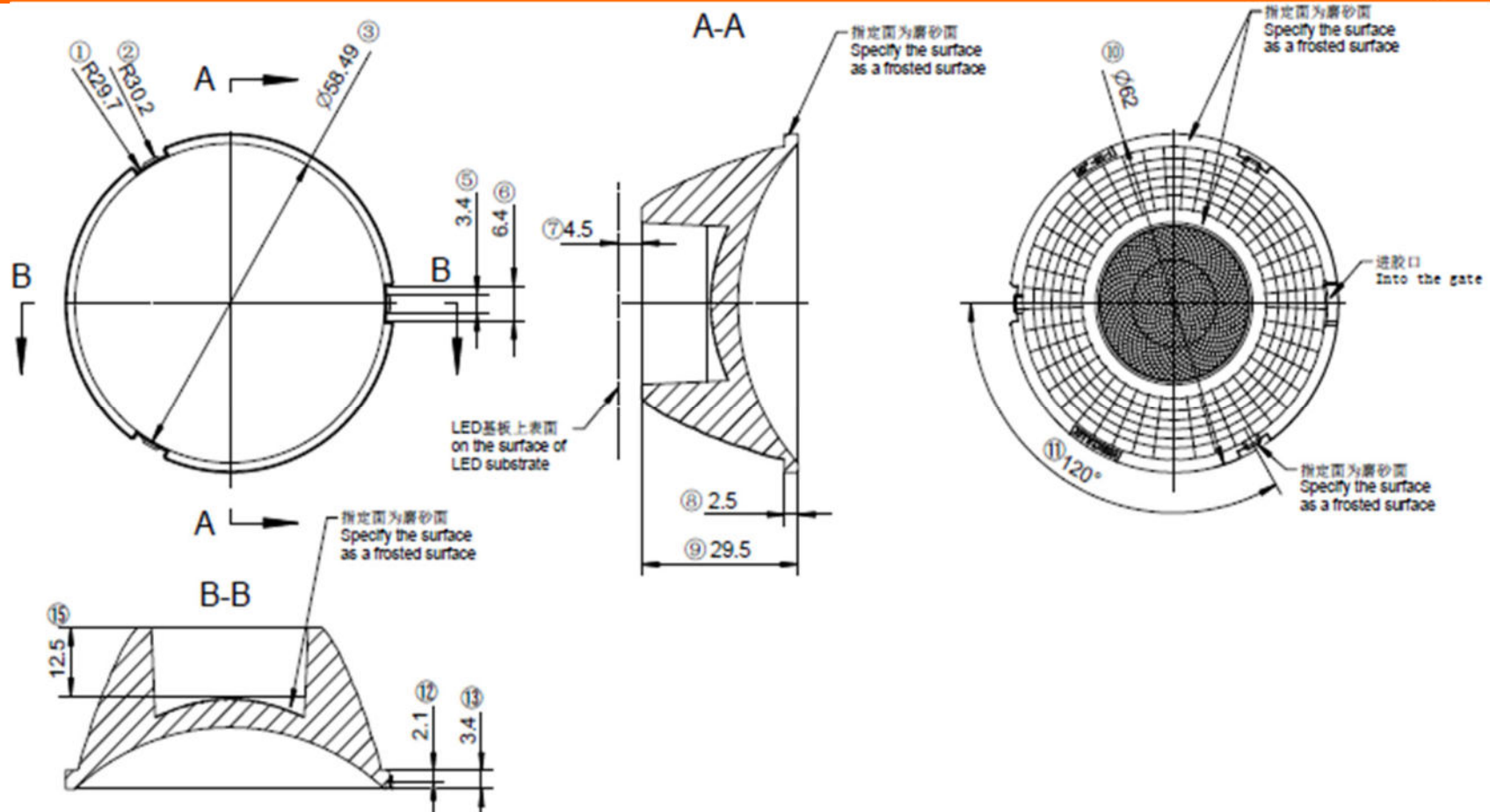


Technical remark:

1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design			HK-DX-62@30-36-D12-21-1g-1_PMMA		
Structure design			HK low glare 62@30-36 degree lens		
Review			Number of drawing	qty	weight
Validation			Material: PMMA CDHK		

MT5 Tolerance table (mm)	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
	olerance valu		±0.1	±0.15	±0.35	±0.50	±0.80	±1.2



Technical remark:

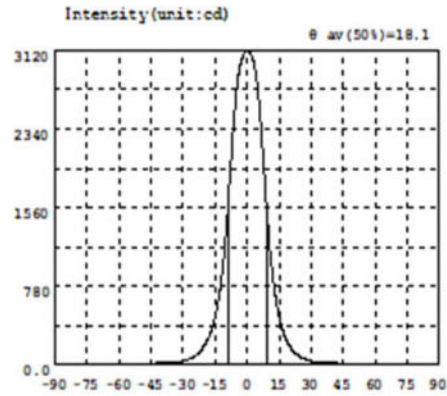
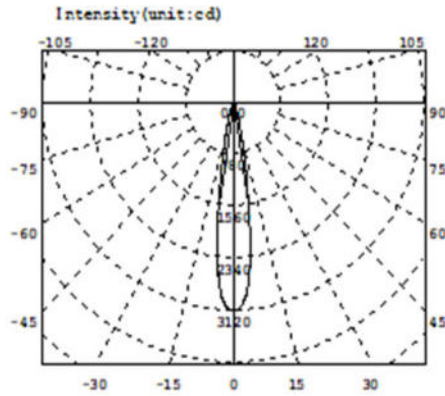
1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design				HK-DX-62@30-60-D12-21-1g-1_PMMA		
Structure design				HK low glare 62@30-60 degree lens		
Review				Number of drawing	qty	weight
Validation				Material: PMMA CDHK		

MT5 Tolerance table (mm)	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
	olerance valu	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0



GO1900L GONIOPHOTOMETER Test Report Page 1 Of 2



Intensity data: (deg , cd) CO-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.8022	-58.5	8.178	-27.0	58.07	4.5	2831	36.0	22.44	67.5	4.523
-88.5	0.7566	-57.0	8.820	-25.5	73.30	6.0	2516	37.5	20.46	69.0	4.106
-87.0	0.7455	-55.5	9.441	-24.0	93.73	7.5	2069	39.0	18.80	70.5	3.693
-85.5	0.7698	-54.0	10.03	-22.5	122.4	9.0	1606	40.5	17.40	72.0	3.283
-84.0	0.9302	-52.5	10.66	-21.0	160.6	10.5	1198	42.0	16.19	73.5	2.813
-82.5	1.168	-51.0	11.33	-19.5	207.7	12.0	882.9	43.5	15.13	75.0	2.512
-81.0	1.438	-49.5	12.02	-18.0	268.6	13.5	648.5	45.0	14.14	76.5	2.135
-79.5	1.698	-48.0	12.68	-16.5	351.1	15.0	479.7	46.5	13.24	78.0	1.807
-78.0	1.981	-46.5	13.45	-15.0	465.2	16.5	359.1	48.0	12.49	79.5	1.506
-76.5	2.310	-45.0	14.35	-13.5	627.5	18.0	266.9	49.5	11.80	81.0	1.236
-75.0	2.660	-43.5	15.32	-12.0	849.2	19.5	203.8	51.0	11.11	82.5	1.008
-73.5	3.002	-42.0	16.36	-10.5	1155	21.0	155.6	52.5	10.46	84.0	0.7912
-72.0	3.468	-40.5	17.57	-9.0	1559	22.5	119.0	54.0	9.819	85.5	0.6409
-70.5	3.868	-39.0	19.03	-7.5	2013	24.0	92.08	55.5	9.255	87.0	0.5800
-69.0	4.277	-37.5	20.79	-6.0	2462	25.5	71.74	57.0	8.626	88.5	0.5851
-67.5	4.697	-36.0	22.80	-4.5	2804	27.0	56.84	58.5	7.963	90.0	0.5354
-66.0	5.103	-34.5	25.49	-3.0	2995	28.5	46.00	60.0	7.363		
-64.5	5.685	-33.0	28.87	-1.5	3078	30.0	38.30	61.5	6.749		
-63.0	6.319	-31.5	33.26	0.0	3115	31.5	32.59	63.0	6.126		
-61.5	6.963	-30.0	39.01	1.5	3087	33.0	28.34	64.5	5.491		
-60.0	7.559	-28.5	47.05	3.0	3005	34.5	25.04	66.0	4.940		

Electricity Parameter:

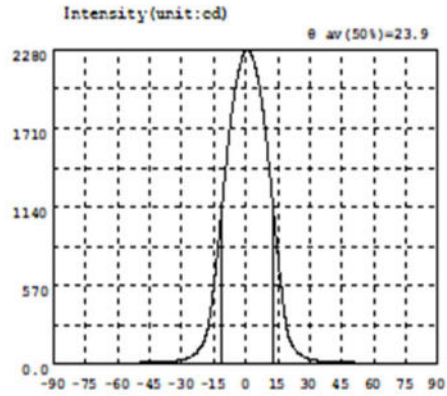
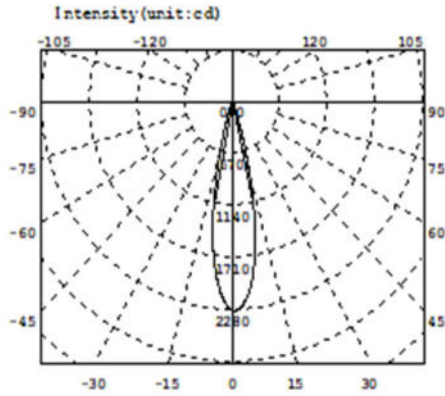
Current I: 0.1000A Power: 3.299W
Voltage V: 33.00V PF: 1.000

Optical Parameter (Distance=2.410m):

Equivalent Luminous flux: $\Phi_{eff}=437.51m$ Efficiency: $Eff=132.64lm/W$
Diffuse angle: @ (25%): 25.0deg @ (50%): 18.1deg @ (75%): 13.0deg @ (50%): 18.1deg
Diffuse angle: @ (25%): 25.0deg @ (50%): 18.1deg @ (75%): 13.0deg @ (50%): 18.1deg
Imax=3115cd (C=0.0deg,G=0.0deg) CO-180Plane Imax= 3115cd(G=0.0deg)
CO-180Plane IO= 3115cd



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Intensity data: (deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.7344	-58.5	8.086	-27.0	46.26	4.5	2157	36.0	22.85	67.5	4.854
-88.5	0.7228	-57.0	8.767	-25.5	57.10	6.0	2050	37.5	20.68	69.0	4.445
-87.0	0.7113	-55.5	9.418	-24.0	72.10	7.5	1902	39.0	18.84	70.5	4.014
-85.5	0.7341	-54.0	9.969	-22.5	93.34	9.0	1723	40.5	17.37	72.0	3.579
-84.0	0.8032	-52.5	10.50	-21.0	123.7	10.5	1512	42.0	16.15	73.5	3.059
-82.5	0.9503	-51.0	11.04	-19.5	168.6	12.0	1281	43.5	15.13	75.0	2.607
-81.0	1.122	-49.5	11.59	-18.0	245.9	13.5	1033	45.0	14.26	76.5	2.218
-79.5	1.317	-48.0	12.15	-16.5	377.7	15.0	793.9	46.5	13.50	78.0	1.882
-78.0	1.589	-46.5	12.73	-15.0	553.1	16.5	578.2	48.0	12.85	79.5	1.647
-76.5	1.918	-45.0	13.38	-13.5	766.4	18.0	392.3	49.5	12.23	81.0	1.368
-75.0	2.279	-43.5	14.13	-12.0	1002	19.5	239.0	51.0	11.66	82.5	1.144
-73.5	2.661	-42.0	15.01	-10.5	1249	21.0	162.6	52.5	11.07	84.0	0.9337
-72.0	3.164	-40.5	16.02	-9.0	1479	22.5	120.2	54.0	10.49	85.5	0.7638
-70.5	3.616	-39.0	17.24	-7.5	1694	24.0	91.58	55.5	9.923	87.0	0.7031
-69.0	4.056	-37.5	18.80	-6.0	1878	25.5	71.20	57.0	9.304	88.5	0.6589
-67.5	4.465	-36.0	20.65	-4.5	2025	27.0	56.46	58.5	8.596	90.0	0.7424
-66.0	4.844	-34.5	22.89	-3.0	2143	28.5	45.77	60.0	7.916		
-64.5	5.390	-33.0	25.38	-1.5	2228	30.0	38.00	61.5	7.279		
-63.0	6.058	-31.5	28.53	0.0	2273	31.5	32.54	63.0	6.625		
-61.5	6.746	-30.0	32.75	1.5	2274	33.0	28.37	64.5	5.969		
-60.0	7.431	-28.5	38.44	3.0	2231	34.5	25.39	66.0	5.356		

Electricity Parameter:

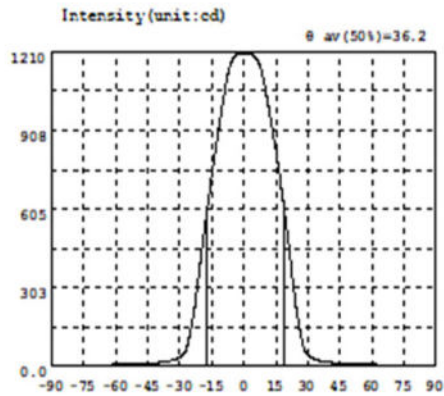
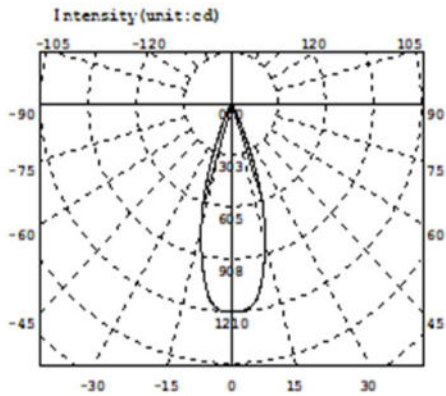
Current I: 0.1000A Power: 3.299W
 Voltage V: 33.00V PF: 1.000

Optical Parameter (Distance=2.410m):

Equivalent Luminous flux: Φ_{eff} = 440.9lm Efficiency: Eff = 133.67lm/W
 Diffuse angle: @ (25%) : 31.3deg @ (50%) : 23.9deg @ (75%) : 16.4deg @ (50%) : 23.9deg
 Diffuse angle: @ (25%) : 31.3deg @ (50%) : 23.9deg @ (75%) : 16.5deg @ (50%) : 23.9deg
 Imax=2278cd (C=0.0deg,G=1.0deg) C0-180Plane Imax= 2278cd(G=1.0deg)
 C0-180Plane I0= 2273cd



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Intensity data: (deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.7005	-58.5	7.097	-27.0	63.97	4.5	1197	36.0	20.67	67.5	4.340
-88.5	0.7003	-57.0	7.652	-25.5	112.0	6.0	1182	37.5	18.29	69.0	3.823
-87.0	0.6776	-55.5	8.216	-24.0	178.3	7.5	1155	39.0	16.38	70.5	3.409
-85.5	0.6882	-54.0	8.726	-22.5	258.4	9.0	1112	40.5	14.95	72.0	2.941
-84.0	0.7234	-52.5	9.199	-21.0	352.6	10.5	1049	42.0	13.78	73.5	2.537
-82.5	0.8391	-51.0	9.661	-19.5	454.6	12.0	979.7	43.5	12.78	75.0	2.156
-81.0	0.9341	-49.5	10.18	-18.0	554.7	13.5	906.1	45.0	12.05	76.5	1.801
-79.5	1.192	-48.0	10.60	-16.5	646.0	15.0	829.7	46.5	11.49	78.0	1.522
-78.0	1.418	-46.5	11.01	-15.0	732.7	16.5	746.9	48.0	11.05	79.5	1.273
-76.5	1.677	-45.0	11.49	-13.5	818.1	18.0	662.4	49.5	10.62	81.0	1.057
-75.0	1.962	-43.5	12.13	-12.0	902.3	19.5	569.8	51.0	10.20	82.5	0.8889
-73.5	2.322	-42.0	12.90	-10.5	980.8	21.0	470.9	52.5	9.661	84.0	0.7289
-72.0	2.688	-40.5	13.87	-9.0	1054	22.5	361.4	54.0	9.208	85.5	0.5943
-70.5	3.149	-39.0	15.08	-7.5	1120	24.0	258.5	55.5	8.700	87.0	0.5374
-69.0	3.514	-37.5	16.64	-6.0	1163	25.5	176.3	57.0	8.149	88.5	0.5233
-67.5	3.884	-36.0	18.58	-4.5	1188	27.0	108.1	58.5	7.577	90.0	0.5219
-66.0	4.391	-34.5	21.06	-3.0	1202	28.5	62.60	60.0	7.041		
-64.5	4.964	-33.0	23.96	-1.5	1203	30.0	43.61	61.5	6.531		
-63.0	5.520	-31.5	27.88	0.0	1200	31.5	33.46	63.0	5.999		
-61.5	6.088	-30.0	33.89	1.5	1199	33.0	27.50	64.5	5.436		
-60.0	6.586	-28.5	44.02	3.0	1200	34.5	23.60	66.0	4.892		

Electricity Parameter:

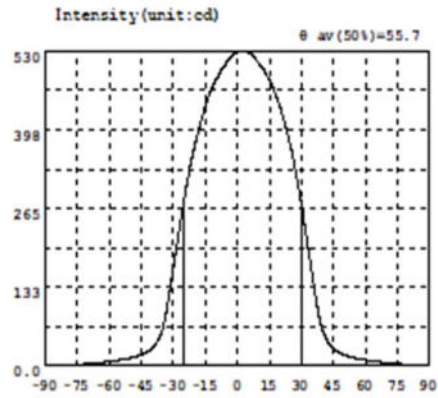
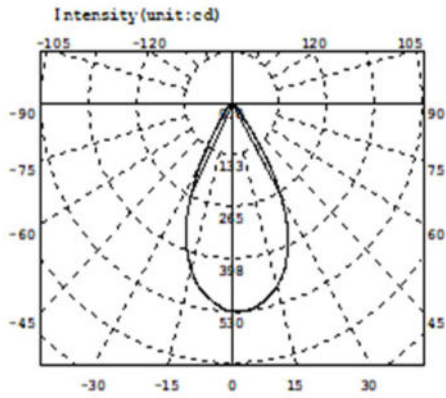
Current I: 0.1000A Power: 3.299W
Voltage V: 33.00V PF: 1.000

Optical Parameter(Distance=2.410m):

Equivalent Luminous flux: Φ_{eff} = 444.4lm Efficiency: Eff=134.72lm/W
Diffuse angle: @ (25%): 45.1deg @ (50%): 36.2deg @ (75%): 25.4deg @ (50%): 36.2deg
Diffuse angle: @ (25%): 45.1deg @ (50%): 36.2deg @ (75%): 25.6deg @ (50%): 36.2deg
Imax=1204cd (C=0.0deg,C=-2.0deg) C0-180Plane Imax= 1204cd(C=-2.0deg)
C0-180Plane IO= 1200cd



GO1900L GONIOPHOTOMETER Test Report Page 1 Of 2



Intensity data:(deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.8474	-58.5	7.996	-27.0	233.0	4.5	528.6	36.0	130.7	67.5	6.252
-88.5	0.8362	-57.0	8.788	-25.5	266.6	6.0	525.2	37.5	97.52	69.0	5.568
-87.0	0.8024	-55.5	9.518	-24.0	299.2	7.5	520.4	39.0	71.47	70.5	4.850
-85.5	0.7912	-54.0	10.30	-22.5	328.8	9.0	514.0	40.5	53.85	72.0	4.293
-84.0	0.7810	-52.5	11.17	-21.0	354.0	10.5	507.4	42.0	42.46	73.5	3.783
-82.5	0.8156	-51.0	12.17	-19.5	376.8	12.0	499.8	43.5	34.38	75.0	3.301
-81.0	1.008	-49.5	13.49	-18.0	398.1	13.5	491.0	45.0	28.78	76.5	2.896
-79.5	1.251	-48.0	15.18	-16.5	418.3	15.0	481.1	46.5	24.64	78.0	2.464
-78.0	1.461	-46.5	16.71	-15.0	436.0	16.5	469.8	48.0	21.55	79.5	2.069
-76.5	1.734	-45.0	18.55	-13.5	452.5	18.0	456.5	49.5	19.15	81.0	1.743
-75.0	2.020	-43.5	20.85	-12.0	466.5	19.5	441.3	51.0	17.25	82.5	1.406
-73.5	2.361	-42.0	23.75	-10.5	478.5	21.0	423.3	52.5	15.63	84.0	1.145
-72.0	2.748	-40.5	27.70	-9.0	488.4	22.5	403.3	54.0	14.28	85.5	0.9586
-70.5	3.168	-39.0	33.12	-7.5	497.4	24.0	383.1	55.5	12.96	87.0	0.7459
-69.0	3.625	-37.5	40.84	-6.0	505.7	25.5	360.7	57.0	11.65	88.5	0.6577
-67.5	4.144	-36.0	51.97	-4.5	513.1	27.0	333.0	58.5	10.64	90.0	0.5591
-66.0	4.674	-34.5	69.37	-3.0	520.3	28.5	302.9	60.0	9.803		
-64.5	5.313	-33.0	96.44	-1.5	525.7	30.0	271.4	61.5	9.025		
-63.0	6.036	-31.5	129.9	0.0	528.3	31.5	236.8	63.0	8.261		
-61.5	6.708	-30.0	164.8	1.5	529.7	33.0	201.1	64.5	7.550		
-60.0	7.366	-28.5	199.1	3.0	529.7	34.5	165.7	66.0	6.884		

Electricity Parameter:

Current I: 0.1000A Power: 3.299W
Voltage V: 33.00V PF: 1.000

Optical Parameter(Distance=2.410m):

Equivalent Luminous flux: Φ_{eff} = 432.2lm Efficiency: Eff = 131.02lm/W
Diffuse angle: @ (25%): 67.2deg @ (50%): 55.7deg @ (75%): 40.9deg @ (50%): 55.7deg
Diffuse angle: @ (25%): 67.3deg @ (50%): 55.9deg @ (75%): 41.1deg @ (50%): 55.9deg
 I_{max} = 529.9cd (C=0.0deg, G=2.0deg) C0-180Plane I_{max} = 529.9cd (G=2.0deg)
C0-180Plane I_0 = 528.3cd

	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	highly	29.5	/	29.66	29.68	29.66	29.68	/	Test environment: In 20 ℃ -25 ℃ environment to achieve thermal equilibrium after the test.
	The diameter of	62	/	62	61.96	62	62	/	
	The thickness of the	2.5	/	2.56	2.58	2.55	2.54	/	
Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"									

2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PMMA	Color	Transparent	OK
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4.Optical index	Testing LED	CREE 1820				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.					
	FWHM	See light distribution curve				
	K-value		7.1	7	7.1	7.1
	angle		18.1°	18.3°	18°	18.1°
	Efficiency		92.50%	92.00%	92.30%	91.70%
Facula	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:

- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

PC product size changes with temperature table

Temperature (°C)	Size: 50mm	Size: 100mm	Size: 150mm	Size: 200mm	Size: 250mm	Size: 300mm
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.02	0.04	0.06	0.08	0.10	0.12
20	0.04	0.08	0.12	0.16	0.20	0.24
30	0.06	0.12	0.18	0.24	0.30	0.36
40	0.08	0.16	0.24	0.32	0.40	0.48

- Precautions:
- Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
 - Try to avoid touching the total reflection surface when taking the lens.
 - The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
 - The working temperature of the lens should be within the temperature resistance limit of the lens material. Exceeding the temperature resistance limit will cause the lens to crack or melt and affect the service life of the lens. It is recommended that

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	highly	29.5	/	/	29.71	29.74	29.75	29.71	/	Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.
	The diameter of	62	/	/	61.96	61.76	61.9	61.78	/	
	The thickness of the	2.5	/	/	2.6	2.61	2.66	2.65	/	
	Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"										

2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PMMA	Color	Transparent	OK
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4.Optical index	Testing LED	CREE 1820				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.					
	FWHM	See light distribution curve				
	K-value		5.1	5.1	5	5
	angle		23.9°	24°	24.1°	24.2°
	Efficiency		93.00%	92.30%	92.50%	92.70%
Facula	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:

- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

PC product size changes with temperature table

Temperature (°C)	Size: 50mm	Size: 100mm	Size: 150mm	Size: 200mm	Size: 250mm	Size: 300mm
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.05	0.08	0.12	0.15	0.18	0.22
20	0.10	0.15	0.22	0.28	0.35	0.42
30	0.15	0.22	0.30	0.38	0.48	0.58
40	0.20	0.28	0.38	0.48	0.60	0.72

- Precautions:
- Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
 - Try to avoid touching the total reflection surface when taking the lens.
 - The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
 - The working temperature of the lens should be within the temperature resistance limit of the lens material. Exceeding the temperature resistance limit will cause the lens to crack or melt and affect the service life of the lens. It is recommended that

	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	highly	29.5		29.78	29.71	29.7	29.78		Test environment: In 20℃ -25℃ environment to achieve thermal equilibrium after the test.
	The diameter of	62		61.92	61.9	61.9	61.86		
	The thickness of the	2.5		2.6	2.61	2.6	2.6		
Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"									

2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PMMA	Color	Transparent	OK
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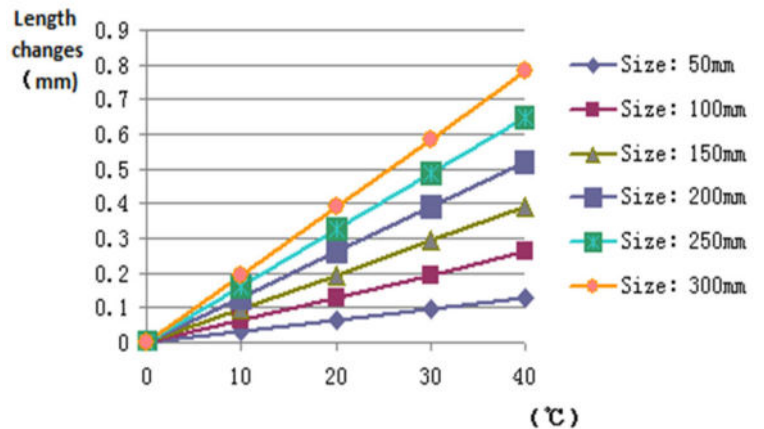
4.Optical index	Testing LED	CREE 1820				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.					
	FWHM	See light distribution curve				
	K-value		2.7	2.7	2.5	2.6
	angle		36.2°	36°	37°	36.5°
	Efficiency		93.50%	93.00%	93.10%	92.80%
Facula	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:

- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

PC product size changes with temperature table



Temperature (°C)	50mm	100mm	150mm	200mm	250mm	300mm
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.05	0.08	0.12	0.15	0.20	0.25
20	0.10	0.15	0.22	0.28	0.35	0.42
30	0.15	0.22	0.30	0.38	0.48	0.58
40	0.20	0.28	0.38	0.48	0.60	0.72

- Precautions:
- Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
 - Try to avoid touching the total reflection surface when taking the lens.
 - The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
 - The working temperature of the lens should be within the temperature resistance limit of the lens material. Exceeding the temperature resistance limit will cause the lens to crack or melt and affect the service life of the lens. It is recommended that

	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	highly	29.5		29.68	29.66	29.71	29.68		Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.
	The diameter of	62		61.96	61.99	62	61.97		
	The thickness of the	2.5		2.53	2.54	2.56	2.57		
Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"									

2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PMMA	Color	Transparent	OK
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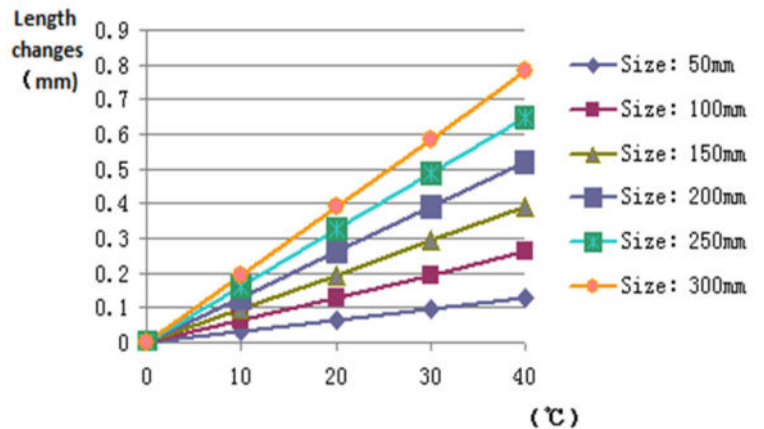
4.Optical index	Testing LED	CREE 1820				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.					
	FWHM	See light distribution curve				
	K-value					
	angle		55.7°	55°	56°	56.5°
	Efficiency		91.50%	91.30%	91.70%	91.00%
Facula	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:

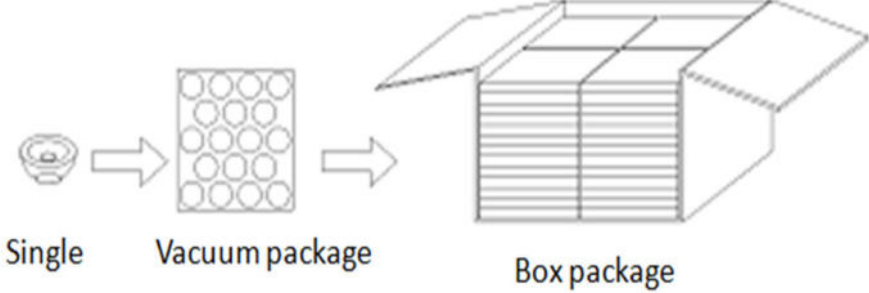
- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

PC product size changes with temperature table



Temperature (°C)	Size: 50mm	Size: 100mm	Size: 150mm	Size: 200mm	Size: 250mm	Size: 300mm
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.02	0.04	0.06	0.08	0.10	0.12
20	0.04	0.08	0.12	0.16	0.20	0.24
30	0.06	0.12	0.18	0.24	0.30	0.36
40	0.08	0.16	0.24	0.32	0.40	0.48

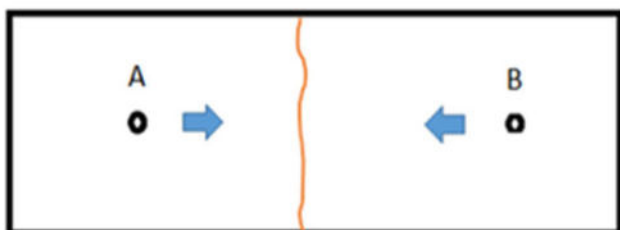
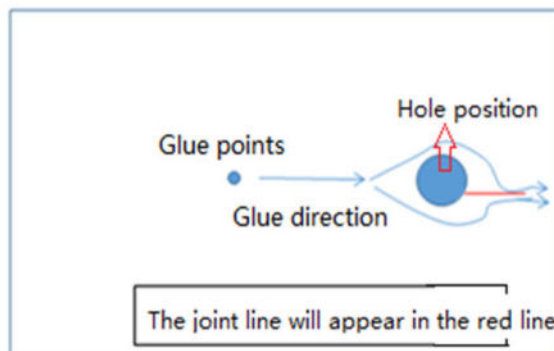
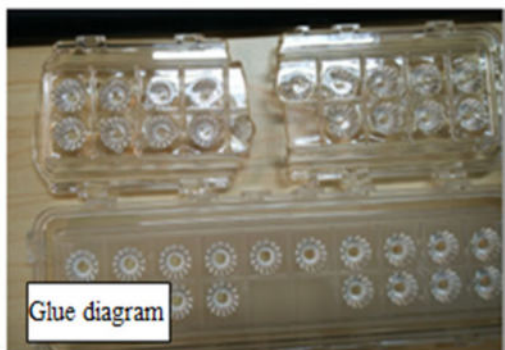
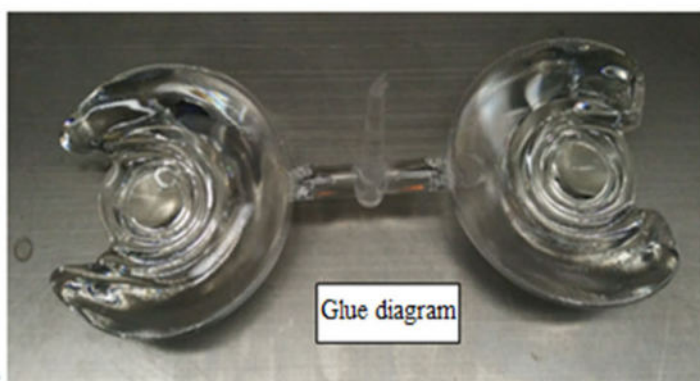
- Precautions:
- Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
 - Try to avoid touching the total reflection surface when taking the lens.
 - The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
 - The working temperature of the lens should be within the temperature resistance limit of the lens material. Exceeding the temperature resistance limit will cause the lens to crack or melt and affect the service life of the lens. It is recommended that

PN		HK-DX-62@30-15-D12-21-1g-1_PMMA		Product Name	HK low glare 62@30-15 degree lens		
Product material		PMMA		Customer			
Package diagram		 <p style="text-align: center;">Single Vacuum package Box package</p>					
Product packing		9	A/ Box	4	pcs/Layer		
		9	Layer/Box	324	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2. 07. 0078	Blister box	23cm*21cm	36	BAG	
	2	2. 08. 0001	PE film	25cm*27cm	36	PCS	
	3	2. 06. 0005	Reel label paper	62mm*42mm	36	PCS	
	4	2. 06. 0005	Box label paper	62mm*70mm	1	PCS	
	5	2. 06. 0003	big plate	46cm*42cm	10	PCS	
	6	2. 06. 0011	big flat carton	48cm*44cm*37cm	1	PCS	
Remarks	Scattered packaging is not restricted by this specification, the customer has the requirements of the customer shall prevail						

Special notice

When glue pass through holes, columns and other structures, or part of the thin structure, will form a weld line. The product which uses multi-point injection welding line will appear because of the combination of sol, as shown below:

Syntner



The joint line will appear in the red line

Please note :

The appearance of lines in the structure of the product as well as at the screw hole is a normal phenomenon, will not affect the actual use of the product, and can not be avoided at this stage.

Appearance inspection standards

1 Operating procedures

1.1.1 Sampling standards, sampling plan and AQL

Test level : GB/T2828.1-2012 The first part is according to the acceptance quality limit (AQL) retrieval batch inspection sampling plan, general inspection level II level, CR class defect coefficient 0, MA defect rejection level AQL = 0.65, MI class defect rejection level AQL = 1.0; defect level please see 5.4.

2 Code table

Code	Code description	Unit	Code		Code description	Unit
N	Amount/pcs	pcs	D		Diameter	mm
L	Length	mm	H		Depth	mm
W	Width	mm	DS		Distance	mm
S	Proportion	mm ²	SS		Offset	mm

3 Test conditions

3.1 Sight distance and working hours: Sight distance should be 30-35cm, each side of the inspection time does not exceed 12s, the visual angle of 45-135 degrees;

3.2 Light: 2x40w cool white fluorescent lamp, the light source is 500-550mm away from the lens surface; in order to make the appearance defect can be correctly recognized, the illumination should be 500-1000Lux, and the observation time is 10 seconds.

3.3 Visual inspection staff should be 1.0 (including corrected visual acuity) above, no color blindness, color weakness.

4 Appearance inspection standards

Test items	Judging standard	Inspection equipment	Defect level		
		Testing method	MI	MA	CR
Check the sample	When start the machine and process, all products have to check the appearance of the sample, the appearance of the sample is divided into qualified samples and limited samples.	Sample comparison , visual			
	1: Qualified sample refers to the appearance and structure standard of the product which recognized by the client, the sample size should be confirmed before mass production;				

	2: The limited sample refers to the limit of a particular exceptionally developed sample. Limit the sample only for its specific point of exception to confirm; The priority is higher than the other criteria in this table. When there is a limited sample, the limit sample shall prevail.				
Raw edge	Not allowed to affect the size and assembly	Visual, point card		√	
Scratch	1: Non-optical surface and non-exposed surface scratches should be visually insignificant and the length is less than 1/10 of the maximum surface size.	Visual, point card, calipers		√	
Fingerprint	Fingerprints are not allowed on all products	Visual		√	
Foreign objects, black spots, white spots	The product may not be attached to foreign objects, including oil, fiber, dregs of water gap and so on				√
Deformation	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces.	Visual, feeler			√
Poor ejection	Products may not appear bad ejection, including no convex top, thimble printed on the assembly surface shall not be higher than the product surface, non-assembled surface thimble height should not exceed the product size tolerances; thimble printing should be less than the product surface and no more than 0.3; thimble surface treatment should be consistent with the product side.	Visual, point card		√	
	Ejection strain: the optical surface and the appearance of the exposed surface after assembly are not allowed to have a strain, and the structural surface does not allow visual obvious strain.				
Insufficient filling	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces , The signature sample shall prevail.	Visual, point card		√	
Shrink	When the entire surface of the product shrinks, the optical properties and dimensions must meet the requirements, and the visual will not significantly affect the appearance.Part shrink reference point defects	Visual, point card		√	
Flow marks、Welding line	1 : Product does not allow the presence of flow marks and welding lines unless the structure can not be avoided;	Visual		√	
	2: The remaining flow marks shall not appear in the optical surface, a single L ≤ 10mm, no more than two				

Bubble	No bubbles are allowed	Visual		√	
Foreign objects, black spots, white spots	Not obvious or $D \leq 0.3\text{mm}$ black spots and foreign bodies in the area of 100x100mm not more than 1; Exceeded foreign matter black spots is judged bad.	Visual, point card	√		
Damaged	No damage is allowed	Visual			√
Cold glue	Optical surface may not have cold glue, non-optical surface cold glue should meet the visual is not obvious.	Visual	√		
Bad incision	1: Do not affect the product size, shall not penetrate the optical surface, the cut should be smooth;	Visual			√
	2: Laser cutting products, the optical surface burns shall not occur after the processing is completed. Beading must not affect product installation				
	3: Three molds and hot runner gate shall not appear residue.				
Scrub	Scrub surface should be uniform, off the scrub phenomenon should not be obvious , A single off scrub imprint requires $D \leq 1\text{ mm}$ and no more than 1 area within a 50x50 mm area	Visual		√	