



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-50@24-15-D9-21-1g-1	1. 01. 02581	HK Glareless 50@24-15° lens
HK-DX-50@24-24-D9-21-1g-1	1. 01. 02582	HK Glareless 50@24-24° lens
HK-DX-50@24-36-D9-21-1g-1	1. 01. 02590	HK Glareless 50@24-36° lens
HK-DX-50@24-60-D9-21-1g-1	1. 01. 12803	HK Glareless 50@24-60° 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.com/>

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.



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Basic product information

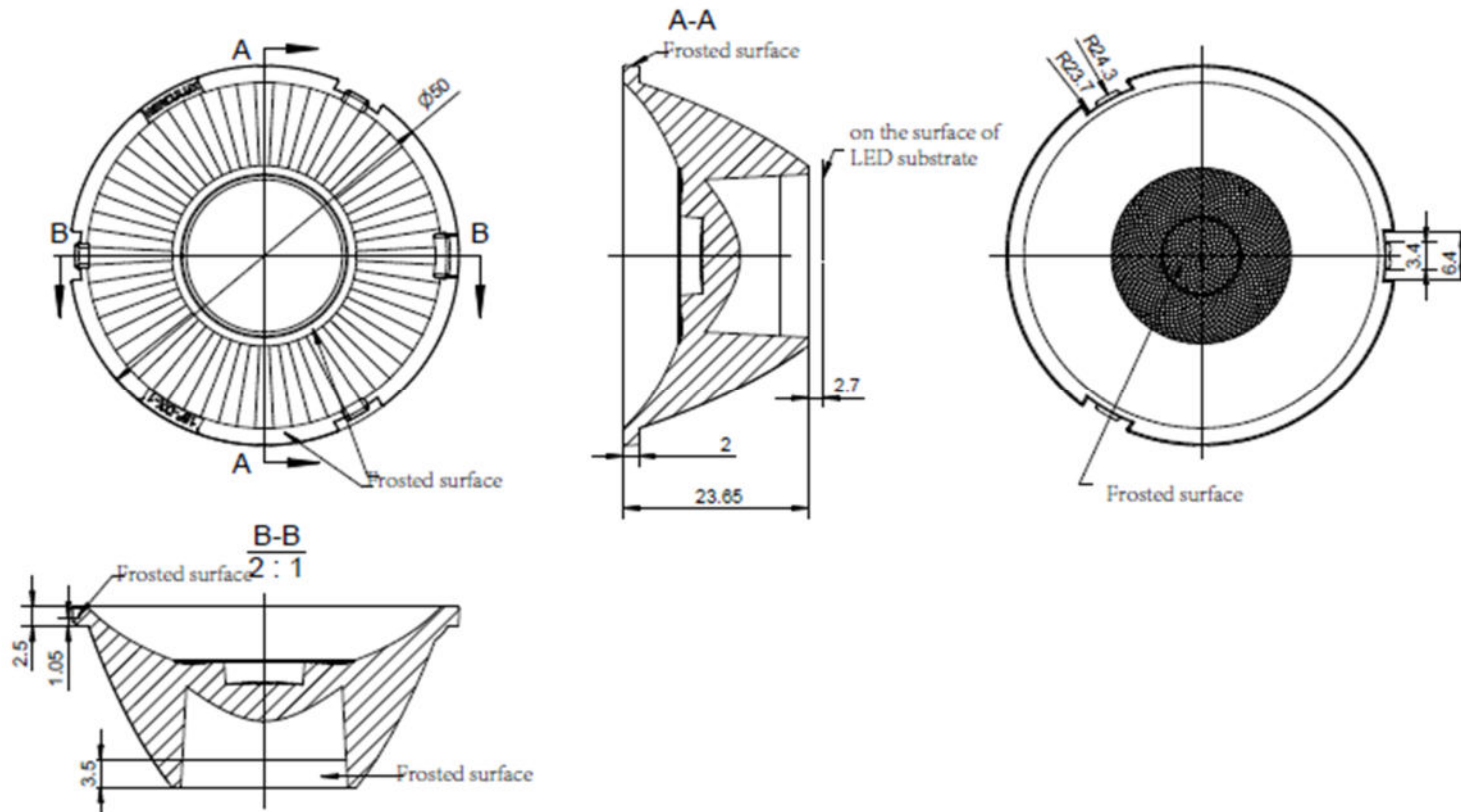
TEL: 0755-2937 1541

FAX: 0755-2907 5140

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

Date updated: 2022/12/26

Product Picture:	
Size(L*W*H/Φ*H):	Φ : 50mm*H : 23.65mm
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:	D9
Recommended MAX power:	Not more than 25W

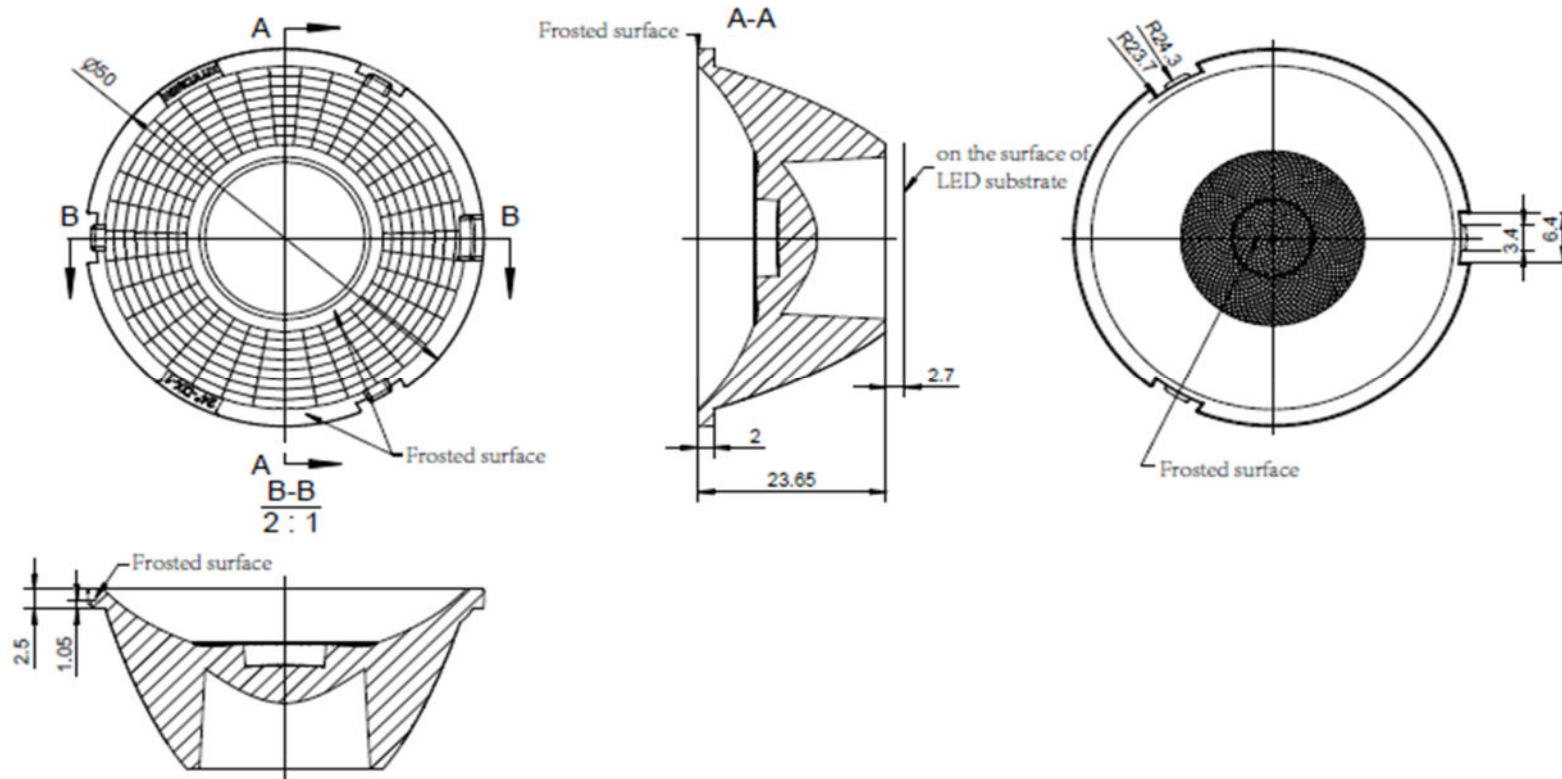


Technical remark:

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.
- *4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: $Ra < 3.2\mu m$

Optical design			HK-DX-50@24-15-D9-21-1g-1	
Structure design			HK Glareless 50@24-15° lens	
Review			number of drawing	1.01.02581
Validation			qty	weight
				CDHK
			Material:	PC

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
	olerance valu	±0.1	±0.15	±0.2	±0.35	±0.50	±0.80	±1.2	±2.0

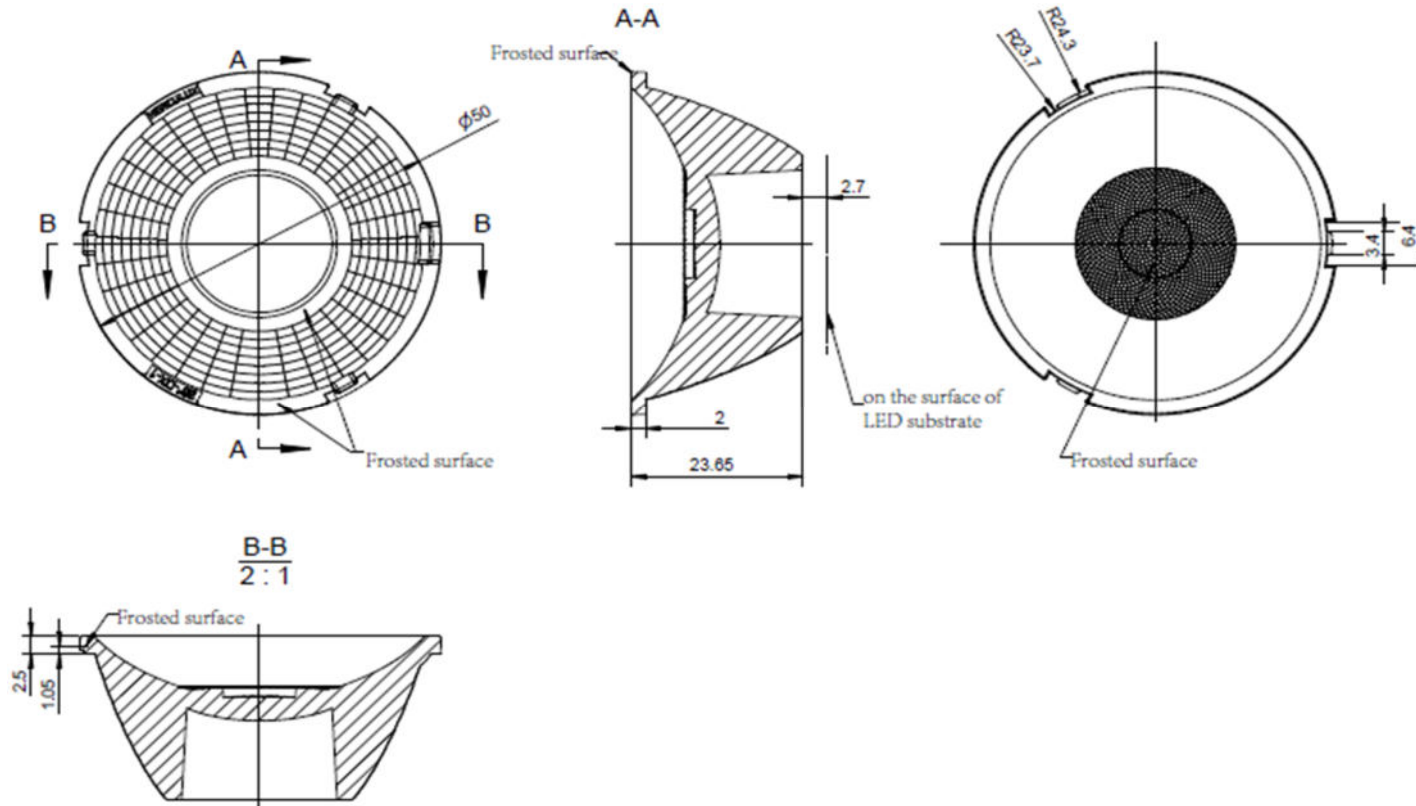


Technical remark:

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.
- *4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: $Ra < 3.2\mu m$

Optical design			HK-DX-50@24-24-D9-21-1g-1		
structure design			HK Glareless 50@24-24° lens		
Review			number of drawing	qty	weight
Validation			CDHK		
			Material: PC		

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
	olerance valu		±0.1	±0.15	±0.2	±0.35	±0.50	±0.80	±1.2

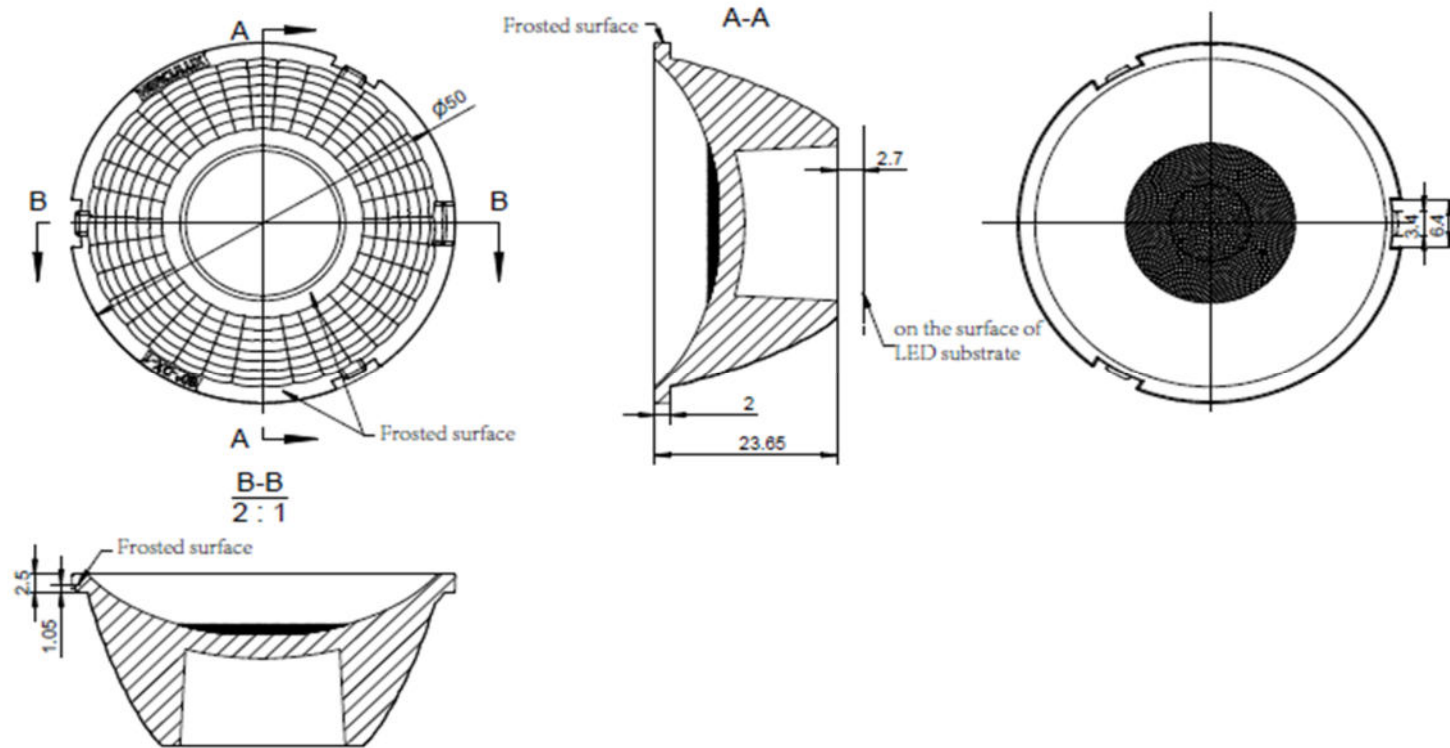


Technical remark:

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.
- *4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: $Ra < 3.2\mu m$

Optical design			HK-DX-50@24-36-D9-21-1g-1		
structure design			1.01.02590		
Review			number of drawing	qty	weight
Validation			Material: PC CDHK		

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
	olerance valu	±0.1	±0.15	±0.2	±0.35	±0.50	±0.80	±1.2	±2.0

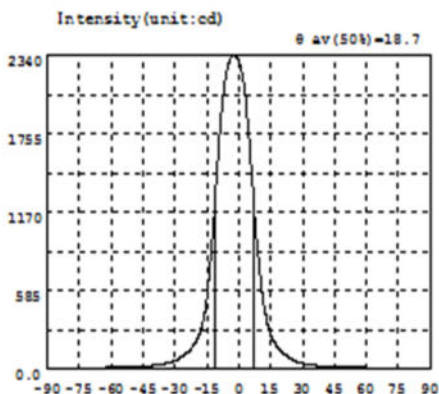
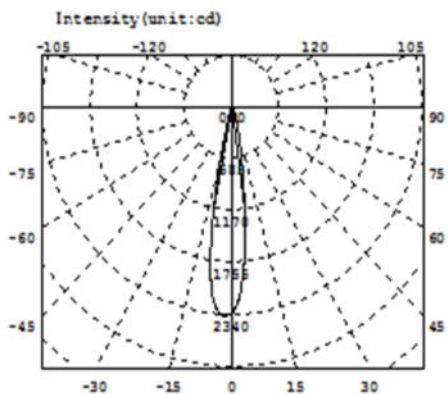


Technical remark:

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.
- *4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: $Ra < 3.2\mu m$

Optical design			HK-DX-50@24-60-D9-21-1g-1	
structure desig			HK Glareless 50@24-60° lens	
Review			number of drawing	1.01.12803
Validation			qty	weight
			Material: PC	
			CDHK	

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450	
	olerance valu	±0.1	±0.15	±0.2	±0.35	±0.50	±0.80	±1.2	±2.0	



Intensity data:(deg , cd) C0-180

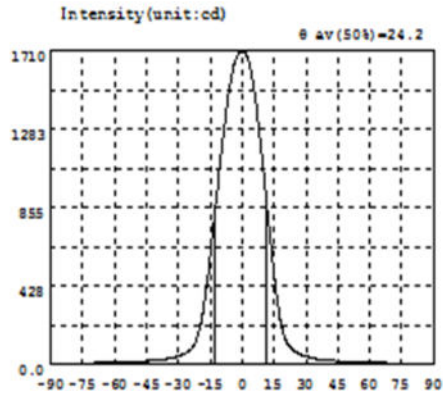
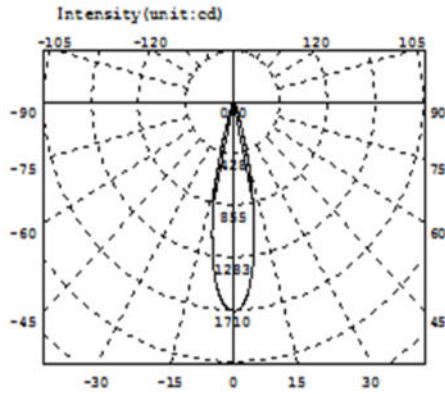
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	1.739	-58.5	9.733	-27.0	86.35	4.5	1775	36.0	23.29	67.5	4.874
-88.5	1.955	-57.0	10.33	-25.5	103.7	6.0	1457	37.5	20.95	69.0	4.495
-87.0	2.180	-55.5	11.02	-24.0	124.4	7.5	1127	39.0	19.04	70.5	3.613
-85.5	2.326	-54.0	11.73	-22.5	150.5	9.0	842.5	40.5	17.51	72.0	3.890
-84.0	2.519	-52.5	12.49	-21.0	183.0	10.5	615.7	42.0	16.26	73.5	3.528
-82.5	2.724	-51.0	13.25	-19.5	226.8	12.0	449.7	43.5	15.28	75.0	3.263
-81.0	2.974	-49.5	14.09	-18.0	287.8	13.5	328.7	45.0	14.24	76.5	2.984
-79.5	3.240	-48.0	14.83	-16.5	383.2	15.0	251.5	46.5	13.43	78.0	2.707
-78.0	3.492	-46.5	16.11	-15.0	544.7	16.5	201.4	48.0	12.68	79.5	2.400
-76.5	3.854	-45.0	17.38	-13.5	788.4	18.0	164.6	49.5	11.94	81.0	2.167
-75.0	4.181	-43.5	18.97	-12.0	1084	19.5	136.4	51.0	11.23	82.5	1.935
-73.5	4.540	-42.0	20.84	-10.5	1422	21.0	114.1	52.5	10.55	84.0	1.726
-72.0	4.890	-40.5	23.09	-9.0	1761	22.5	94.73	54.0	9.895	85.5	1.571
-70.5	5.412	-39.0	25.75	-7.5	2027	24.0	78.57	55.5	9.280	87.0	1.547
-69.0	5.977	-37.5	29.03	-6.0	2200	25.5	65.02	57.0	8.710	88.5	1.893
-67.5	6.565	-36.0	33.01	-4.5	2298	27.0	54.20	58.5	8.462	90.0	1.441
-66.0	7.079	-34.5	37.75	-3.0	2336	28.5	45.84	60.0	7.586		
-64.5	7.562	-33.0	43.54	-1.5	2333	30.0	39.25	61.5	7.190		
-63.0	8.031	-31.5	50.89	0.0	2294	31.5	33.92	63.0	6.590		
-61.5	8.523	-30.0	60.22	1.5	2199	33.0	29.60	64.5	6.044		
-60.0	9.058	-28.5	71.88	3.0	2029	34.5	26.08	66.0	5.373		

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} = 380.4lm Efficiency: $Eff=116.04lm/W$
 Diffuse angle: @ (25%) : 25.4deg @ (50%) : 18.7deg @ (75%) : 13.6deg @ (50%) : 18.7deg
 Diffuse angle: @ (25%) : 25.5deg @ (50%) : 19.1deg @ (75%) : 13.8deg @ (50%) : 19.1deg
 $I_{max}=2340cd$ (C=0.0deg,G=-2.5deg) C0-180Plane $I_{max}= 2340cd$ (G=-2.5deg)
 C0-180Plane $I_0= 2294cd$



Intensity data: (deg , cd) C0-180

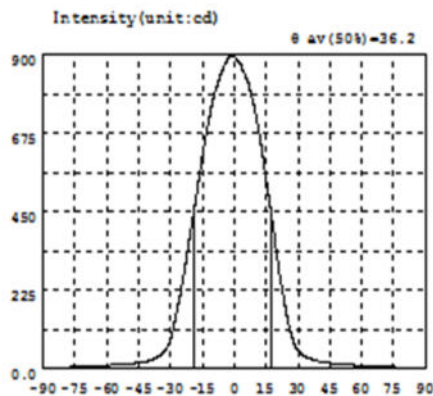
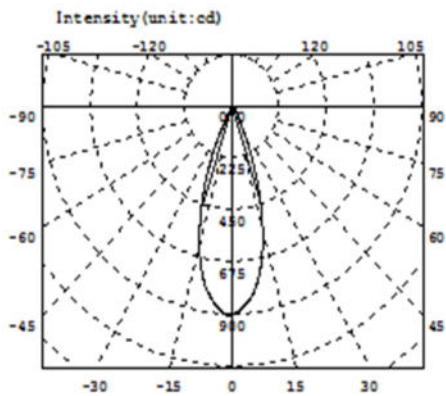
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	1.570	-58.5	10.20	-27.0	57.11	4.5	1571	36.0	25.07	67.5	5.960
-88.5	1.707	-57.0	10.77	-25.5	67.65	6.0	1457	37.5	22.78	69.0	5.572
-87.0	1.943	-55.5	11.34	-24.0	81.80	7.5	1312	39.0	20.74	70.5	5.136
-85.5	2.157	-54.0	11.85	-22.5	107.1	9.0	1153	40.5	19.09	72.0	4.777
-84.0	2.612	-52.5	12.57	-21.0	152.6	10.5	986.1	42.0	17.86	73.5	4.366
-82.5	2.576	-51.0	13.28	-19.5	224.6	12.0	816.3	43.5	16.89	75.0	3.857
-81.0	2.839	-49.5	14.02	-18.0	323.1	13.5	644.4	45.0	16.08	76.5	3.436
-79.5	3.138	-48.0	14.73	-16.5	448.5	15.0	481.5	46.5	15.14	78.0	3.074
-78.0	3.449	-46.5	15.56	-15.0	600.2	16.5	339.0	48.0	14.34	79.5	2.511
-76.5	3.852	-45.0	16.34	-13.5	763.5	18.0	233.5	49.5	13.47	81.0	2.429
-75.0	4.377	-43.5	17.19	-12.0	926.7	19.5	159.8	51.0	12.68	82.5	2.188
-73.5	4.801	-42.0	18.21	-10.5	1087	21.0	116.2	52.5	11.95	84.0	2.036
-72.0	5.195	-40.5	19.66	-9.0	1238	22.5	92.11	54.0	11.37	85.5	1.868
-70.5	5.636	-39.0	21.26	-7.5	1383	24.0	76.73	55.5	10.75	87.0	1.711
-69.0	6.095	-37.5	23.22	-6.0	1507	25.5	64.53	57.0	10.22	88.5	1.615
-67.5	6.682	-36.0	25.91	-4.5	1602	27.0	54.93	58.5	9.638	90.0	2.071
-66.0	7.285	-34.5	29.58	-3.0	1662	28.5	47.75	60.0	9.012		
-64.5	7.870	-33.0	33.66	-1.5	1696	30.0	42.08	61.5	8.448		
-63.0	8.424	-31.5	37.99	0.0	1707	31.5	37.13	63.0	7.835		
-61.5	9.006	-30.0	42.65	1.5	1694	33.0	32.41	64.5	7.217		
-60.0	9.607	-28.5	48.82	3.0	1651	34.5	28.20	66.0	6.575		

Electricity Parameter:

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

Optical Parameter (Distance=2.410m):

Equivalent Luminous flux: $\Phi_{eff} = 370.4lm$ Efficiency: $Eff = 112.97lm/W$
Diffuse angle: @ (25%): 32.2deg @ (50%): 24.2deg @ (75%): 16.3deg @ (50%): 24.2deg
Diffuse angle: @ (25%): 32.2deg @ (50%): 24.2deg @ (75%): 16.3deg @ (50%): 24.2deg
Imax=1707cd (C=0.0deg,G=0.0deg) C0-180Plane Imax= 1707cd(G=0.0deg)
C0-180Plane I0= 1707cd



Intensity data:(deg , cd) C0-180

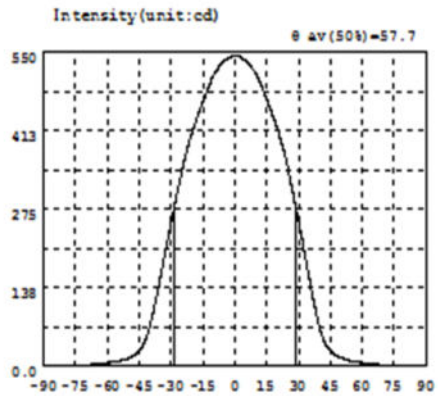
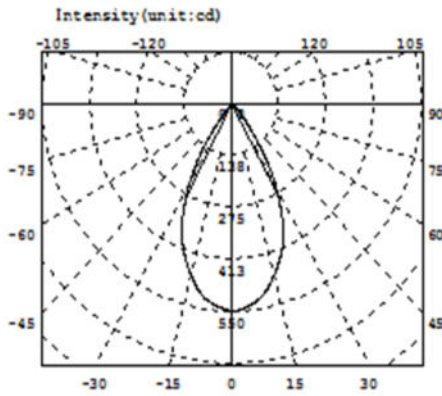
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	1.197	-58.5	8.770	-27.0	167.3	4.5	849.2	36.0	26.90	67.5	4.848
-88.5	1.300	-57.0	9.328	-25.5	212.7	6.0	826.5	37.5	23.86	69.0	4.411
-87.0	1.459	-55.5	9.864	-24.0	262.7	7.5	795.8	39.0	21.34	70.5	4.050
-85.5	1.695	-54.0	10.45	-22.5	318.1	9.0	757.6	40.5	19.23	72.0	3.763
-84.0	2.248	-52.5	11.26	-21.0	376.1	10.5	714.0	42.0	17.56	73.5	3.470
-82.5	2.211	-51.0	12.01	-19.5	434.5	12.0	662.7	43.5	16.06	75.0	3.208
-81.0	2.473	-49.5	12.77	-18.0	492.1	13.5	603.8	45.0	14.74	76.5	2.932
-79.5	2.778	-48.0	13.66	-16.5	551.9	15.0	542.0	46.5	13.62	78.0	2.641
-78.0	3.032	-46.5	14.74	-15.0	611.4	16.5	477.1	48.0	12.70	79.5	2.306
-76.5	3.336	-45.0	15.98	-13.5	665.6	18.0	415.1	49.5	11.73	81.0	2.062
-75.0	3.642	-43.5	17.53	-12.0	713.7	19.5	347.1	51.0	10.89	82.5	1.784
-73.5	3.973	-42.0	19.37	-10.5	758.2	21.0	281.8	52.5	10.14	84.0	1.604
-72.0	4.347	-40.5	21.81	-9.0	795.3	22.5	226.2	54.0	9.580	85.5	1.457
-70.5	4.777	-39.0	24.73	-7.5	824.3	24.0	175.1	55.5	9.021	87.0	1.397
-69.0	5.219	-37.5	28.23	-6.0	849.4	25.5	128.6	57.0	8.473	88.5	1.362
-67.5	5.767	-36.0	32.61	-4.5	872.5	27.0	90.72	58.5	7.940	90.0	1.149
-66.0	6.298	-34.5	38.54	-3.0	887.7	28.5	65.26	60.0	7.363		
-64.5	6.776	-33.0	46.84	-1.5	898.8	30.0	50.30	61.5	6.888		
-63.0	7.217	-31.5	61.14	0.0	894.4	31.5	41.05	63.0	6.418		
-61.5	7.702	-30.0	85.68	1.5	884.1	33.0	35.08	64.5	5.887		
-60.0	8.229	-28.5	121.7	3.0	869.2	34.5	30.56	66.0	5.283		

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} = 375.5lm Efficiency: E_{ff} =114.52lm/W
Diffuse angle: @ (25%): 47.6deg @ (50%): 36.2deg @ (75%): 24.8deg @ (50%): 36.2deg
Diffuse angle: @ (25%): 47.6deg @ (50%): 36.3deg @ (75%): 25.0deg @ (50%): 36.3deg
Imax=898.8cd (C=0.0deg,G=-1.0deg) C0-180Plane Imax= 898.8cd(G=-1.0deg)
C0-180Plane I0= 894.4cd



Intensity data:(deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.5536	-58.5	5.610	-27.0	306.9	4.5	536.6	36.0	132.9	67.5	2.016
-88.5	0.4643	-57.0	6.511	-25.5	332.8	6.0	531.5	37.5	104.4	69.0	1.767
-87.0	0.6110	-55.5	7.504	-24.0	357.0	7.5	524.9	39.0	79.37	70.5	1.556
-85.5	0.6671	-54.0	8.724	-22.5	379.0	9.0	516.9	40.5	59.00	72.0	1.377
-84.0	0.6906	-52.5	10.23	-21.0	398.2	10.5	506.9	42.0	43.31	73.5	1.168
-82.5	0.7578	-51.0	12.04	-19.5	415.9	12.0	494.9	43.5	32.69	75.0	1.034
-81.0	0.8248	-49.5	14.20	-18.0	432.9	13.5	481.3	45.0	25.56	76.5	0.9340
-79.5	0.8694	-48.0	16.84	-16.5	448.7	15.0	467.1	46.5	20.65	78.0	0.8831
-78.0	0.9477	-46.5	20.64	-15.0	463.4	16.5	451.5	48.0	17.24	79.5	0.8265
-76.5	1.016	-45.0	26.05	-13.5	478.0	18.0	436.5	49.5	14.64	81.0	0.7780
-75.0	1.076	-43.5	34.00	-12.0	492.5	19.5	420.4	51.0	12.40	82.5	0.7313
-73.5	1.192	-42.0	45.88	-10.5	505.9	21.0	403.8	52.5	10.49	84.0	0.6779
-72.0	1.353	-40.5	62.90	-9.0	516.8	22.5	384.8	54.0	8.914	85.5	0.6662
-70.5	1.578	-39.0	84.39	-7.5	523.7	24.0	363.3	55.5	7.673	87.0	0.6265
-69.0	1.805	-37.5	109.5	-6.0	530.0	25.5	336.0	57.0	6.634	88.5	0.5495
-67.5	2.079	-36.0	136.9	-4.5	535.6	27.0	307.5	58.5	5.584	90.0	0.5547
-66.0	2.394	-34.5	166.2	-3.0	539.3	28.5	280.5	60.0	4.586		
-64.5	2.750	-33.0	195.5	-1.5	542.7	30.0	252.3	61.5	3.791		
-63.0	3.241	-31.5	222.0	0.0	544.8	31.5	222.8	63.0	3.185		
-61.5	3.883	-30.0	251.5	1.5	544.0	33.0	192.9	64.5	2.789		
-60.0	4.655	-28.5	279.1	3.0	540.3	34.5	162.7	66.0	2.360		

Electricity Parameter:

Current I: 0.1000A Power: 3.358W
Voltage V: 33.59V PF: 1.000

Optical Parameter (Distance=2.410m):

Equivalent Luminous flux: $\Phi_{eff}= 465.7lm$ Efficiency: Eff=138.70lm/W
Diffuse angle: @ (25%): 71.8deg @ (50%): 57.7deg @ (75%): 40.6deg @ (50%): 57.7deg
Diffuse angle: @ (25%): 71.8deg @ (50%): 57.7deg @ (75%): 40.6deg @ (50%): 57.7deg
Imax=544.8cd (C=0.0deg,G=0.0deg) C0-180Plane Imax= 544.8cd(G=0.0deg)
 C0-180Plane I0= 544.8cd

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks																																										
1.Size	diameter	50			50.08	49.97	50.08	49.97		Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.																																										
	height	23.65			23.7	23.65	23.7	23.65																																												
	thickness	2			2.04	1.99	2.04	1.99																																												
	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	No burr	No burr	OK																																											
			No stains	No stains	No stains	No stains	No stains																																													
3.Material	PC			Color	Transparent			OK																																												
4.Optical index	Testing LED	D9																																																		
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	FWHM	See light distribution curve																																																		
	angle		18.7	18.8	18.9	18.9																																														
	K-value (CD/LM)		6.10	6.20	6.00	6.00																																														
	Efficiency		92.00%	92.00%	92.00%	92.00%																																														
Facult	See the signature sample																																																			
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Remarks: 1、Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual. 2、Ambient temperature on the size of the product refer to the table on the right	<p style="text-align: center;">PC product size changes with temperature table</p> <table border="1"> <caption>Data for PC product size changes with temperature table</caption> <thead> <tr> <th>Temperature (°C)</th> <th>50mm</th> <th>100mm</th> <th>150mm</th> <th>200mm</th> <th>250mm</th> <th>300mm</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>10</td> <td>0.05</td> <td>0.08</td> <td>0.10</td> <td>0.12</td> <td>0.15</td> <td>0.18</td> </tr> <tr> <td>20</td> <td>0.08</td> <td>0.12</td> <td>0.18</td> <td>0.25</td> <td>0.32</td> <td>0.38</td> </tr> <tr> <td>30</td> <td>0.10</td> <td>0.18</td> <td>0.28</td> <td>0.38</td> <td>0.48</td> <td>0.55</td> </tr> <tr> <td>40</td> <td>0.12</td> <td>0.25</td> <td>0.38</td> <td>0.50</td> <td>0.62</td> <td>0.72</td> </tr> </tbody> </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	0.10	0.12	0.15	0.18	20	0.08	0.12	0.18	0.25	0.32	0.38	30	0.10	0.18	0.28	0.38	0.48	0.55	40	0.12	0.25	0.38	0.50	0.62	0.72
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	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Test result5	Test result6	Test result7	Test result8	Judgment	Remarks																																									
1.Size	diameter	50		49.95	49.92	49.92	49.93	49.91	49.94	49.91	49.93		Test environment: In 20 °C -25 °C environment to achieve thermal																																									
	height	23.65		23.72	23.72	23.77	23.74	23.78	23.79	23.79	23.81																																											
	thickness	2		1.99	2.02	2.04	2.06	2.03	2.07	2.03	2.04																																											
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	FWHM	See light distribution curve																																																				
	angle		24.2	24.5	24.9	24.7	24.6	24.6	24.5	24.7																																												
	K-value		4.6	4.6	4.40	4.45	4.46	4.46	4.60	4.45																																												
efficiency		92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%																																											
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1.Size	diameter	50		49.94	50.05	50.02	50.03	49.95	50.06	50	49.98		Test environment: In 20 °C -25 °C environment to achieve thermal																																									
	height	23.65		23.75	23.85	23.87	23.86	23.86	23.88	23.78	23.75																																											
	thickness	2		2.06	2.05	2.14	2.15	2.15	2.11	2.04	2.03																																											
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	FWHM	See light distribution curve																																																				
	angle		36.2	36.7	36	36.7	35	36.6	36.2	36.2																																												
	K-value		2.39	2.3	2.25	2.30	2.5	2.25	2.30	2.30																																												
Efficiency		92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%	92.00%																																												
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Temperature (°C)	Size: 50mm	Size: 100mm	Size: 150mm	Size: 200mm	Size: 250mm	Size: 300mm																																																
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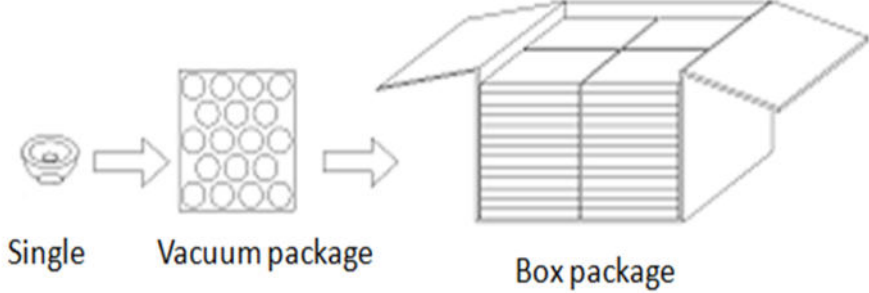
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1.Size	diameter	50			50.05	50.02	50.05	50.02		Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.																																										
	height	23.65			23.81	23.85	23.81	23.85																																												
	thickness	2			2.05	2.07	2.05	2.07																																												
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	FWHM	See light distribution curve																																																		
	angle		57.7	57.2	58	57.7																																														
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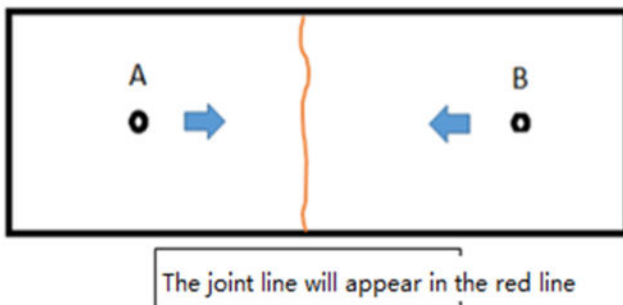
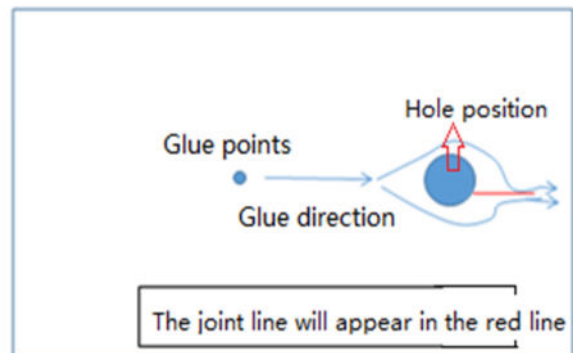
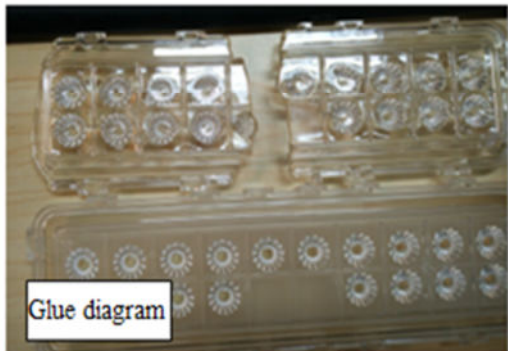
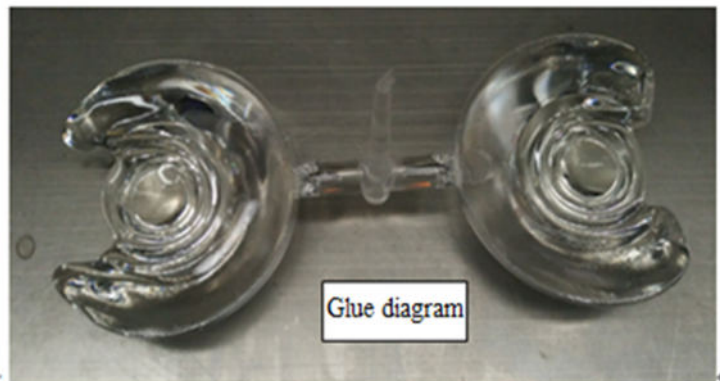
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PN		HK-DX-50@24-15-D9-21-1g-1		Product Name	HK Glareless 50@24-15° lens		
Product material		PC		Customer			
Package diagram		 <p style="text-align: center;"> Single Vacuum package Box package </p>					
Product packing		14	A/ Box	4	pcs/Layer		
		10	Layer/Box	560	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0024-1	Blister box	23cm*21cm	40	BAG	
	2	2.08.0001	PE film	30cm*30cm	40	PCS	
	3	2.06.0005	Reel label paper	6.2cm*8cm	40	PCS	
	4	2.06.0005	Box label paper	6.2cm*9.2cm	1	PCS	
	5	2.06.0003	big plate	46.8cm*42.8cm	11	PCS	
	6	2.06.0015	big flat carton	48cm*44cm*19cm	1	PCS	
Remarks	The loose packing is not subject to this specification. Customer's requirements 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:

Synthesis



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-50@24-15-D9-21-1g-1_PMMA	1. 01. 02581_PMMA	HK Glareless 50@24-15° lens
HK-DX-50@24-24-D9-21-1g-1_PMMA	1. 01. 02582_PMMA	HK Glareless 50@24-24° lens
HK-DX-50@24-36-D9-21-1g-1_PMMA	1. 01. 02590_PMMA	HK Glareless 50@24-36° lens
HK-DX-50@24-60-D9-21-1g-1_PMMA	1. 01. 12803_PMMA	HK Glareless 50@24-60° 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, lot industrial park 2 road HercuLux Photoelectric Park

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

Fax: 028-85887730

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

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.



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Basic product information

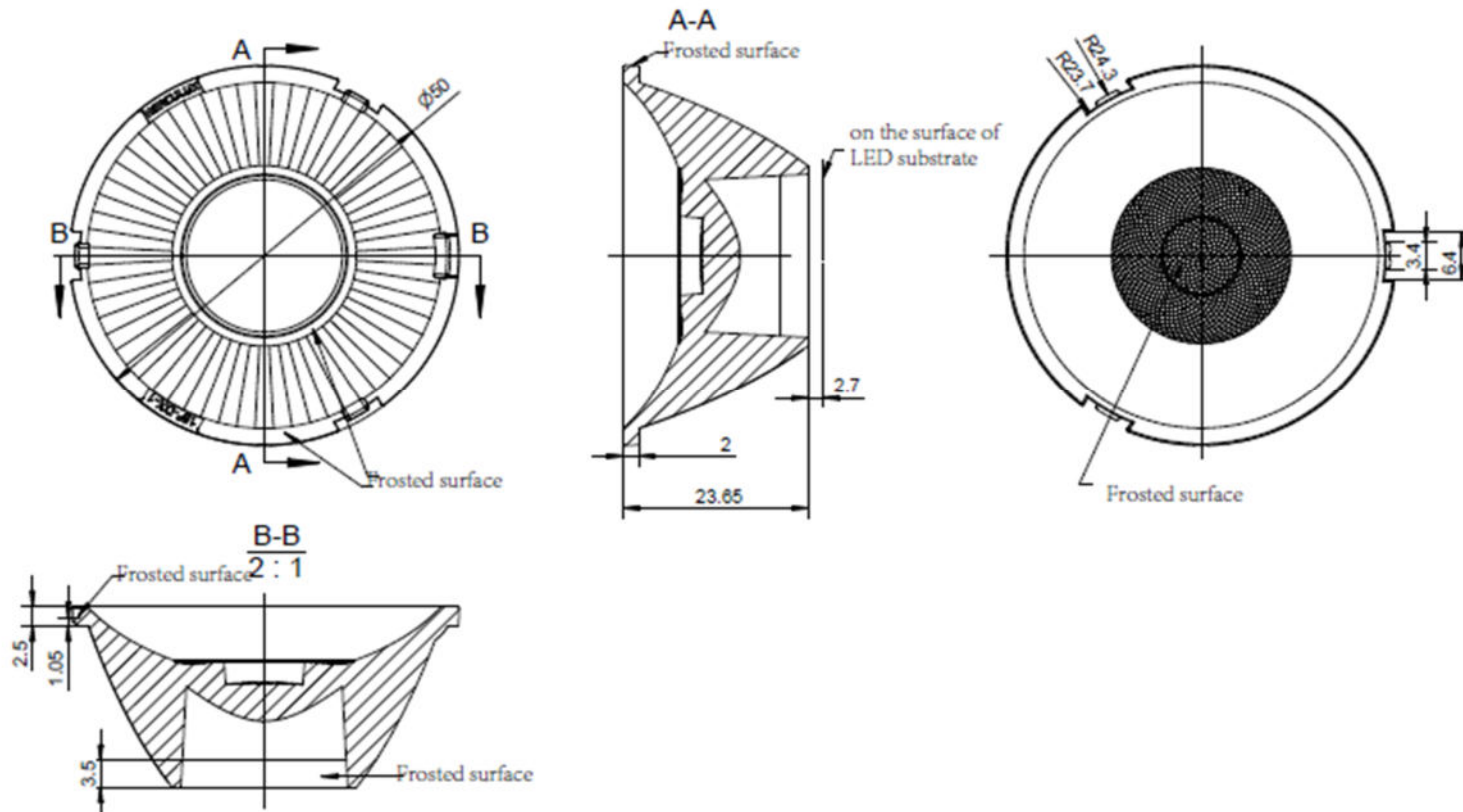
TEL: 0755-2937 1541

FAX: 0755-2907 5140

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

Date updated: 2023/8/26

Product Picture:	
Size(L*W*H/Φ*H):	Φ: 50mm*H: 23.65mm
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:	D9
Recommended MAX power:	Not more than 25W

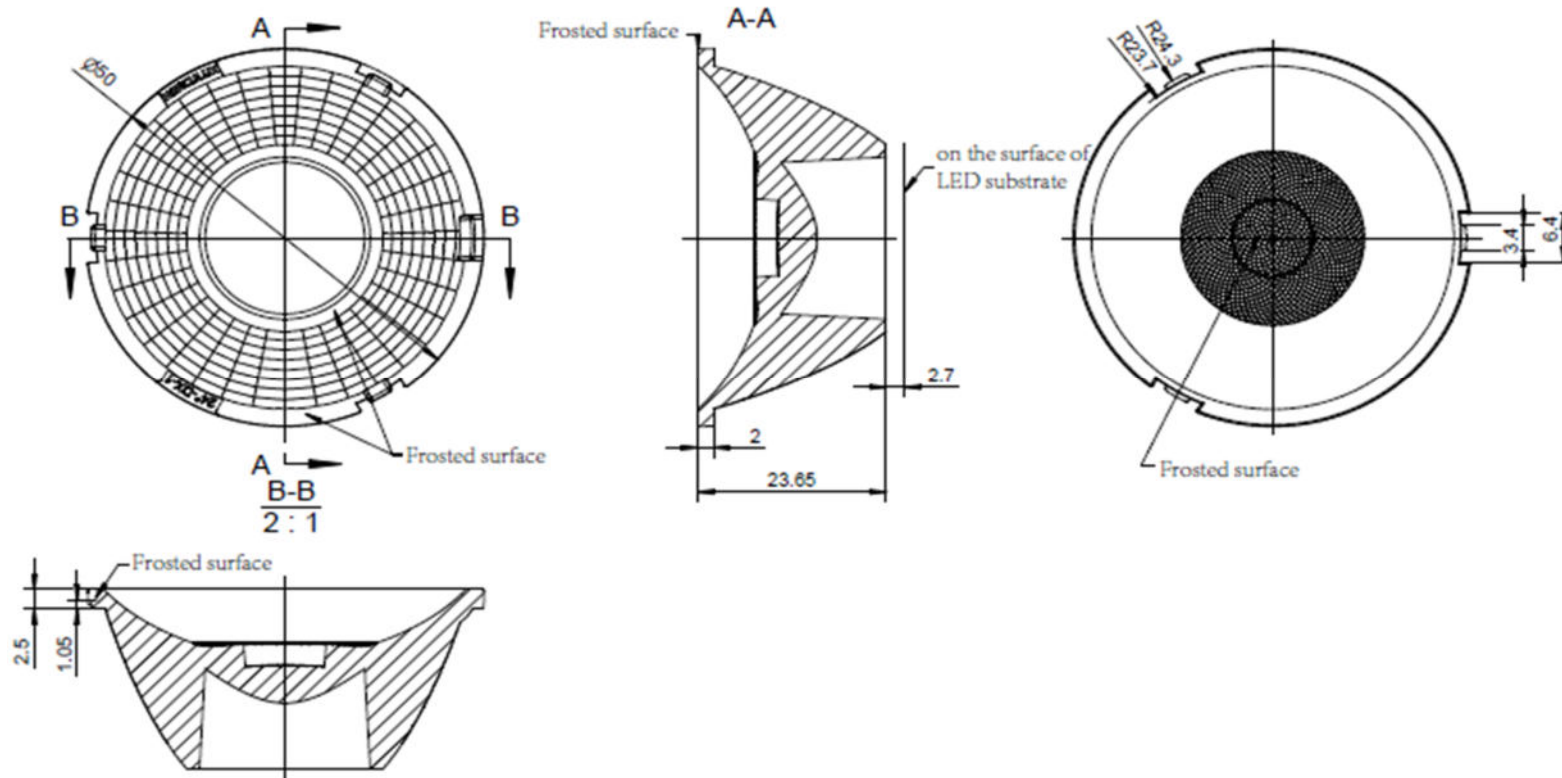


Technical remark:

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.
- *4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: Ra<3.2μm

Optical design			HK-DX-50@24-15-D9-21-1g-1_PMMA	
structure design			HK Glareless 50@24-15° lens	
Review			number of drawing	qty
Validation			weight	
			Material:	PMMA
			CDHK	

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450	
	olerance valu	±0.1	±0.15	±0.2	±0.35	±0.50	±0.80	±1.2	±2.0	

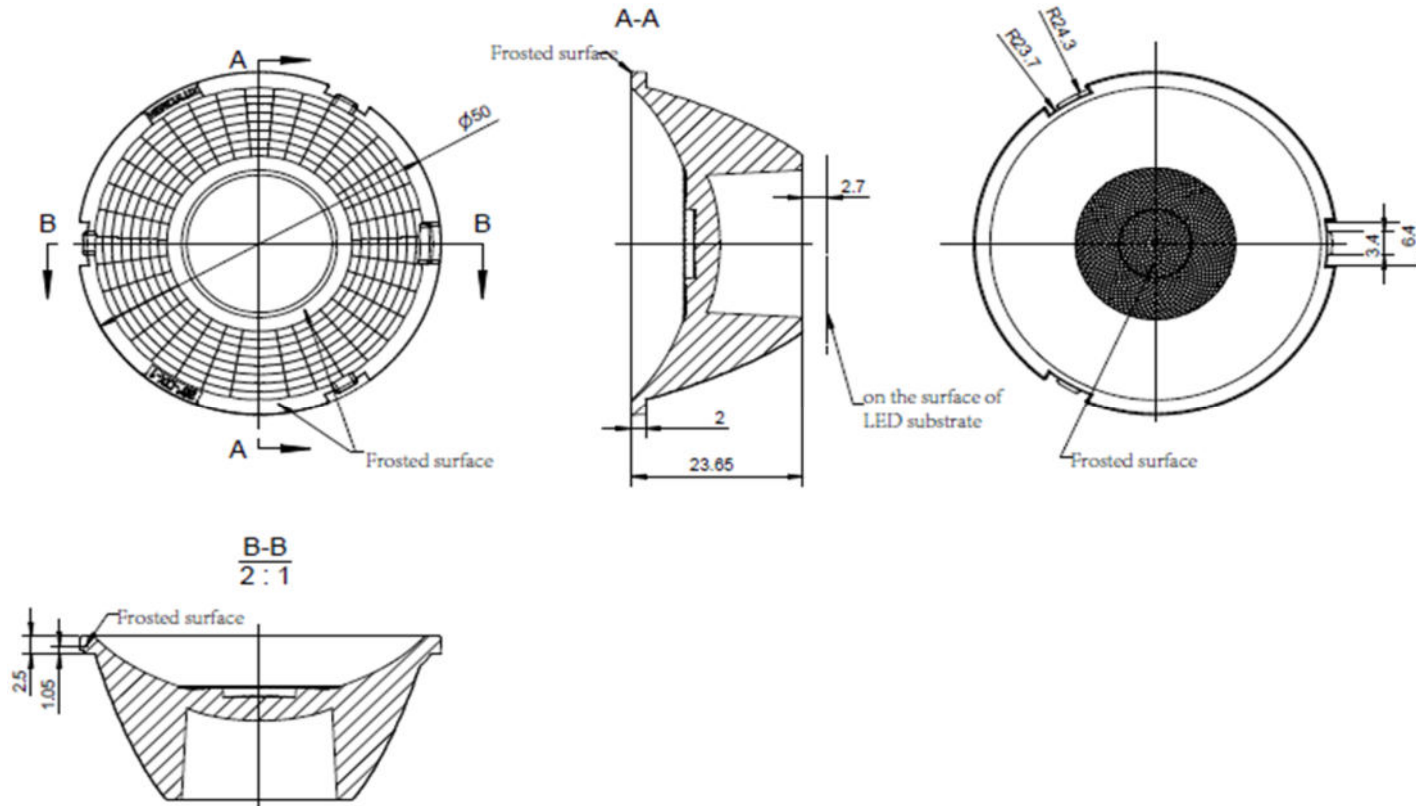


Technical remark:

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.
- *4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: Ra<3.2μm

Optical design			HK-DX-50@24-24-D9-21-1g-1_PMMA	
structure desig			HK Glareless 50@24-24° lens	
Review			number of drawing	1.01.02582_PMMA
Validation			qty	weight
				CDHK
			Material:	PMMA

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
	olerance valu	±0.1	±0.15	±0.2	±0.35	±0.50	±0.80	±1.2	±2.0

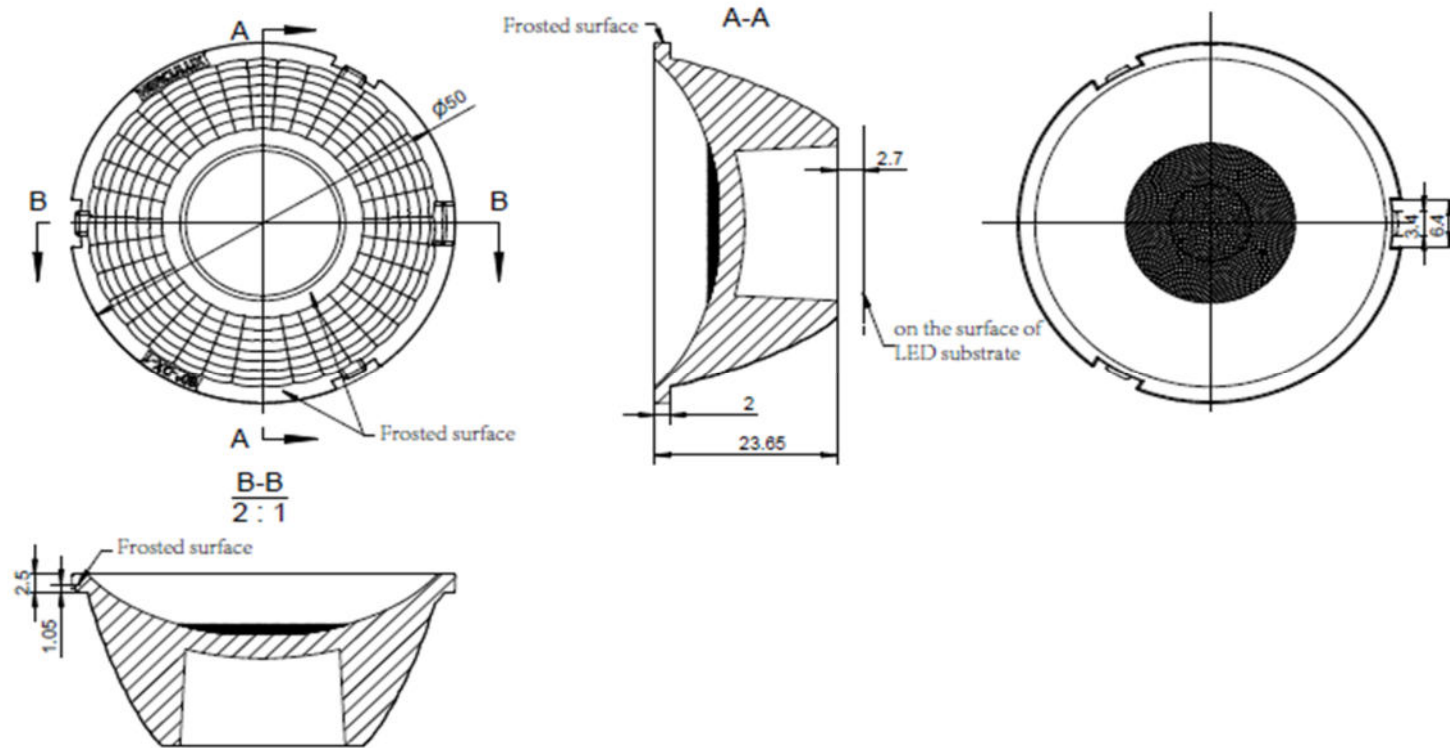


Technical remark:

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.
- *4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: $Ra < 3.2\mu m$

Optical design			HK-DX-50@24-36-D9-21-1g-1_PMMA	
Structure design			HK Glareless 50@24-36° lens	
Review			number of drawing	qty
Validation				weight
			Material: PMMA	
			CDHK	

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
	olerance valu	±0.1	±0.15	±0.2	±0.35	±0.50	±0.80	±1.2	±2.0

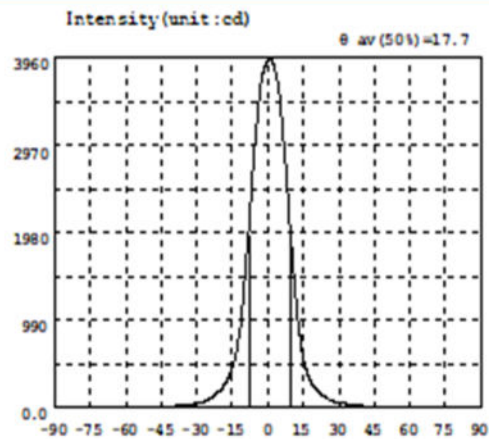
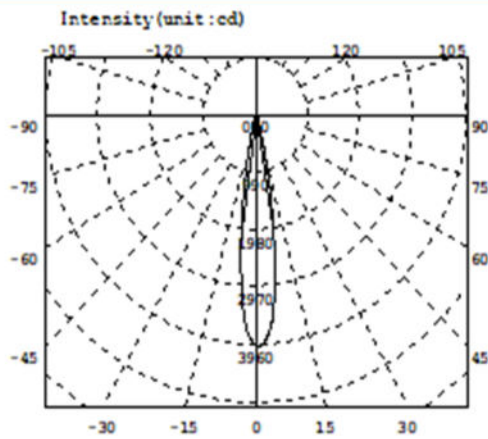


Technical remark:

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.
- *4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: $Ra < 3.2 \mu m$

Optical design			HK Glareless 50@24-60° lens	HK-DX-50@24-60-D9-21-1g-1_PMMA		
structure desig				1.01.12803_PMMA		
Review				umber of drawin	qty	weight
Validation				CDHK		
			Material:	PMMA		

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450	
	olerance valu	±0.1	±0.15	±0.2	±0.35	±0.50	±0.80	±1.2	±2.0	



Intensity data:(deg , cd) C0-180

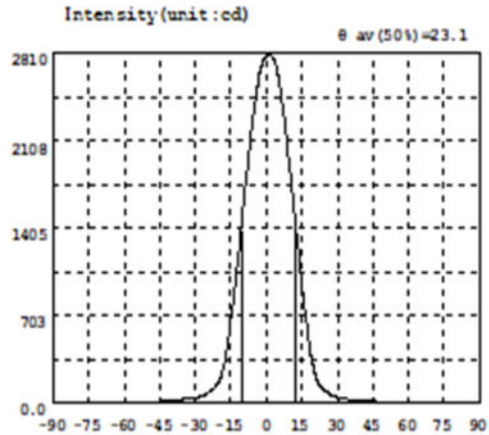
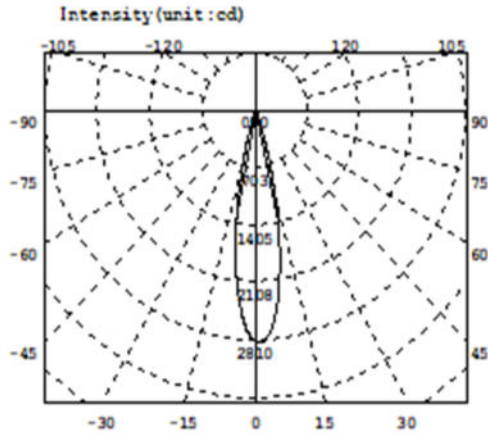
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-90.0	2.369	-58.5	12.96	-27.0	76.55	4.5	3618	36.0	39.37	67.5	8.553
-88.5	2.395	-57.0	13.81	-25.5	93.30	6.0	3254	37.5	34.90	69.0	7.774
-87.0	2.511	-55.5	14.60	-24.0	114.9	7.5	2758	39.0	30.75	70.5	7.127
-85.5	2.729	-54.0	15.51	-22.5	142.9	9.0	2202	40.5	26.94	72.0	6.606
-84.0	3.061	-52.5	16.28	-21.0	177.3	10.5	1663	42.0	24.20	73.5	6.080
-82.5	3.366	-51.0	17.03	-19.5	217.7	12.0	1186	43.5	22.31	75.0	5.616
-81.0	3.661	-49.5	17.81	-18.0	272.3	13.5	815.6	45.0	20.87	76.5	5.091
-79.5	4.056	-48.0	18.63	-16.5	346.6	15.0	571.2	46.5	19.68	78.0	4.678
-78.0	4.453	-46.5	19.52	-15.0	448.6	16.5	417.4	48.0	18.69	79.5	4.271
-76.5	4.907	-45.0	20.58	-13.5	604.8	18.0	309.4	49.5	17.83	81.0	3.916
-75.0	5.387	-43.5	21.81	-12.0	847.9	19.5	243.0	51.0	17.19	82.5	3.606
-73.5	5.872	-42.0	23.28	-10.5	1212	21.0	194.0	52.5	16.56	84.0	3.315
-72.0	6.361	-40.5	25.04	-9.0	1689	22.5	156.9	54.0	16.10	85.5	3.048
-70.5	6.898	-39.0	27.08	-7.5	2225	24.0	127.2	55.5	15.67	87.0	2.753
-69.0	7.490	-37.5	29.48	-6.0	2760	25.5	103.5	57.0	14.86	88.5	2.503
-67.5	8.238	-36.0	32.32	-4.5	3263	27.0	85.51	58.5	13.60	90.0	2.374
-66.0	9.140	-34.5	35.96	-3.0	3627	28.5	72.08	60.0	12.75		
-64.5	9.992	-33.0	40.52	-1.5	3844	30.0	62.41	61.5	11.93		
-63.0	10.77	-31.5	46.41	0.0	3940	31.5	54.92	63.0	11.15		
-61.5	11.47	-30.0	53.84	1.5	3934	33.0	48.95	64.5	10.36		
-60.0	12.16	-28.5	63.74	3.0	3827	34.5	43.98	66.0	9.477		

Electricity Parameter:

Current I: 0.1000A Power: 3.200W
Voltage V: 32.00V PF: 1.000

Optical Parameter (Distance=2.559m) :

Equivalent Luminous flux: $\phi_{eff}=544.9lm$ Efficiency: $Eff=170.31lm/W$
Diffuse angle: @ (25%) : 24.0deg @ (50%) : 17.7deg @ (75%) : 12.3deg @ (50%) : 17.7deg
Diffuse angle: @ (25%) : 24.0deg @ (50%) : 17.8deg @ (75%) : 12.3deg @ (50%) : 17.8deg
Imax=3951cd (C=0.0deg,G=0.5deg) C0-180Plane Imax= 3951cd(G=0.5deg)
C0-180Plane I0= 3940cd



Intensity data:(deg , cd) C0-180

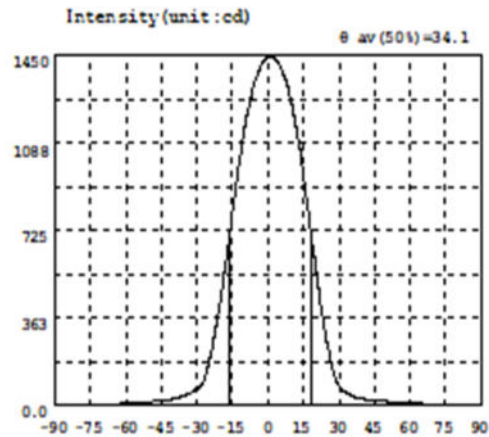
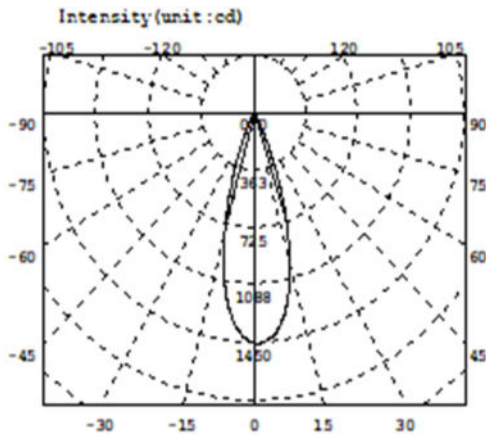
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	1.808	-58.5	12.06	-27.0	63.33	4.5	2671	36.0	29.57	67.5	8.548
-88.5	1.822	-57.0	12.98	-25.5	75.48	6.0	2510	37.5	26.66	69.0	7.700
-87.0	1.911	-55.5	13.99	-24.0	92.07	7.5	2294	39.0	24.67	70.5	7.138
-85.5	2.116	-54.0	14.83	-22.5	114.2	9.0	2047	40.5	22.90	72.0	6.583
-84.0	2.383	-52.5	15.49	-21.0	145.6	10.5	1780	42.0	21.53	73.5	6.041
-82.5	2.614	-51.0	16.20	-19.5	201.0	12.0	1506	43.5	20.74	75.0	5.493
-81.0	2.947	-49.5	17.00	-18.0	295.6	13.5	1228	45.0	20.03	76.5	4.910
-79.5	3.409	-48.0	17.72	-16.5	455.4	15.0	963.9	46.5	19.23	78.0	4.359
-78.0	3.945	-46.5	18.44	-15.0	660.7	16.5	716.4	48.0	18.49	79.5	3.913
-76.5	4.307	-45.0	19.18	-13.5	898.2	18.0	501.1	49.5	17.81	81.0	3.490
-75.0	4.775	-43.5	20.10	-12.0	1162	19.5	314.0	51.0	17.09	82.5	3.109
-73.5	5.236	-42.0	21.15	-10.5	1438	21.0	206.1	52.5	16.55	84.0	2.740
-72.0	5.619	-40.5	23.00	-9.0	1717	22.5	144.7	54.0	15.92	85.5	2.526
-70.5	6.105	-39.0	26.15	-7.5	1988	24.0	112.3	55.5	15.04	87.0	2.265
-69.0	6.640	-37.5	29.71	-6.0	2229	25.5	89.86	57.0	14.09	88.5	1.999
-67.5	7.250	-36.0	33.24	-4.5	2451	27.0	72.72	58.5	13.27	90.0	2.035
-66.0	8.046	-34.5	37.11	-3.0	2629	28.5	59.90	60.0	12.39		
-64.5	9.013	-33.0	40.74	-1.5	2744	30.0	50.62	61.5	11.67		
-63.0	9.884	-31.5	44.58	0.0	2793	31.5	43.56	63.0	10.93		
-61.5	10.66	-30.0	48.55	1.5	2804	33.0	38.18	64.5	10.27		
-60.0	11.36	-28.5	54.43	3.0	2768	34.5	33.57	66.0	9.534		

Electricity Parameter:

Current I: 0.1000A Power: 3.200W
Voltage V: 32.00V PF: 1.000

Optical Parameter (Distance=2.559m) :

Equivalent Luminous flux: Φ_{eff} = 545.8lm Efficiency: Eff = 170.56lm/W
Diffuse angle: @ (25%) : 31.2deg @ (50%) : 23.1deg @ (75%) : 15.4deg @ (50%) : 23.1deg
Diffuse angle: @ (25%) : 31.3deg @ (50%) : 23.3deg @ (75%) : 15.5deg @ (50%) : 23.3deg
 I_{max} = 2804cd (C=0.0deg, G=1.5deg) C0-180Plane I_{max} = 2804cd (G=1.5deg)
C0-180Plane I_0 = 2793cd



Intensity data:(deg , cd) C0-180

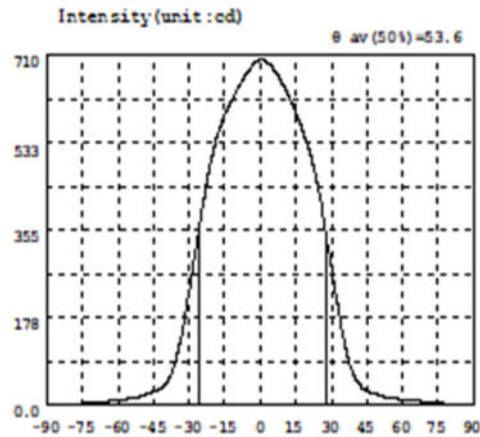
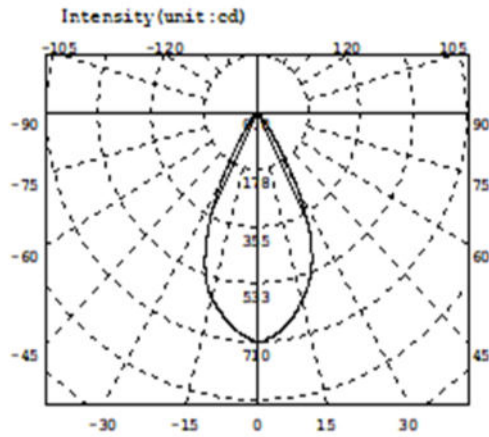
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	1.859	-58.5	11.95	-27.0	108.3	4.5	1416	36.0	40.36	67.5	8.769
-88.5	1.834	-57.0	13.05	-25.5	156.1	6.0	1390	37.5	35.30	69.0	8.105
-87.0	1.898	-55.5	14.31	-24.0	218.0	7.5	1349	39.0	31.41	70.5	7.512
-85.5	2.052	-54.0	15.41	-22.5	292.5	9.0	1297	40.5	28.17	72.0	6.922
-84.0	2.282	-52.5	15.83	-21.0	378.8	10.5	1228	42.0	25.64	73.5	6.319
-82.5	2.513	-51.0	16.38	-19.5	472.8	12.0	1149	43.5	23.59	75.0	5.814
-81.0	2.797	-49.5	17.05	-18.0	577.5	13.5	1058	45.0	22.09	76.5	5.263
-79.5	3.229	-48.0	18.05	-16.5	687.6	15.0	955.5	46.5	20.67	78.0	4.773
-78.0	3.627	-46.5	19.09	-15.0	797.7	16.5	842.9	48.0	19.39	79.5	4.235
-76.5	4.139	-45.0	20.40	-13.5	907.6	18.0	730.1	49.5	18.19	81.0	3.763
-75.0	4.646	-43.5	22.07	-12.0	1016	19.5	619.3	51.0	17.08	82.5	3.439
-73.5	5.116	-42.0	24.20	-10.5	1112	21.0	511.6	52.5	16.01	84.0	3.095
-72.0	5.528	-40.5	26.75	-9.0	1194	22.5	407.9	54.0	15.19	85.5	2.738
-70.5	5.965	-39.0	30.42	-7.5	1265	24.0	313.2	55.5	14.44	87.0	2.484
-69.0	6.529	-37.5	35.23	-6.0	1326	25.5	233.1	57.0	13.51	88.5	2.224
-67.5	7.084	-36.0	39.94	-4.5	1370	27.0	165.4	58.5	12.85	90.0	2.067
-66.0	7.751	-34.5	45.17	-3.0	1405	28.5	114.3	60.0	12.41		
-64.5	8.585	-33.0	51.48	-1.5	1430	30.0	83.17	61.5	11.49		
-63.0	9.399	-31.5	59.17	0.0	1443	31.5	66.01	63.0	10.71		
-61.5	10.23	-30.0	69.01	1.5	1445	33.0	54.74	64.5	10.09		
-60.0	11.07	-28.5	83.13	3.0	1434	34.5	46.55	66.0	9.394		

Electricity Parameter:

Current I: 0.1000A Power: 3.200W
Voltage V: 32.00V PF: 1.000

Optical Parameter (Distance=2.559m) :

Equivalent Luminous flux: $\Phi_{\text{eff}} = 543.3\text{lm}$ Efficiency: $\text{Eff} = 169.79\text{lm/W}$
Diffuse angle: @ (25%) : 44.3deg @ (50%) : 34.1deg @ (75%) : 23.9deg @ (50%) : 34.1deg
Diffuse angle: @ (25%) : 44.4deg @ (50%) : 34.1deg @ (75%) : 24.0deg @ (50%) : 34.1deg
Imax=1446cd (C=0.0deg, G=1.0deg) C0-180Plane Imax= 1446cd (G=1.0deg)
C0-180Plane I0= 1443cd



Intensity data:(deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	1.961	-58.5	11.65	-27.0	324.3	4.5	689.5	36.0	116.4	67.5	8.484
-88.5	1.872	-57.0	12.87	-25.5	369.3	6.0	679.1	37.5	88.26	69.0	7.821
-87.0	1.949	-55.5	14.25	-24.0	412.8	7.5	669.0	39.0	67.34	70.5	7.303
-85.5	2.166	-54.0	15.66	-22.5	453.8	9.0	656.6	40.5	51.63	72.0	6.867
-84.0	2.371	-52.5	16.70	-21.0	491.1	10.5	642.6	42.0	41.13	73.5	6.429
-82.5	2.603	-51.0	18.07	-19.5	522.0	12.0	626.5	43.5	34.30	75.0	5.988
-81.0	2.924	-49.5	19.88	-18.0	548.3	13.5	610.2	45.0	29.91	76.5	5.239
-79.5	3.257	-48.0	22.29	-16.5	569.9	15.0	594.2	46.5	26.66	78.0	4.677
-78.0	3.689	-46.5	25.10	-15.0	589.5	16.5	575.8	48.0	24.06	79.5	4.207
-76.5	4.113	-45.0	28.11	-13.5	604.5	18.0	555.5	49.5	21.78	81.0	3.792
-75.0	4.580	-43.5	31.35	-12.0	618.5	19.5	536.0	51.0	19.71	82.5	3.407
-73.5	4.990	-42.0	35.13	-10.5	633.3	21.0	512.7	52.5	17.91	84.0	3.054
-72.0	5.440	-40.5	40.59	-9.0	647.4	22.5	484.4	54.0	16.42	85.5	2.759
-70.5	5.951	-39.0	49.15	-7.5	661.1	24.0	452.0	55.5	15.11	87.0	2.545
-69.0	6.474	-37.5	63.31	-6.0	671.2	25.5	415.3	57.0	13.99	88.5	2.358
-67.5	6.979	-36.0	85.14	-4.5	681.8	27.0	366.5	58.5	12.96	90.0	2.244
-66.0	7.554	-34.5	113.2	-3.0	690.2	28.5	324.6	60.0	11.86		
-64.5	8.205	-33.0	147.3	-1.5	698.2	30.0	282.6	61.5	10.95		
-63.0	8.887	-31.5	187.5	0.0	701.7	31.5	237.8	63.0	10.47		
-61.5	9.690	-30.0	229.0	1.5	701.0	33.0	193.7	64.5	9.726		
-60.0	10.65	-28.5	277.1	3.0	695.6	34.5	152.0	66.0	9.067		

Electricity Parameter:

Current I: 0.1000A Power: 3.200W
Voltage V: 32.00V PF: 1.000

Optical Parameter (Distance=2.559m) :

Equivalent Luminous flux: $\Phi_{\text{eff}} = 544.2\text{lm}$ Efficiency: $\text{Eff} = 170.08\text{lm/W}$
Diffuse angle: @ (25%) : 65.5deg @ (50%) : 53.6deg @ (75%) : 39.3deg @ (50%) : 53.6deg
Diffuse angle: @ (25%) : 65.5deg @ (50%) : 53.6deg @ (75%) : 39.3deg @ (50%) : 53.6deg
 $I_{\text{max}} = 701.7\text{cd}$ (C=0.0deg, G=0.0deg) C0-180Plane $I_{\text{max}} = 701.7\text{cd}$ (G=0.0deg)
C0-180Plane $I_0 = 701.7\text{cd}$

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks																																										
1.Size	diameter	50	/	/	50.21	50.18	50.21	50.18	/	Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.																																										
	height	23.65	/	/	23.72	23.73	23.72	23.73	/																																											
	thickness	2	/	/	2.01	1.99	2.01	1.99	/																																											
	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	No burr	No burr	OK																																											
			No stains	No stains	No stains	No stains	No stains																																													
3.Material	PMMA				Color	Transparent			OK																																											
4.Optical index	Testing LED	D9																																																		
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	FWHM	See light distribution curve																																																		
	angle	/	17.7	18	17.5	17.3	/																																													
	K-value (CD/LM)	/	7.25	6.90	7.30	7.35	/																																													
	Efficiency	/	93.00%	93.00%	93.00%	93.00%	/																																													
Facul	See the signature sample																																																			
Comprehensive judgment	Qualified																																																			
Remarks: 1、Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual. 2、Ambient temperature on the size of the product refer to the table on the right	<p style="text-align: center;">PMMA product size changes with temperature table</p> <table border="1"> <caption>PMMA product size changes with temperature table</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Size: 50mm</th> <th>Size: 100mm</th> <th>Size: 150mm</th> <th>Size: 200mm</th> <th>Size: 250mm</th> <th>Size: 300mm</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>10</td> <td>0.05</td> <td>0.08</td> <td>0.12</td> <td>0.15</td> <td>0.18</td> <td>0.22</td> </tr> <tr> <td>20</td> <td>0.10</td> <td>0.15</td> <td>0.22</td> <td>0.28</td> <td>0.35</td> <td>0.42</td> </tr> <tr> <td>30</td> <td>0.15</td> <td>0.22</td> <td>0.30</td> <td>0.38</td> <td>0.48</td> <td>0.58</td> </tr> <tr> <td>40</td> <td>0.20</td> <td>0.28</td> <td>0.38</td> <td>0.48</td> <td>0.60</td> <td>0.72</td> </tr> </tbody> </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
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																																														
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	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Test result5	Test result6	Test result7	Test result8	Judgment	Remarks																																									
1.Size	diameter	50		50.05	50.12	50.12	50.2	50.12	50.05	50.16	50.2		Test environment: In 20 °C -25 °C environment to achieve thermal																																									
	height	23.65		23.85	23.84	23.92	23.91	23.93	23.93	23.91	23.91																																											
	thickness	2		2.02	2.05	2.1	2.13	2.1	2.09	2.07	2.13																																											
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See attachment "Appearance Inspection Standards"																																																						
2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr		No burr		No burr		No burr				OK																																									
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	FWHM	See light distribution curve																																																				
	angle		23	23.5	23.3	24	23.9	23.5	23.4	23.7																																												
	K-value		5.13	5.01	5.10	4.85	4.9	5.02	5.10	5.00																																												
Efficiency		93.00%	93.00%	93.00%	93.00%	93.00%	93.00%	93.00%	93.00%	93.00%	93.00%																																											
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Temperature (°C)	Size: 50mm	Size: 100mm	Size: 150mm	Size: 200mm	Size: 250mm	Size: 300mm																																																
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1.Size	diameter	50			50.22	50.16	50.2	50.27	50.18	50.23	50.23	50.14	Test environment: In 20 °C -25 °C environment to achieve thermal																																									
	height	23.65			23.77	23.77	23.85	23.84	23.87	23.85	23.79	23.79																																										
	thickness	2			2.03	2.02	2.11	2.14	2.15	2.12	2.05	2.06																																										
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	FWHM	See light distribution curve																																																				
	angle				34	34.3	34.6	35	34.5	34.7	35.1	33.9																																										
	K-value				2.66	2.55	2.50	2.40	2.48	2.4	2.40	2.67																																										
efficiency				93.00%	93.00%	93.00%	93.00%	93.00%	93.00%	93.00%	93.00%																																											
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Temperature (°C)	Size: 50mm	Size: 100mm	Size: 150mm	Size: 200mm	Size: 250mm	Size: 300mm																																																
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		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks	
1.Size	diameter	50	/	/	50.13	50.14	50.13	50.14	/	Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.	
	height	23.65	/	/	23.8	23.77	23.8	23.77	/		
	thickness	2	/	/	1.97	1.97	1.97	1.97	/		
	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		
4.Optical index	Testing LED	D9									
	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										
	FWHM	See light distribution curve									
	angle	/	57.7	57.2	58	57.7	/	OK			
	K-value (CD/LM)	/	/	/	/	/					
	Efficiency	/	90.00%	90.00%	90.00%	90.00%					
Facult	See the signature sample										
Comprehensive judgment	Qualified										

Remarks:

1、Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.

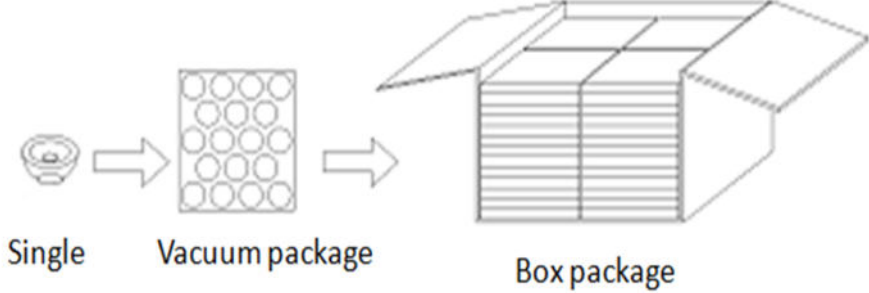
2、Ambient temperature on the size of the product refer to the table on the right

PMMA 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	0.08	0.12	0.18	0.25	0.32	0.38
30	0.10	0.18	0.28	0.38	0.48	0.55
40	0.12	0.25	0.38	0.50	0.62	0.72

Precautions:

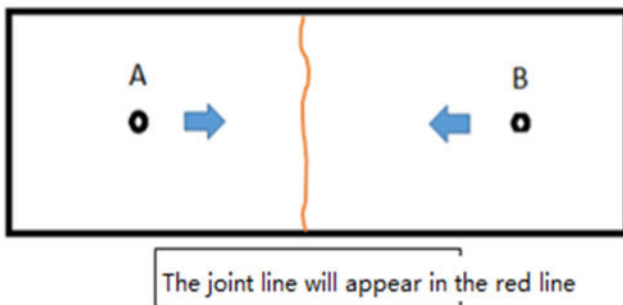
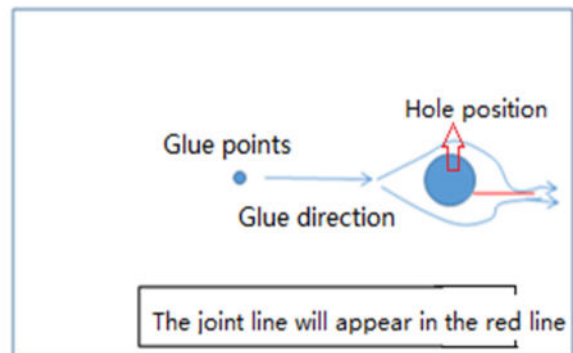
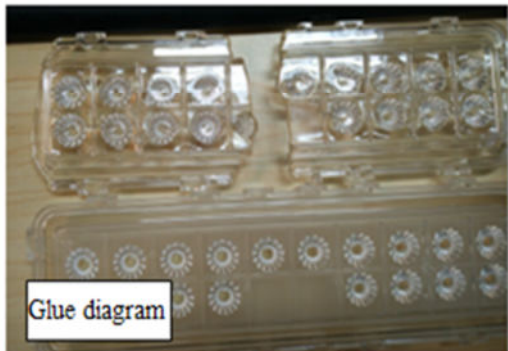
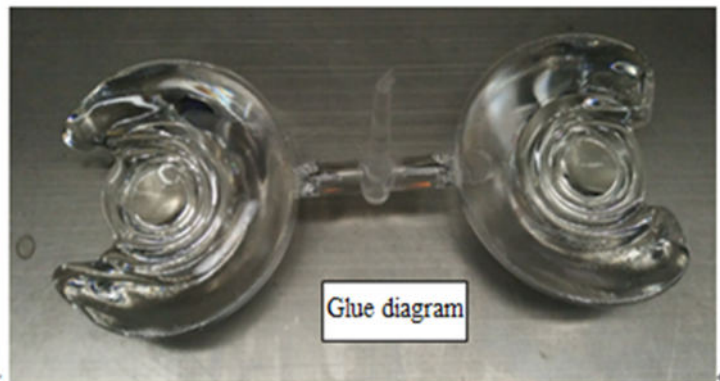
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PN		HK-DX-50@24-15-D9-21-1g-1_PMMA		Product Name		HK Glareless 50@24-15° lens	
Product material		PMMA		Customer			
Package diagram		 <p style="text-align: center;"> Single Vacuum package Box package </p>					
Product packing		14	A/ Box	4	pcs/Layer		
		10	Layer/Box	560	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0024-1	Blister box	23cm*21cm	40	BAG	
	2	2.08.0001	PE film	30cm*30cm	40	PCS	
	3	2.06.0005	Reel label paper	6.2cm*8cm	40	PCS	
	4	2.06.0005	Box label paper	6.2cm*9.2cm	1	PCS	
	5	2.06.0003	big plate	46.8cm*42.8cm	11	PCS	
	6	2.06.0015	big flat carton	48cm*44cm*19cm	1	PCS	
Remarks	The loose packing is not subject to this specification. Customer's requirements 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



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 $L \leq 10\text{mm}$, 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		√	