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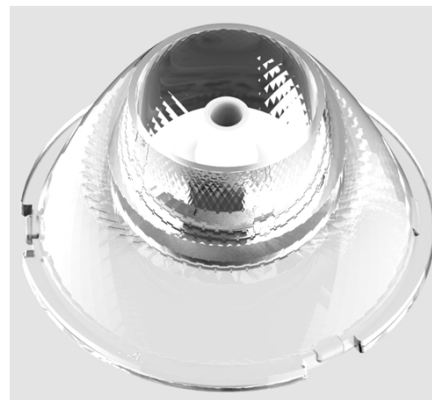
Chengdu HercuLux Photoelectric
Technology Co.,Ltd
Product Approval

Approval number :

Customer :

Manufacturer : Chengdu HercuLux Photoelectric Technology Co.,Ltd

PN	Code	Product
HK-HG-30@15-10-D3.5-20-1g-1_ASM	1.01.12627.10	HK Dark 30@15-10 Degree lens
HK-HG-30@15-10-D3.5-20-1g-1	1.01.12627_01	HK Dark 30@15-10 degree lens_01
HK-HG-12@09-0614-S	1.01.12627_02.10	HK Dark 30@15-10 Degree Awl_02
HK-HG-10@05-0615-S	1.01.12627_03.10	HK Dark 30@15-10 Degree Cover_03



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-

TEL: 0755-2937 1541

FAX: 0755-2907 5140

*Approval In duplicate , for both supplier and customer.

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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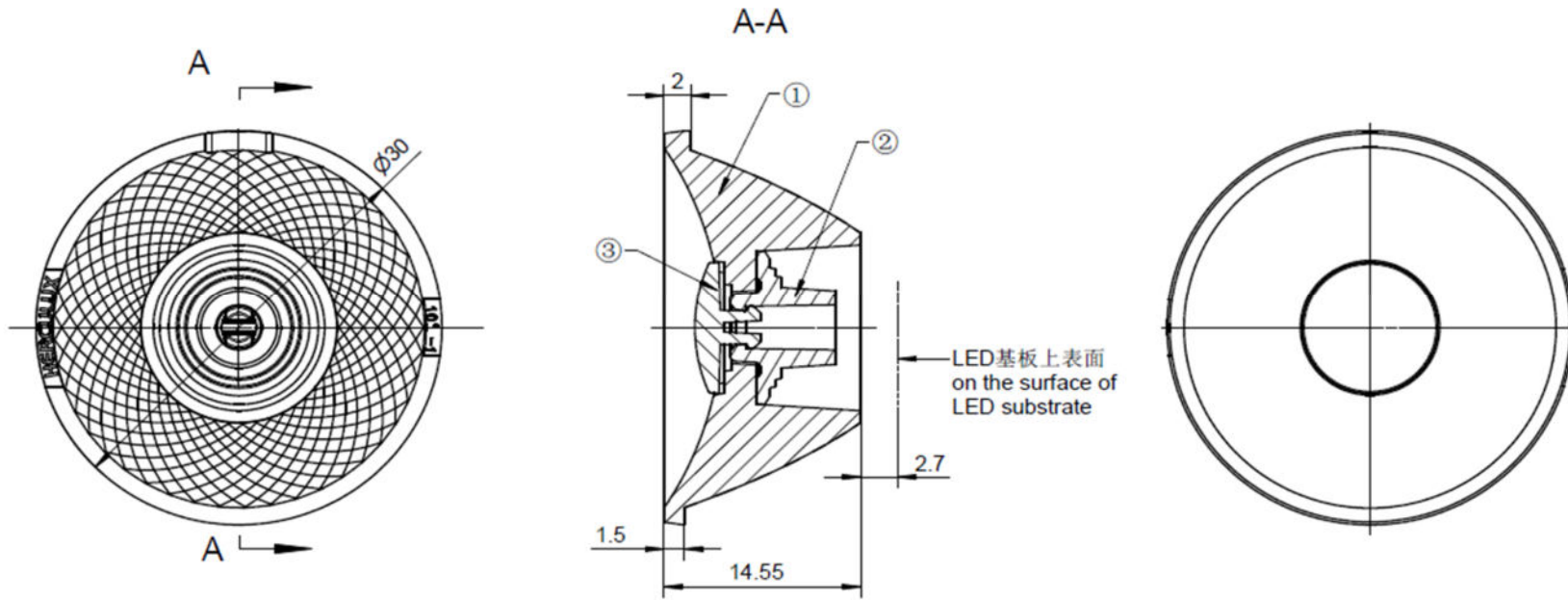
TEL: 0755-2937 1541

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

Date updated: 2023/4/14

Product Picture:	
PN:	HK-HG-30@15-10-D3.5-20-1g-1_ASM
Size(L*W*H/Φ*H):	Φ:30mm; H:14.55mm
Material:	Components (PMMA, ceramic, PC (black))
Efficiency:	\
Temperature(Topr):	\ "Material extreme temperature resistance : -40°C to +100°C long-term use temperature : -40°C to +80°C"
Matched LES:	LUMINUS: CXM-3 (black lens backing)
FWHM:	10°
Recommended power Usage:	No more than 10W

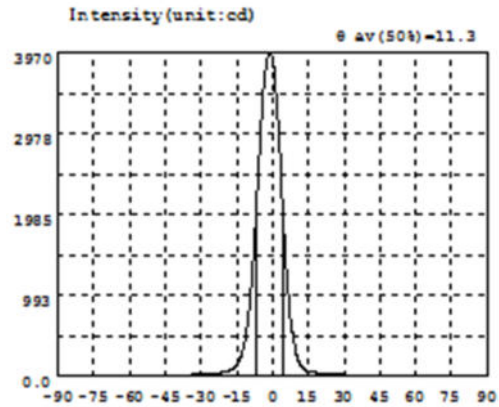
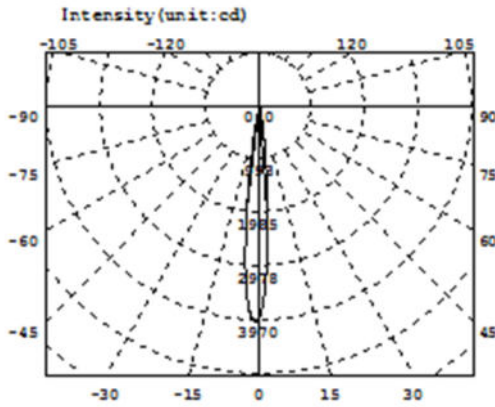


Technical remark:

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.

NO.	Code	Product Name	PN	Product material
①	1.01.12627_01	HK Dark 30@15-10 degree lens_01	HK-HG-30@15-10-D3.5-20-1g-1	PMMA
②	1.01.12627_02.10	HK Dark 30@15-10 Degree Aw1_02	HK-HG-12@09-0614-S	ceramic
③	1.01.12627_03.10	HK Dark 30@15-10 Degree Cover_03	HK-HG-10@05-0615-S	PC (black)
Optical design			HK-HG-30@15-10-D3.5-20-1g-1_ASM	
Structure design			HK Dark 30@15-10 Degree lens	
Review			Number of drawing	qty weight
Validation			Material:	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



Intensity data:(deg , cd) C0-180

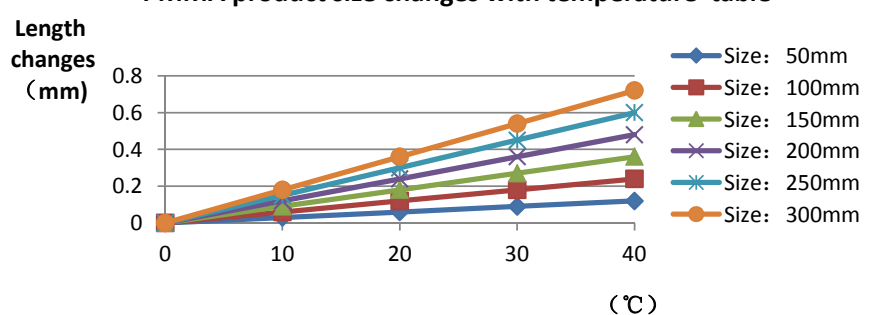
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.3277	-58.5	2.191	-27.0	23.25	4.5	1878	36.0	9.987	67.5	0.9277
-88.5	0.3721	-57.0	2.523	-25.5	27.00	6.0	1176	37.5	9.011	69.0	0.8878
-87.0	0.4054	-55.5	2.892	-24.0	30.99	7.5	700.7	39.0	8.030	70.5	0.8317
-85.5	0.4057	-54.0	3.285	-22.5	35.58	9.0	403.2	40.5	7.192	72.0	0.7471
-84.0	0.4287	-52.5	3.725	-21.0	41.38	10.5	203.1	42.0	6.501	73.5	0.7052
-82.5	0.4202	-51.0	4.242	-19.5	49.49	12.0	116.4	43.5	5.863	75.0	0.5997
-81.0	0.4421	-49.5	4.852	-18.0	63.07	13.5	74.86	45.0	5.224	76.5	0.5573
-79.5	0.4811	-48.0	5.514	-16.5	89.48	15.0	55.62	46.5	4.669	78.0	0.5495
-78.0	0.5378	-46.5	6.268	-15.0	139.2	16.5	45.38	48.0	4.133	79.5	0.5468
-76.5	0.6350	-45.0	7.006	-13.5	228.8	18.0	38.86	49.5	3.611	81.0	0.5213
-75.0	0.6988	-43.5	7.782	-12.0	388.2	19.5	33.68	51.0	3.176	82.5	0.4977
-73.5	0.7618	-42.0	8.573	-10.5	668.2	21.0	29.42	52.5	2.947	84.0	0.4560
-72.0	0.7920	-40.5	9.588	-9.0	1101	22.5	25.57	54.0	2.485	85.5	0.3968
-70.5	0.7694	-39.0	10.72	-7.5	1745	24.0	22.17	55.5	2.148	87.0	0.3579
-69.0	0.8700	-37.5	12.05	-6.0	2510	25.5	19.23	57.0	1.848	88.5	0.3384
-67.5	0.9028	-36.0	13.12	-4.5	3257	27.0	16.88	58.5	1.602	90.0	0.4690
-66.0	0.9993	-34.5	13.83	-3.0	3757	28.5	15.04	60.0	1.397		
-64.5	1.150	-33.0	14.75	-1.5	3958	30.0	13.58	61.5	1.218		
-63.0	1.343	-31.5	16.13	0.0	3880	31.5	12.38	63.0	1.062		
-61.5	1.580	-30.0	17.87	1.5	3428	33.0	11.45	64.5	1.031		
-60.0	2.050	-28.5	20.24	3.0	2718	34.5	10.66	66.0	0.9682		

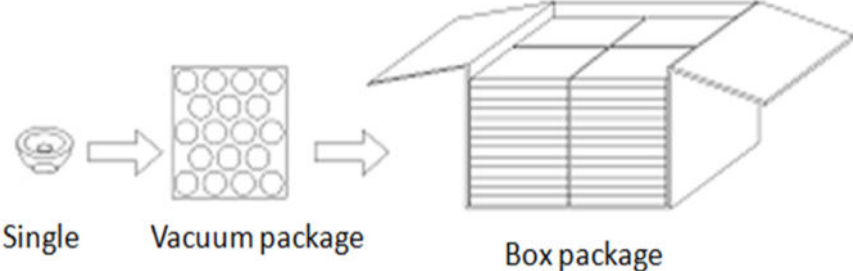
Electricity Parameter:

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

Optical Parameter (Distance=2.410m):

Equivalent Luminous flux: $\phi_{eff}=223.4lm$ Efficiency: $Eff=68.14lm/W$
Diffuse angle: @ (25%): 15.8deg @ (50%): 11.3deg @ (75%): 7.6deg @ (50%): 11.3deg
Diffuse angle: @ (25%): 15.8deg @ (50%): 11.4deg @ (75%): 7.8deg @ (50%): 11.4deg
Imax=3964cd (C=0.0deg,G=-1.0deg) C0-180Plane Imax= 3964cd(G=-1.0deg)
C0-180Plane I0= 3880cd

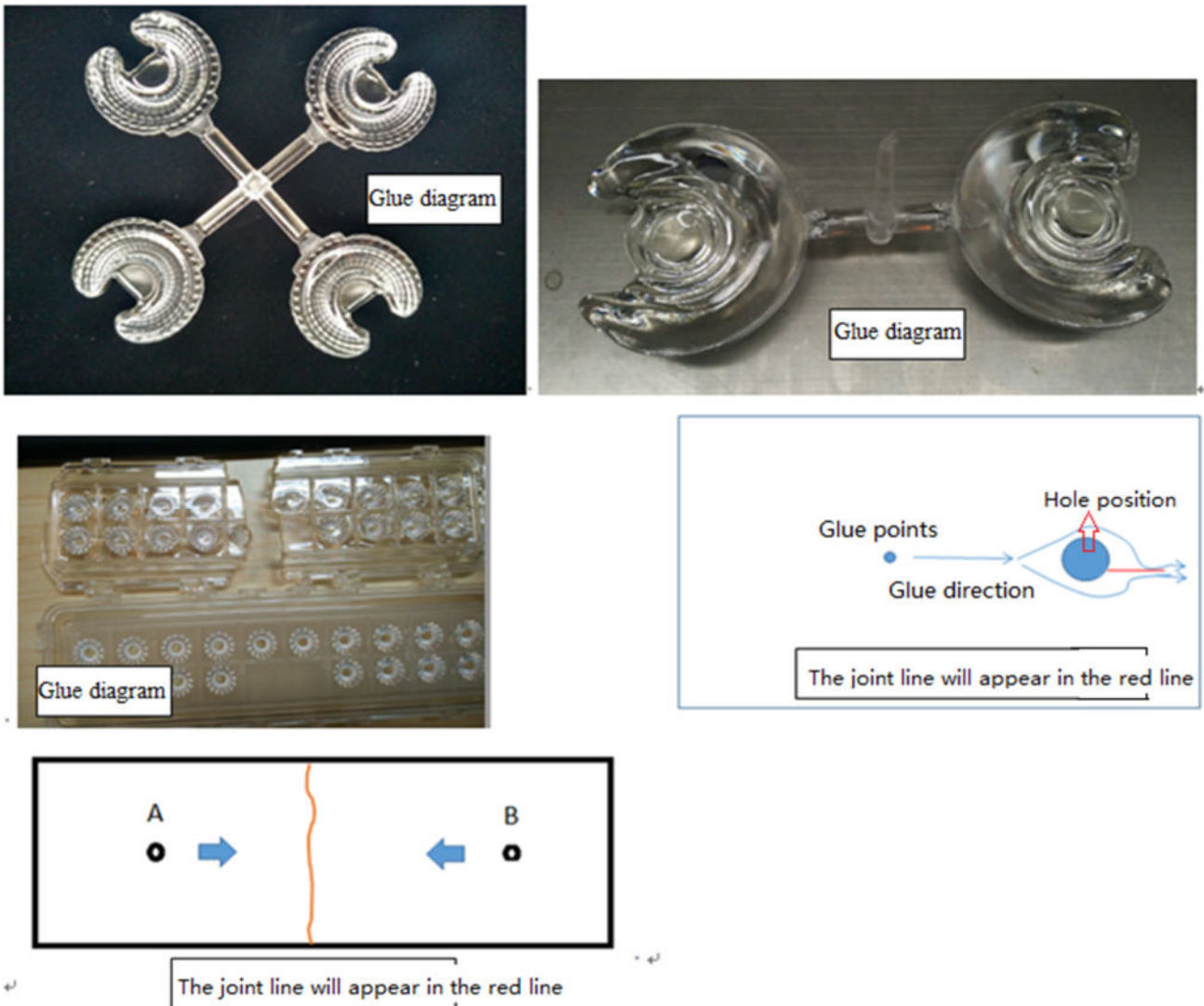
	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks																																										
1.Size	diameter	30		29.91	29.86	29.91	29.86		Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.																																										
	height	14.55		14.43	14.47	14.43	14.47																																												
	thickness	1.5		1.48	1.49	1.48	1.49																																												
	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	Components (PMMA, ceramic, PC (black))			Color	Transparent			OK																																											
4.Optical index	Testing LED	LUMINUS: CXM-3 (black lens backing)																																																	
	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																																																	
	angle		11.2	11.3	11.2	11.3																																													
	K-value		17.69	17.02	17.74	17.02																																													
	Efficiency		61.28%	64.90%	62.12%	61.28%																																													
Facula	See the signature sample																																																		
Comprehensive judgment	Qualified																																																		
Remarks:	<p>1、 Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.</p> <p>2、 Ambient temperature on the size of the product refer to the table on the right</p>																																																		
	<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>0.20</td> <td>0.25</td> <td>0.30</td> <td>0.35</td> </tr> <tr> <td>30</td> <td>0.15</td> <td>0.22</td> <td>0.28</td> <td>0.35</td> <td>0.42</td> <td>0.50</td> </tr> <tr> <td>40</td> <td>0.20</td> <td>0.28</td> <td>0.35</td> <td>0.45</td> <td>0.55</td> <td>0.65</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	0.20	0.25	0.30	0.35	30	0.15	0.22	0.28	0.35	0.42	0.50	40	0.20	0.28	0.35	0.45	0.55	0.65
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	0.20	0.25	0.30	0.35																																													
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40	0.20	0.28	0.35	0.45	0.55	0.65																																													
Precautions:	<p>1、 Wear clean gloves during lens assembly to prevent contamination of the lens surface.</p> <p>2、 Take the lens try to avoid touching the total reflection surface.</p> <p>3、 When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.</p> <p>4、 The working temperature of the lens should be within the temperature limit of the lens material. Exceeding the temperature limit will cause damage to the lens and affect the service life of the lens.</p>																																																		

PN		HK-HG-30@15-10-D3.5-20-1g-1_ASM		Product Name		HK Dark 30@15-10 Degree lens	
Product material		Components (PMMA, ceramic, PC (black))		Customer			
Package diagram		 <p style="text-align: center;">Single Vacuum package Box package</p>					
Product packing		27	A/ Box	4	pcs/Layer		
		16	Layer/Box	1728	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0097	Blister box	23cm*21cm	64	BAG	
	2	2.08.0001	PE film	30cm*30cm	64	PCS	
	3	2.06.0005	Reel label paper	6.2cm*8cm	64	PCS	
	4	2.06.0005	Box label paper	6.2cm*9.2cm	1	PCS	
	5	2.06.0003	big plate	46.8cm*42.8cm	17	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:

Symptom



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 $100 \times 100\text{mm}$ 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 $50 \times 50\text{ mm}$ area	Visual		√	



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PN	Code	Product
HK-HG-30@16-15-D4-21-1g-1	1. 01. 92013	HK Dark 30@16-15° lens
HK-HG-30@16-24-D4-21-1g-1	1. 01. 92014	HK Dark 30@16-24° lens
HK-HG-30@16-36-D4-21-1g-1	1. 01. 92015	HK Dark 30@16-36° lens
HK-HG-30@16-50-D4-21-1g-1	1. 01. 92016	HK Dark 30@16-50° lens



Supplier confirmation				Client confirmation			
Proposed		DATE		Qualified <input type="checkbox"/>		DATE	
Project manager		DATE		Unqualified <input type="checkbox"/>		DATE	
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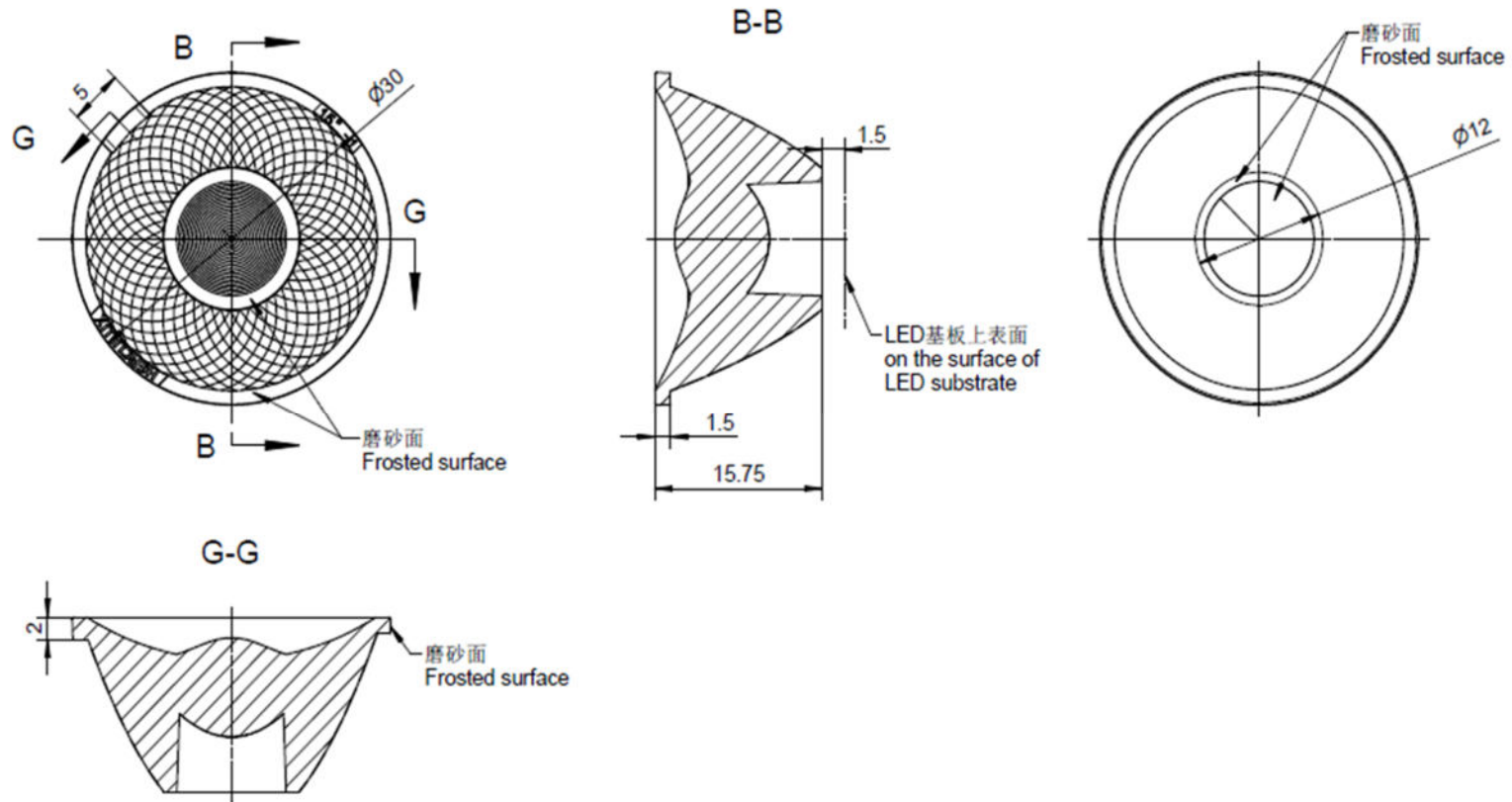
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4. The lens made of PC should not be exposed to direct sunlight in the storage and use environment. If the lens turns yellow or cracks due to long-term sunlight exposure, our company will not be responsible for the warranty.



Basic product information

Product Picture:	
Size(L*W*H/Φ*H):	Φ:30mm; H:15.75mm
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°、50°
Matched LES:	D6
Recommended MAX power:	Not more than 10W

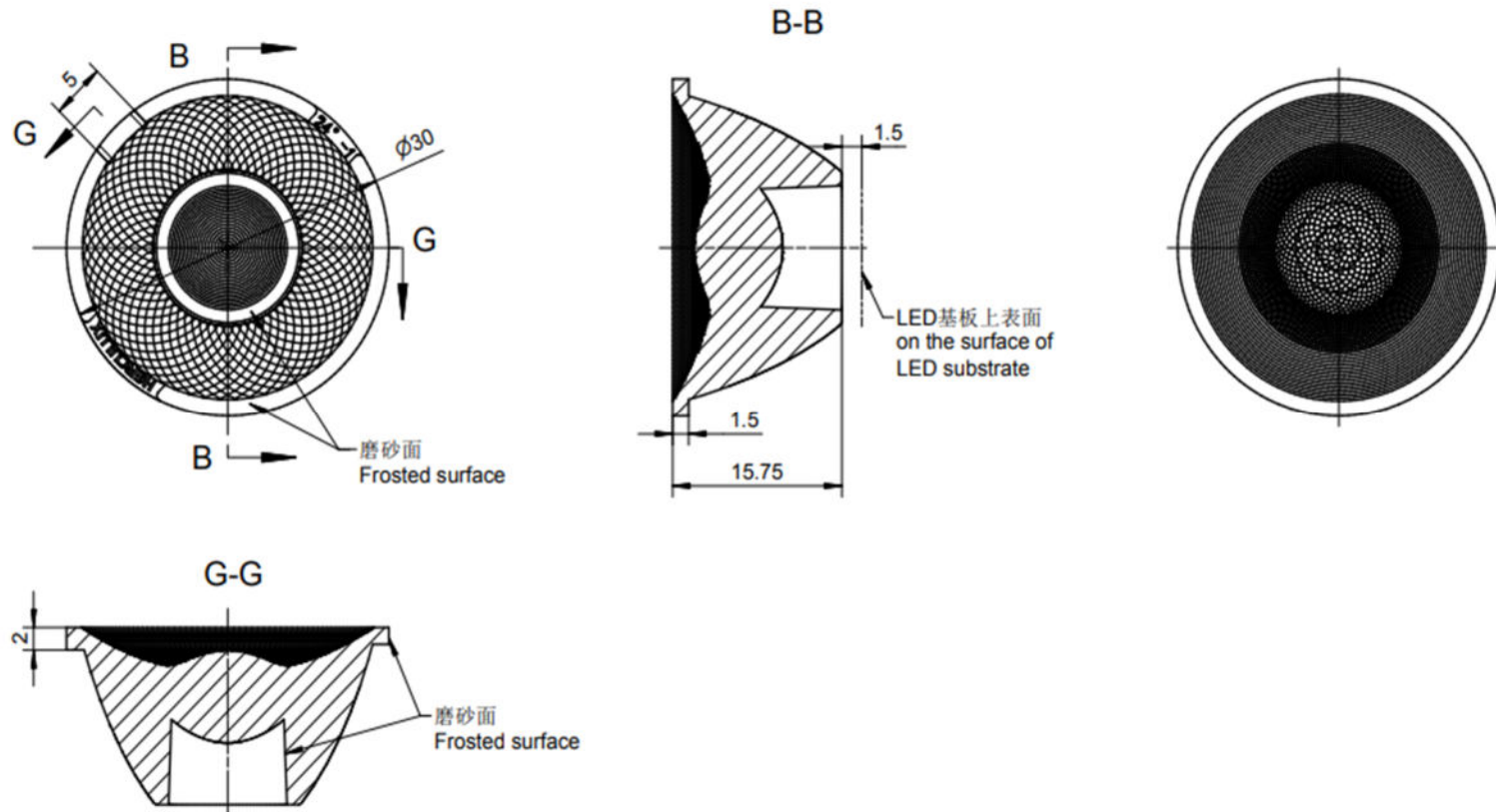


Technical remark:

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-HG-30@16-15-D4-21-1g-1		
Structure design			HK Dark 30@16-15° lens		
Review			number of draw	qty	weight
Validation			Material: PMMA		CDHK

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

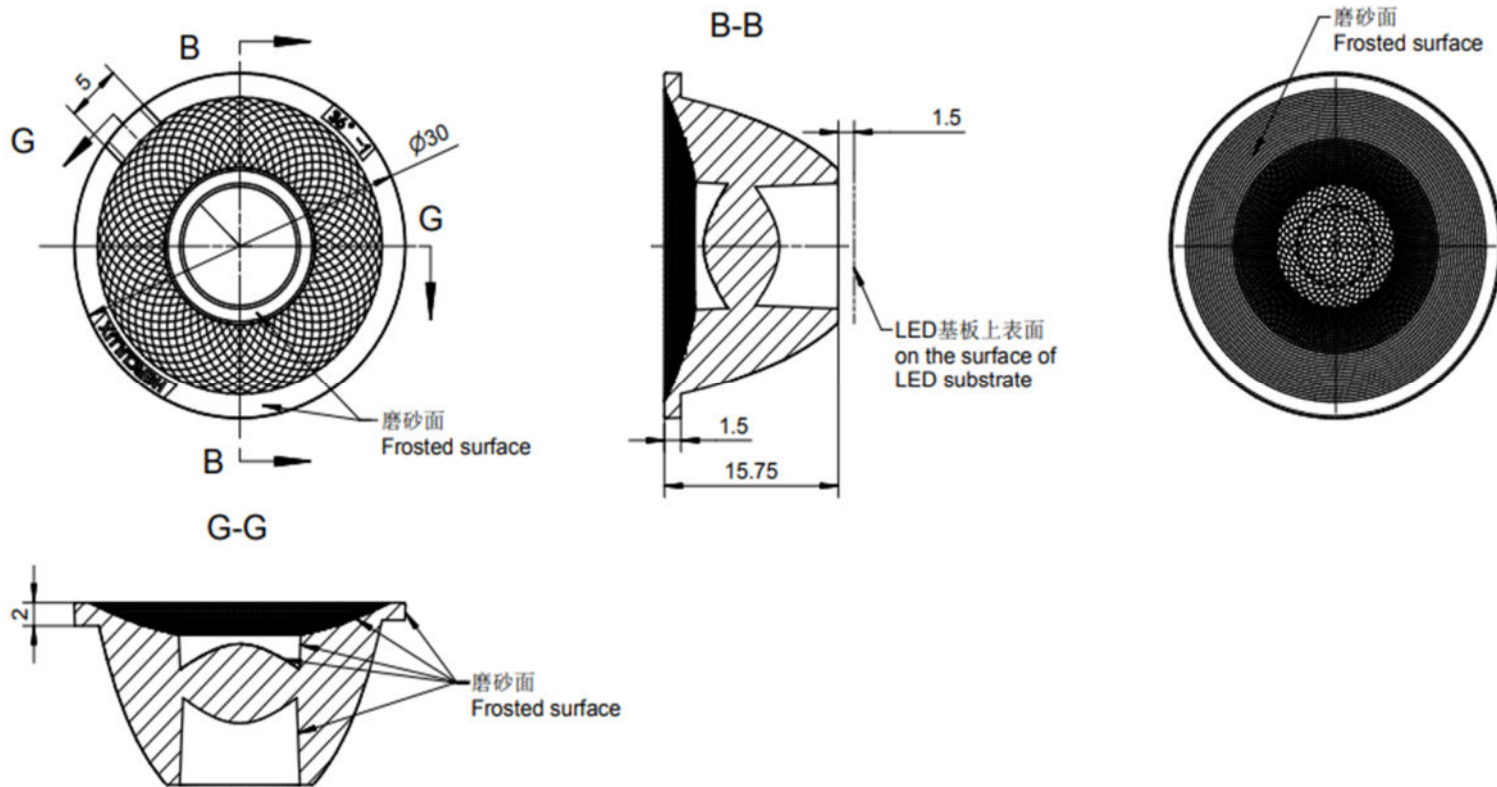


Technical remark:

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-HG-30@16-24-D4-21-1g-1		
Structure design			HK Dark 30@16-24° lens		
Review			number of draw	qty	weight
Validation			Material: PMMA CDHK		

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

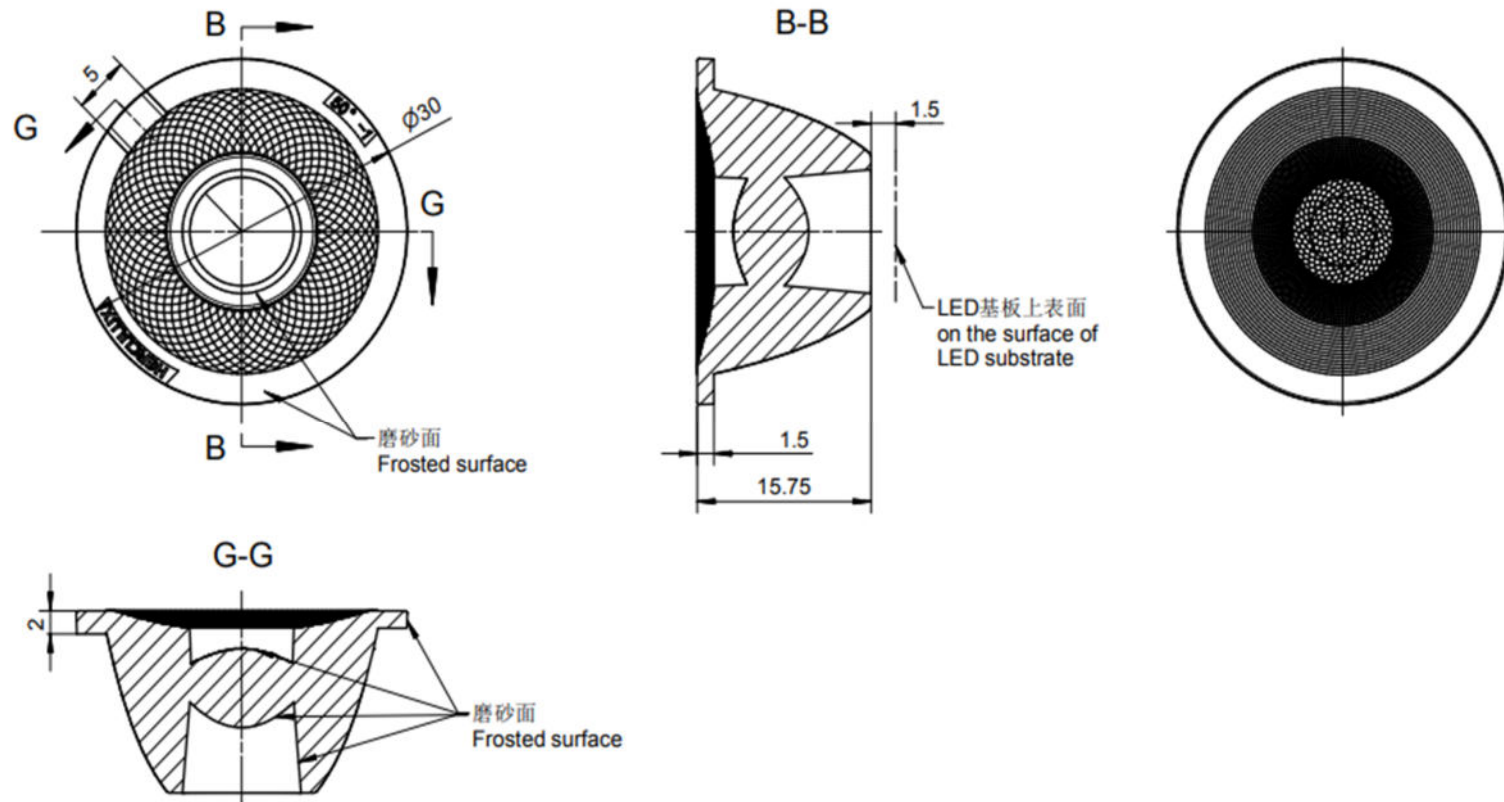


Technical remark:

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-HG-30@16-36-D4-21-1g-1		
Structure design			HK Dark 30@16-36° lens		
Review			number of draw	qty	weight
Validation			Material: PMMA		CDHK

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

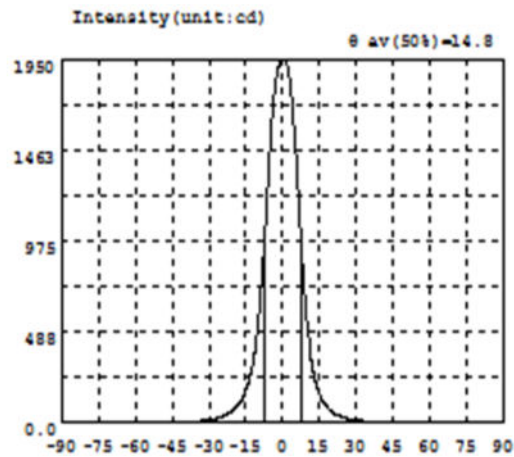
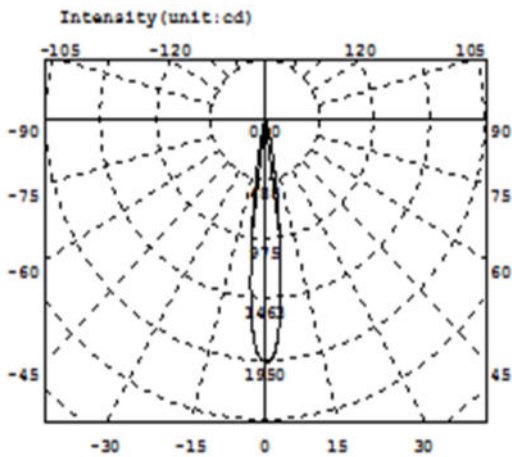


Technical remark:

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-HG-30@16-50-D4-21-1g-1		
Structure design			HK Dark 30@16-50° lens		
Review			number of draw	qty	weight
Validation			Material: PMMA		
			CDHK		

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



Intensity data:(deg , cd) CO-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.3949	-58.5	2.074	-27.0	24.18	4.5	1607	36.0	9.568	67.5	0.9722
-88.5	0.3810	-57.0	2.314	-25.5	30.03	6.0	1307	37.5	8.721	69.0	0.8535
-87.0	0.3297	-55.5	2.750	-24.0	37.75	7.5	973.7	39.0	8.020	70.5	0.7028
-85.5	0.2794	-54.0	3.184	-22.5	47.45	9.0	687.8	40.5	7.306	72.0	0.5614
-84.0	0.2563	-52.5	3.680	-21.0	59.59	10.5	471.6	42.0	6.757	73.5	0.4757
-82.5	0.2223	-51.0	4.141	-19.5	76.02	12.0	306.2	43.5	6.215	75.0	0.4191
-81.0	0.2501	-49.5	4.548	-18.0	98.81	13.5	213.2	45.0	5.660	76.5	0.3800
-79.5	0.3118	-48.0	4.941	-16.5	131.7	15.0	153.8	46.5	5.167	78.0	0.3848
-78.0	0.3957	-46.5	5.769	-15.0	178.2	16.5	113.4	48.0	4.587	79.5	0.3777
-76.5	0.5035	-45.0	6.050	-13.5	242.3	18.0	85.40	49.5	4.242	81.0	0.3731
-75.0	0.5401	-43.5	6.477	-12.0	331.5	19.5	65.47	51.0	3.881	82.5	0.3666
-73.5	0.5999	-42.0	6.960	-10.5	474.9	21.0	51.81	52.5	3.510	84.0	0.3407
-72.0	0.6173	-40.5	7.534	-9.0	683.9	22.5	41.66	54.0	3.091	85.5	0.3007
-70.5	0.6534	-39.0	8.183	-7.5	964.3	24.0	33.52	55.5	2.656	87.0	0.2691
-69.0	0.7509	-37.5	8.878	-6.0	1292	25.5	26.88	57.0	2.258	88.5	0.2326
-67.5	0.8740	-36.0	9.780	-4.5	1603	27.0	21.95	58.5	1.918	90.0	0.3312
-66.0	0.9386	-34.5	10.91	-3.0	1816	28.5	18.31	60.0	1.611		
-64.5	1.046	-33.0	12.38	-1.5	1917	30.0	15.54	61.5	1.345		
-63.0	1.222	-31.5	14.28	0.0	1949	31.5	13.43	63.0	1.152		
-61.5	1.490	-30.0	16.76	1.5	1927	33.0	11.79	64.5	1.065		
-60.0	1.786	-28.5	19.93	3.0	1823	34.5	10.55	66.0	1.004		

Electricity Parameter:

Current I: 0.1000A Power: 3.180W
Voltage V: 31.79V PF: 1.000

Optical Parameter(Distance=2.559m):

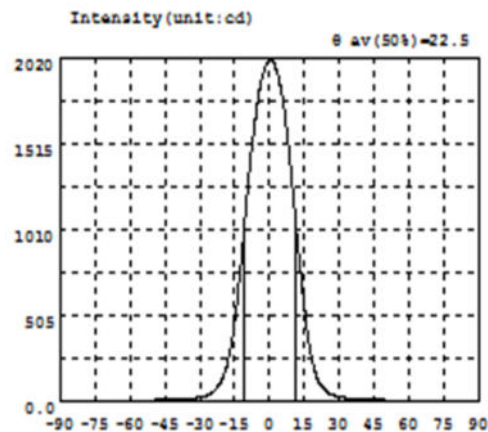
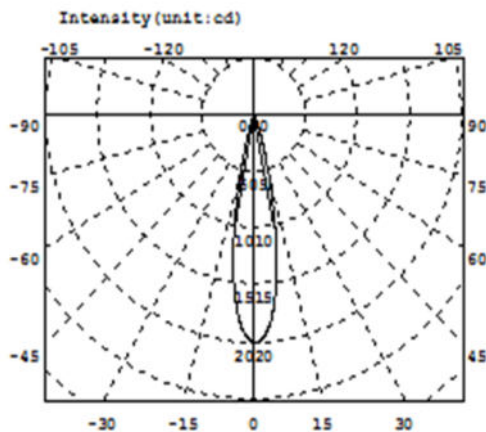
Equivalent Luminous flux: $\Phi_{eff}=191.6lm$ Efficiency: $Eff=60.27lm/W$

Diffuse angle: @ (25%): 20.6deg @ (50%): 14.8deg @ (75%): 10.4deg @ (50%): 14.8deg

Diffuse angle: @ (25%): 20.6deg @ (50%): 14.8deg @ (75%): 10.4deg @ (50%): 14.8deg

$I_{max}=1949cd$ (C=0.0deg,G=0.0deg) CO-180Plane $I_{max}=1949cd$ (G=0.0deg)

CO-180Plane $I_0=1949cd$



Intensity data: (deg , cd) C0-180

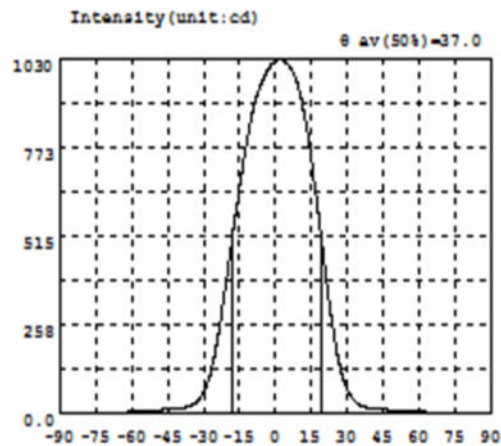
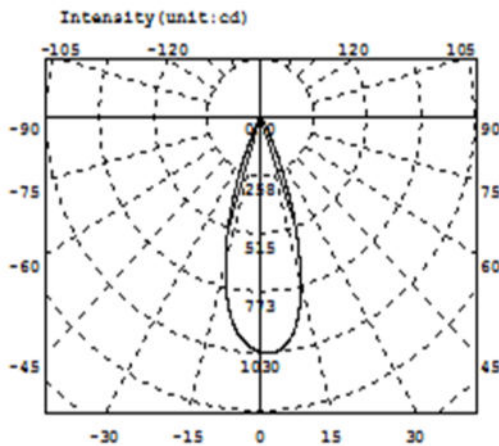
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.7388	-58.5	8.037	-27.0	41.25	4.5	1862	36.0	19.26	67.5	5.059
-88.5	0.8671	-57.0	8.766	-25.5	50.76	6.0	1739	37.5	17.87	69.0	4.624
-87.0	1.058	-55.5	9.485	-24.0	64.28	7.5	1575	39.0	16.62	70.5	4.261
-85.5	1.324	-54.0	10.20	-22.5	85.23	9.0	1382	40.5	15.65	72.0	3.919
-84.0	1.566	-52.5	10.91	-21.0	117.1	10.5	1165	42.0	14.96	73.5	3.581
-82.5	1.820	-51.0	11.58	-19.5	166.5	12.0	943.5	43.5	14.40	75.0	3.324
-81.0	2.039	-49.5	12.13	-18.0	237.4	13.5	729.8	45.0	13.91	76.5	3.033
-79.5	2.283	-48.0	12.81	-16.5	336.4	15.0	542.1	46.5	13.45	78.0	2.777
-78.0	2.494	-46.5	13.41	-15.0	477.0	16.5	375.4	48.0	12.97	79.5	2.484
-76.5	2.777	-45.0	14.00	-13.5	654.2	18.0	259.5	49.5	12.41	81.0	2.198
-75.0	3.072	-43.5	14.59	-12.0	861.8	19.5	179.5	51.0	11.81	82.5	1.898
-73.5	3.401	-42.0	15.17	-10.5	1087	21.0	125.6	52.5	11.08	84.0	1.602
-72.0	3.730	-40.5	15.88	-9.0	1307	22.5	90.20	54.0	10.47	85.5	1.332
-70.5	4.095	-39.0	16.90	-7.5	1509	24.0	67.64	55.5	9.741	87.0	1.115
-69.0	4.472	-37.5	17.81	-6.0	1676	25.5	52.92	57.0	9.041	88.5	0.9045
-67.5	4.846	-36.0	19.03	-4.5	1820	27.0	42.86	58.5	8.395	90.0	0.6252
-66.0	5.281	-34.5	20.55	-3.0	1917	28.5	35.58	60.0	7.783		
-64.5	5.728	-33.0	22.67	-1.5	1978	30.0	30.36	61.5	7.196		
-63.0	6.247	-31.5	25.56	0.0	2013	31.5	26.41	63.0	6.777		
-61.5	6.804	-30.0	29.45	1.5	1998	33.0	23.35	64.5	6.081		
-60.0	7.416	-28.5	34.52	3.0	1945	34.5	20.95	66.0	5.558		

Electricity Parameter:

Current I: 0.1000A Power: 3.328W
 Voltage V: 33.29V PF: 1.000

Optical Parameter (Distance=2.559m) :

Equivalent Luminous flux: Φ eff= 369.8lm Efficiency: Eff=111.13lm/W
 Diffuse angle: @ (25%): 30.0deg @ (50%): 22.5deg @ (75%): 15.4deg @ (50%): 22.5deg
 Diffuse angle: @ (25%): 30.0deg @ (50%): 22.5deg @ (75%): 15.4deg @ (50%): 22.5deg
 I_{max}=2014cd (C=0.0deg,G=0.5deg) C0-180Plane I_{max}= 2014cd(G=0.5deg)
 C0-180Plane I₀= 2013cd



Intensity data: (deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.7898	-58.5	7.489	-27.0	124.5	4.5	1019	36.0	24.35	67.5	4.928
-88.5	0.7910	-57.0	8.154	-25.5	171.6	6.0	1006	37.5	20.93	69.0	4.454
-87.0	0.9450	-55.5	8.819	-24.0	226.8	7.5	986.6	39.0	18.64	70.5	4.146
-85.5	1.187	-54.0	9.684	-22.5	294.4	9.0	957.9	40.5	16.97	72.0	3.783
-84.0	1.452	-52.5	10.27	-21.0	365.6	10.5	920.1	42.0	15.65	73.5	3.397
-82.5	1.694	-51.0	10.98	-19.5	440.1	12.0	868.9	43.5	14.59	75.0	3.110
-81.0	1.960	-49.5	11.67	-18.0	514.1	13.5	805.6	45.0	13.69	76.5	2.872
-79.5	2.177	-48.0	12.34	-16.5	587.6	15.0	732.2	46.5	12.89	78.0	2.660
-78.0	2.372	-46.5	13.01	-15.0	658.6	16.5	652.2	48.0	12.17	79.5	2.602
-76.5	2.591	-45.0	13.78	-13.5	726.7	18.0	569.8	49.5	11.51	81.0	2.191
-75.0	2.817	-43.5	14.63	-12.0	788.8	19.5	487.1	51.0	10.84	82.5	1.932
-73.5	3.073	-42.0	15.57	-10.5	845.3	21.0	399.3	52.5	10.16	84.0	1.626
-72.0	3.435	-40.5	16.75	-9.0	892.1	22.5	314.3	54.0	9.501	85.5	1.357
-70.5	3.887	-39.0	18.26	-7.5	928.0	24.0	244.8	55.5	8.856	87.0	1.091
-69.0	4.256	-37.5	20.09	-6.0	958.1	25.5	181.9	57.0	8.233	88.5	0.8810
-67.5	4.692	-36.0	22.95	-4.5	981.9	27.0	132.6	58.5	7.644	90.0	0.7361
-66.0	5.073	-34.5	27.76	-3.0	998.8	28.5	96.28	60.0	7.101		
-64.5	5.455	-33.0	35.50	-1.5	1013	30.0	69.16	61.5	6.626		
-63.0	5.948	-31.5	47.18	0.0	1022	31.5	50.40	63.0	6.190		
-61.5	6.394	-30.0	63.98	1.5	1027	33.0	38.20	64.5	5.776		
-60.0	6.915	-28.5	89.06	3.0	1025	34.5	29.80	66.0	5.341		

Electricity Parameter:

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

Optical Parameter(Distance=2.559m):

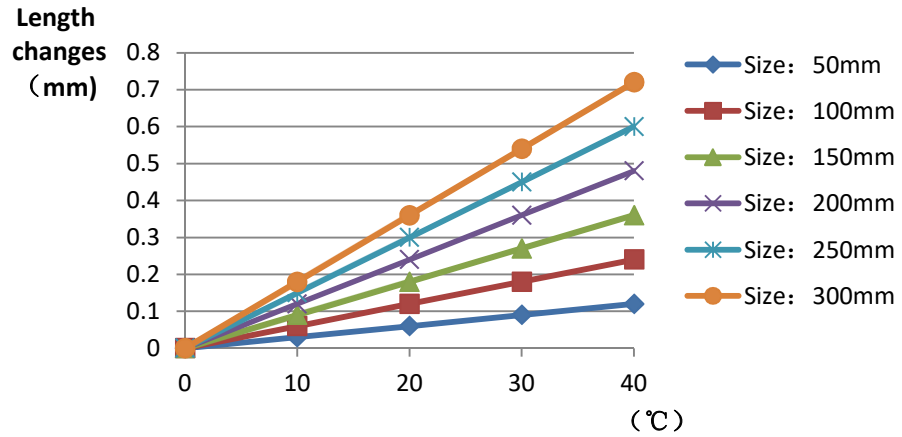
Equivalent Luminous flux: Φ_{eff} = 421.6lm Efficiency: Eff=127.81lm/W
Diffuse angle: @ (25%) : 46.9deg @ (50%) : 37.0deg @ (75%) : 26.6deg @ (50%): 37.0deg
Diffuse angle: @ (25%) : 47.0deg @ (50%) : 37.0deg @ (75%) : 26.8deg @ (50%): 37.0deg
Imax=1027cd (C=0.0deg,G=2.0deg) C0-180Plane Imax= 1027cd(G=2.0deg)
C0-180Plane IO= 1022cd

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	diameter	30	/	/	29.77	29.77	29.76	29.76	/	Test environment : In 20 °C - 25 °C environment to achieve thermal equilibrium after the test.
	height	15.75	/	/	15.62	15.62	15.61	15.61	/	
	thickness	1.5	/	/	1.48	1.47	1.46	1.45	/	
	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	D6								
	The size and rated power of the light-emitting surface (LES) of the COB recommended by this lens should conform to the parameters in the product basic information table. 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								
	angle	/	14.8	15.3	14.9	15.3	/			
	K-value (CD/LM)	/	9	8.9	9.1	8.8	/			
	Efficiency	/	84.50%	84.50%	86.10%	86.00%	/			
Facula	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



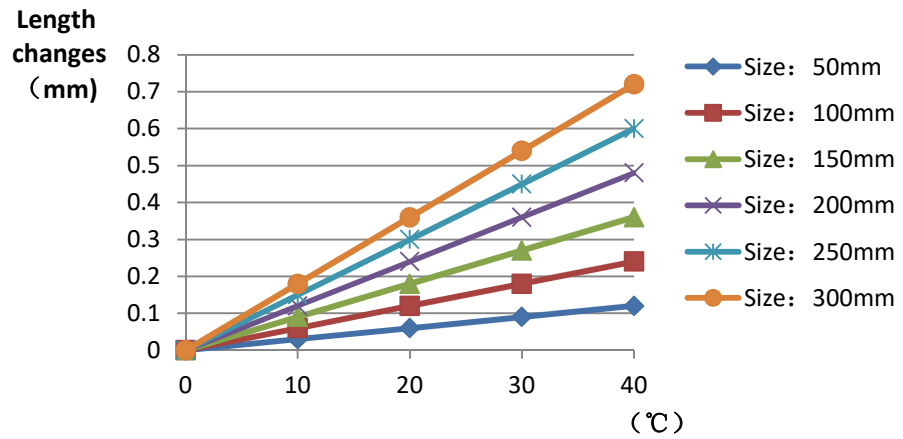
Precautions:

1. Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
2. Try to avoid touching the total reflection surface when taking the lens.
3. 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.).
4. 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 the upper surface temperature of the LED colloid should be less than 120 degrees.

		Standard size	Upper Size limit	Lower size limit	Test resu lt1	Test resu lt2	Test resu lt3	Test resu lt4	Test resu lt5	Test resu lt6	Test resu lt7	Test resu lt8	Jud gment	Remarks
1.Size	diameter	30	/	/	30	30	30	30	30	30	30	30	/	Test environment : In 20 °C - 25 °C environment to achieve thermal equilibrium after the test.
	height	15.75	/	/	16	16	16	16	16	16	16	16	/	
	thicknes s	1.5	/	/	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	/	
	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		OK	
			No stains		No stains		No stains		No stains					
3.Material	PMMA						Color		Transparent				OK	
4.Optical index	Testing LED	D6												
	The size and rated power of the light-emitting surface (LES) of the COB recommended by this lens should conform to the parameters in the product basic information table. 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												
	angle	/		22.8	22.5	22.9	22.5	/						
	K-value (CD/LM)	/		5.4	5.6	5.3	5.5	/						
	Efficiency	/		87.00%	86.50%	87.10%	87.30%	/						
Facula	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



Precautions:

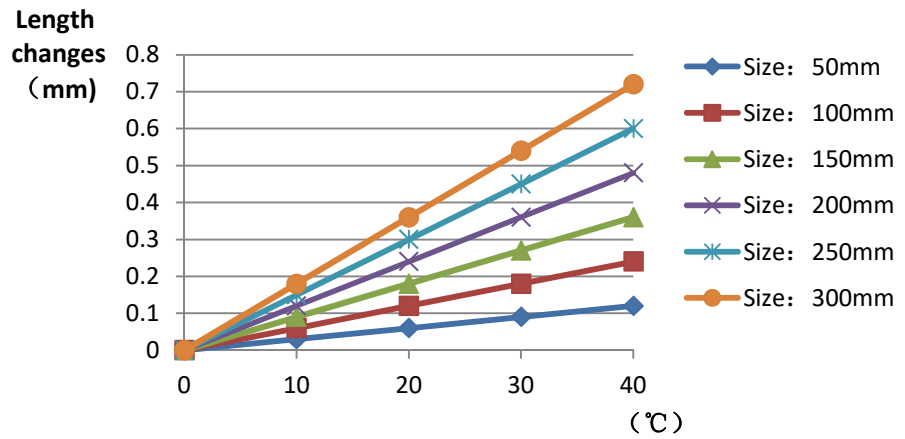
1. Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
2. Try to avoid touching the total reflection surface when taking the lens.
3. The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
4. 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 the upper surface temperature of the LED colloid should be less than 120 degrees.

		Standard size	Upper Size limit	Lower size limit	Test resu lt1	Test resu lt2	Test resu lt3	Test resu lt4	Test resu lt5	Test resu lt6	Test resu lt7	Test resu lt8	Jud gment	Remarks
1.Size	diameter	30			29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9		Test environment : In 20 °C - 25 °C environment to achieve thermal equilibrium after the test.
	height	15.75			15.7	15.7	15.7	15.6	15.7	15.7	15.7	15.7		
	thicknes s	1.5			1.42	1.45	1.46	1.43	1.49	1.49	1.45	14.7		
	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		OK	
			No stains		No stains		No stains		No stains					
3.Material	PMMA						Color		Transparent				OK	
4.Optical index	Testing LED	D6												
	The size and rated power of the light-emitting surface (LES) of the COB recommended by this lens should conform to the parameters in the product basic information table. 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												
	angle				35.7	36.2	37	36.5						
	K-value (CD/LM)				2.50	2.46	2.30	2.46						
	Efficiency				87.00%	86.50%	87.50%	87.30%						
Facula	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



Precautions:

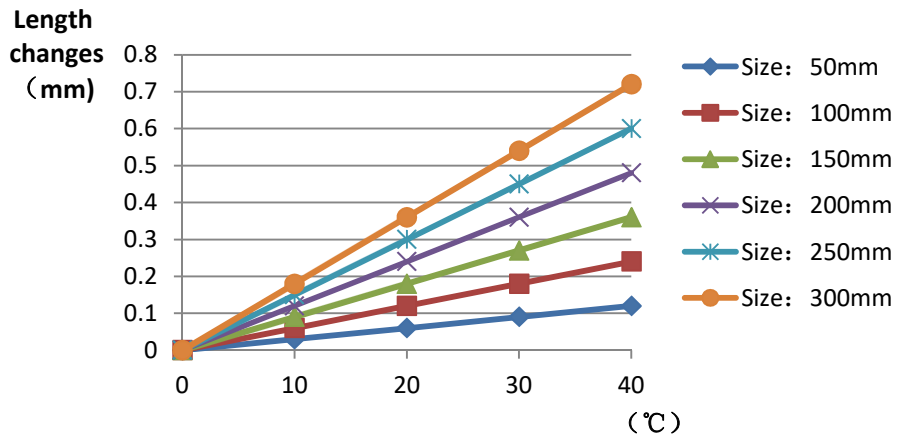
1. Please wear clean gloves during the lens assembly process to prevent the lens surface from being contaminated.
2. Try to avoid touching the total reflection surface when taking the lens.
3. The lens surface is contaminated. Only use a soft cotton cloth dipped in analytically pure neutral solvent to wipe gently. Do not wipe with industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA Body, etc.).
4. 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 the upper surface temperature of the LED colloid should be less than 120 degrees.

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	diameter	30			30.04	30.05	30.05	30.04		Test environment : In 20 °C - 25 °C environment to achieve thermal equilibrium after the test.
	height	15.75			15.8	15.8	15.82	15.83		
	thickness	1.5			1.55	1.52	1.52	1.54		
	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		OK	
			No stains		No stains		No stains			
3.Material	PMMA				Color	Transparent			OK	
4.Optical index	Testing LED	D6								
	The size and rated power of the light-emitting surface (LES) of the COB recommended by this lens should conform to the parameters in the product basic information table. 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								
	angle				51.5	45.9	46.2	47		
	K-value (CD/LM)									
	Efficiency				81.00%	83.00%	82.00%	84.00%		
Facula	See the signature sample									
Comprehensive judgment		Qualified								

Remarks:

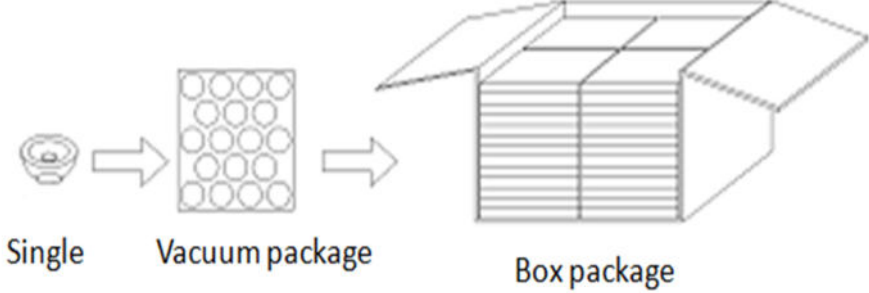
1、 Tool Number: V-
Vernier Caliper 2D-
Quadratic H-Height
Gauge M-Tool
Microscope P-Needle T-
Thick Gauge R-Radius
Gauge E-Visual.
2、 Ambient temperature
on the size of the product
refer to the table on the
right

PMMA product size changes with temperature table



Precautions:

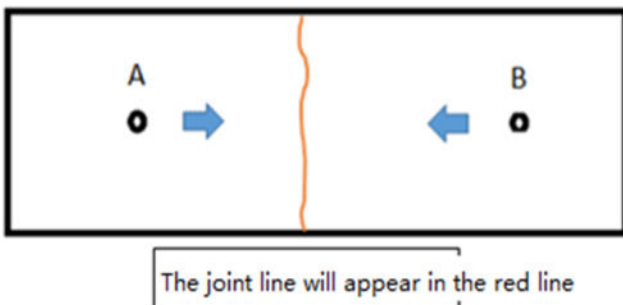
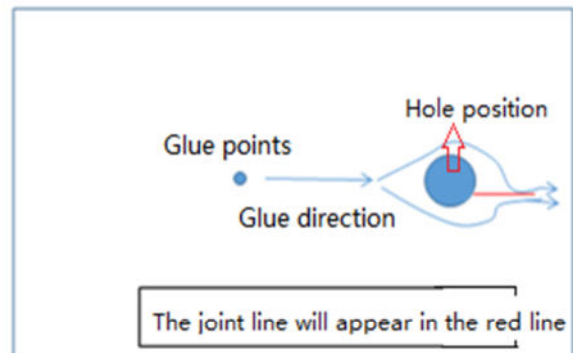
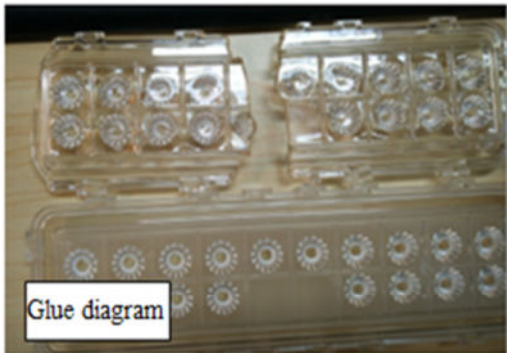
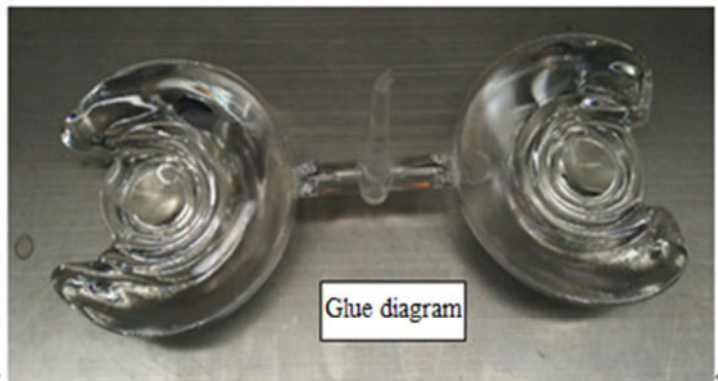
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PN		HK-HG-30@16-15-D4-21-1g-1	Product Name	HK Dark 30@16-15° lens			
Product material		PMMA					
Package diagram		 <p style="text-align: center;">Single Vacuum package Box package</p>					
Product packing		27	A/ Box	4	pcs/Layer		
		16	Layer/Box	1728	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0097	Blister box	23cm*21cm	64	BAG	
	2	2.08.0001	PE film	30cm*30cm	64	PCS	
	3	2.06.0005	Reel label paper	6.2cm*8cm	64	PCS	
	4	2.06.0005	Box label paper	6.2cm*9.2cm	1	PCS	
	5	2.06.0003	big plate	46.8cm*42.8cm	17	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 $100 \times 100\text{mm}$ 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 $50 \times 50\text{ mm}$ area	Visual		√	