HERCULUX Chengdu HercuLux Photoelectric 恒坤光电 Technology Co.,Ltd

Product Approval

Approval number : Effective date of approval :

Customer:

PN	Material Code	Product
HK-50@14-12-1310-20-1g-1	1.01.6582	HK 50@14-12°Lens
HK-50@14-24-1310-20-1g-1	1.01.6637	HK 50@14-24°Lens
HK-50@14-36-1310-20-1g-1	1.01.6638	HK 50@14-36°Lens

Manufacturer: Chengdu HercuLux Photoelectric Technology Co.,Ltd



	Supplier co	onfirmation		Client cor	nfirmation	
Proposed		DATE	Qualified□		5.4.75	
Project manager		DATE	Unqualified□		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 www.hkoptics.com

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

TEL: 0755-2937 1541 FAX: 0755-2907 5140

*Approval In duplicate, for both supplier and customer.

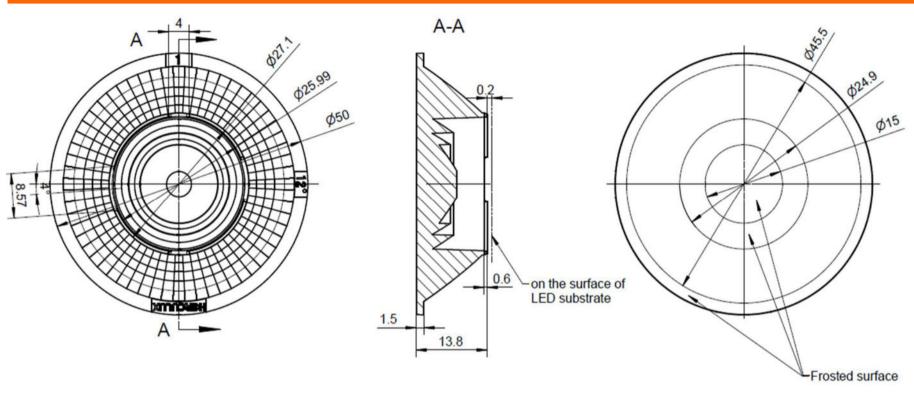


HERCULUX 恒坤光电 Product Approval

TEL: 0755-2937 1541 Date updated: 2018/6/5 FAX: 0755-2907 5140 www.hkoptics.com

Product Picture:	
PN:	HK-50@14-12-1310-20-1g-1
Size(L*W*H/Φ*H):	Ф:50mm; H:13.8mm
Material:	PC
Effiency:	85%
Temperature(Topr):	-40°C to +120°C
FWHM:	12°/24°/36°
Matched LES:	CREE1310



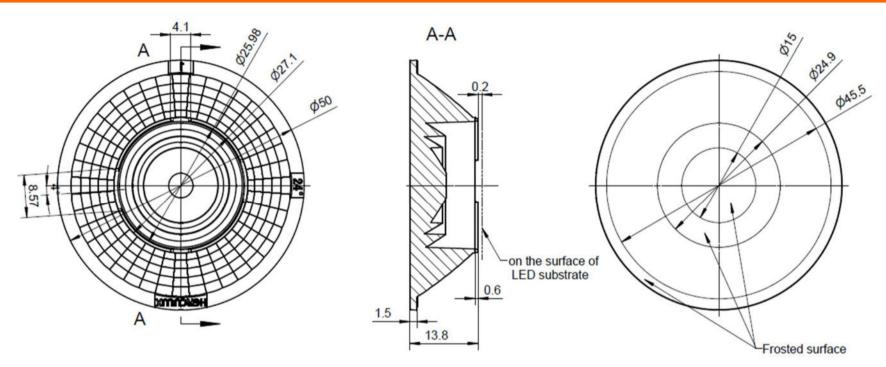


Technical Requirement:

- 1. The surface don't have any defects of flash, shrink and bubble.
- 2. The uncharted fillet and pattern draft subject to the 3D drawing.
- 3. The uncharted dimensional tolerance subject to the 3D drawing.

ptical Design	1		HK-50@14-	-12-1310-20-1g-1	1.01.6582
ructure Desig	gn	HK 50@14-12° Lens	Pages	Qty	Weight
Assess			2		
Authorized		Material: PC		CDHK	



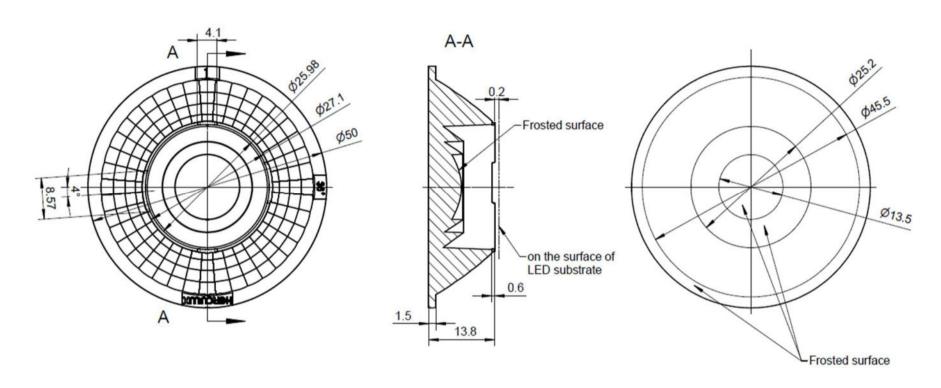


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ptical Design	1		HK-50@14-	-24-1310-20-1g-1	1. 01. 6637
ructure Desi	gn	HK 50@14-24° Lens	Pages	Qty	Weight
Assess			2		
Authorized		Material: PC		CDHK	



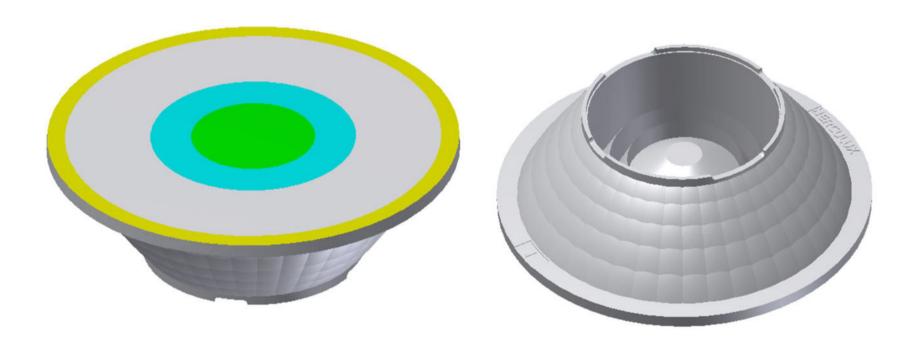


Technical Requirement:

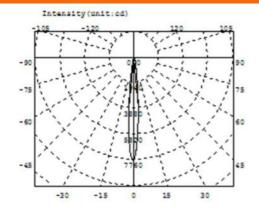
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- 2. The uncharted fillet and pattern draft subject to the 3D drawing.
- 3. The uncharted dimensional tolerance subject to the 3D drawing.

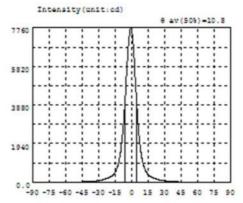
ptical Design	1		HK-50@14-	-36-1310-20-1g-1	1.01.6638
ructure Desig	gn	HK 50@14-36° Lens	Pages	Qty	Weight
Assess			2		
Authorized		Material: PC		CDHK	











Intensity data: (deg , cd) CO-180

Α	1	λ	1	Α	1	λ	1	λ	1	Α	I
-90.0	0.4586	-58.5	8.182	-27.0	116.2	4.5	4135	36.0	39.04	67.5	4.811
-88.5	0.4719	-57.0	8.846	-25.5	136.1	6.0	2875	37.5	33.33	69.0	4.487
-87.0	0.6389	-55.5	9.774	-24.0	160.0	7.5	1942	39.0	28.54	70.5	4.175
-85.5	1.085	-54.0	10.74	-22.5	189.4	9.0	1322	40.5	24.59	72.0	3.805
-84.0	1.468	-52.5	11.63	-21.0	221.5	10.5	920.6	42.0	21.34	73.5	3.438
-82.5	1.812	-51.0	12.75	-19.5	260.5	12.0	670.5	43.5	18.67	75.0	3.085
-81.0	2.159	-49.5	14.15	-18.0	312.5	13.5	507.3	45.0	16.52	76.5	2.694
-79.5	2.529	-48.0	15.38	-16.5	388.8	15.0	396.2	46.5	14.78	78.0	2.417
-78.0	2.849	-46.5	16.96	-15.0	502.2	16.5	312.4	48.0	13.55	79.5	2.043
-76.5	3.241	-45.0	18.89	-13.5	674.9	18.0	260.1	49.5	13.15	81.0	1.725
-75.0	3.563	-43.5	21.38	-12.0	936.2	19.5	219.7	51.0	12.92	82.5	1.462
-73.5	3.943	-42.0	24.45	-10.5	1342	21.0	186.9	52.5	10.44	84.0	0.9815
-72.0	4.276	-40.5	28.20	-9.0	1975	22.5	159.2	54.0	9.163	85.5	0.7597
-70.5	4.588	-39.0	32.70	-7.5	2839	24.0	136.8	55.5	8.513	87.0	0.5946
-69.0	4.978	-37.5	38.03	-6.0	4033	25.5	117.4	57.0	7.894	88.5	0.5035
-67.5	5.340	-36.0	44.41	-4.5	5477	27.0	100.5	58.5	7.290	90.0	0.4713
-66.0	5.668	-34.5	52.22	-3.0	6783	28.5	85.93	60.0	6.744		
-64.5	6.092	-33.0	61.43	-1.5	7595	30.0	73.51	61.5	6.372		
-63.0	6.535	-31.5	72.10	0.0	7663	31.5	62.64	63.0	5.993		
-61.5	7.082	-30.0	84.48	1.5	6897	33.0	53.43	64.5	5.605		
-60.0	7.590	-28.5	99.25	3.0	5567	34.5	45.62	66.0	5.247		

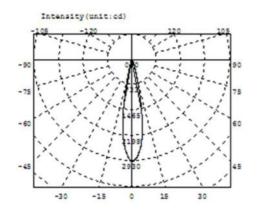
Electricity Parameter:

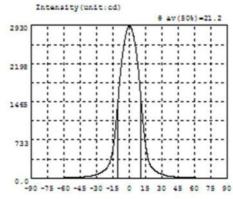
Current I: 0.1000A Power: 3.630W Voltage V: 36.29V PF: 1.000

Optical Parameter (Distance=2.559m):

CO-180Plane IO= 7663cd







Intensity data: (deg , cd) CO-180

Α	1	λ	1	Α	1	A	1	Α	1	A	1
-90.0	0.2938	-58.5	8.357	-27.0	95.41	4.5	2677	36.0	40.86	67.5	5.567
-88.5	0.3279	-57.0	8.983	-25.5	111.3	6.0	2503	37.5	35.47	69.0	5.177
-87.0	0.3958	-55.5	9.684	-24.0	130.7	7.5	2267	39.0	31.03	70.5	4.805
-85.5	0.4979	-54.0	10.52	-22.5	154.7	9.0	1962	40.5	27.37	72.0	4.429
-84.0	0.6823	-52.5	11.44	-21.0	184.2	10.5	1604	42.0	24.54	73.5	4.076
-82.5	1.215	-51.0	12.48	-19.5	225.6	12.0	1245	43.5	22.12	75.0	3.723
-81.0	1.746	-49.5	13.68	-18.0	286.8	13.5	916.0	45.0	20.28	76.5	3.355
-79.5	2.163	-48.0	15.30	-16.5	365.3	15.0	648.5	46.5	18.45	76.0	3.000
-78.0	2.526	-46.5	17.62	-15.0	535.9	16.5	457.2	48.0	16.32	79.5	2.652
-76.5	2.902	-45.0	20.25	-13.5	756.3	18.0	325.4	49.5	14.50	81.0	2.296
-75.0	3.344	-43.5	22.63	-12.0	1054	19.5	246.6	51.0	13.08	82.5	1.914
-73.5	3.759	-42.0	24.67	-10.5	1407	21.0	199.9	52.5	11.89	84.0	1.510
-72.0	4.112	-40.5	27.10	-9.0	1774	22.5	166.9	54.0	10.94	85.5	1.024
-70.5	4.496	-39.0	30.41	-7.5	2110	24.0	141.4	55.5	10.06	87.0	0.6830
-69.0	4.883	-37.5	34.55	-6.0	2378	25.5	120.1	57.0	9.290	88.5	0.6000
-67.5	5.280	-36.0	39.39	-4.5	2584	27.0	102.5	58.5	8.678	90.0	0.5208
-66.0	5.676	-34.5	45.19	-3.0	2747	28.5	87.85	60.0	8.111		
-64.5	6.117	-33.0	52.09	-1.5	2873	30.0	75.38	61.5	7.619		
-63.0	6.585	-31.5	60.48	0.0	2922	31.5	64.61	63.0	7.072		
-61.5	7.105	-30.0	70.25	1.5	2896	33.0	55.40	64.5	6.483		
-60.0	7.750	-28.5	81.90	3.0	2811	34.5	47.47	66.0	5.986		

Electricity Parameter:

Current I: 0.1000A Power: 3.610W Voltage V: 36.09V PF: 0.000

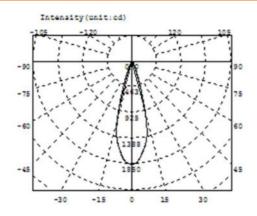
Optical Parameter (Distance=2.410m):

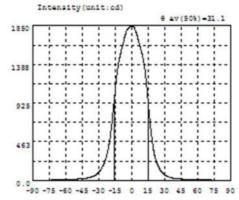
Equivalent Luminous flux: Φ eff= 518.8lm Efficiency: Eff=143.72lm/W

Diffuse angle: @(25%): 28.0deg@(50%): 21.2deg@(75%): 14.9deg@(50%): 21.2deg
Diffuse angle: @(25%): 28.0deg@(50%): 21.2deg@(75%): 14.9deg@(50%): 21.2deg
Imax=2922cd (C=0.0deg, C=0.0deg)
C0-180Plane Imax= 2922cd (C=0.0deg)

CO-180Plane IO= 2922cd







Intensity data: (deg , cd) CO-180

Α	1	A	I	Α	I	A	1	A	I	A	I
-90.0	0.3822	-58.5	10.26	-27.0	151.9	4.5	1753	36.0	33.47	67.5	6.384
-88.5	0.4585	-57.0	11.02	-25.5	191.8	6.0	1679	37.5	29.27	69.0	5.898
-87.0	0.6900	-55.5	11.84	-24.0	240.6	7.5	1607	39.0	25.95	70.5	5.403
-85.5	1.240	-54.0	12.61	-22.5	307.4	9.0	1534	40.5	23.21	72.0	4.920
-84.0	1.798	-52.5	13.60	-21.0	398.3	10.5	1448	42.0	20.98	73.5	4.473
-82.5	2.273	-51.0	14.57	-19.5	521.3	12.0	1324	43.5	19.11	75.0	4.024
-81.0	2.680	-49.5	15.77	-18.0	677.9	13.5	1146	45.0	17.50	76.5	3.626
-79.5	3.135	-48.0	17.15	-16.5	871.6	15.0	928.9	46.5	16.08	78.0	3.196
-78.0	3.499	-46.5	18.83	-15.0	1082	16.5	718.5	48.0	14.97	79.5	2.761
-76.5	3.883	-45.0	20.69	-13.5	1264	18.0	542.3	49.5	14.03	81.0	2.274
-75.0	4.349	-43.5	22.91	-12.0	1396	19.5	401.7	51.0	13.15	82.5	1.844
-73.5	4.722	-42.0	25.69	-10.5	1492	21.0	291.2	52.5	12.37	84.0	1.298
-72.0	5.175	-40.5	29.02	-9.0	1575	22.5	222.6	54.0	11.68	85.5	0.6935
-70.5	5.774	-39.0	33.09	-7.5	1655	24.0	172.7	55.5	10.91	87.0	0.4756
-69.0	6.203	-37.5	38.17	-6.0	1731	25.5	134.9	57.0	10.32	88.5	0.3393
-67.5	6.787	-36.0	44.49	-4.5	1793	27.0	106.2	58.5	9.727	90.0	0.1998
-66.0	7.268	-34.5	52.85	-3.0	1824	28.5	84.46	60.0	9.130		
-64.5	7.850	-33.0	63.72	-1.5	1842	30.0	67.91	61.5	8.610	j l	
-63.0	8.454	-31.5	78.02	0.0	1847	31.5	55.24	63.0	8.047		
-61.5	9.006	-30.0	96.61	1.5	1837	33.0	45.84	64.5	7.478		
-60.0	9.622	-28.5	121.0	3.0	1808	34.5	38.85	66.0	6.912		

Electricity Parameter:

Current I: 0.1000A Power: 3.610W Voltage V: 36.09V PF: 1.000

Optical Parameter (Distance=2.559m):

C0-180Plane IO= 1847cd



					_						
			Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Jud	gment	
	diamet	er	50	50. 2	49. 7	49. 9	49.84	49.88	(ЭK	
1.Size	height	1	13.8	14	13. 6	13.8	13.84	13.86	(ЭK	
	height	2	12. 3	12. 4	12. 1	12. 26	12.28	12.4	(ЭK	
			G	ate shear can not a	ffect the ap	pearance of th	ne lamp				
			S	ee attachment "App	pearance Ir	spection Stan	dards"				
2.Appear	rance		e attachment appearance			No burr	No burr	No bur	r	ОК	
Quality			nspection Standards"	L	No stains	No stains	No stains	No stair	าร	OK	
3.Materia	al			PC		Color	Tra	nsparent		OK	
	Testing I	esting LED CREE1310									
	FWH	M			See light di	istribution curv	е				
4.Optica	angle	Э			10.8°	11°	11.5°		OK		
I index	K-val	ue				14. 16	13. 18	12.60		OK	
	Efficie					90. 09%	88. 96%	88. 37%		OK	
	Facula	See t	he signature sa	mple	`						
	ehensive ment					Qualifie	d				
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. Test environment: In 20 C -25 C environment to achieve thermal equilibrium after the test. (Ambient temperature on the size of the product refer to the table on the right)			Leng chan (m	ges m) 0.8 0.6 0.4 0.2	t size char	nges with ten	*	Size: 50m Size: 100 Size: 150 Size: 200 Size: 250 Size: 300	mm mm mm mm		

Precautions:

- 1、Wear clean gloves during lens assembly to prevent contamination of the lens surface.
- 2. Take the lens try to avoid touching the total reflection surface.
- 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.



			Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Jud	gment
	diamet	er	50	50. 2	49. 7	49. 98	50.04	49.94	(ЭK
1.Size	height	t1	13.8	14	13. 6	13. 9	13.96	13.94	(ЭK
	height	t2	12.3	12. 4	12. 1	12. 26	12.2	12.26	(ЭK
			G	ate shear can not a	ffect the ap	pearance of th	ne lamp			
			S	See attachment "Ap	pearance Ir	spection Stan	dards"			
2.Appear	rance	"∆	e attachment Appearance	E	No burr	No burr	No burr	No bur	r	ОК
Quality			nspection Standards"	J	No stains	No stains	No stains	No stair	าร	OK
3.Materia	al			PC		Color	Tra	nsparent		OK
	Testing	LED			CR	EE1310				
	FWHI	М			See light di	stribution curv	е			
4.Optica	angle	е				21.2°	20. 7°	20.6°		OK
I index	K-val	ue				5. 63	5. 68	5. 68		OK
	Efficie	ency				86. 98%	87. 03%	86. 21%		OK
	Facula	See t	he signature sa	mple	`					
	ehensive ment					Qualifie	d			
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. Test environment: In 20 C -25 C environment to achieve thermal equilibrium after the test. (Ambient temperature on the size of the product refer to the table on the right)			Leng chan, (mi	(th 1 ges m) 0.8 0.6 0.4 0.2 0	t size chan	ges with tem	*	Size: 50m Size: 100r Size: 150r Size: 250r Size: 250r Size: 300r	mm mm mm mm	

Precautions:

- 1. Wear clean gloves during lens assembly to prevent contamination of the lens surface.
- 2. Take the lens try to avoid touching the total reflection surface.
- 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.



					_							
			Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Judo	gment		
	diamet	er	50	50. 2	49. 7	49. 94	49.9	49.84	(ΣK		
1.Size	height	1	13.8	14	13. 6	13.85	13.86	13.82	(ΣK		
	height	2	12. 3	12. 4	12. 1	12. 29	12.3	12.28	(ΣK		
			G	ate shear can not a	ffect the ap	pearance of th	ne lamp					
			S	ee attachment "Ap	pearance Ir	spection Stan	dards"					
2.Appear	ance		e attachment appearance	E	No burr	No burr	No burr	No bur	r	OK		
Quality			nspection Standards"	L	No stains	No stains	No stains	No stair	าร	ÖK		
3.Materia	ıl			PC		Color	Tra	nsparent		OK		
	Testing I	LED		CREE1310								
	FWH	M			See light di	stribution curv	re					
4.Optica	angle	Э				31.1°	30.9°	32.1°	(OK		
I index	K-val	ue				3. 09	3. 34	3. 02	(OK		
	Efficie	ency				86. 13%	87. 08%	84.68%	(OK		
	Facula	See tl	he signature sa	mple	`							
	hensive ment					Qualifie	ed					
1、Tool I Caliper 2 Height G Microsco Thick Ga Gauge E 2、Test © -25 ℃ achieve t after the temperat the produ	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. Test environment: In 20 125 12 environment to achieve thermal equilibrium after the test. (Ambient temperature on the size of the product refer to the table on the right)			PC prodeingth 1 0.8 0.6 0.4 0.2 0 0	uct size ch	nanges with t	*	Size: 5 Size: 1 Size: 1 Size: 2 Size: 2 Size: 3	.00mm .50mm .00mm	า า า		

Precautions:

- 1. Wear clean gloves during lens assembly to prevent contamination of the lens surface.
- 2. Take the lens try to avoid touching the total reflection surface.
- 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.

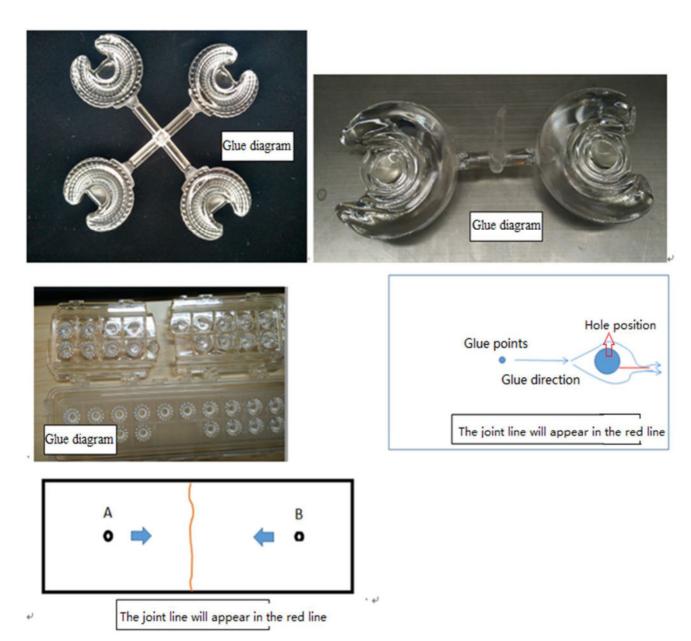


PN		HK-50@14-12-1310-20-1g-1		Product Name	HK 50@14-12°Lens		3
Product material		PC		Customer			
Package diagram		Single Vacuum package Box package					
Product packing		14	A/ Box	4	Box/Layer		
Product	packing	16	Layer/Box	896	A/ Carton		
	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0063	Blister box	23cm*21cm	64	BAG	
	2	2.08.0001	PE film	30cm*30cm	64	PCS	
Packagin	3	2.06.0005	Reel label paper	6.2cm*8cm	64	PCS	
g Materials	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	2.06.0001	big carton	46.8cm*42.8cm*36c m	1	PCS	
Remarks	Scattered packaging is not subject to this specification						



Special notice

When gule 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:



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

1.1.1Sampling standards, sampling plan and AQL

Test level : GB/T2828.1-2012The first part is according to the acceptance quality limit (AQL) retrieval batch inspection sampling plan, general inspection level Π 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	Н	Depth	mm
W	Width	mm	DS	Distance	mm
S	Proportion	mm²	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, chip should be from the lens surface 500-550mm, in order to make the bad appearance can be correctly found, the illumination should not be less than 500Lux;
 - 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	ludging standard	Inspection equipment	Defect level		
rescitents	Judging standard	Testing method	MI	MA	CR
	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.				
Check the sample	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;	Sample comparison , visual			√

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	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 things, impurities	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. 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.	Visual, point card		√	
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; 2: The remaining flow marks shall not appear in the optical surface, a single L ≤ 10mm, no more than two 	Visual		✓	

Bubble	No bubbles are allowed	Visual		√	
Foreign matter、Dark spots	Not obvious or D ≤ 0.3mm 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	V		
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	√		
	1: Do not affect the product size, shall not penetrate the optical surface, the cut should be smooth;				
Bad incision	2: Laser cutting products, the optical surface burns shall not occur after the processing is completed. Beading must not affect product installation	Visual			√
	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 mm and no more than 1 area within a 50x50 mm area	Visual		√	