

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

### **Product Approval**

#### Approval number:

Customer:

Product: HK-4420-15 Reflective cup Material Code: 1.08.6603

PN: HK-44@20-15-D9-2#-1g-1

Manufacturer: Chengdu HercuLux Photoelectric Technology Co.,Ltd



	Supplier confirmation			Client confirmation			
Proposed		DATE		Qualified□			
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.

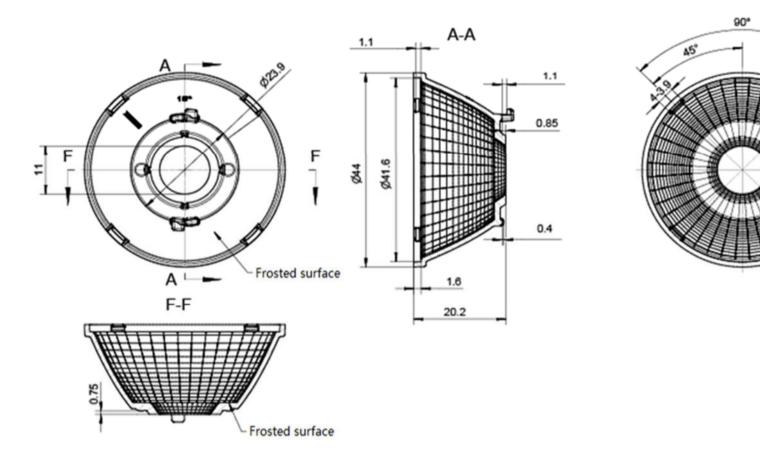


# HERCULUX 恒坤光电 Product Approval

TEL: 0755-2937 1541 Date updated: 2019/1/22 FAX: 0755-2907 5140 www.hkoptics.com

Product Picture:	
PN:	HK-44@20-15-D9-2#-1g-1
Size(L*W*H/Φ*H):	Ф:44mm*H:20.2mm
1.07.81418_HK-166@03-0223-S	PC镀铝
Effiency:	\
Temperature(Topr):	-40°C to +120°C
FWHM:	15°
Matched LES:	D9





#### 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.

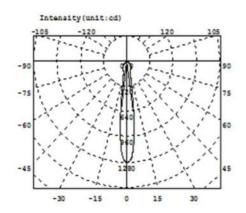
Optical Design			HK 4420-15		)-15-D9-2#-1g-1	1. 08. 6603
Structure Design		HK-4420 Reflectiv		Pages	Qty	Weight
Assess			•	2		
Authorized		Material:	PC镀铝		CDHK	

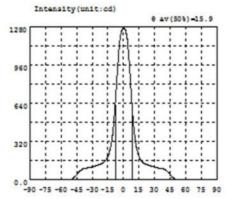












Intensity data: (deg , cd) C0-180

λ	I	λ	I	λ	1	λ	1	Α	1	λ	I
-90.0	0.2930	-58.5	0.4606	-27.0	117.8	4.5	1097	36.0	96.04	67.5	0.6906
-88.5	0.3058	-57.0	0.5096	-25.5	122.0	6.0	924.3	37.5	93.91	69.0	0.6829
-87.0	0.3063	-55.5	0.5522	-24.0	126.3	7.5	719.8	39.0	90.76	70.5	0.7211
-85.5	0.3439	-54.0	0.5778	-22.5	130.9	9.0	533.1	40.5	83.20	72.0	0.7134
-84.0	0.3189	-52.5	0.6823	-21.0	136.6	10.5	386.2	42.0	72.33	73.5	0.7320
-82.5	0.3317	-51.0	1.422	-19.5	144.2	12.0	293.6	43.5	58.48	75.0	0.7388
-81.0	0.3312	-49.5	6.125	-18.0	155.2	13.5	234.2	45.0	43.08	76.5	0.7495
-79.5	0.3433	-48.0	15.62	-16.5	171.4	15.0	193.7	46.5	28.11	78.0	0.7388
-78.0	0.3575	-46.5	28.06	-15.0	196.3	16.5	168.5	48.0	15.70	79.5	0.7497
-76.5	0.3312	-45.0	43.01	-13.5	234.8	18.0	152.5	49.5	6.031	81.0	0.7752
-75.0	0.3685	-43.5	58.38	-12.0	290.5	19.5	141.4	51.0	1.361	82.5	0.8101
-73.5	0.3567	-42.0	72.36	-10.5	376.7	21.0	133.8	52.5	0.7498	84.0	0.8248
-72.0	0.3578	-40.5	84.00	-9.0	507.5	22.5	128.3	54.0	0.6589	85.5	0.8632
-70.5	0.3822	-39.0	91.89	-7.5	686.8	24.0	123.7	55.5	0.6276	87.0	0.8888
-69.0	0.3976	-37.5	95.02	-6.0	890.8	25.5	119.4	57.0	0.6054	88.5	0.9286
-67.5	0.3836	-36.0	97.50	-4.5	1070	27.0	115.3	58.5	0.5987	90.0	0.9554
-66.0	0.4061	-34.5	100.0	-3.0	1195	28.5	111.5	60.0	0.6115		
-64.5	0.4076	-33.0	102.6	-1.5	1252	30.0	107.7	61.5	0.6466		
-63.0	0.4348	-31.5	105.7	0.0	1273	31.5	104.1	63.0	0.6594		
-61.5	0.4349	-30.0	109.5	1.5	1257	33.0	100.9	64.5	0.6624		
-60.0	0.4459	-28.5	113.7	3.0	1210	34.5	98.22	66.0	0.6879		

#### Electricity Parameter:

Current I: 0.1000A Power: 0.8700W Voltage V: 8.699V PF: 1.000

#### Optical Parameter (Distance=2.559m):

CO-180Plane IO= 1273cd



								1	1			
		:	Standard size	Upper Size limit	Low size I		Test result1	Test result2	Test result3	Test result4	Jud gme nt	Remarks
	Diamet	er	44			/	43.89	43.91	43.93	44.07		Test environment:
1.Size	Hightl	า	20.2				20. 23	20.22	20.26	2.1		In 20 °C -25 °C environment
												to achieve thermal equilibrium
												after the test.
				Gate she	ar can	not a	affect the a	ppearance	of the lamp	)		
				See atta	chmer	nt "Ap	pearance	Inspection	Standards"			
2.Appear	See attachmer "Appearane		chment	E		Ν	lo burr	No burr	No burr	No bu	rr	ОК
Quality		"Appearance Inspection Standards"		L	E No		o stains	No stains	No stains	No stains		OK
3.Materia	ıl			PC镀铂				Color	Transparent			OK
	Testing I	_ED						D9				
4.Optica	compai	rable to	o the sour	ce of the te	st, if it	is re	quired to be of the use	ht source re e out of ran environme distribution	ge. Accord ent, the lens	ing to the h	neat d	issipation
I IIIGOX	angle	)					15. 9	15. 9				
	Efficie	ncy					91.84	91.68		$\overline{}$		
			ne signatui	re sample			,					
	hensive ment							Qı	ualified			
Caliper 2 Height Ga Microsco Thick Ga Gauge E- 2、 Ambi	Number: V D-Quadra auge M-To pe P-Neeo uge R-Rao -Visual. ient tempe	tic H- pol dle T- dius erature	on	Length changes (mm)	0.9	prod	luct size cl	nanges wi		Size: Size: Size: Size: Size: Size: Size:	50mm 100mi 150mi 200mi 250mi	n n n
	of the prod le on the r		er		0 0		10 2	20 30	40 (°C	!)		

#### Precautions:

- 1、Wear clean gloves during lens assembly to prevent contamination of the lens surface.
- Take the lens try to avoid touching the total reflection surface.
   When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.



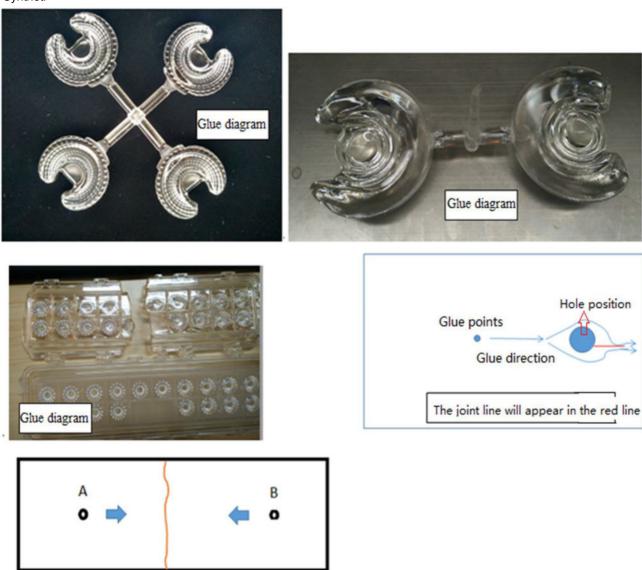
Р	N	HK-44@20-15-D9-2	2#-1g-1	Product Name	HK-4420-15 Re	flective	cup
Product	material	PC镀铝		Customer			
Package	diagram		-	-			>
Product	nacking	39	PCS/BAG	6	BAG/LAYER		
110000	paoming	5	Layer/Box	1170	Piece/Box		
	NO.	Material Code	Item name	Specification	Single box usage	Unit	Remarks
	1	·	Plastic bags		30	BAG	
Deelseein	2	2.06.0005	Box label	6.2cm*7.6cm	1	PCS	
Packagin g Materials	3	2.06.0007	Partition	39*29cm	6	PCS	
Materials	4	2.06.0008	Carton	40*30*26cm	1	PCS	
Remarks	The loose layers of 2	packing is not subject to this s 4 bags for each layer and 5 b	specification. Cus	stomer's requiremer yer)	its shall prevail(Ther	e are th	nree



#### 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:

#### Syntneti



#### 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.

The joint line will appear in the red line



#### 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  $\Pi$  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, 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	ludging standard	Inspection equipment	Defec	t level	
resciteriis	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			√

1		Ī	Ī	
	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	<b>√</b>	
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			<b>√</b>
Deformation	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces.	Visual, feeler		<b>√</b>
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	<ol> <li>1 : Product does not allow the presence of flow marks and welding lines unless the structure can not be avoided;</li> <li>2: The remaining flow marks shall not appear in the optical surface, a single L ≤ 10mm, no more than two</li> </ol>	Visual	✓	

Bubble	No bubbles are allowed	Visual		√	
Foreign objects, black spots, white 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	<b>√</b>		
	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		<b>√</b>	



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

### **Product Approval**

#### Approval number:

Customer:

Product: HK-4420-24 Reflective cup

Material Code: 1.08.6604

PN: HK-44@20-24-D9-2#-1g-1

Manufacturer: Chengdu HercuLux Photoelectric Technology Co.,Ltd



	Supplier confirmation			Client confirmation			
Proposed		DATE		Qualified□			
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.

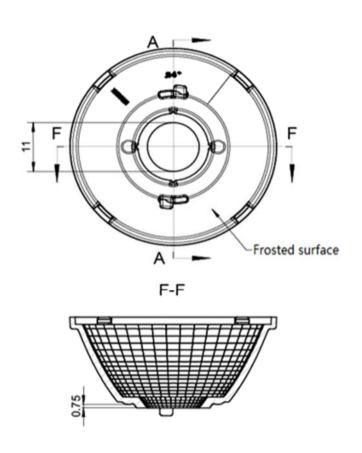


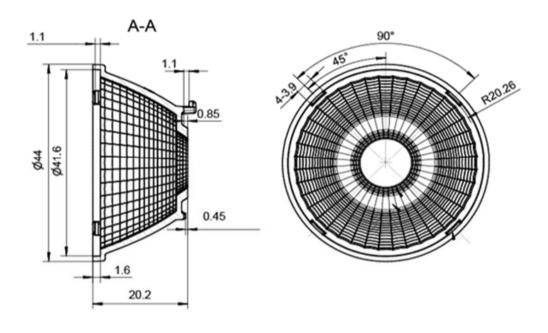
# HERCULUX 恒坤光电 Product Approval

TEL: 0755-2937 1541 Date updated: 2019/1/22 FAX: 0755-2907 5140 www.hkoptics.com

Product Picture:	
PN:	HK-44@20-24-D9-2#-1g-1
Size(L*W*H/Φ*H):	Ф:44mm*H:20.2mm
1.07.81418_HK-166@03-0223-S	PC镀铝
1.07.81418_HK-166@03-0223-S Effiency:	PC镀铝 \
Effiency:	\







#### 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.

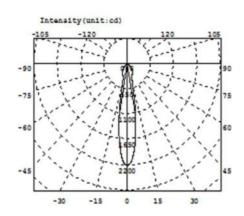
Optical Design				HK-44@20	D-24-D9-2#-1g-1	1. 08. 6604
Structure Design		HK-4420 Reflectiv		Pages	Qty	Weight
Assess			•	2		
Authorized		Material:	PC镀铝		CDHK	

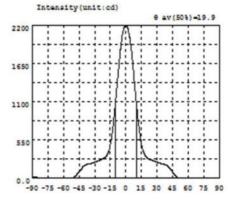












Intensity data: (deg , cd) C0-180

A	I	A	I	λ	I	A	I	A	I	A	1
-90.0	14.74	-58.5	7.272	-27.0	250.2	4.5	1930	36.0	204.7	67.5	1.319
-88.5	14.38	-57.0	7.037	-25.5	259.6	6.0	1734	37.5	198.5	69.0	1.371
-87.0	13.96	-55.5	6.828	-24.0	269.3	7.5	1494	39.0	189.2	70.5	1.400
-85.5	13.56	-54.0	6.683	-22.5	279.9	9.0	1241	40.5	171.9	72.0	1.482
-84.0	13.19	-52.5	6.697	-21.0	293.6	10.5	1012	42.0	146.8	73.5	1.530
-82.5	12.74	-51.0	8.380	-19.5	312.0	12.0	801.8	43.5	117.3	75.0	1.605
-81.0	12.31	-49.5	17.30	-18.0	341.0	13.5	619.3	45.0	84.73	76.5	1.686
-79.5	11.91	-48.0	36.69	-16.5	390.7	15.0	480.6	46.5	55.28	78.0	1.754
-78.0	11.49	-46.5	62.79	-15.0	483.6	16.5	396.0	48.0	29.70	79.5	1.820
-76.5	11.09	-45.0	93.76	-13.5	616.7	18.0	344.7	49.5	10.55	81.0	1.903
-75.0	10.70	-43.5	123.4	-12.0	797.2	19.5	307.1	51.0	2.217	82.5	2.024
-73.5	10.36	-42.0	151.1	-10.5	1017	21.0	288.1	52.5	1.321	84.0	2.127
-72.0	10.02	-40.5	175.5	-9.0	1262	22.5	275.5	54.0	1.221	85.5	2.228
-70.5	9.699	-39.0	192.4	-7.5	1503	24.0	265.4	55.5	1.159	87.0	2.343
-69.0	9.361	-37.5	199.8	-6.0	1742	25.5	256.4	57.0	1.155	88.5	2.499
-67.5	9.044	-36.0	205.5	-4.5	1946	27.0	247.4	58.5	1.159	90.0	2.634
-66.0	8.718	-34.5	211.5	-3.0	2096	28.5	239.4	60.0	1.161		
-64.5	8.400	-33.0	217.8	-1.5	2172	30.0	231.8	61.5	1.175		
-63.0	8.084	-31.5	222.8	0.0	2195	31.5	224.3	63.0	1.213		
-61.5	7.801	-30.0	232.8	1.5	2161	33.0	217.2	64.5	1.247		
-60.0	7.521	-28.5	240.8	3.0	2071	34.5	211.0	66.0	1.274		

#### Electricity Parameter:

Current I: 0.1000A Power: 4.907W Voltage V: 49.09V PF: 1.000

#### Optical Parameter (Distance=2.410m):

CO-180Plane IO= 2195cd



			1	1					1			1
		\$	Standard size	Upper Size limit	Low size I		Test result1	Test result2	Test result3	Test result4	Jud gme nt	Remarks
	Diamet	er	44			/	43.81	44.11	43.91	43.81		Test environment:
1.Size	Hightl	า	20.2				20. 28	20.29	20.16	20.25		In 20 °C -25 °C environment
												to achieve thermal equilibrium
												after the test.
				Gate she	ar can	not a	affect the a	ppearance	of the lamp	)		
	See attachment "Appe							Inspection	Standards"			
2.Appear	ance	atta	See chment earance	Е -		Ν	lo burr	No burr	No burr	No bui	rr	ОК
Quality		Inspection Standards"  No stain:							No stains	No stai	ns	ÖK
3.Materia	ıl			PC镀铝				Color	Tra	nsparent		OK
	Testing I	_ED						D9				
4.Optica	compai	rable to	the sour	ce of the te	st, if it	is re	quired to be of the use	ht source re e out of ran environme distribution	ge. Accord ent, the lens	ing to the h	neat d	issipation
	angle	)					19.6	19.9	19.6	19. 7		/
•	Efficie	ncy		88.			88. 74	88. 93	88. 88	88. 23		
	Facula	See th	ne signatui	re sample			`					
	hensive ment						I	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				Length changes (mm)	0.9			hanges wi		Size: Size: Size: Size: Size: Size:	50mm 100mi 150mi 200mi 250mi	n n n

#### Precautions:

- 1、Wear clean gloves during lens assembly to prevent contamination of the lens surface.
- Take the lens try to avoid touching the total reflection surface.
   When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.



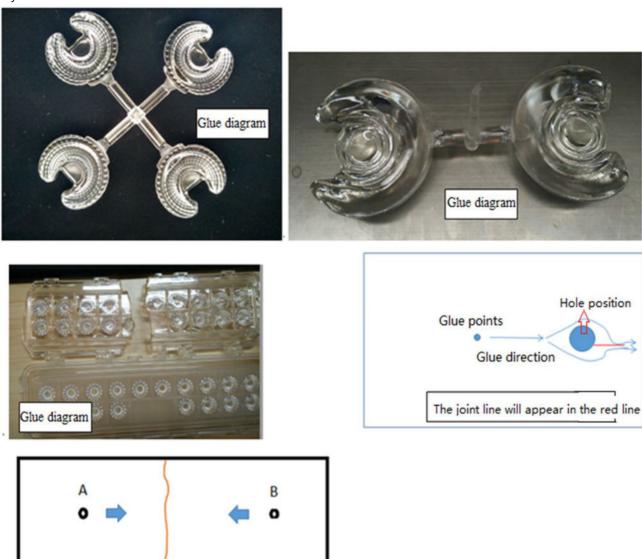
Р	N	HK-44@20-24-D9-2	2#-1g-1	Product Name	HK-4420-24 Re	flective	cup
Product	material	PC镀铝		Customer			
Package	diagram		-	-			
Product	nacking	39	PCS/BAG	6	BAG/LAYER		
riodaet	padimig	5	Layer/Box	1170	Piece/Box		
	NO.	Material Code	Item name	Specification	Specification Single box usage		Remarks
	1		Plastic bags		30	BAG	
Dooleasia	2	2.06.0005	Box label	6.2cm*7.6cm	1	PCS	
Packagin g Materials	3	2.06.0007	Partition	39*29cm	6	PCS	
ivialeriais	4	2.06.0008	Carton	40*30*26cm	1	PCS	
Remarks	The loose layers of 2	packing is not subject to this : 4 bags for each layer and 5 b	specification. Cua	stomer's requiremer yer)	its shall prevail(Ther	e are th	nree



#### 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:

#### Syntneti



#### 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.

The joint line will appear in the red line



#### 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  $\Pi$  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	Unit	Code	Code	Unit
	description			description	
N	Amount/pcs	pcs	D	Diameter	mm
L	Length	mm	Ħ	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, 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	ludging atondard	Inspection equipment	Defect level				
reschenis	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			√		

1		Ī	Ī	
	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	<b>√</b>	
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			<b>√</b>
Deformation	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces.	Visual, feeler		<b>√</b>
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	<ol> <li>1 : Product does not allow the presence of flow marks and welding lines unless the structure can not be avoided;</li> <li>2: The remaining flow marks shall not appear in the optical surface, a single L ≤ 10mm, no more than two</li> </ol>	Visual	✓	

Bubble	No bubbles are allowed	Visual		√	
Foreign objects, black spots, white 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	<b>√</b>		
	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		√	



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

### **Product Approval**

#### Approval number:

Customer:

Product: HK-4420-36 Reflective cup

Material Code: 1.08.6605

PN: HK-44@20-36-D9-2#-1g-1

Manufacturer: Chengdu HercuLux Photoelectric Technology Co.,Ltd



	Supplier co	onfirmation	Client confirmation				
Proposed		DATE	Qualified□				
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.

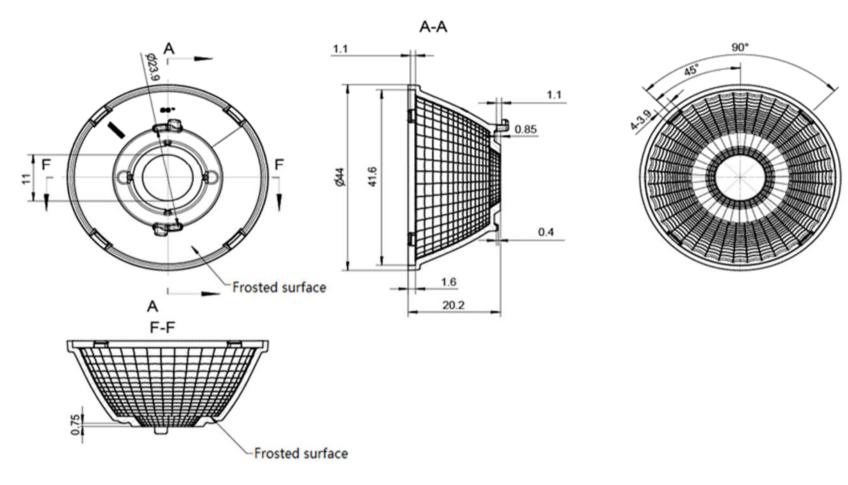


# HERCULUX 恒坤光电 Product Approval

TEL: 0755-2937 1541 Date updated: 2019/1/22 FAX: 0755-2907 5140 www.hkoptics.com

Product Picture:	
PN:	HK-44@20-36-D9-2#-1g-1
Size(L*W*H/Φ*H):	Ф:44mm*H:20.2mm
1.07.81418_HK-166@03-0223-S	PC镀铝
Effiency:	\
Temperature(Topr):	-40°C to +120°C
FWHM:	36°
Matched LES:	D9





#### 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.

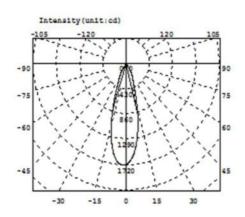
Optical Design				HK-44@20	)-36-D9-2#-1g-1	1. 08. 6605
Structure Design		HK-4420 Reflectiv		Pages	Qty	Weight
Assess			•	2		
Authorized		Material:	PC镀铝		CDHK	

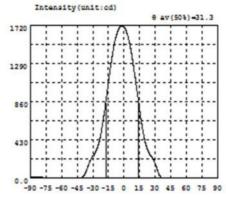












Intensity data: (deg , cd) C0-180

λ	I	λ	I	λ	I	λ	1	λ	1	Α	1
-90.0	14.11	-58.5	6.436	-27.0	304.9	4.5	1557	36.0	6.242	67.5	0.9974
-88.5	13.61	-57.0	6.183	-25.5	348.6	6.0	1475	37.5	2.152	69.0	1.026
-87.0	13.03	-55.5	5.985	-24.0	406.6	7.5	1378	39.0	1.813	70.5	1.071
-85.5	12.59	-54.0	5.788	-22.5	482.2	9.0	1263	40.5	1.677	72.0	1.125
-84.0	12.16	-52.5	5.631	-21.0	581.9	10.5	1144	42.0	1.594	73.5	1.173
-82.5	11.73	-51.0	5.477	-19.5	693.6	12.0	1020	43.5	1.500	75.0	1.266
-81.0	11.25	-49.5	5.355	-18.0	816.0	13.5	887.0	45.0	1.409	76.5	1.316
-79.5	10.87	-48.0	5.308	-16.5	950.3	15.0	753.0	46.5	1.322	78.0	1.397
-78.0	10.50	-46.5	5.269	-15.0	1090	16.5	637.1	48.0	1.255	79.5	1.503
-76.5	10.16	-45.0	5.247	-13.5	1213	18.0	531.9	49.5	1.176	81.0	1.571
-75.0	9.751	-43.5	5.309	-12.0	1328	19.5	445.5	51.0	1.108	82.5	1.674
-73.5	9.411	-42.0	5.518	-10.5	1434	21.0	375.8	52.5	1.055	84.0	1.765
-72.0	9.103	-40.5	6.727	-9.0	1528	22.5	321.0	54.0	1.040	85.5	1.877
-70.5	8.794	-39.0	20.93	-7.5	1599	24.0	282.7	55.5	0.9762	87.0	1.991
-69.0	8.448	-37.5	50.77	-6.0	1655	25.5	257.3	57.0	0.9701	88.5	2.126
-67.5	8.158	-36.0	93.63	-4.5	1693	27.0	235.2	58.5	0.9504	90.0	2.187
-66.0	7.853	-34.5	141.1	-3.0	1709	28.5	202.0	60.0	0.9419		
-64.5	7.554	-33.0	186.6	-1.5	1708	30.0	157.8	61.5	0.9421	,	
-63.0	7.257	-31.5	221.6	0.0	1699	31.5	107.9	63.0	0.9363		
-61.5	6.958	-30.0	248.1	1.5	1671	33.0	59.74	64.5	0.9476		
-60.0	6.688	-28.5	270.4	3.0	1620	34.5	25.19	66.0	0.9588		

#### Electricity Parameter:

Current I: 0.1000A Power: 4.907W Voltage V: 49.09V PF: 1.000

#### Optical Parameter (Distance=2.410m):

CO-180Plane IO= 1699cd



	1		-	-					,			
			Standard size	Upper Size limit	Low size li		Test result1	Test result2	Test result3	Test result4	Jud gme nt	Remarks
1.Size	Diameter		44			/	43. 91	43.89	43.84	43.79		Test environment:
	Highth		20.2				20. 13	20.23	20.21	20.2		In 20 °C -25 °C environment
												to achieve thermal equilibrium
												after the test.
				Gate shear can not affect the appearance of the lamp								
				See atta	chmen	t "Ap	pearance	Inspection :	Standards"			
2.Appear	ance	atta	See schment searance	nent		No burr		No burr	No burr	No burr		014
Quality	In:		pection ndards"	ion		No stains		No stains	No stains	No stains		OK
3.Materia	ıl			PC镀铝			Color	Tra	nsparent	OK		
	Testing I	.ED						D9				
4.Optica	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 a See light distribution curve							issipation				
Tilldex	angle						31.8	31. 3	32	32. 7		
	Efficiency						85. 34	85. 46	84. 95	85. 26	26	
			he signatu	re sample			,				<u> </u>	
	ehensive ment			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			e on	PC product size changes with temperature table  Length					n n n			
to the table on the right					0 📫		10 2	0 30	40 (°C	!)		

#### Precautions:

- 1、Wear clean gloves during lens assembly to prevent contamination of the lens surface.
- Take the lens try to avoid touching the total reflection surface.
   When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.



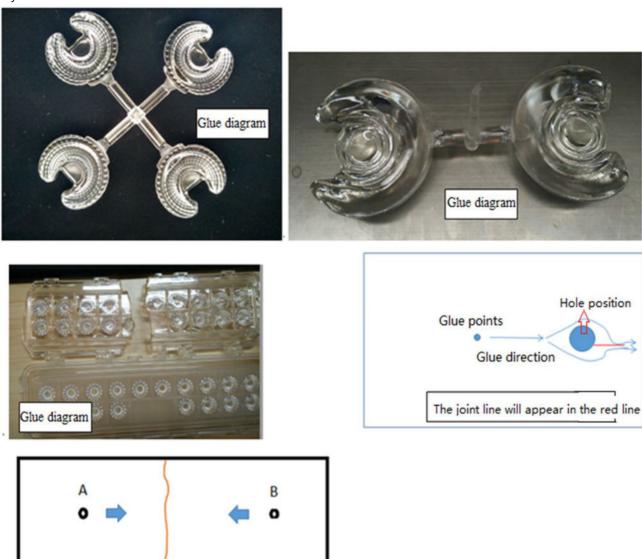
PN		HK-44@20-36-D9-2#-1g-1		Product Name	HK-4420-36 Reflective cup		cup	
Product	material	PC镀铝		Customer				
Package diagram			-					
Product	nacking	39	PCS/BAG	6	BAG/LAYER			
rioddot	paoking	5	Layer/Box	1170	Piece/Box			
	NO.	Material Code	Item name	Specification	Single box usage	Unit	Remarks	
	1		Plastic bags		30	BAG		
Da alva siis	2	2.06.0005	Box label	6.2cm*7.6cm	1	PCS		
Packagin g Materials	3	2.06.0007	Partition	39*29cm	6	PCS		
Materials	4	2.06.0008	Carton	40*30*26cm	1	PCS		
Remarks	The loose packing is not subject to this specification. Customer's requirements shall prevail (There are three layers of 24 bags for each layer and 5 bags for the top layer)							



#### 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:

#### Syntneti



#### 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.

The joint line will appear in the red line



#### 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  $\Pi$  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	Unit	Code	Code	Unit
	description			description	
N	Amount/pcs	pcs	D	Diameter	mm
L	Length	mm	Ħ	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, 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		
reschenis		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			√

1		Ī	1	Ī	
	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		<b>√</b>	
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				<b>√</b>
Deformation	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces.	Visual, feeler			<b>√</b>
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	<ol> <li>1 : Product does not allow the presence of flow marks and welding lines unless the structure can not be avoided;</li> <li>2: The remaining flow marks shall not appear in the optical surface, a single L ≤ 10mm, no more than two</li> </ol>	Visual		✓	

Bubble	No bubbles are allowed	Visual		√	
Foreign objects, black spots, white 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	<b>√</b>		
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	<b>√</b>		
	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		√	