



**HERCULUX**  
恒坤光电

Chengdu HercuLux Photoelectric  
Technology Co.,Ltd  
**Product Approval**

Approval number :

Customer :

Manufacturer : Chengdu HercuLux Photoelectric Technology Co.,Ltd

PN	Code	Product
HK-44@20-15-D9-20-1g-1	1. 01. 5423	NM-44@20-15° Lens
HK-44@20-24-D9-20-1g-1	1. 01. 5413	NM-44@20-24° Lens
HK-44@20-36-D9-20-1g-1	1. 01. 4357	NM-44@20-36° Lens
HK-44@20-60-D9-20-1g-1	1. 01. 4358	NM-44@20-60° Lens



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

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

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

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

Fax : 028-85887730

[www.hkoptics.com](http://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.



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# Product Approval

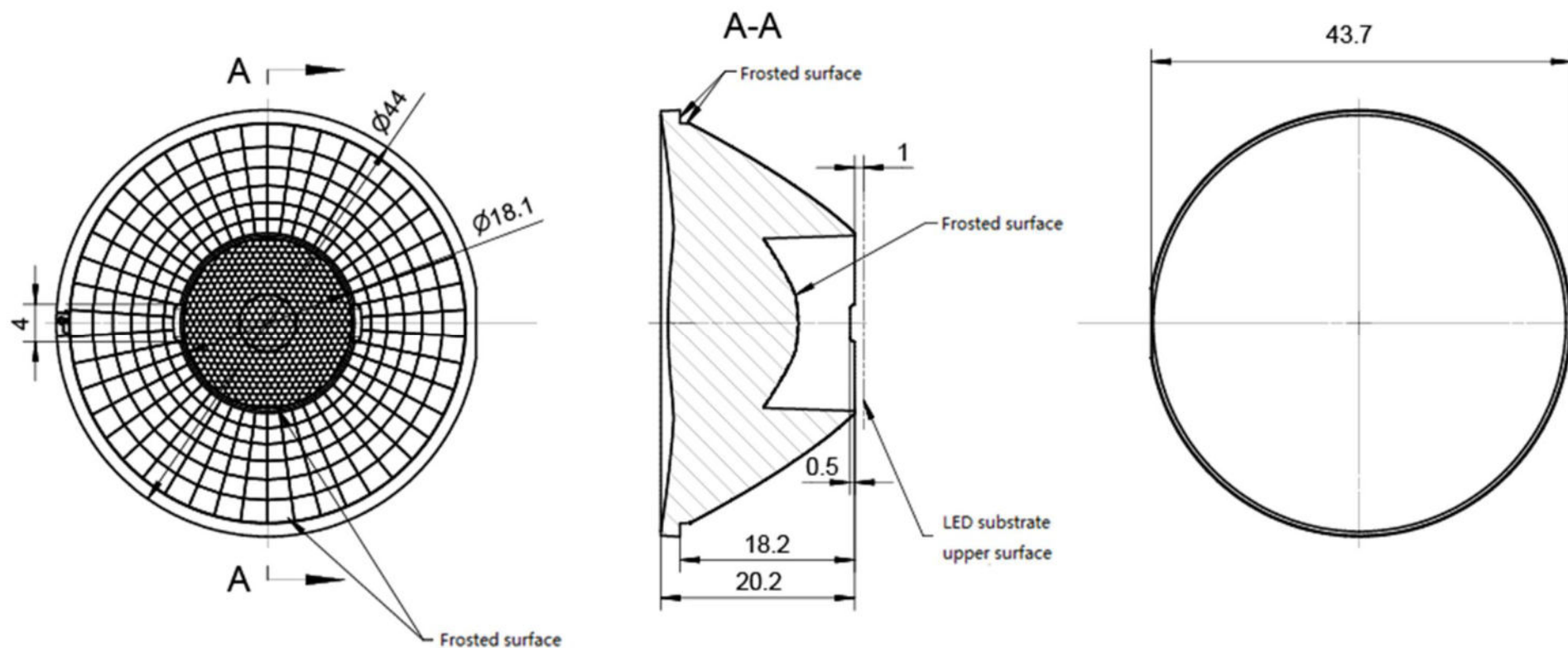
TEL: 0755-2937 1541

FAX: 0755-2907 5140

[www.hkoptics.com](http://www.hkoptics.com)

Date updated: 2019/4/9

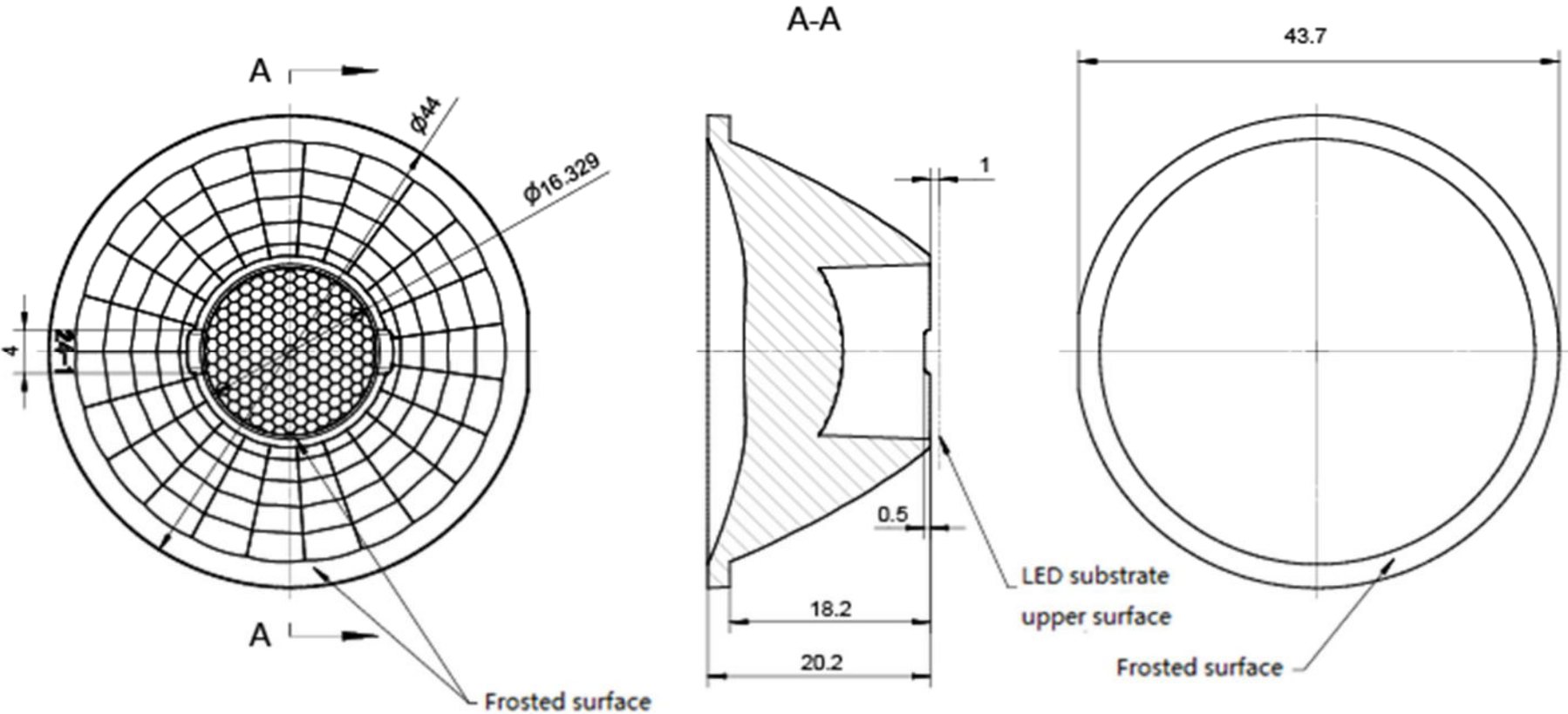
Product Picture:		
PN:	HK-44@20-15-D9-20-1g-1	
Size(L*W*H/ $\Phi$ *H):	$\Phi$ :44mm; H:20.2mm	
1.07.81418_HK-166@03-0223-S	PC	
Effiency:	\	
Temperature(Topr):	-40°C to +120°C	
FWHM:	15°/24°/36°/60°	
Matched LES:	D9	

**Technical remark:**

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

Optical design			NM-44@20-15°Lens		HK-44@20-15-D9-20-1g-1		
Structure design						1.01.5423	
Review					Number of drawing	qty	weight
Validation			Material:	PC	CDHK		

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

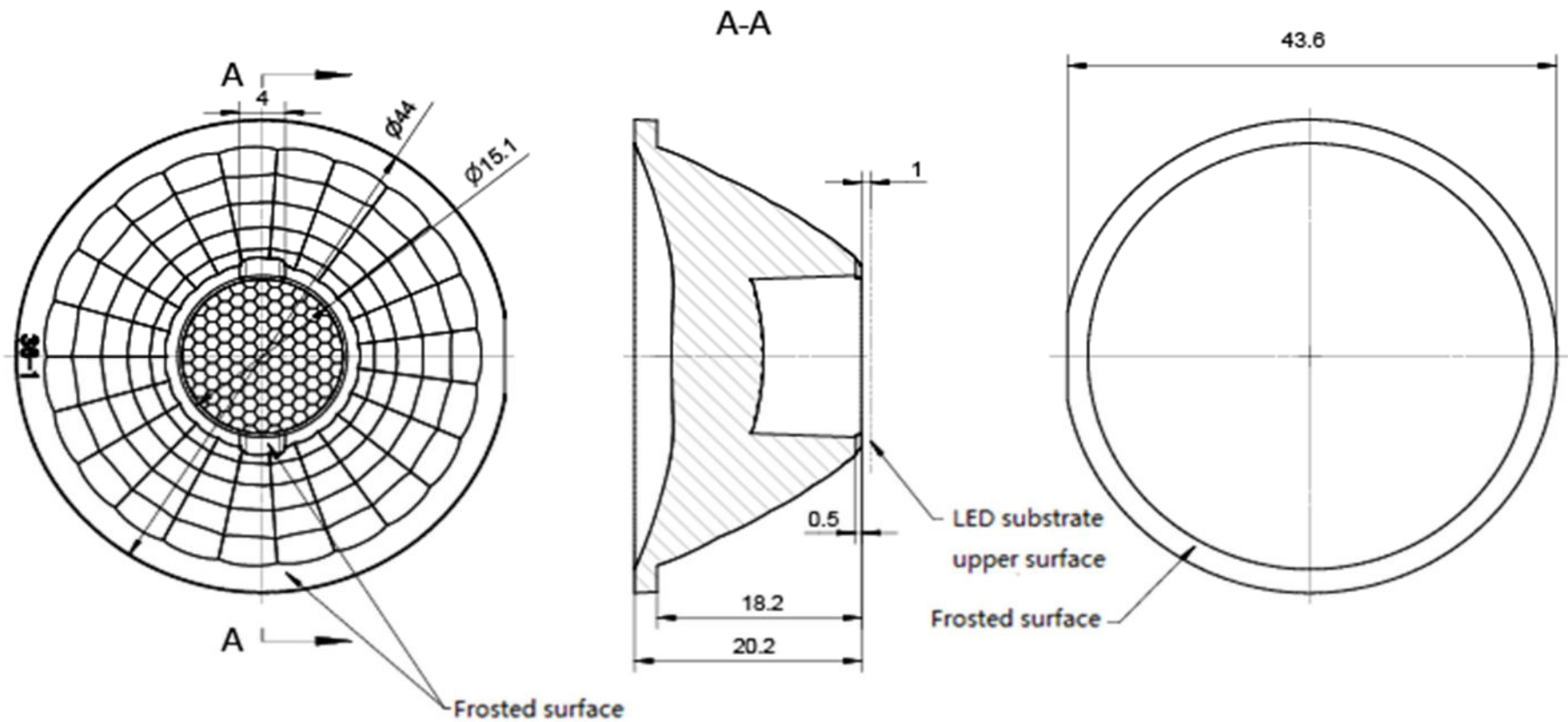


**Technical remark:**

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

Optical design			NM-44@20-24°Lens		HK-44@20-24-D9-20-1g-1		
Structure design					1.01.5413		
Review					umber of drawin	qty	weight
Validation			Material:	PC	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		

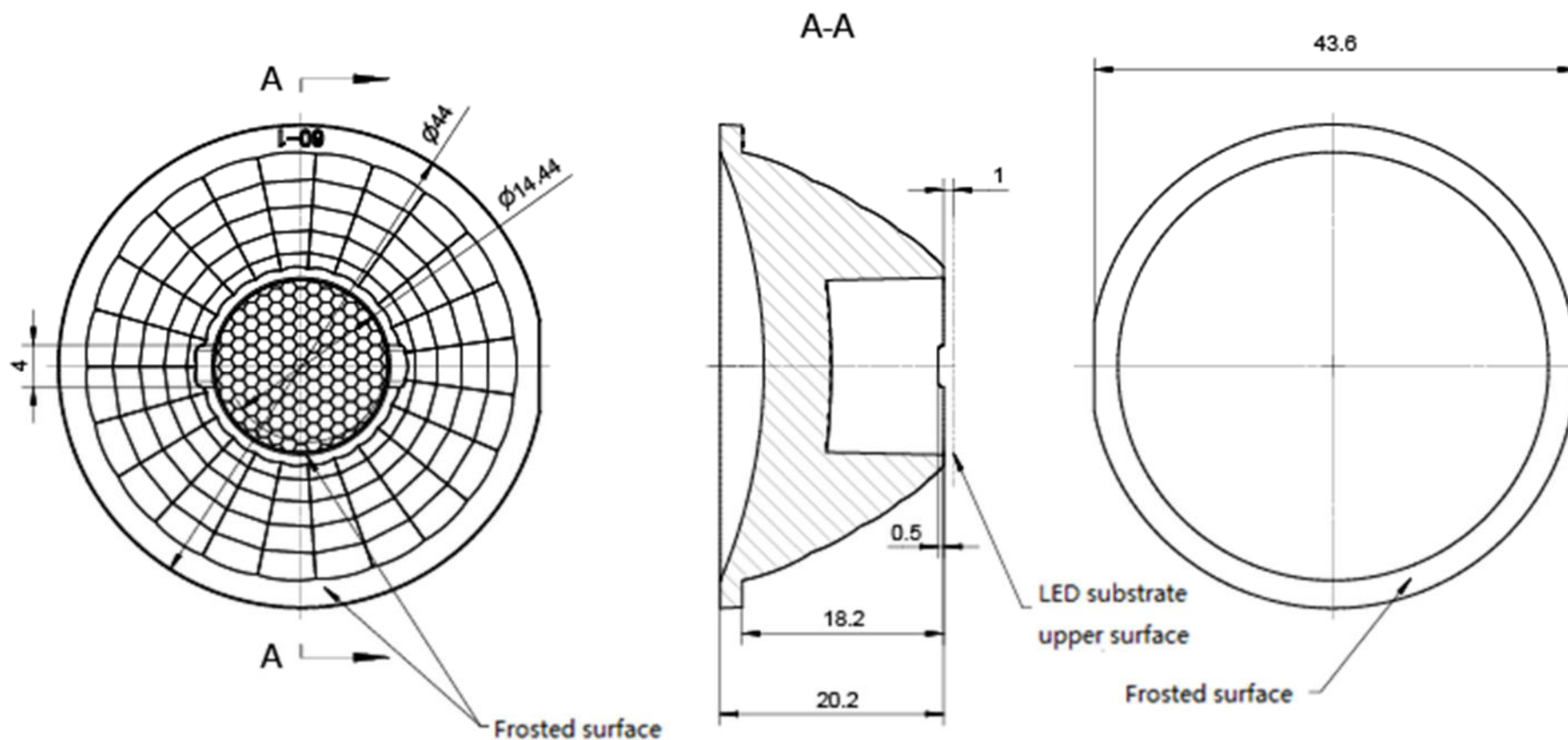


Technical remark:

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

Optical design			NM-44@20-36°Lens		HK-44@20-36-D9-20-1g-1		
Structure design					1.01.4357		
Review					umber of drawin	qty	weight
Validation			Material:	PC	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		

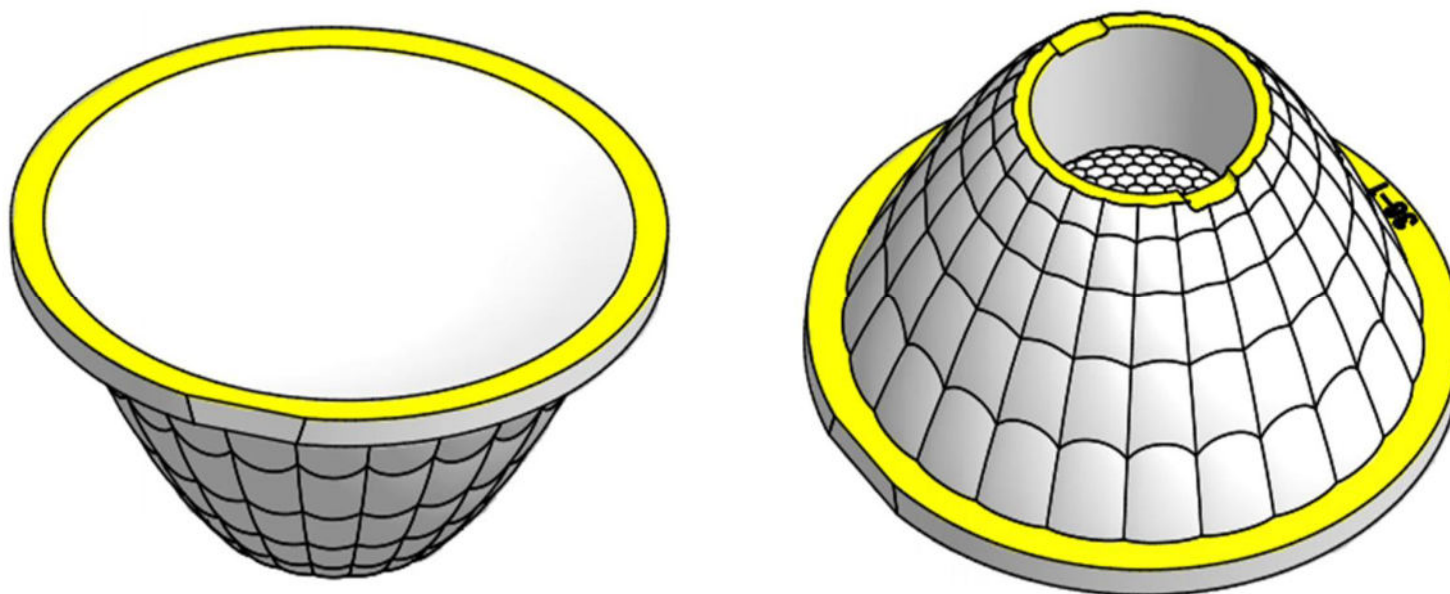
**Technical remark:**

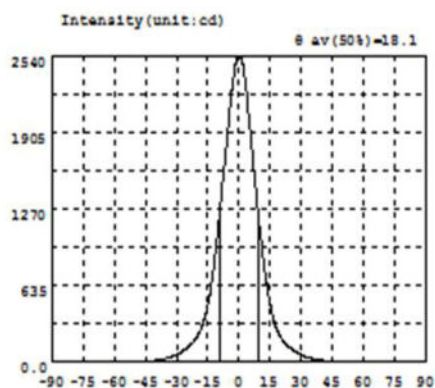
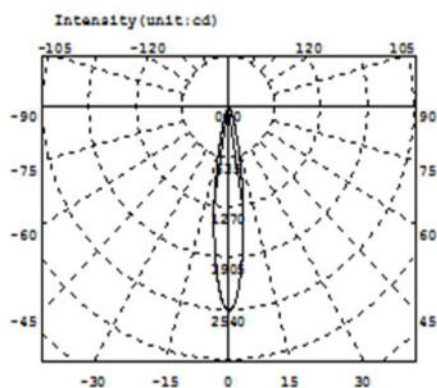
1. The 3D map is not indicated for rounded corners and draft angle.
2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
3. The surface has no flash, shrinkage, bubbles and other defects.

Optical design			NM-44@20-60°Lens		HK-44@20-60-D9-20-1g-1		
Structure design					1.01.4358		
Review					umber of drawin	qty	weight
Validation			Material:	PC	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	0.2930	-58.5	3.708	-27.0	93.79	4.5	2079	36.0	27.58	67.5	2.297
-88.5	0.3569	-57.0	3.923	-25.5	111.9	6.0	1810	37.5	22.34	69.0	2.132
-87.0	0.4208	-55.5	4.195	-24.0	132.9	7.5	1538	39.0	18.06	70.5	2.009
-85.5	0.4583	-54.0	4.517	-22.5	158.1	9.0	1275	40.5	14.71	72.0	1.836
-84.0	0.4713	-52.5	4.905	-21.0	190.2	10.5	1030	42.0	12.09	73.5	1.633
-82.5	0.5096	-51.0	5.392	-19.5	229.7	12.0	812.6	43.5	10.07	75.0	1.425
-81.0	0.5339	-49.5	6.010	-18.0	286.1	13.5	627.2	45.0	8.504	76.5	1.148
-79.5	0.5250	-48.0	6.797	-16.5	367.1	15.0	480.0	46.5	7.279	78.0	0.9467
-78.0	0.5771	-46.5	7.803	-15.0	478.1	16.5	362.1	48.0	6.404	79.5	0.9879
-76.5	0.8876	-45.0	9.140	-13.5	627.7	18.0	282.7	49.5	5.656	81.0	1.013
-75.0	1.252	-43.5	10.82	-12.0	815.8	19.5	226.4	51.0	5.105	82.5	1.082
-73.5	1.486	-42.0	12.95	-10.5	1041	21.0	185.3	52.5	4.686	84.0	1.146
-72.0	1.703	-40.5	15.69	-9.0	1291	22.5	154.3	54.0	4.352	85.5	1.235
-70.5	1.929	-39.0	19.17	-7.5	1550	24.0	129.8	55.5	4.043	87.0	1.285
-69.0	2.080	-37.5	23.44	-6.0	1812	25.5	108.9	57.0	3.835	88.5	1.336
-67.5	2.196	-36.0	28.68	-4.5	2079	27.0	90.99	58.5	3.602	90.0	1.363
-66.0	2.400	-34.5	35.24	-3.0	2321	28.5	75.34	60.0	3.417		
-64.5	2.828	-33.0	43.08	-1.5	2482	30.0	62.29	61.5	3.209		
-63.0	3.045	-31.5	52.53	0.0	2537	31.5	51.13	63.0	2.976		
-61.5	3.270	-30.0	63.83	1.5	2489	33.0	41.77	64.5	2.764		
-60.0	3.474	-28.5	77.85	3.0	2323	34.5	34.01	66.0	2.414		

## Electricity Parameter:

Current I: 0.1000A      Power: 3.660W  
Voltage V: 36.59V      PF: 1.000

## Optical Parameter(Distance=2.559m):

Equivalent Luminous flux:  $\Phi_{\text{eff}} = 393.7\text{lm}$       Efficiency:  $\text{Eff} = 107.58\text{lm/W}$

Diffuse angle: @ (25%): 26.8deg @ (50%): 18.1deg @ (75%): 10.8deg @ (50%): 18.1deg

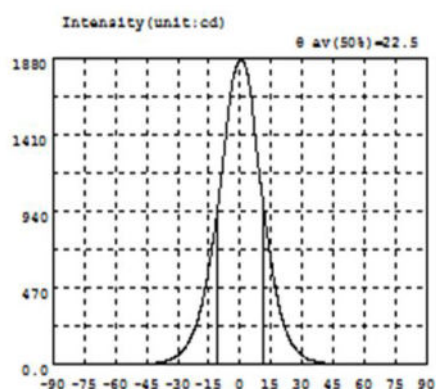
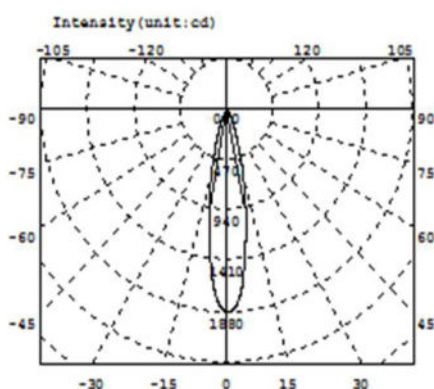
Diffuse angle: @ (25%): 26.8deg @ (50%): 18.1deg @ (75%): 10.8deg @ (50%): 18.1deg

$I_{\text{max}} = 2537\text{cd}$  (C=0.0deg, G=0.0deg)

C0-180Plane  $I_{\text{max}} = 2537\text{cd}$  (G=0.0deg)

C0-180Plane  $I_0 = 2537\text{cd}$





Intensity data:(deg , cd) C0-180

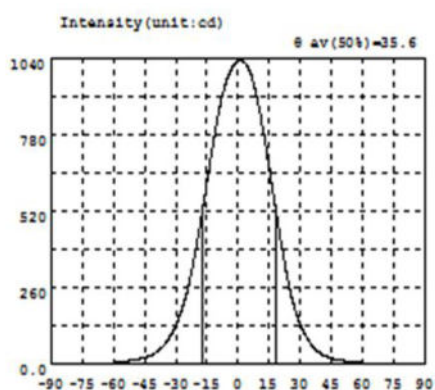
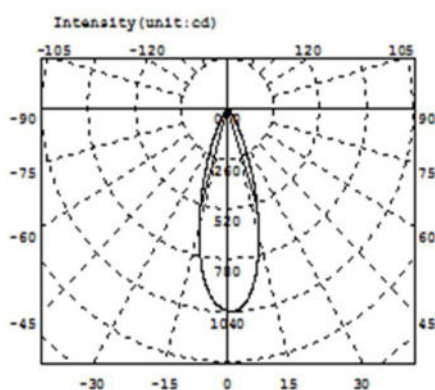
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.3057	-58.5	5.334	-27.0	98.02	4.5	1715	36.0	21.76	67.5	3.611
-88.5	0.3442	-57.0	5.498	-25.5	125.2	6.0	1563	37.5	17.50	69.0	3.200
-87.0	0.4333	-55.5	5.624	-24.0	159.4	7.5	1374	39.0	14.13	70.5	2.768
-85.5	0.4849	-54.0	5.726	-22.5	200.9	9.0	1204	40.5	11.62	72.0	2.370
-84.0	0.5609	-52.5	5.843	-21.0	251.0	10.5	1046	42.0	9.845	73.5	1.948
-82.5	0.6502	-51.0	5.971	-19.5	315.4	12.0	896.9	43.5	8.585	75.0	1.540
-81.0	0.7139	-49.5	6.153	-18.0	393.9	13.5	755.7	45.0	7.678	76.5	1.199
-79.5	0.7905	-48.0	6.380	-16.5	489.0	15.0	626.5	46.5	6.990	78.0	1.084
-78.0	0.8423	-46.5	6.759	-15.0	596.5	16.5	512.1	48.0	6.536	79.5	1.070
-76.5	0.9759	-45.0	7.351	-13.5	715.8	18.0	408.1	49.5	6.268	81.0	1.033
-75.0	1.386	-43.5	8.210	-12.0	848.3	19.5	317.4	51.0	6.074	82.5	0.9988
-73.5	1.810	-42.0	9.412	-10.5	993.6	21.0	249.4	52.5	5.894	84.0	0.9953
-72.0	2.258	-40.5	11.10	-9.0	1149	22.5	195.4	54.0	5.781	85.5	1.004
-70.5	2.715	-39.0	13.52	-7.5	1320	24.0	153.5	55.5	5.679	87.0	1.017
-69.0	3.137	-37.5	16.86	-6.0	1505	25.5	119.8	57.0	5.615	88.5	1.055
-67.5	3.593	-36.0	21.29	-4.5	1664	27.0	93.74	58.5	5.439	90.0	1.057
-66.0	3.962	-34.5	27.22	-3.0	1775	28.5	73.13	60.0	5.219		
-64.5	4.291	-33.0	35.08	-1.5	1837	30.0	56.95	61.5	4.856		
-63.0	4.559	-31.5	45.54	0.0	1872	31.5	44.34	63.0	4.603		
-61.5	4.800	-30.0	58.99	1.5	1862	33.0	34.71	64.5	4.325		
-60.0	5.156	-28.5	76.34	3.0	1811	34.5	27.35	66.0	3.996		

**Electricity Parameter:**

Current I: 0.1000A      Power: 3.380W  
Voltage V: 33.79V      PF: 1.000

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

Equivalent Luminous flux:  $\Phi_{\text{eff}} = 404.4\text{lm}$       Efficiency:  $\text{Eff} = 119.66\text{lm/W}$   
Diffuse angle: @ (25%): 33.9deg @ (50%): 22.5deg @ (75%): 14.0deg @ (50%): 22.5deg  
Diffuse angle: @ (25%): 33.9deg @ (50%): 22.6deg @ (75%): 14.0deg @ (50%): 22.6deg  
Imax=1873cd (C=0.0deg, G=0.5deg)      C0-180Plane Imax= 1873cd(G=0.5deg)  
C0-180Plane I0= 1872cd



Intensity data: (deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.2147	-58.5	7.226	-27.0	189.1	4.5	1011	36.0	61.29	67.5	3.404
-88.5	0.2600	-57.0	8.450	-25.5	223.9	6.0	987.8	37.5	50.23	69.0	2.983
-87.0	0.3508	-55.5	9.536	-24.0	264.7	7.5	952.2	39.0	41.37	70.5	2.555
-85.5	0.4414	-54.0	10.99	-22.5	313.0	9.0	907.8	40.5	34.43	72.0	2.158
-84.0	0.5324	-52.5	12.67	-21.0	365.7	10.5	856.1	42.0	28.92	73.5	1.807
-82.5	0.6440	-51.0	14.33	-19.5	424.0	12.0	797.9	43.5	24.49	75.0	1.477
-81.0	0.6794	-49.5	16.28	-18.0	486.8	13.5	733.2	45.0	21.11	76.5	1.201
-79.5	0.7909	-48.0	18.49	-16.5	551.8	15.0	665.3	46.5	18.40	78.0	1.067
-78.0	0.8368	-46.5	20.98	-15.0	618.0	16.5	596.3	48.0	16.15	79.5	0.9898
-76.5	0.9393	-45.0	23.91	-13.5	685.3	18.0	529.8	49.5	14.25	81.0	0.9814
-75.0	1.103	-43.5	27.53	-12.0	751.3	19.5	463.5	51.0	12.63	82.5	0.9069
-73.5	1.410	-42.0	31.88	-10.5	813.1	21.0	400.9	52.5	11.22	84.0	0.8714
-72.0	1.739	-40.5	37.46	-9.0	867.9	22.5	339.3	54.0	9.947	85.5	0.8149
-70.5	2.138	-39.0	44.20	-7.5	914.6	24.0	283.0	55.5	8.802	87.0	0.7696
-69.0	2.568	-37.5	52.61	-6.0	953.5	25.5	236.8	57.0	7.797	88.5	0.7356
-67.5	3.021	-36.0	63.07	-4.5	983.9	27.0	196.5	58.5	6.933	90.0	0.7005
-66.0	3.520	-34.5	76.25	-3.0	1006	28.5	162.6	60.0	6.145		
-64.5	4.005	-33.0	92.22	-1.5	1021	30.0	134.7	61.5	5.483		
-63.0	4.618	-31.5	110.9	0.0	1030	31.5	111.0	63.0	4.891		
-61.5	5.595	-30.0	132.9	1.5	1032	33.0	91.25	64.5	4.282		
-60.0	6.317	-28.5	159.3	3.0	1026	34.5	74.82	66.0	3.823		

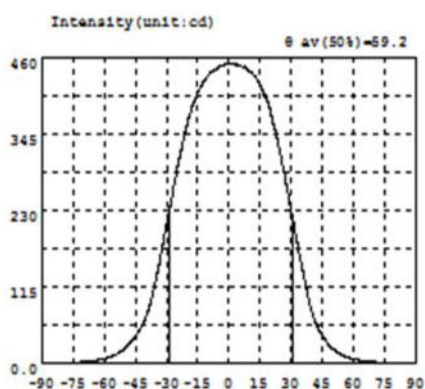
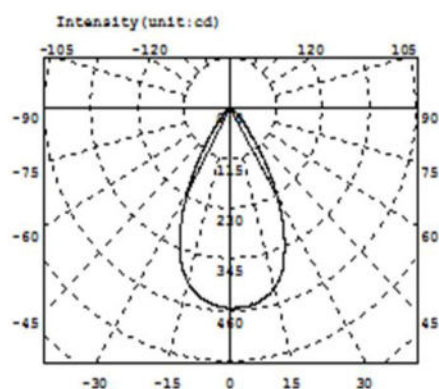
**Electricity Parameter:**

Current I: 0.1000A      Power: 3.230W  
Voltage V: 32.29V      PF: 1.000

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

Equivalent Luminous flux:  $\Phi_{\text{eff}} = 459.2\text{lm}$       Efficiency:  $\text{Eff} = 142.19\text{lm/W}$   
Diffuse angle: @ (25%): 48.9deg @ (50%): 35.6deg @ (75%): 23.9deg @ (50%): 35.6deg  
Diffuse angle: @ (25%): 49.0deg @ (50%): 35.6deg @ (75%): 24.0deg @ (50%): 35.6deg  
Imax=1032cd (C=0.0deg, G=1.0deg)      C0-180Plane Imax= 1032cd (G=1.0deg)  
C0-180Plane IO= 1030cd





Intensity data: (deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.3185	-58.5	9.405	-27.0	258.1	4.5	448.3	36.0	131.3	67.5	3.731
-88.5	0.4465	-57.0	10.99	-25.5	282.5	6.0	447.6	37.5	108.5	69.0	3.289
-87.0	0.7020	-55.5	12.73	-24.0	307.9	7.5	446.1	39.0	88.22	70.5	2.845
-85.5	0.9438	-54.0	15.02	-22.5	327.2	9.0	442.6	40.5	72.24	72.0	2.459
-84.0	1.097	-52.5	17.73	-21.0	349.3	10.5	438.2	42.0	59.76	73.5	2.127
-82.5	1.250	-51.0	21.08	-19.5	367.6	12.0	432.3	43.5	50.03	75.0	1.902
-81.0	1.390	-49.5	24.96	-18.0	382.1	13.5	426.1	45.0	42.04	76.5	1.753
-79.5	1.518	-48.0	29.94	-16.5	394.9	15.0	417.6	46.5	35.21	78.0	1.615
-78.0	1.658	-46.5	35.20	-15.0	407.0	16.5	407.9	48.0	29.12	79.5	1.541
-76.5	1.812	-45.0	41.01	-13.5	415.5	18.0	397.7	49.5	24.12	81.0	1.450
-75.0	2.028	-43.5	48.29	-12.0	424.1	19.5	384.8	51.0	20.08	82.5	1.364
-73.5	2.312	-42.0	56.64	-10.5	431.0	21.0	364.8	52.5	16.54	84.0	1.273
-72.0	2.620	-40.5	66.66	-9.0	436.3	22.5	345.8	54.0	13.97	85.5	1.165
-70.5	3.002	-39.0	78.95	-7.5	439.6	24.0	325.0	55.5	11.81	87.0	1.051
-69.0	3.572	-37.5	95.22	-6.0	443.0	25.5	302.4	57.0	10.21	88.5	0.9138
-67.5	4.078	-36.0	114.4	-4.5	446.1	27.0	278.5	58.5	8.801	90.0	0.8178
-66.0	4.674	-34.5	136.4	-3.0	448.0	28.5	253.8	60.0	7.770		
-64.5	5.288	-33.0	160.1	-1.5	449.8	30.0	228.7	61.5	6.801		
-63.0	6.008	-31.5	184.6	0.0	450.0	31.5	203.8	63.0	5.410		
-61.5	6.991	-30.0	209.5	1.5	449.5	33.0	178.0	64.5	4.636		
-60.0	8.206	-28.5	233.4	3.0	449.3	34.5	154.4	66.0	4.167		

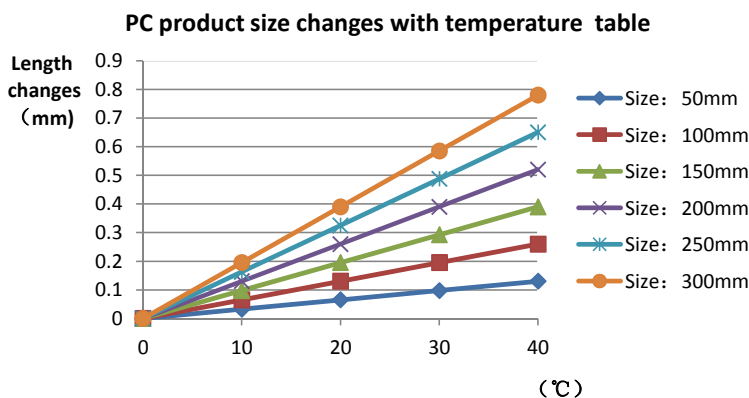
## Electricity Parameter:

Current I: 0.1000A Power: 3.340W  
Voltage V: 33.40V PF: 1.000

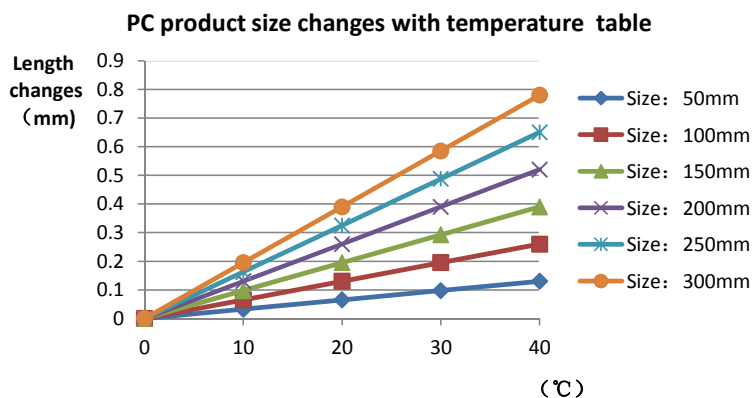
## Optical Parameter (Distance=2.559m):

Equivalent Luminous flux:  $\Phi_{eff}=433.4lm$  Efficiency:  $Eff=129.78lm/W$   
Diffuse angle: @ (25%): 73.3deg @ (50%): 59.2deg @ (75%): 44.7deg @ (50%): 59.2deg  
Diffuse angle: @ (25%): 73.3deg @ (50%): 59.2deg @ (75%): 44.9deg @ (50%): 59.2deg  
Imax=450.7cd (C=0.0deg, G=1.0deg) C0-180Plane Imax= 450.7cd (G=1.0deg)  
C0-180Plane I0= 450.0cd

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks																																										
1.Size	diameter	44			44.08	44.07	43.99	44.06		Test environment: In 20℃ -25℃ environment to achieve thermal equilibrium after the test.																																										
	height1	20.2			18.27	18.24	18.3	18.26																																												
	height2	18.2			20.24	20.21	20.29	20.22																																												
	Gate shear can not affect the appearance of the lamp																																																			
See attachment "Appearance Inspection Standards"																																																				
2.Appearance Quality		See attachment "Appearance Inspection Standards"	E	No burr		No burr	No burr	No burr	OK																																											
				No stains		No stains	No stains	No stains																																												
3.Material		PC				Color	Transparent		OK																																											
4.Optical index	Testing LED		D9																																																	
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.																																																			
	FWHM		See light distribution curve																																																	
	angle				17.9°	17.5°	17.6°	17.1°																																												
	K-value				6.21	6.42	6.25	6.48																																												
	Efficiency																																																			
Facula		See the signature sample																																																		
Comprehensive judgment		Qualified																																																		
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		Temperature (°C)	Size: 50mm	Size: 100mm	Size: 150mm	Size: 200mm	Size: 250mm	Size: 300mm																																												
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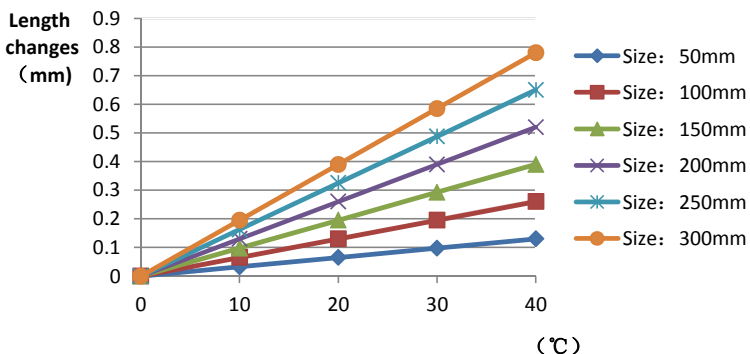


1.Size		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks																																										
	diameter	44			43.89	43.9	43.88	43.93		Test environment: In 20℃ -25℃ environment to achieve thermal equilibrium after the test.																																										
	height1	20.2			20.18	20.2	20.16	20.2																																												
	height2	18.2			18.20	18.19	18.18	18.2																																												
	Gate shear can not affect the appearance of the lamp																																																			
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3.Material		PC				Color	Transparent			OK																																										
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	FWHM		See light distribution curve																																																	
	angle				21.9°	21.5°	21.8°	21.8°																																												
	K-value				4.74	4.61	4.6	4.48																																												
	Efficiency				93.45%	91.10%	90.88%	91.10%																																												
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		<div>PC product size changes with temperature table</div> <table border="1"><caption>PC 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>0.10</td><td>0.12</td><td>0.15</td><td>0.20</td></tr><tr><td>20</td><td>0.08</td><td>0.12</td><td>0.15</td><td>0.20</td><td>0.25</td><td>0.38</td></tr><tr><td>30</td><td>0.10</td><td>0.18</td><td>0.22</td><td>0.28</td><td>0.35</td><td>0.58</td></tr><tr><td>40</td><td>0.12</td><td>0.25</td><td>0.30</td><td>0.38</td><td>0.45</td><td>0.78</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	0.10	0.12	0.15	0.20	20	0.08	0.12	0.15	0.20	0.25	0.38	30	0.10	0.18	0.22	0.28	0.35	0.58	40	0.12	0.25	0.30	0.38	0.45	0.78
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1.Size		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
	diameter	44			44	43.93	44	43.98		Test environment: In 20℃ -25℃ environment to achieve thermal equilibrium after the test.
	height1	20.2								
	height2	18.2			18.18	18.21	18.2	18.2		
	Gate shear can not affect the appearance of the lamp									
	See attachment "Appearance Inspection Standards"									
2.Appearance Quality		See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	OK		
				No stains	No stains	No stains	No stains			
3.Material		PC			Color	Transparent			OK	
4.Optical index	Testing LED		D9							
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.									
	FWHM		See light distribution curve							
	angle			36.6°	36.7°	36.1°	36.2°			
	K-value			2.09	2.11	2.17	2.13			
	Efficiency			89.49%	90.65%	90.89%	90.16%			
Facula		See the signature sample								
Comprehensive judgment		Qualified								
Remarks:		<div><div>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</div><div><div>PC product size changes with temperature table</div><div><div><div>Length changes (mm)</div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div>0.9</div><div>0.8</div><div>0.7</div><div>0.6</div><div>0.5</div><div>0.4</div><div>0.3</div><div>0.2</div><div>0.1</div><div>0</div></div><div><div>0</div><div>10</div><div>20</div><div>30</div><div>40</div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div>Size: 50mm</div><div>Size: 100mm</div><div>Size: 150mm</div><div>Size: 200mm</div><div>Size: 250mm</div><div>Size: 300mm</div></div></div><div><div>(℃)</div></div></div></div></div></div>								
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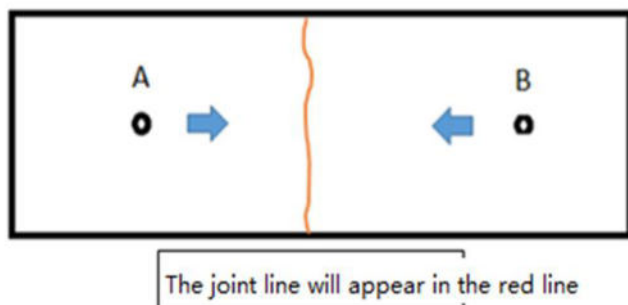
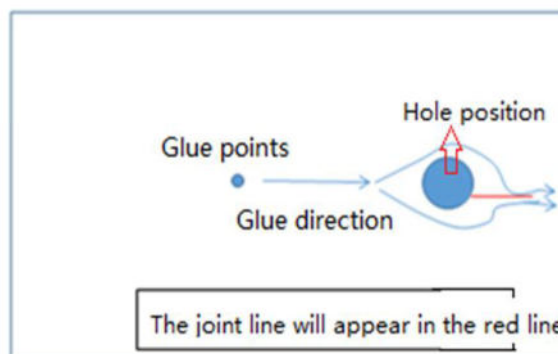
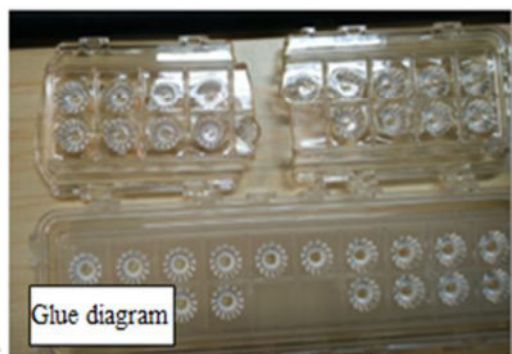
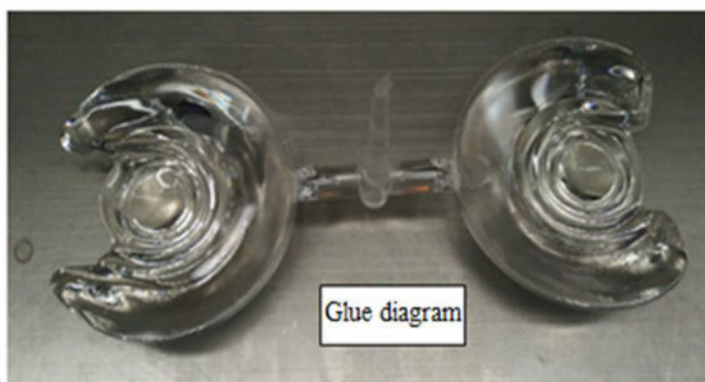
		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	diameter	44			43.94	44.01	43.96	44.03		Test environment: In 20℃ -25℃ environment to achieve thermal equilibrium after the test.
	height1	20.2								
	height2	18.2			18.26	18.27	18.24	18.27		
	Gate shear can not affect the appearance of the lamp									
	See attachment "Appearance Inspection Standards"									
2.Appearance Quality		See attachment "Appearance Inspection Standards"	E	No burr		No burr	No burr	No burr	OK	
			No stains		No stains	No stains	No stains			
3.Material		PC				Color	Transparent			OK
4.Optical index	Testing LED		D9							
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and tested to prevent the lens life.									
	FWHM		See light distribution curve							
	angle				59.3°	59.2°	59.4°	59.2°		
	K-value									
	Efficiency				87.40%	87.30%	87.50%	87.00%		
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		<div>PC product size changes with temperature table</div> <div></div>								
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PN		HK-44@20-15-D9-20-1g-1		Product Name		NM-44@20-15°Lens	
Product material		PC		Customer			
Package diagram		<div><p>Single      Vacuum package      Box package</p></div>					
Product packing		18	A/ Box	4	Box/Layer		
		14	Layer/Box	1008	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0018	Blister box	23cm*21cm	56	BAG	
	2	2.08.0001	PE film	30cm*30cm	56	PCS	
	3	2.06.0005	Reel label paper	6.2cm*8cm	56	PCS	
	4	2.06.0005	Box label paper	6.2cm*9.2cm	1	PCS	
	5	2.06.0003	big plate	46.8cm*42.8cm	15	PCS	
	6	2.06.0015	big flat carton	48cm*44cm*19cm	1	PCS	
Remarks	The loose packing is not subject to this specification. Customer's requirements shall prevail						

## Special notice

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

## Synthesis



Please note :

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

## Appearance inspection standards

### 1 Operating procedures

#### 1.1.1 Sampling standards, sampling plan and AQL

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

#### 2 Code table

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

### 3 Test conditions

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

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

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

## 4 Appearance inspection standards

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



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

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