



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

Approval number : \_\_\_\_\_

Customer :

Product : 3517 multi-scale 24°lens

Material Code : 1.01.3019

PN : HK-35@17-24-SP4-22-1g-1

Manufacturer : Chengdu HercuLux Photoelectric Technology Co.,Ltd



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

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\*Approval In duplicate , for both supplier and customer.



**HERCULUX**  
恒坤光电

# Product Approval

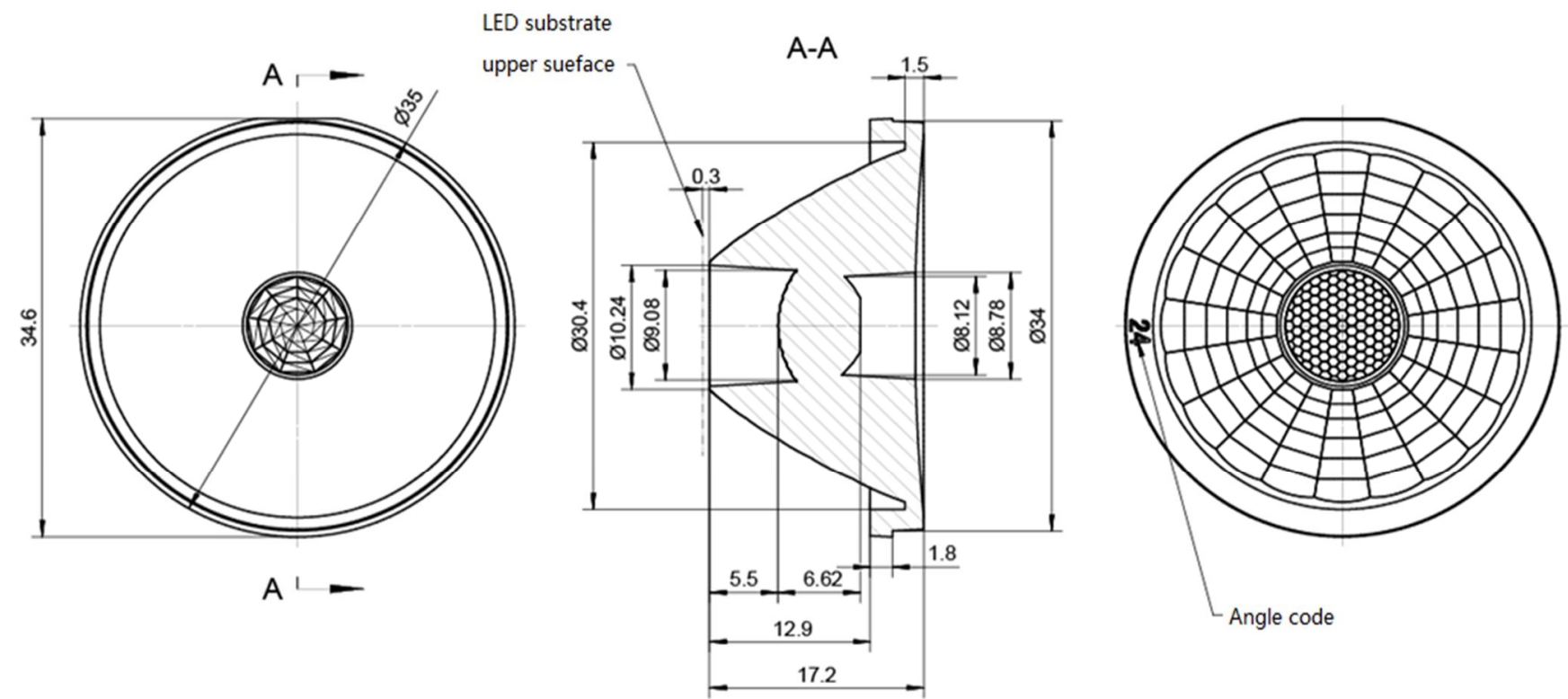
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Date updated: 2019/1/8

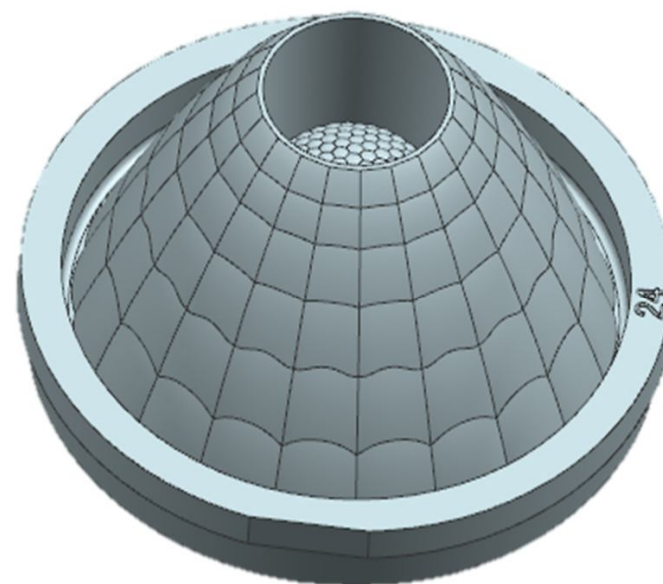
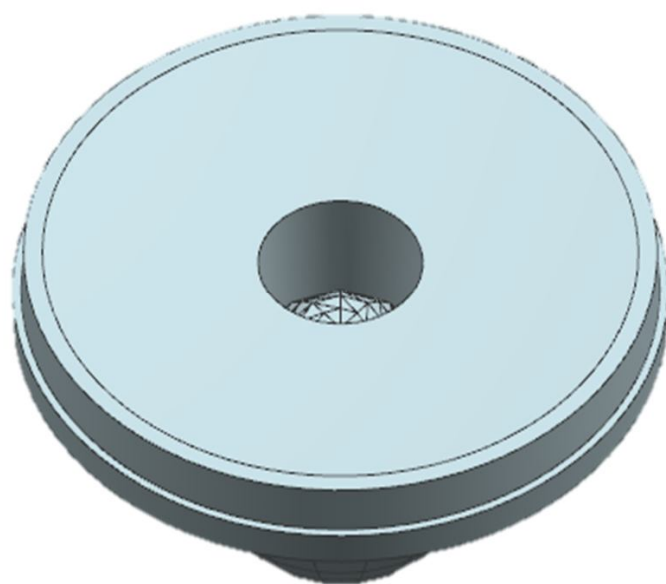
Product Picture:		
PN:	HK-35@17-24-SP4-22-1g-1	
Size(L*W*H/Φ*H):	Φ:35mm; H:17.2mm	
1.07.81418_HK-166@03-0223-S	PMMA	
Effiency:	\	
Temperature(Topr):	-40°C to +70°C	
FWHM:	24°	
Matched LES:	Sharp 4W	

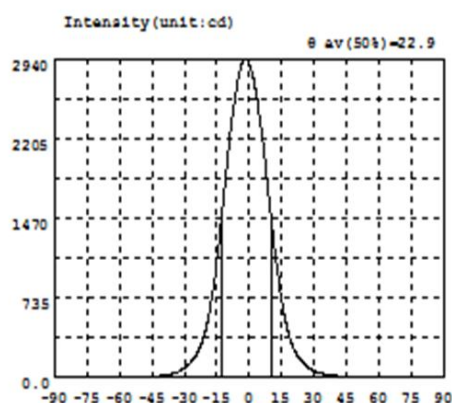
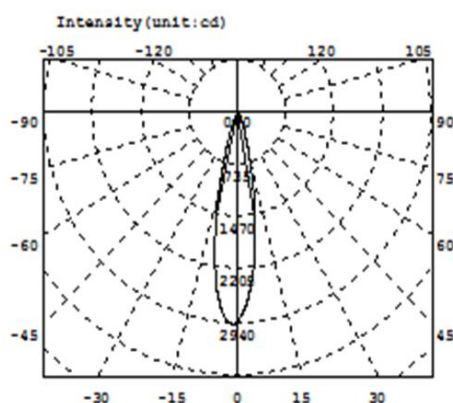


Technical Requirement:

- 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			3517 multi-scale 24° lens	HK-35@17-24-SP4-22-1g-1		1.01.3019
Structure Design				Pages	Qty	Weight
Assess				2		
Authorized			Material:	PMMA	CDHK	





Intensity data: (deg , cd) C0-180

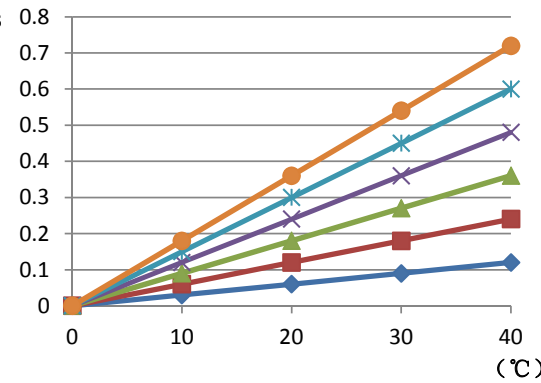
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.4968	-58.5	5.502	-27.0	141.9	4.5	2440	36.0	31.13	67.5	2.933
-88.5	0.5734	-57.0	5.723	-25.5	180.7	6.0	2216	37.5	25.63	69.0	2.688
-87.0	0.7014	-55.5	5.985	-24.0	227.8	7.5	1953	39.0	21.40	70.5	2.448
-85.5	0.8668	-54.0	6.357	-22.5	293.2	9.0	1672	40.5	17.81	72.0	2.228
-84.0	1.008	-52.5	7.033	-21.0	381.1	10.5	1395	42.0	15.05	73.5	1.980
-82.5	1.173	-51.0	7.947	-19.5	499.6	12.0	1136	43.5	12.89	75.0	1.779
-81.0	1.340	-49.5	8.900	-18.0	652.3	13.5	900.4	45.0	11.15	76.5	1.577
-79.5	1.518	-48.0	9.879	-16.5	847.9	15.0	700.1	46.5	9.629	78.0	1.432
-78.0	1.712	-46.5	11.12	-15.0	1085	16.5	539.9	48.0	8.279	79.5	1.259
-76.5	1.941	-45.0	12.68	-13.5	1353	18.0	413.2	49.5	7.164	81.0	1.151
-75.0	2.159	-43.5	14.60	-12.0	1642	19.5	312.8	51.0	6.329	82.5	1.011
-73.5	2.412	-42.0	17.09	-10.5	1925	21.0	247.0	52.5	5.825	84.0	0.9332
-72.0	2.656	-40.5	20.50	-9.0	2221	22.5	192.8	54.0	5.584	85.5	0.8438
-70.5	2.913	-39.0	24.71	-7.5	2464	24.0	154.5	55.5	5.279	87.0	0.8521
-69.0	3.196	-37.5	28.30	-6.0	2659	25.5	124.6	57.0	4.956	88.5	0.8267
-67.5	3.540	-36.0	33.76	-4.5	2820	27.0	98.39	58.5	4.634	90.0	0.9262
-66.0	3.848	-34.5	42.12	-3.0	2916	28.5	78.66	60.0	4.311		
-64.5	4.191	-33.0	53.89	-1.5	2936	30.0	63.58	61.5	4.014		
-63.0	4.504	-31.5	69.06	0.0	2893	31.5	51.62	63.0	3.757		
-61.5	4.873	-30.0	88.01	1.5	2783	33.0	42.43	64.5	3.459		
-60.0	5.214	-28.5	111.8	3.0	2633	34.5	36.00	66.0	3.175		

**Electricity Parameter:**

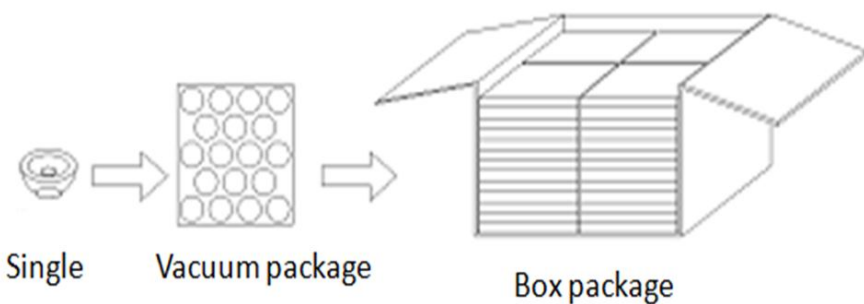
Current I: 0.1000A      Power: 3.590W  
Voltage V: 35.90V      PF: 1.000

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

Equivalent Luminous flux:  $\Phi_{\text{eff}} = 594.61\text{lm}$       Efficiency:  $\text{Eff} = 165.65\text{lm/W}$   
Diffuse angle:      @ (25%): 32.0deg @ (50%): 22.9deg @ (75%): 15.1deg @ (50%): 22.9deg  
Diffuse angle:      @ (25%): 32.2deg @ (50%): 23.2deg @ (75%): 15.4deg @ (50%): 23.2deg  
 $I_{\text{max}} = 2936\text{cd}$  (C=0.0deg, G=-1.5deg)      C0-180Plane  $I_{\text{max}} = 2936\text{cd}$  (G=-1.5deg)  
C0-180Plane  $I_0 = 2893\text{cd}$

1.Size		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
	Diameter	35			35.02	35.05	34.95			Test environment: In 20 ℃ -25 ℃ environment to achieve thermal equilibrium after the test.
	Highth	12.9			12.97	12.94	12.98			
	Gate shear can not affect the appearance of the lamp									
	See attachment "Appearance Inspection Standards"									
2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr		No burr	No burr	No burr	OK		
			No stains		No stains	No stains	No stains			
3.Material	PMMA					Color	Transparent		OK	
4.Optical index	Testing LED	Sharp 4W								
	FWHM	See light distribution curve								
	Angle				23.7	23.5				
	K-value				4.27	4.61				
	Efficiency				101.45%	91.06%				
	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.</div><div>2、 Ambient temperature on the size of the product refer to the table on the right</div></div> <div><div>PMMA product size changes with temperature table</div><div><div>Length changes (mm)</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>(°C)</div></div></div></div>								
Precautions:		<div>1、 Wear clean gloves during lens assembly to prevent contamination of the lens surface.</div> <div>2、 Take the lens try to avoid touching the total reflection surface.</div> <div>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.</div>								

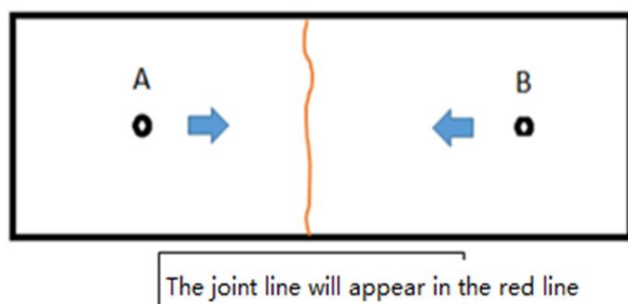
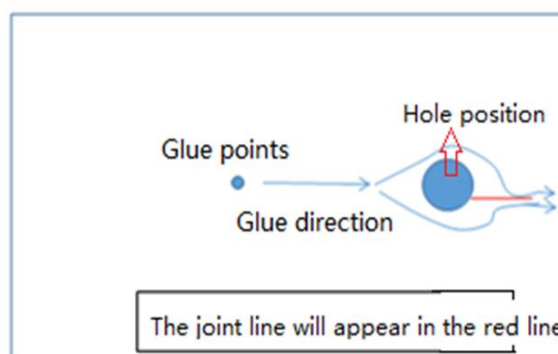
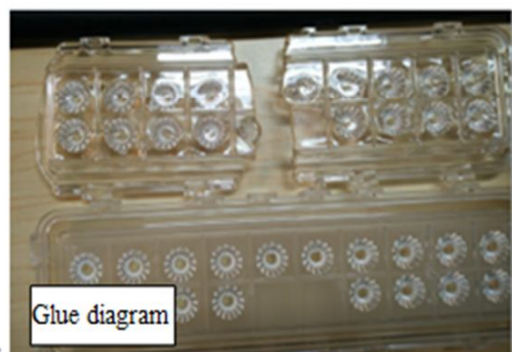
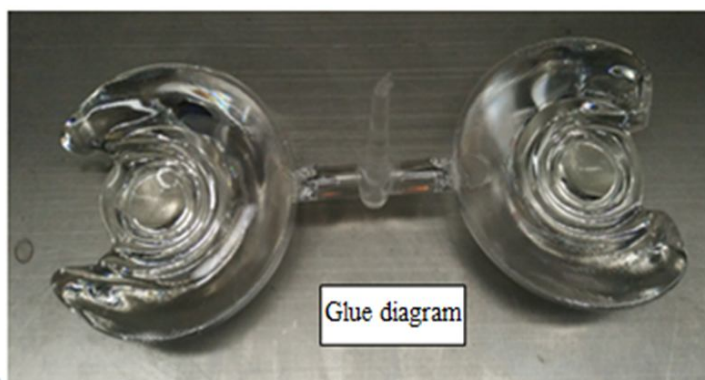


PN		HK-35@17-24-SP4-22-1g-1		Product Name	3517 multi-scale 24°lens		
Product material		PMMA		Customer			
Package diagram		<div><p>Single      Vacuum package      Box package</p></div>					
Product packing		27	A/ Box	4	Box/Layer		
		17	Layer/Box	1836	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0049	Blister box	23cm*21cm	68	BAG	
	2	2.08.0001	PE film	30cm*30cm	68	PCS	
	3	2.06.0005	Reel label paper	6.2cm*8cm	68	PCS	
	4	2.06.0005	Box label paper	6.2cm*9.2cm	1	PCS	
	5	2.06.0003	big plate	46.8cm*42.8cm	18	PCS	
	6	2.06.0001	big carton	46.8cm*42.8cm*36cm	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 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		√	