



HERCULUX
恒坤光电

Chengdu HercuLux Photoelectric
Technology Co.,Ltd
Product Approval

Approval number: _____

Effective date of approval: _____

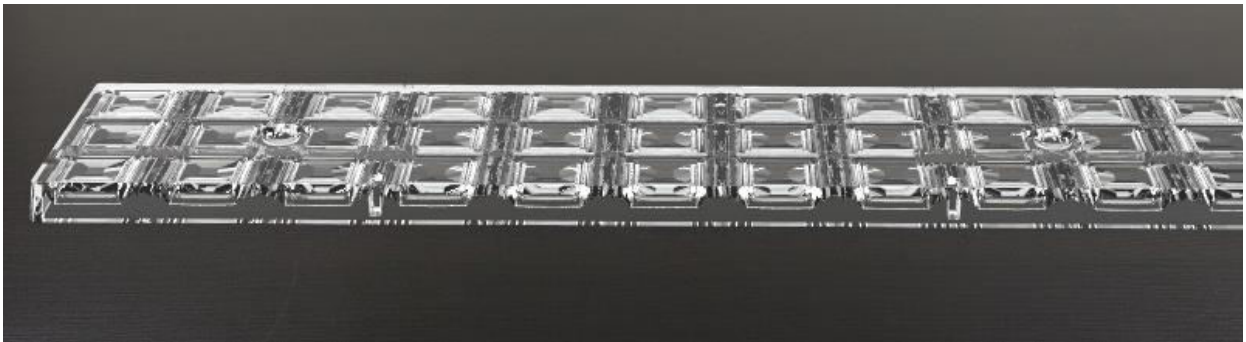
Customer: _____

Product: HK-286@08-Mining lamp-90°

Material Code: 1.01.71077

PN: HK-286@08-90-3030-22-1g-33

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, lot 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

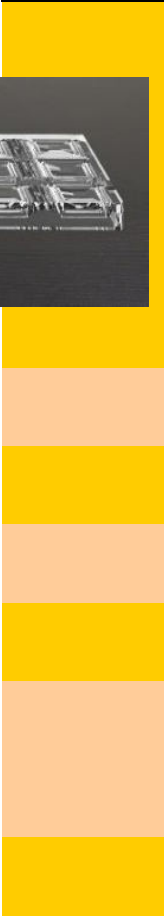
FAX: 0755-2907 5140

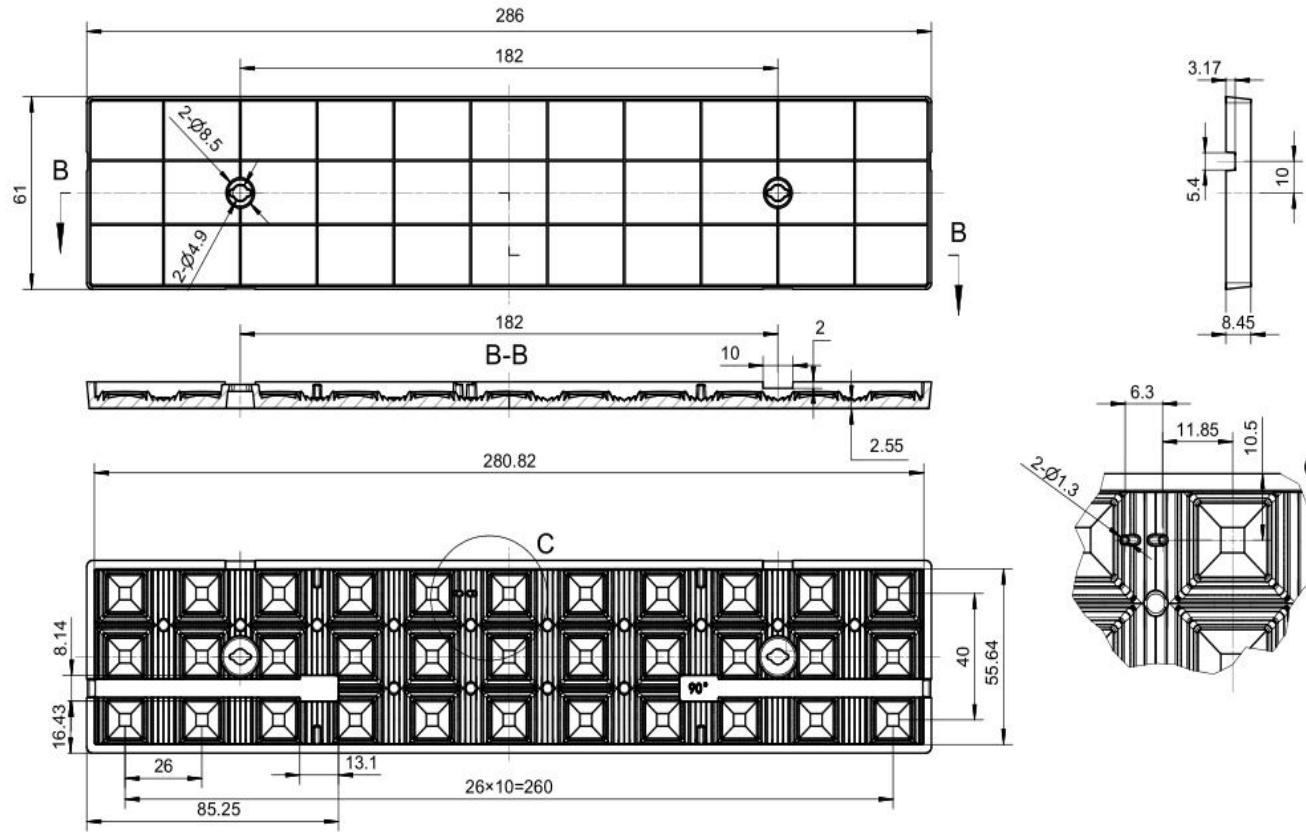
www.hkoptics.com

Date updated:

Product Picture:	
PN:	HK-286@08-90-3030-22-1g-33
Size(L*W*H/Φ*H):	286mm*61mm*08mm
Material:	PMMA
Efficiency:	>80%
Temperature(Topr):	/
FWHM:	90°
Matched LES:	2835

2023/9/27

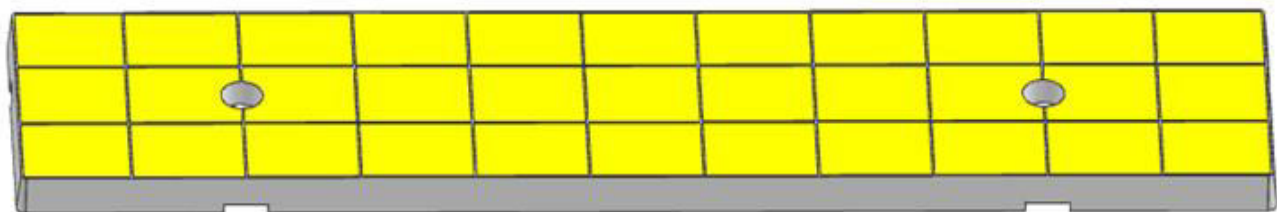
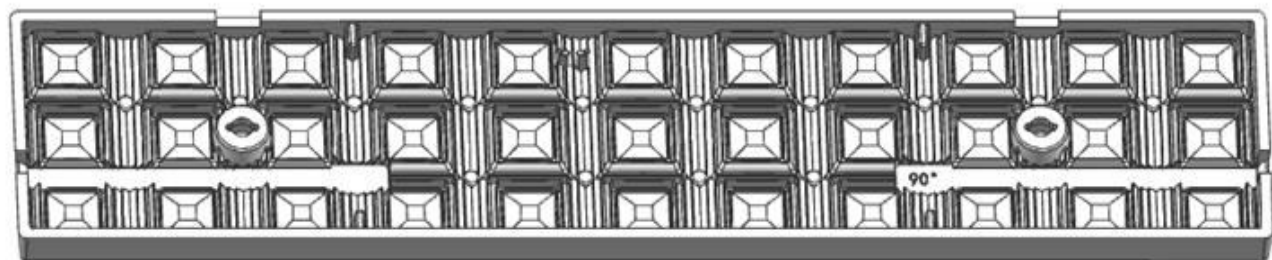


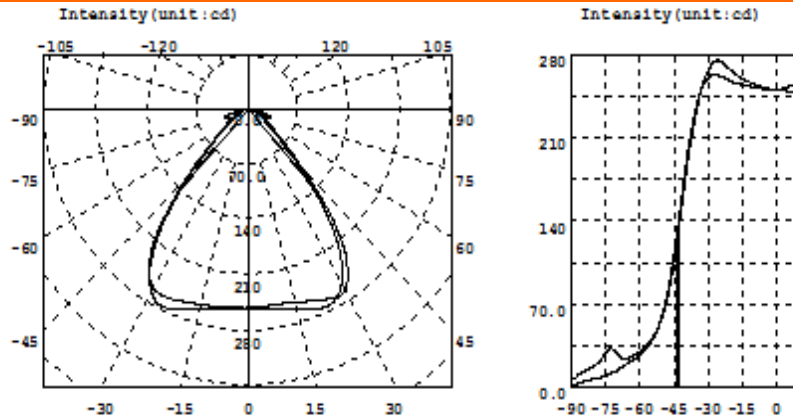


Technical Requirement:

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-286@08-Mining lamp-90°	HK-286@08-90-3030-22-1g-33	1.01.71077
Structure Design				Pages	Qty
Assess				2	
Authorized			Material: PMMA	CDHK	





Intensity data: (deg , cd) C0-180

A	I	A	I	A	I	A	I	A
-90.0	1.755	-58.5	29.91	-27.0	262.4	4.5	252.2	36.0
-88.5	2.483	-57.0	33.35	-25.5	262.1	6.0	253.0	37.5
-87.0	3.783	-55.5	37.26	-24.0	261.3	7.5	253.7	39.0
-85.5	5.071	-54.0	42.04	-22.5	259.7	9.0	254.9	40.5
-84.0	6.252	-52.5	46.26	-21.0	258.3	10.5	256.2	42.0
-82.5	6.792	-51.0	56.35	-19.5	257.0	12.0	257.5	43.5
-81.0	6.989	-49.5	65.89	-18.0	255.9	13.5	258.9	45.0
-79.5	7.634	-48.0	78.26	-16.5	255.1	15.0	260.4	46.5
-78.0	8.527	-46.5	93.74	-15.0	254.2	16.5	262.2	48.0
-76.5	9.486	-45.0	112.6	-13.5	253.3	18.0	264.2	49.5
-75.0	10.53	-43.5	132.7	-12.0	253.0	19.5	266.4	51.0
-73.5	11.53	-42.0	154.2	-10.5	252.6	21.0	268.3	52.5
-72.0	12.65	-40.5	176.3	-9.0	252.0	22.5	269.8	54.0
-70.5	14.11	-39.0	197.1	-7.5	251.5	24.0	270.3	55.5
-69.0	16.07	-37.5	214.0	-6.0	251.0	25.5	269.4	57.0
-67.5	18.06	-36.0	228.7	-4.5	250.4	27.0	266.7	58.5
-66.0	19.91	-34.5	240.8	-3.0	250.0	28.5	262.6	60.0
-64.5	21.60	-33.0	249.9	-1.5	250.0	30.0	256.1	61.5
-63.0	23.37	-31.5	255.9	0.0	250.2	31.5	247.4	63.0
-61.5	25.21	-30.0	259.9	1.5	250.4	33.0	236.8	64.5
-60.0	27.29	-28.5	261.9	3.0	251.2	34.5	224.7	66.0

Electricity Parameter:

Current I: 0.1000A Power: 3.130W
Voltage V: 31.29V PF: 0.000

Optical Parameter (Distance=2.559m):

Equivalent Luminous flux: $\Phi_{\text{eff}}=533.0\text{lm}$ Efficiency: Ef
Diffuse angle: $\theta(25\%):97.4\text{deg}$ $\theta(50\%):85.3\text{deg}$ $\theta(75\%):$
Diffuse angle: $\theta(25\%):99.0\text{deg}$ $\theta(50\%):86.8\text{deg}$ $\theta(75\%):$
Imax=274.9cd (C=90.0deg,G=-25.5deg) C0-180Plane I
C0-180Plane T

Intensity data: (deg , cd) C0-180

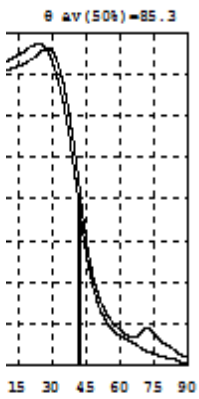
A	I	A	I	A	I	A	I	A	I
-90.0	0.0790	-58.5	2.131	-27.0	11.89	4.5	985.3	36.0	6.567
-88.5	0.1573	-57.0	2.334	-25.5	14.84	6.0	930.7	37.5	6.007
-87.0	0.1472	-55.5	2.545	-24.0	19.33	7.5	832.3	39.0	5.530
-85.5	0.1918	-54.0	2.794	-22.5	26.78	9.0	702.7	40.5	5.171
-84.0	0.1712	-52.5	3.016	-21.0	39.05	10.5	574.5	42.0	4.952
-82.5	0.2148	-51.0	3.169	-19.5	55.04	12.0	454.4	43.5	4.752
-81.0	0.3507	-49.5	3.271	-18.0	77.51	13.5	336.6	45.0	4.598
-79.5	0.4174	-48.0	3.368	-16.5	110.2	15.0	246.9	46.5	4.462
-78.0	0.4181	-46.5	3.430	-15.0	154.7	16.5	182.7	48.0	4.315
-76.5	0.4776	-45.0	3.523	-13.5	203.5	18.0	131.2	49.5	4.081
-75.0	0.6343	-43.5	3.628	-12.0	263.5	19.5	91.69	51.0	3.892
-73.5	0.7013	-42.0	3.778	-10.5	344.0	21.0	63.64	52.5	3.706
-72.0	0.7957	-40.5	3.970	-9.0	446.0	22.5	45.40	54.0	3.496
-70.5	0.8516	-39.0	4.264	-7.5	556.8	24.0	32.12	55.5	3.174
-69.0	1.043	-37.5	4.624	-6.0	681.1	25.5	23.05	57.0	2.884
-67.5	1.189	-36.0	5.029	-4.5	805.6	27.0	17.19	58.5	2.609
-66.0	1.247	-34.5	5.536	-3.0	909.8	28.5	13.56	60.0	2.380
-64.5	1.405	-33.0	6.273	-1.5	969.4	30.0	11.11	61.5	2.148
-63.0	1.577	-31.5	7.160	0.0	1001	31.5	9.364	63.0	1.922
-61.5	1.791	-30.0	8.222	1.5	1016	33.0	8.081	64.5	1.778
-60.0	1.916	-28.5	9.767	3.0	1010	34.5	7.294	66.0	1.582

Electricity Parameter:

Current I: 0.1500A Power: 0.8390W
 Voltage V: 8.399V PF: 0.000

Optical Parameter (Distance=2.410m) :

Equivalent Luminous flux: Φ_{eff} = 152.2lm Efficiency: Eff=181.5
 Diffuse angle: θ (25%): 27.0deg θ (50%): 19.4deg θ (75%): 13.3deg
 Diffuse angle: θ (25%): 27.1deg θ (50%): 19.6deg θ (75%): 13.5deg
 Imax=1016cd (C=0.0deg,G=2.0deg) C0-180Plane Imax= 10:
 C0-180Plane IO= 1001:



I	A	I
210.1	67.5	17.37
193.0	69.0	15.19
173.6	70.5	13.46
154.2	72.0	12.13
134.0	73.5	11.04
113.7	75.0	10.03
95.13	76.5	9.072
80.05	78.0	8.194
67.22	79.5	7.231
56.69	81.0	6.697
48.24	82.5	6.565
42.09	84.0	5.754
37.11	85.5	4.476
32.98	87.0	3.270
29.64	88.5	2.242
27.28	90.0	1.720
25.34		
23.76		
22.16		
20.65		
19.00		

$f_f=170.321m/W$

75.3deg @ (50%): 85.3deg

78.0deg @ (50%): 86.8deg

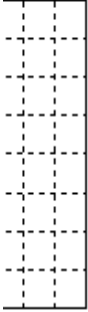
$I_{max}=270.3cd(G=24.0deg)$

$I_0=250.3cd$

U= 250.2cd



θ(50%)=18.7



60 75 90

A	I
67.5	3.481
69.0	3.070
70.5	2.634
72.0	2.258
73.5	1.959
75.0	1.683
76.5	1.426
78.0	1.247
79.5	1.091
81.0	0.8605
82.5	0.6583
84.0	0.4937
85.5	0.2690
87.0	0.2143
88.5	0.1015
90.0	0.1444

331m/W

θ (50%): 18.7deg

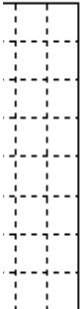
θ (50%): 18.7deg

126cd (G=0.0deg)

6cd



θ(50%)=19.4



A	I
67.5	1.437
69.0	1.270
70.5	1.130
72.0	0.9716
73.5	0.8398
75.0	0.7278
76.5	0.6147
78.0	0.5337
79.5	0.4834
81.0	0.3416
82.5	0.3189
84.0	0.2256
85.5	0.1606
87.0	0.0853
88.5	0.1128
90.0	0.0033

50lm/W

g @ (50%) : 19.4deg

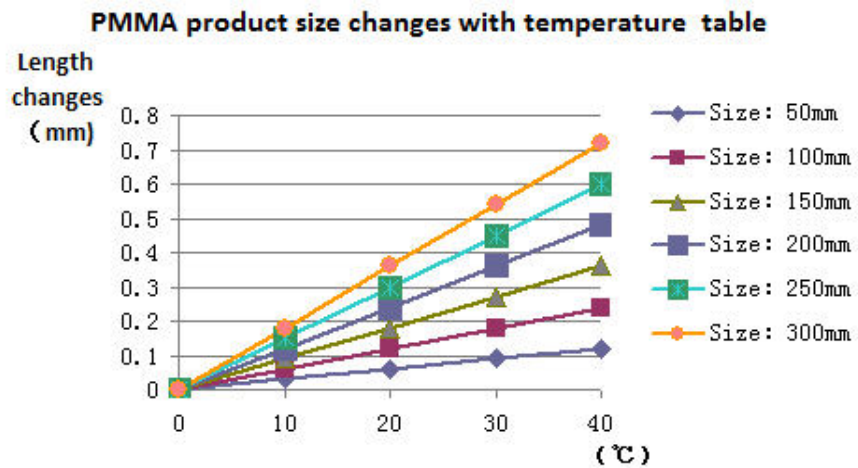
g @ (50%) : 19.6deg

16cd (C=2.0deg)

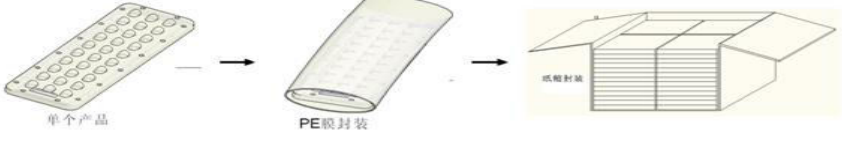
cd

1.Size		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Judgm
	OL	286	286	285.6	285.92	285.9	OK
	OW	61	61.2	60.8	60.92	60.86	OK
	D of locating	1.3	1.35	1.1	1.1	1.13	OK
	S of locating	6.3	6.35	6.25	6.3	6.32	OK
	Gate shear can not affect the appearance of the lamp						
See attachment "Appearance Inspection Standards"							
2.Appearance Quality	See attachment "Appearance Inspection Standards"	E	No burr	No burr	No burr	No burr	
			No stains	No stains	No stains	No stains	
3.Material	PMMA			Color	Transparent		
4.Optical index	Testing LED	2835					
	FWHM	See light distribution curve					
		Standard	Test result 1		Test result 2		
	Angle	90° -8°	85.2°X85.4°		83.2°X84.8°		
	Efficiency	>80%	83.10%		85.40%		
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、 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)



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 with industrial solvents.

PN	HK-286@08-90-3030-22-1g-33		Product Name	HK-286@08-Mining lam		
Product material	PMMA		Customer			
Package diagram	 <p>单个产品 → PE膜封装 → 纸箱封装</p>					
Product packing	2	Packet	3/46:2/12	Each layer	5	
	162	Floor/Carton				
Packaging Materials	NO.	Material Code	Item name	Specification	Single box usage	Unit
	1		Blister box		81	PCS
	2	2.06.0005	Box label paper	62mm*70mm	1	PCS
	3	2.06.0007	Middle plate	39cm*29cm	6	PCS
	4	2.06.0012	Middle carton	40cm*30cm*26cm	1	PCS
Remarks	Scattered packaging is not subject to this specification					

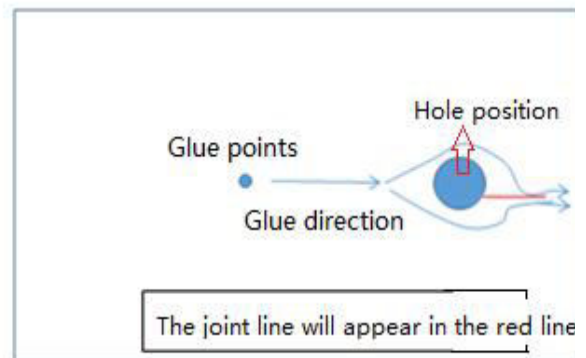
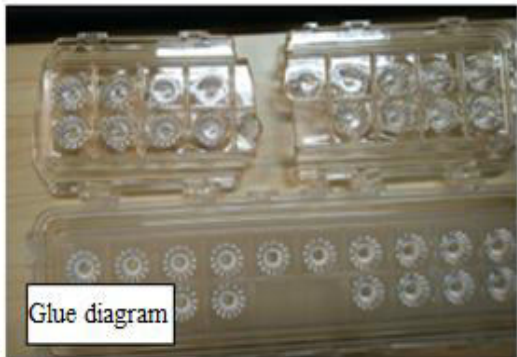
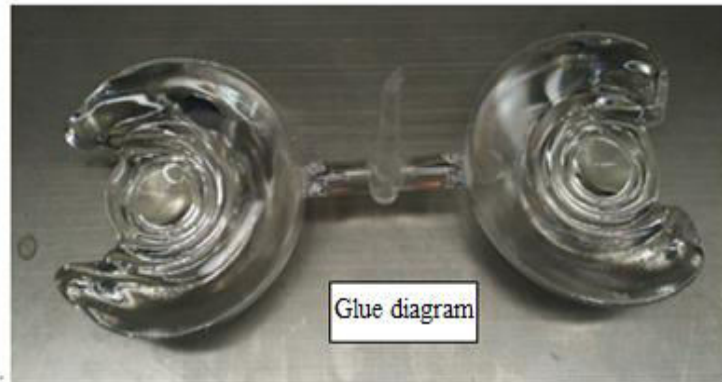
LUX

[ip-90°](#)

The number of
Remarks

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

1.1.1 Sampling standards, sampling plan and AQL

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

2 Code table

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

3 Test conditions

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

3.2 Light: 2x40w cool white fluorescent lamp, 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	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 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.	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 matter、Dark 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		√	