



**HERCULUX**  
恒坤光电

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

Approval number :

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Customer :

Product : HK Dark 68@32-10 degree lens

Material Code : 1.01.12630.10

PN : HK-HG-68@32-10-D9-20-1g-1\_ASM

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

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

Fax : 028-85887730

<http://www.herculux.cn/>

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

TEL: 0755-2937 1541

FAX: 0755-2907 5140

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

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Please use this product within the permitted range and environment according to the structure and material of the product. If the usage exceeds the recommended value, please test and verify by yourself. If the product is damaged due to out-of-range use, our company will not be responsible for the warranty.

#### Product material:

Customized products: The specifications and models of materials used are subject to the agreement between the two parties.

Conventional products: As a product that we continuously research and improve, under the premise of ensuring the quality and availability of the product, our company reserves the right to change the material. If the material specification and model change, without prior notice.

#### product data:

The measurement data and dimensional tolerances of the 2D drawings in the product data sheet of this acknowledgement are for reference only, and the final size shall prevail in kind.

The measurement data presented in this acknowledgment is a performance test of the product based on our company's internal test conditions and quality requirements, and the reported data is a typical value of the average results of multiple measurements. Therefore, in some cases, the actual product may deviate from the data provided. We reserve the right to notify you in advance of this data.

#### Product changes and improvements:

Changes and improvements of customized products are subject to the agreement between the two parties in the contract or technical documents.

As the conventional products that we continue to research and improve, our company reserves the right to make technical changes to its products, and reserves the right to make changes to data resulting from improvements without prior notice.

#### Operation cautions:

1. Please wear clean gloves during product assembly to prevent product surface contamination.
2. Try to avoid touching the optical surface of the lens when taking the lens.
3. When the surface of the product is polluted, please wipe it gently with a soft cotton cloth dipped in analytically pure neutral solvent. It is forbidden to use industrial solvents (alcohol, isopropanol, acetone, ether, toluene, xylene, carbon tetrachloride, MMA monomer, etc.) wipe.



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# Product Approval

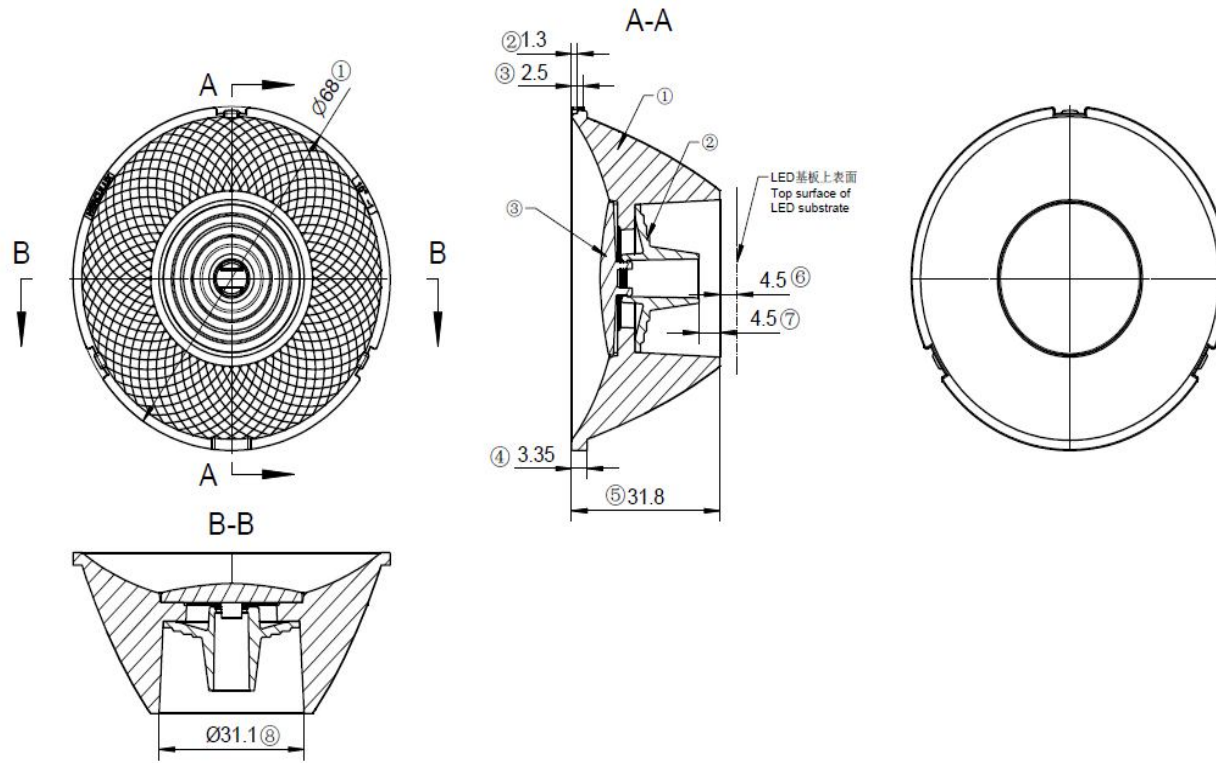
TEL: 0755-2937 1541

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www.hkoptics.com

Date updated: 2024/9/30

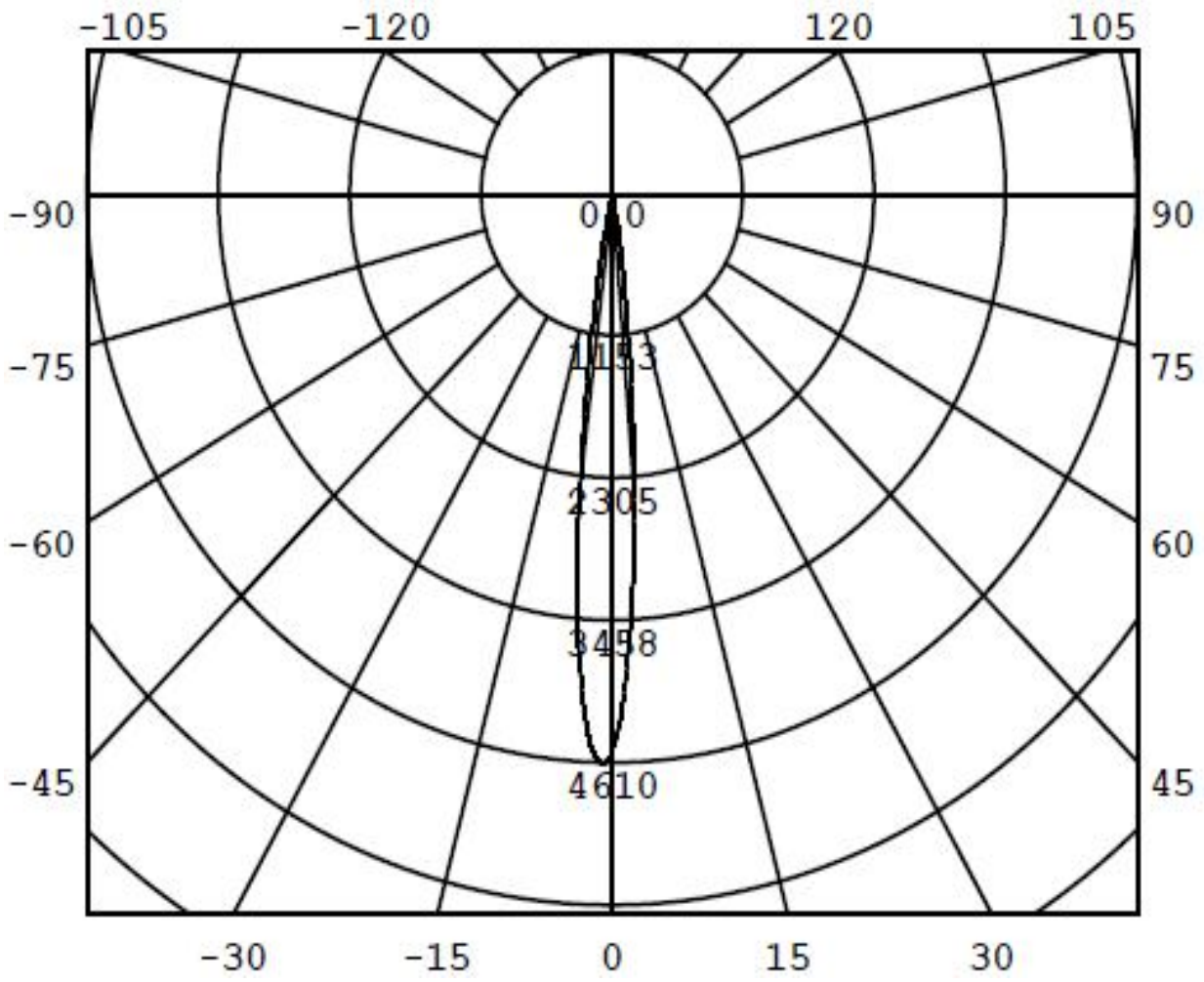
|                          |   |
|--------------------------|---|
| Product Picture:         |                   |
| PN:                      | HK-HG-68@32-10-D9-20-1g-1_ASM   |
| Size(L*W*H/Φ*H):         | Φ:68mm; H:32mm  |
| Material:                | PMMA+High temperature resistant PC+ceramic  |
| Efficiency:              | \   |
| Temperature(Topr):       | Material limit temperature resistance: -40°C to +100°C<br>Long-term use temperature: -40°C to +80°C |
| FWHM:                    | 10°   |
| Matched LES:             | D9  |
| Recommended power Usage: | < 20W   |

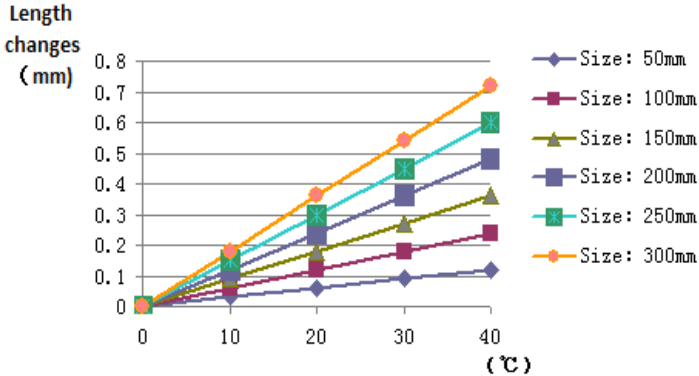


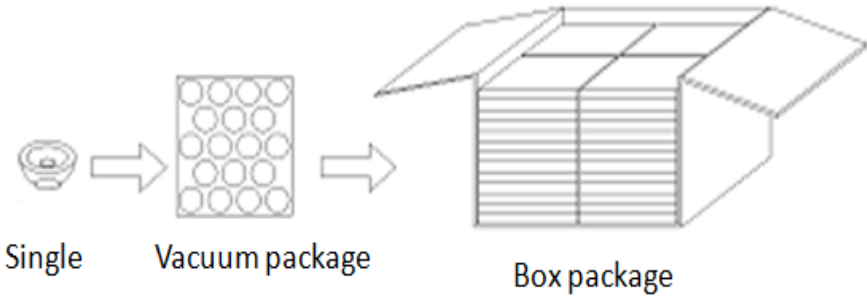
Technical Requirement:

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.

| The serial number | Material code    | The product name                           | Product number                            | material                             | The number of |
|-------------------|------------------|--|---|--------------------------------------|---------------|
| ①                 | 1.01.12630_01    | HK black 68@32-10 degree lens_01           | <a href="#">HK-HG-68@32-10-D9-20-1g-1</a> | PMMA                                 | 1             |
| ②                 | 1.01.12630_02.10 | HK black 68@32-10 degree awl_02            | <a href="#">HK-HG-29@17-0620-S</a>        | ceramic                              | 1             |
| ③                 | 1.01.12630_03.10 | HK black light 68@32-10 degree cover plate | <a href="#">HK-HG-30@07-0621-S</a>        | High temperature resistant PC+ black | 1             |
| Optical Design    |                  |  | HK-HG-68@32-10-D9-20-1g-1_ASM             |                                      | 1.01.12630.10 |
| structure Design  |                  | HK Dark 68@32-10 degree lens               | Pages                                     | Qty                                  | Weight        |
| Assess            |                  |  | 2   |                                      |               |
| Authorized        |                  | Material:PC                                |   | CDHK                                 |               |

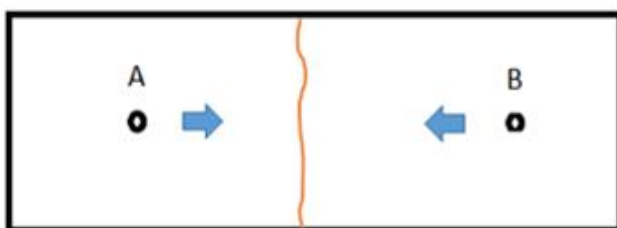
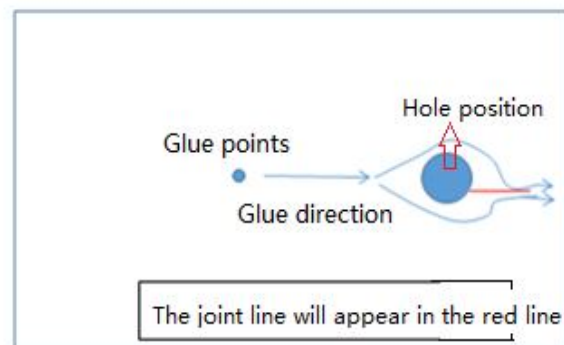
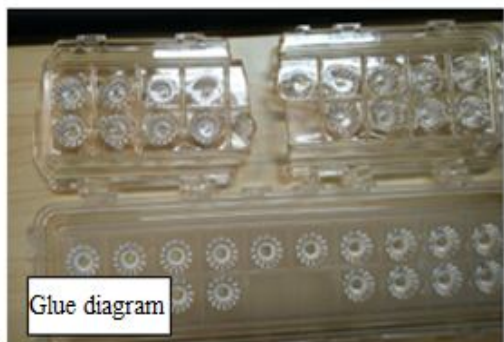
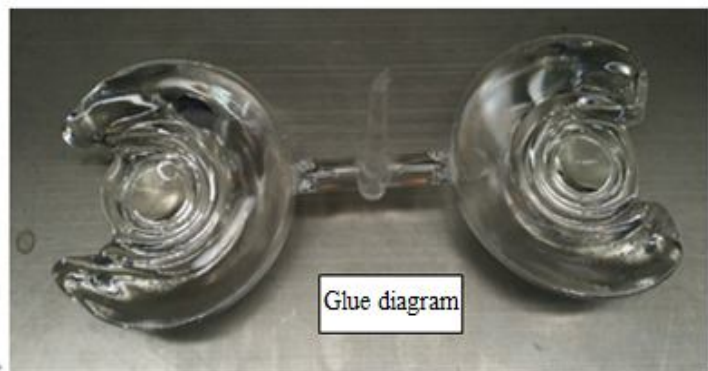


|  | Standard size  | Upper Size limit             | Lower size limit | Test result1 | Test result2 | Test result3 | Test result4 | Judgment | Remarks  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|--|--|------------------------------|------------------|--------------|--------------|--------------|--------------|----------|--|------------------|------------|-------------|-------------|-------------|-------------|-------------|---|------|------|------|------|------|------|----|------|------|------|------|------|------|----|------|------|------|------|------|------|----|------|------|------|------|------|------|----|------|------|------|------|------|------|
| 1.Size   | highly   | 31.8                         |                  | 31.75        | 31.85        | 31.74        | 31.79        | OK       | Test environment: In 20 °C -25 °C environment to achieve thermal stability |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  | The diameter of  | 68                           |                  | 67.92        | 68.04        | 68           | 67.9         | OK       |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  | The thickness of the   | 2.5                          |                  | 2.56         | 2.61         | 2.52         | 2.58         | 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      | OK           |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  |  |                              | No stains        | No stains    | No stains    | No stains    |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| 3.Material                                       | PMMA+High temperature resistant PC+ceramic   |                              |                  | Color        | Transparent  |              |              | OK       |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| 4.Optical index                                  | Testing LED  | D9                           |                  |              |              |              |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  | <p>The size and rated power of the LED light source recommended for use in this lens should be equal to that of the light source in this test. If it is needed to be used beyond the range. Please fully test and verify the performance of the lens such as temperature resistance and optical effect according to the heat dissipation capacity of the lamp and the actual situation of the operating environment. In case of affecting the life of the lens. <b>This lens is limited to power up to 20W. The Dark series lenses are designed with a cross over design for good anti-glare effect, so we do not recommend to add a honeycomb to the lens.</b></p> <p><b>If you put a honeycomb on top of the lens, it is easy to overheat the honeycomb due to the high output at the focal point of the Dark series, which may cause the risk of melting of the lens.</b></p>   |                              |                  |              |              |              |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  | FWHM   | See light distribution curve |                  |              |              |              |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  | Angle  |                              |                  |              |              |              |              |          | OK   |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  | Efficiency   |                              |                  | 11.8°        |              |              |              |          | OK   |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  | K  |                              |                  |              |              |              |              |          | OK   |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| Facula   | See the signature sample   |                              |                  |              |              |              |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| Comprehensive judgment                           | Qualified  |                              |                  |              |              |              |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| Remarks:   | <p>1、 Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.</p> <p>2、 Ambient temperature on the size of the product refer to the table on the right</p>  |                              |                  |              |              |              |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
|  | <p align="center"><b>PMMA product size changes with temperature table</b></p>  <table border="1"> <caption>PMMA 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>0.12</td> <td>0.15</td> <td>0.18</td> <td>0.22</td> </tr> <tr> <td>20</td> <td>0.10</td> <td>0.15</td> <td>0.22</td> <td>0.28</td> <td>0.35</td> <td>0.42</td> </tr> <tr> <td>30</td> <td>0.15</td> <td>0.22</td> <td>0.30</td> <td>0.38</td> <td>0.48</td> <td>0.58</td> </tr> <tr> <td>40</td> <td>0.20</td> <td>0.28</td> <td>0.38</td> <td>0.48</td> <td>0.60</td> <td>0.72</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 | 0.12 | 0.15 | 0.18 | 0.22 | 20 | 0.10 | 0.15 | 0.22 | 0.28 | 0.35 | 0.42 | 30 | 0.15 | 0.22 | 0.30 | 0.38 | 0.48 | 0.58 | 40 | 0.20 | 0.28 | 0.38 | 0.48 | 0.60 | 0.72 |
| 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                         | 0.12             | 0.15         | 0.18         | 0.22         |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| 20   | 0.10   | 0.15                         | 0.22             | 0.28         | 0.35         | 0.42         |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| 30   | 0.15   | 0.22                         | 0.30             | 0.38         | 0.48         | 0.58         |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| 40   | 0.20   | 0.28                         | 0.38             | 0.48         | 0.60         | 0.72         |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |
| Precautions:                                     | <p>1、 Wear clean gloves during lens assembly to prevent contamination of the lens surface.</p> <p>2、 Take the lens try to avoid touching the total reflection surface.</p> <p>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.</p>   |                              |                  |              |              |              |              |          |  |                  |            |             |             |             |             |             |   |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |    |      |      |      |      |      |      |

|                     |  |   |                 |                |                  |                              |         |
|---------------------|--|---|-----------------|----------------|------------------|------------------------------|---------|
| PN                  |  | HK-HG-68@32-10-D9-20-1g-1_ASM   |                 | Product Name   |                  | HK Dark 68@32-10 degree lens |         |
| Product material    |  | PMMA+High temperature resistant PC+ceramic  |                 | Customer       |                  |                              |         |
| Package diagram     |  |  <p style="text-align: center;">Single      Vacuum package      Box package</p> |                 |                |                  |                              |         |
| Product packing     |  | 8   |                 | A/box          |                  | 4                            |         |
|                     |  | 4   |                 | Layer/the box  |                  | 128                          |         |
| Packaging Materials | NO.  | Material Code   | Item name       | Specification  | Single box usage | Unit                         | Remarks |
|                     | 1  | 2. 07. 0080   | Blister box     | 23cm*21cm      | 16               | PCS                          |         |
|                     | 2  | 2. 08. 0001   | PE film         | 25cm*27cm      | 16               | block                        |         |
|                     | 3  | 2. 06. 0005   | Box label paper | 62mm*42mm      | 16               | zhang                        |         |
|                     | 4  | 2. 06. 0005   | Box label paper | 62mm*70mm      | 1                | zhang                        |         |
|                     | 4  | 2. 06. 0003   | The big plate   | 46cm*42cm      | 5                | PCS                          |         |
|                     | 4  | 2. 06. 0018   | The big carton  | 48cm*44cm*19cm | 1                | PCS                          |         |
| Remarks             | Scattered packaging is not restricted by this specification, the customer has the requirements of the customer 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:



The joint line will appear in the red line

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 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    | The size and rated power of | 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 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 ≤ 10mm, 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                       |   | √ |   |