“IOSOLUTION” has Total Solution for advanced optical components based on optical design technology and super precision technology.

IOSolution Co., Ltd.

www.iosolution.co.kr
In September 2009, IOSolution was established as a manufacturing company that specializes in and manufactures precision optical products used in optical communication lenses, security cameras and automotive electronics components, IR lenses for radiation, and medical machinery components. We mainly produce aspheric lenses for optical communication. Moreover, we have built an all-in-one production system that can directly design and process precision molds for the figuration of aspheric lenses as well as actually shape the lenses.

Thanks to the enhanced competitiveness of our aspheric glass lenses for optical communication, the global demand for our products is increasing, and our share in the global market is rapidly expanding. As a result, we are supplying lenses to major optical communication module companies. We are doing our utmost efforts to innovate technology and develop high value-added products such as square lenses and microarray lenses. In addition, we are relentlessly developing new items for the precision processing and media business, thereby rising as a comprehensive optical company.
Business Model

Technology for high-precision processing

Optical design and lens molding technology that used high-precision processing technology

- IR Lens
- Media Lens module
- Optical communication Module
- Molding Core
- Lens Module

**Optical Design**
Glass molding Tech.

**Lenses for optical communication**
- Aspherical Lens
- Ball lens
- Square lens & Plastic lens
- Micro lens Array

**CNC Precision Tech.**
DTM Precision Tech.
Glass molding Tech.

**Technology for high-precision processing**
- Chalcogenide IR lens
- IR-correction image lens and assembly
- Automotive Components

**Imprinting Tech.**
Optical Assembly Tech.
Plastic molding Tech.

**Media optics**
- Diffractive Grating lens
- Plastic injection lens / films
- Sensor lens and module
- Image lens and module

**Applications**
- Telecom and Datacom manuals, and active 25G, 100G, and 400G transceiver lens components
  - TO CAN
  - CSA(TCSA, ROSS, BOSA)
  - Parallel Optics(AOC MLA)
  - MUX, DEMUX

- Smartphone IR lens / module (after-market)
- Smart car IR lens / module
- Consumer camera lens / module
- Security camera IR lens / module
- IR lens / module for defense
- Mold core for molding
- Aspheric lens body tube
- Automotive electronics components

**Applications**
- Display
  - VR and AR - HUD lens
  - OLED/LED PKG
- Smart car (ADAS)
  - Laser/radar sensor lens
  - Lighting PKG for automobiles
  - Refract and non-reflection films
- Front/rear security camera module for automobiles
- Medical/health care
  - Endoscopes and bio-optical sensors
  - Security / consumer industry
  - Security camera image lens
Optical Communication Lens

**ASPHERICAL LENS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Wavelength</td>
<td>Normal: 1250<del>1620nm, Specific: 600</del>800nm</td>
</tr>
<tr>
<td>Glass Materials</td>
<td>Optical glass</td>
</tr>
<tr>
<td>Metal Holder Materials</td>
<td>SUS &amp; Alloy</td>
</tr>
<tr>
<td>Process Method</td>
<td>Automatic Glass Mold Press Process</td>
</tr>
<tr>
<td>Type of Products</td>
<td>Bare-Type, CAN-Type, Chip-Type</td>
</tr>
<tr>
<td>Numerical Aperture</td>
<td>Customized</td>
</tr>
<tr>
<td>Transmittance</td>
<td>&gt; 98% (AR Coated)</td>
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<tr>
<td>Leakage</td>
<td>10⁻⁸ torr</td>
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</tbody>
</table>

**CAN type coupling lens**

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Type</th>
<th>Designed Wavelength (nm)</th>
<th>Transmittance (%)</th>
<th>LP (mm)</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>CI (mm)</th>
<th>NA (λD + fiber)</th>
<th>Focal Length (mm)</th>
<th>Magnification</th>
<th>C.E. (%)</th>
<th>Outline Dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF1A-02W</td>
<td></td>
<td>1260~1620</td>
<td>Min. 99%</td>
<td>1.27</td>
<td>1.1</td>
<td>6.02 (1.490)</td>
<td>10.1 (1.490)</td>
<td>0.5 x 0.125</td>
<td>1.34 (1.490)</td>
<td>4</td>
<td>94.3</td>
<td>Ø4.3 x 3.97</td>
</tr>
<tr>
<td>FA13BW</td>
<td></td>
<td>1260~1620</td>
<td>Min. 99%</td>
<td>1.27</td>
<td>1.1</td>
<td>3.87 (1.310)</td>
<td>7.54 (1.310)</td>
<td>0.5 x 0.2</td>
<td>1.19 (1.310)</td>
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<td>70.4</td>
<td>Ø4.3 x 3.7</td>
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<tr>
<td>LF1A-04W</td>
<td></td>
<td>1260~1620</td>
<td>Min. 99%</td>
<td>1.27</td>
<td>0.7</td>
<td>4.23 (1.310)</td>
<td>7.5 (1.310)</td>
<td>0.5 x 0.25</td>
<td>0.95 (1.310)</td>
<td>4</td>
<td>92.2</td>
<td>Ø4.3 x 3.97</td>
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<td>LF1A-06W ****</td>
<td>LD to Fiber</td>
<td>1260~1620</td>
<td>Min. 99%</td>
<td>1.27</td>
<td>1.1</td>
<td>6.49 (1.310)</td>
<td>10.16 (1.310)</td>
<td>0.45 x 0.1</td>
<td>1.27 (1.310)</td>
<td>4.5</td>
<td>91.6</td>
<td>Ø5.5 x 3.97</td>
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<tr>
<td>FCA42BW0</td>
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<td>1260~1620</td>
<td>Min. 99%</td>
<td>1.27</td>
<td>0.8</td>
<td>3.13 (1.310)</td>
<td>6.5 (1.310)</td>
<td>0.5 x 0.167</td>
<td>0.92 (1.310)</td>
<td>3</td>
<td>81.5</td>
<td>Ø4.3 x 3.7</td>
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<td>FA21BW</td>
<td></td>
<td>1260~1620</td>
<td>Min. 99%</td>
<td>1.27</td>
<td>1.0</td>
<td>3.93 (1.310)</td>
<td>7.5 (1.310)</td>
<td>0.4 x 0.16</td>
<td>1.11 (1.310)</td>
<td>2.5</td>
<td>80.1</td>
<td>Ø4.3 x 3.7</td>
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<tr>
<td>LP2P-01X</td>
<td></td>
<td>1260~1620</td>
<td>Min. 99%</td>
<td>1.24</td>
<td>2.7</td>
<td>0.78 (1.310)</td>
<td>5.82 (1.310)</td>
<td>0.2 x 0.4</td>
<td>0.92 (1.310)</td>
<td>0.5</td>
<td>—</td>
<td>Ø5.4 x 3.12</td>
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<tr>
<td>CCA215SMO</td>
<td>Fiber to PD</td>
<td>1260~1620</td>
<td>Min. 98%</td>
<td>1.77</td>
<td>0.4</td>
<td>—</td>
<td>—</td>
<td>0.05 Beam Dia 1.0 mm</td>
<td>0.00 (1.310)</td>
<td>—</td>
<td>—</td>
<td>Ø5.4 x 3.27</td>
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<tr>
<td>FA27BW [LD]</td>
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<td>1260~1620</td>
<td>Min. 98%</td>
<td>1.31</td>
<td>2.7</td>
<td>0.78 (1.310)</td>
<td>5.88 (1.310)</td>
<td>0.2 x 0.4</td>
<td>0.94 (1.310)</td>
<td>0.5</td>
<td>—</td>
<td>Ø5.4 x 3.28</td>
</tr>
</tbody>
</table>

* All these data is a simulation result except the transmittance and use them as reference only.
** G69% calculating condition : LD_220/°34.5(-1) deg (FWHM), SMF FC ferrule
*** LP : LD chip Position, CP: Chip Position
**** for cooled LD TO
[CL]: (1k pcs/month, production capacity limited)

Dimension Reference

(LD to Fiber lens) (Fiber to PD lens)
### Chip type coupling lens

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Type</th>
<th>Designed Wavelength(μm)</th>
<th>Transmittance(%)</th>
<th>LP (mm)</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>Oil (mm)</th>
<th>NA (L x Fiber)</th>
<th>Focal Length (μm)</th>
<th>Magnification</th>
<th>C.E.,%**</th>
<th>Outline Dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF1H-01W</td>
<td></td>
<td>1260~1620</td>
<td>Min. 98%</td>
<td>1.2***</td>
<td>6.62(1310)</td>
<td>9.17(1310)</td>
<td>0.4 x 0.1</td>
<td>1.36(1310)</td>
<td>4</td>
<td>93.4</td>
<td>Ø3.0 x 1.6</td>
<td></td>
</tr>
<tr>
<td>LF1H-13W</td>
<td>LD to Fiber</td>
<td>1260~1620</td>
<td>Min. 98%</td>
<td>1.4***</td>
<td>4.0(1550)</td>
<td>6.71(1593)</td>
<td>0.38 x 0.18</td>
<td>1.34(1593)</td>
<td>2.1</td>
<td>57.8</td>
<td>Ø3.0 x 1.6</td>
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</tr>
<tr>
<td>RH030-00K</td>
<td></td>
<td>1260~1620</td>
<td>Min. 98%</td>
<td>1.0***</td>
<td>4.59(1530)</td>
<td>5.89(1530)</td>
<td>0.57 x 0.136</td>
<td>1.00(1530)</td>
<td>3.7</td>
<td>94.5</td>
<td>Ø3.0 x 1.6</td>
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<td>RH075W 35L</td>
<td></td>
<td>850 typ.</td>
<td>Min. 98%</td>
<td>1.9***</td>
<td>7.0(850)</td>
<td>9.33(920)</td>
<td>0.4 x 0.13</td>
<td>1.63(850)</td>
<td>3</td>
<td>90.0(850)</td>
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<tr>
<td>RH125W 35L</td>
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<td>1260~1340</td>
<td>Min. 98%</td>
<td>1.15***</td>
<td>4.97(1310)</td>
<td>6.62(1310)</td>
<td>0.42 x 0.1</td>
<td>1.04(1310)</td>
<td>4</td>
<td>94.2</td>
<td>Ø2.5 x 0.9</td>
<td></td>
</tr>
</tbody>
</table>

* All these data are a simulation result except a transmittance and use them as reference only.
** C.E.,% calculating condition : LD_22/''34(4) deg (FWHM), SMF PC ferrule
*** wih 0.3F cover glass (BK7)
**** wih 0.25F cover glass (DK7)
[CL] : (1k pcs/month, production capacity limited)

### Chip type collimator lens

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Type</th>
<th>Designed Wavelength(μm)</th>
<th>Transmittance(%)</th>
<th>LP (mm)</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>Beam Diameter (mm)</th>
<th>NA</th>
<th>Focal Length (μm)</th>
<th>Outline Dimension CD x L</th>
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</thead>
<tbody>
<tr>
<td>CH01A-00K</td>
<td></td>
<td>1260 ~ 1620</td>
<td>Min. 98%</td>
<td>0.6</td>
<td>0.77(1310)</td>
<td>0.46</td>
<td>0.63(1310)</td>
<td>Ø2.5 x 0.55</td>
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<tr>
<td>CCH02BW0</td>
<td>LD Collimator</td>
<td>1260 ~ 1620</td>
<td>Min. 98%</td>
<td>0.6</td>
<td>0.77(1310)</td>
<td>0.66</td>
<td>0.65(1310)</td>
<td>Ø2.5 x 0.80</td>
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<tr>
<td>CH056W 35L</td>
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<td>1260 ~ 1620</td>
<td>Min. 98%</td>
<td>1.1**</td>
<td>1.22(1310)</td>
<td>0.5</td>
<td>1.22(1310)</td>
<td>Ø2.8 x 0.9</td>
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<tr>
<td>LF2H-03W</td>
<td></td>
<td>1260 ~ 1620</td>
<td>Min. 98%</td>
<td>1.1</td>
<td>1.44(1310)</td>
<td>0.5</td>
<td>1.44(1310)</td>
<td>Ø3.0 x 1.6</td>
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<tr>
<td>LF2H-01W</td>
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<td>1260 ~ 1620</td>
<td>Min. 98%</td>
<td>2.38</td>
<td>0.97(1310)</td>
<td>0.2</td>
<td>3.09(1310)</td>
<td>Ø3.0 x 1.6</td>
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<td></td>
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<tr>
<td>CH045W 35L</td>
<td></td>
<td>1260 ~ 1620</td>
<td>Min. 98%</td>
<td>3.34</td>
<td>1.67(1310)</td>
<td>0.2</td>
<td>1.89(1310)</td>
<td>Ø3.0 x 1.6</td>
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<td></td>
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<tr>
<td>CH056W 35L</td>
<td></td>
<td>1260 ~ 1400</td>
<td>Min. 98%</td>
<td>1.12</td>
<td>0.36(1310)</td>
<td>0.1</td>
<td>1.89(1310)</td>
<td>Ø3.0 x 1.6</td>
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<tr>
<td>CH085W 35L</td>
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<td>Min. 98%</td>
<td>1.17</td>
<td>0.31(1310)</td>
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<td>1.89(1310)</td>
<td>Ø3.75 x 1.9</td>
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<td>CH065W 35L</td>
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<td>3.39</td>
<td>0.8 (1310)</td>
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<td>4.02 (1310)</td>
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<td>CH010BW0</td>
<td></td>
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<td>Min. 98%</td>
<td>0.72</td>
<td>0.05(1310)</td>
<td>0.3</td>
<td>1.15(1310)</td>
<td>Ø1.8 x 1.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* All these data are a simulation result except a transmittance and use them as reference only.
** C.E.,% calculating condition : LD_22/''34(4) deg (FWHM), SMF PC ferrule
[CL] : (1k pcs/month, production capacity limited)

### T-type lens

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Type</th>
<th>Designed Wavelength(μm)</th>
<th>Transmittance(%)</th>
<th>LP (mm)</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>Beam Diameter (mm)</th>
<th>NA (L x Fiber)</th>
<th>Focal Length (μm)</th>
<th>Magnification</th>
<th>C.E.,%**</th>
<th>Outline Dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTH-01BW0 35L</td>
<td></td>
<td>1260 ~ 1620</td>
<td>Min. 98%</td>
<td>0.35</td>
<td>0.84(1310)</td>
<td>0.5</td>
<td>0.623(1310)</td>
<td>3.8</td>
<td>67.6</td>
<td>1.95 x 2 x 0.8</td>
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<td>CTH01BW0</td>
<td>LD Collimator</td>
<td>1260 ~ 1620</td>
<td>Min. 98%</td>
<td>0.35</td>
<td>0.84(1310)</td>
<td>0.5</td>
<td>0.623(1310)</td>
<td>3.8</td>
<td>67.6</td>
<td>1.95 x 2 x 0.8</td>
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</tr>
</tbody>
</table>

* All these data are a simulation result except a transmittance and use them as reference only.
** C.E.,% calculating condition : LD_22/''34(4) deg (FWHM), SMF PC ferrule
[CL] : (1k pcs/month, production capacity limited)
### Bare type collimator lens

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Type</th>
<th>Designed Wavelength (nm)</th>
<th>Transmittance (%)</th>
<th>LP (mm)</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>Beam Diameter (mm)</th>
<th>NA</th>
<th>Focal Length (mm)</th>
<th>Outline Dimension OD x L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBT22BWCL</td>
<td>Fiber Collimator</td>
<td>780~1005</td>
<td>Min, 98%</td>
<td>—</td>
<td>1.8</td>
<td>—</td>
<td>1.5 (1005)</td>
<td>0.30</td>
<td>2.53 (1005)</td>
<td>Ø3.0 x 1.3</td>
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<tr>
<td>CBT20SWCL</td>
<td></td>
<td>1550</td>
<td>Min, 98%</td>
<td>—</td>
<td>0.32</td>
<td>—</td>
<td>0.45 (1550)</td>
<td>0.44</td>
<td>0.52 (1550)</td>
<td>Ø1.0 x 0.35</td>
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<tr>
<td>CBT23BW0</td>
<td></td>
<td>1550</td>
<td>Min, 98%</td>
<td>—</td>
<td>1.99</td>
<td>—</td>
<td>0.55 (1550)</td>
<td>0.14</td>
<td>1.98 (1550)</td>
<td>Ø1.50 x 0.5</td>
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</table>

*All these data is a simulation result except a transmittance and use them as reference only.

[CL]: (1k pcs/month, production capacity limited)

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### BALL LENS

**Ball Lens**

**Ball Cap**

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### Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Wavelength</td>
<td>Normal : 1,260<del>1,620nm, Specific : 600</del>800nm</td>
</tr>
<tr>
<td>Glass Materials</td>
<td>High Nd (2.0) Glass, Glass</td>
</tr>
<tr>
<td>Metal Holder Materials</td>
<td>SUS &amp; Alloy</td>
</tr>
<tr>
<td>Process Method</td>
<td>Automatic Polishing</td>
</tr>
<tr>
<td>Type of Products</td>
<td>Bare Lens, Ball lens Cap</td>
</tr>
<tr>
<td>Transmittance</td>
<td>&gt; 99% (AR Coated)</td>
</tr>
<tr>
<td>Deviation from Spherical form</td>
<td>&lt; 3 um</td>
</tr>
<tr>
<td>Tolerance of Diameter</td>
<td>± 2 um</td>
</tr>
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</table>
Square / Rectangle / Micro Lens Array (MLA) lens

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Series</th>
<th>Type</th>
<th>Designed Wavelength (nm)</th>
<th>Transmittance (%)</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>Oil (mm)</th>
<th>Beam Diameter (mm) (A NA)</th>
<th>NA (LD x Fiber)</th>
<th>Focal Length (mm)</th>
<th>Magnification</th>
<th>C.E. (%)</th>
<th>Outline Dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBS10B30</td>
<td>Square</td>
<td>LD to Fiber</td>
<td>1280~1620</td>
<td>Mn, 98%</td>
<td>0.25</td>
<td>0.38</td>
<td>0.6 x 0.86</td>
<td>0.53 (1310)</td>
<td>0.65 x 0.13</td>
<td>0.65 x 0.13</td>
<td>5</td>
<td>93.9</td>
<td>1.0 x 1.0</td>
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<tr>
<td>FBR10B30</td>
<td>Rectangle</td>
<td>Fiber Collimator</td>
<td>1280~1620</td>
<td>Mn, 98%</td>
<td>0.25</td>
<td>0.38</td>
<td>0.6 x 0.86</td>
<td>0.44 (1310)</td>
<td>0.65 x 0.13</td>
<td>0.65 x 0.13</td>
<td>5</td>
<td>93.9</td>
<td>1.0 x 0.6</td>
</tr>
<tr>
<td>CSM125B40</td>
<td>MLA (pitch)</td>
<td></td>
<td>1250~1650</td>
<td>Mn, 98%</td>
<td>1.3</td>
<td>1.7</td>
<td>0.176</td>
<td>0.6 (1310)</td>
<td></td>
<td></td>
<td>5</td>
<td>93.9</td>
<td>1.44 x 3.05</td>
</tr>
</tbody>
</table>

* All these data is a simulation result except a transmittance and use them as reference only,
** C.E(%) calculating condition : LD, 22µm, *34(%) oeg (FWHM), SMF PC femur

![Image of Square Type, Rectangle Type, MLA (Micro Lens Array)]

** Description **

- **Type of Lenses**: Square Type, Rectangle Type, MLA (Micro Lens Array)
- **Materials**: Glass, Silicon
- **Process Method**: GMP (Glass Molding Press) & Photolithography
- **Type of Products**: Bare lenses
- **Lens Diameter**: Ø 1µm ~ Ø 650µm and > 1,000µm (GMP)
- **Pitch Accuracy**: < 3µm
- **Uniformity of ROC (Radius of Curvature)**: < 3 %
- **AR Coating**: T98%
- **Application**: Fiber Coupling, Collimation, Imaging ...
We can manufacture products according to the specifications ordered by our clients.

- Form error (P–V): 0.1 – 0.9 μm
- External diameter allowance: ±0.050 – 0.020 mm
- Thickness allowance: ±0.050 – 0.010 mm
- Eccentricity: 20°~60° in

### IR-Lens

**Material**: Zinc Selenide (ZnSe)

**Wavelength usage**: 8~12μm

**Application fields**: High-power CO₂ laser focusing and others

**Characteristics**:
- High performance at broadband wavelength
- Dark yellow and transparent colors in visible light
- Refractive index: 2.4, heat dispersion: 0.000060/°C

**Material**: Germanium (Ge)

**Wavelength usage**: 3~5μm

**Application fields**: Application fields: Thermal infrared images, and spectroscopy MWIR and LWIR

**Characteristics**:
- Easy to process and efficient considering its price
- Excellent thermal conductivity, surface gradient, and strength
- As a material with a high refraction of over 4.0, it can be used as a large caliber.

**Material**: Silicon (Si)

**Wavelength usage**: 1.2 – 7 μm (NIR), mainly used at 3~5 μm

**Application fields**: Detectors, laser, fiber optics, and others

**Characteristics**:
- Light, firm, and durable, and offers ease of mobility
- Excellent for the correction of chromatic aberration as it is of little dispersion
- Has a relatively high refractive index (3.4) compared to glass

**Material**: Chalcogenide

**Wavelength usage**: Used at various wavelengths

**Application fields**: Night vision for automobiles and infrared–light security cameras for night video surveillance

**Characteristics**:
- We can mass-produce at a low price by glass molding.
- As it contains only about 20% – 30% Ge, which is very expensive, it is relatively inexpensive.
Aspheric Mirror

As an optical material that reflects light, such as aluminum, copper, and electroless nickel, it is manufactured using DTM processing. It is used in mirrors of various forms and high-power lasers. We can manufacture it at a low price.

- Processing materials: Al, Cu, electroless Ni, Mo, etc.
- Application fields: High-power laser reflector, lighting, and others

Fresnel

Fresnel lenses function like convex or concave lenses, and are a special type of lenses with a curvature that is divided on the zone plate at a constant pitch for reduced weight and volume.

- Materials: PMMA, PVC, PC, and other plastics
- Application fields: LED lighting, sunlight-collecting devices, displays, etc.
- We can directly process or mold-process it.
- We can process it at a maximum of D 350.
- Minimum area of tools of R 0.010
  (We can deliberate on sizes smaller than this.)

Mold Core Pin

<table>
<thead>
<tr>
<th>LENS</th>
<th>CORE</th>
<th>MOLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOBILE Core / Mold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LED BLU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automotive Lens</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Optical Communication Main Tube**

**CNC Machining**

- **Material**: Round bar - shaped SUS type
- **Type**: CAN type
- **Usage**: Lens body tube for optical communication
- **Manufacturing method**: Direct processing using a CNC machine
- **Characteristics**: Verified as a metal material of excellent corrosion resistance (compatibility and formability)

- **Material**: Round bar - shaped SUS type
- **Type**: Chip type
- **Usage**: Lens body tube lenses for optical communication
- **Manufacturing method**: Direct processing using a CNC machine
- **Characteristics**: Verified as a metal material of excellent corrosion resistance (compatibility and formability)

- **Material**: Alloy plate type
- **Type**: CAN type
- **Usage**: Lens body tube for optical communication
- **Manufacturing method**: Excellent production performance using a press machine
- **Characteristics**: Excellent productivity and reduced production cost of end-products

**Automotive Part**

**Automotive Pin**

- **Material**: Round bar - shaped SUM type
- **Form**: Pin
- **Usage**: Automobile ABS and engine systems, etc.
- **Manufacturing method**: Direct processing using a CNC machine
- **Characteristics**: Excellent machinability and can be mass-produced

**Quick Connector**

- **Material**: Round bar - shaped S40 type
- **Form**: connector
- **Usage**: For combining pipes inside automobiles
- **Manufacturing method**: Direct processing using a CNC machine
- **Characteristics**: Verified as an excellent metal material (compatibility and machinability)

**Automotive Nozzle**

- **Material**: Round bar - shaped SNCM type
- **Form**: shaft, cap, pin
- **Usage**: Fuel injection nozzles of automobiles, etc.
- **Manufacturing method**: Direct processing using a CNC machine
- **Characteristics**: Excellent corrosion resistance and hardness (fatigue limit) after having been tempered and carburized
Automotive Lens Series

**IOA-1520N**
- **Sensor Size**: APTINA 1/4”(ASX3441/3”Format
- **Resolution**: 1.3Mega
- **Focal Length**: 15mm
- **Fno**: F2.0
- **FOV(H X V)**: 135 X 140 X 110 H: 190 X V: 137
- **Flange Back Length**: 2.4mm
- **Back Focal Length**: 2.9mm
- **Lens Dimension**: Ø13.5 x 13.4mm
- **TTL**: 15.8mm
- **Element**: 1G4Glass
- **Mount Dimension**: M12 x P0.5

**IOA-3120N-2MP(BIF)**
- **Sensor Size**: 1/2.9” Format
- **Resolution**: 2Mega
- **Focal Length**: 3.1mm
- **Fno**: F2.0
- **FOV(H X V)**: 1350 X 1054 X 57.6
- **Flange Back Length**: 4.0mm
- **Back Focal Length**: 5.2mm
- **Lens Dimension**: Ø14.0 x 13.0mm
- **TTL**: 17.0mm
- **Element**: 5Glass
- **Mount Dimension**: M12 x P0.5

**IOA-1820N-2MP**
- **Sensor Size**: 1/6” Format
- **Resolution**: 2Mega
- **Focal Length**: 1.8mm
- **Fno**: F2.0
- **FOV(H X V)**: 1180 X 981 X 51.0
- **Flange Back Length**: 2.5mm
- **Back Focal Length**: 3.6mm
- **Lens Dimension**: Ø14.0 x 16.5mm
- **TTL**: 19.0mm
- **Element**: 4Glass
- **Mount Dimension**: M12 x P0.5

**IOA-3520F-2MP**
- **Sensor Size**: 1/3”Format
- **Resolution**: 2Mega
- **Focal Length**: 3.6mm
- **Fno**: F2.0
- **FOV(H X V)**: 105 X 60 X 59
- **Flange Back Length**: 5.6mm
- **Back Focal Length**: 5.6mm
- **Lens Dimension**: Ø14.0 x 15.4mm
- **TTL**: 21.0mm
- **Element**: 4Glass
- **Mount Dimension**: M12 x P0.5

**IOA-2320F-2MP(BIF)**
- **Sensor Size**: 1/4”Format
- **Resolution**: 2Mega
- **Focal Length**: 2.9mm
- **Fno**: F2.0
- **FOV(H X V)**: 130 X 105 X 56
- **Flange Back Length**: 3.0mm
- **Back Focal Length**: 3.9mm
- **Lens Dimension**: Ø13.9 x 10.2mm
- **TTL**: 13.2mm
- **Element**: 5Glass
- **Mount Dimension**: M12 x P0.5

**IOA-2720F-2MP(BIF)**
- **Sensor Size**: 1/4”Format
- **Resolution**: 2Mega
- **Focal Length**: 2.7mm
- **Fno**: F2.0
- **FOV(H X V)**: 105.0 X 89.0 X 50.0
- **Flange Back Length**: 4.8mm
- **Back Focal Length**: 5.64mm
- **Lens Dimension**: Ø15.0 x 15.0mm
- **TTL**: 20.8mm
- **Element**: 6Glass
- **Mount Dimension**: M12 x P0.5

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**Headway Sensing (for ACC)**
- Detects lane borders and/or obstacles

**Rearview Sensing**
- Parking Assist

**Night Vision**

**Side Rearview Sensing**
- Blind-spot detection

**Side-View Sensing**
- Blind-corner monitor

**Interior Sensing/Nam Prevention/airbag control**
Innovative Optics Solution:
Have a responsibility to think I have a dream of the future business!

Headquarters and Factory that manufactures optical lens in Gwangju
409, Home Robot Center, Gwangju Technopark, 333, Cheomdangwagi-ro, Buk-gu, Gwangju 61008, South Korea

Factory that manufactures precision components in Iksan
560, Iksandae-ro, Iksan 54538, Jeollabuk-do, South Korea,
#201, Moving Techno Hall, Wonkwang University

Factory that processes high-precision DTM (molds and lenses) in Pyeongtaek
745–34, Samnam-ro, Jinwui-myeon, Pyeongtaek 17718, Gyeonggi-do, South Korea

Factory that processes image lenses / CNC in Dongtan
40, Dongtansandan 2-gil, Dongtan-myeon, Hwaseong 18487, Gyeonggi-do, South Korea

Factory that Optical Module / Packaging in Daejeon
(34127) 149, Jukdong-ro, Yuseong-gu, Daejeon, Republic of Korea