

# 大赛璐可提供的成型技术

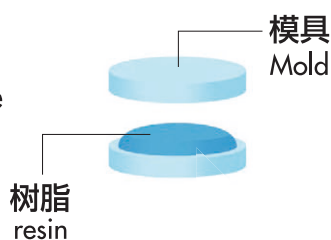
"Mold process" Daicel can offer

**轻松的将模具形状(精细/复杂)一次转印到大面积上的技术!**  
**因此可以实现环境友好且成本优化的工艺!**

Technology for easily transferring mold shapes (fine/complex) onto a large area at once is applied to lenses and other products!  
Enables environmentally friendly and cost-optimized processes!

## 晶圆制造工艺 WLO Manufacturing Process

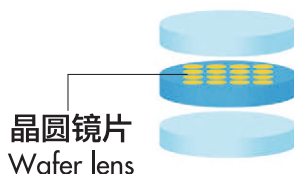
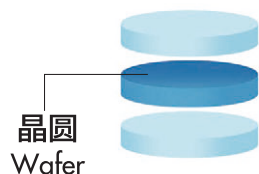
### 1 涂布 Dispense



### 2 固化 Curing

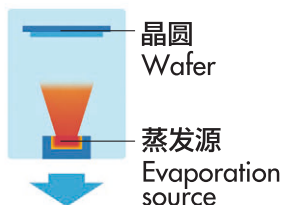


### 3 脱模 Mold release



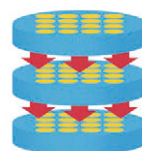
## 相关工艺 Relevance Process

### 涂层 (AR、BPR) Coating



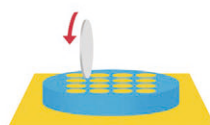
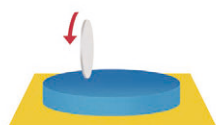
**多点同时涂布**  
Simultaneous multi-point coating

### 贴合 Stacking



**多片叠加, 零部件少!**  
Multi-point simultaneous Stacking! Fewer parts!

### 切割 Dicing



**矩形切割**  
**按需定制形状**  
Rectangle available!  
Customize the shape!

# 可将精巧,复杂的表面 转印至树脂上!

Elaborate, complex surfaces can be transferred to plastic!!

## 晶圆成型品(WLO)<sup>※1</sup>

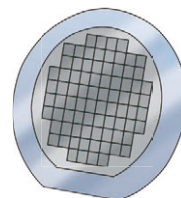
作为成型体 As a molded product

- ✓ 高耐热 (~300[°C])  
High temperature resistant! (~300[°C])
- ✓ 低成本  
Low cost!
- ✓ 通过重复模式实现大面积化  
Large area can be achieved by repeating patterns!  
(Large-area molding is possible with a single small piece mold 2mm□→150mmφ)

作为光学元件 As an optics

- ✓ 低双折射! (0[-])  
low birefringence! (0[-])
- ✓ 高厚度差(可实现高纵横比) (~5[-])  
High uneven wall thickness (high aspect ratio) is possible! (~5[-])

※1 用我们专有的模塑工艺制作的圆盘状模塑产品称为晶圆成型产品(WLO)。  
We call our uniquely molded disc-shaped products "wafer level optics(WLO)".



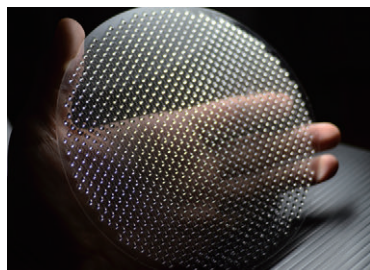
## 探索开发用途

We are looking for a use!

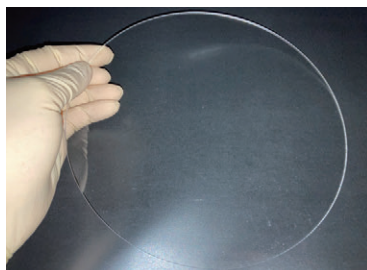
## 已采用于超精密镜头!

Adopted for ultra-precision lenses!

## 晶圆成型品应用例 Example of WLO



晶圆镜片  
Wafer Lens

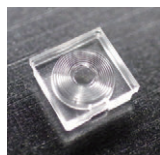


盖片  
Cover

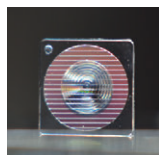


扩散板  
Diffusion plate

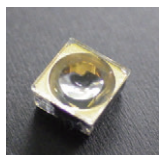
## 用途提案 Suggested example



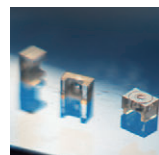
菲涅尔  
Fresnel



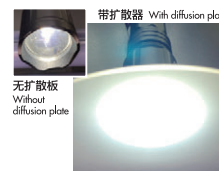
塑形器  
Shaper



带反光镜的镜头  
Reflector with Lens

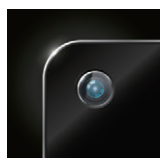


2个带脚的镜头  
2 pieces with legs



LED灯 + 扩散板  
LED lamp + Diffusion plate

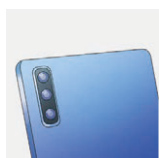
## 产品采用例 Adopted products



智能手机, 闪光灯透镜  
Smartphone, Flash Lens



人体感应智能门铃  
Smart Doorbell, Human Sensors



智能手机测距透镜  
Smartphone, Ranging Lens



VR眼镜  
VR goggles, Eye/Face Track



扫地机器人测距透镜  
cleaning robot, Ranging Lens

# 晶圆级镜片与射出成型镜片的比较

Comparison between Wafer lens and injection molded lenses.

世界首创!  
World's first!

成功实现晶圆级镜片的实用化・产品化

Successfully implementation and commercialized Wafer lens

		射出成型镜片 Injection Molded Lens	晶圆级镜片 Wafer lens	与客户沟通要点 Appeal points for Customer
形状 Shape	无座夹具 Holderless			可将尺寸缩小 1mm 以下 减少夹具成本 (有腿) 节省空间, 轻量化! Size reduction! Less than 1mm! Holder cost reduction! (with legs) Space saving! Lighter weight!
	高厚度差 High aspect ratio			光学设计范围扩大! 镜头数量减少! Broader range of optical design! Reduced number of stacking lenses!
	矩形 Rectangle outline			可实现I切割镜片! I-cut lens capable!
模具 Mold	多片采集 Multi-cavity	需要多个模具, 以及对模具的维护保养 Large quantity of molds, mold maintenance are required 	仅要一个模具, 模具无需保养 One mold maintenance-free 	大幅降低模具生产成本, 管理成本, 以及更换成本! Reduction of mold making cost, management cost, and step change cost!
	耐回流焊 Reflow resistance	无耐性 No tolerant 	有耐性 Tolerant 	耐热性高 (300度) 可进行回流焊处理!! High heat resistance (300°C), reflow processable!

# 晶圆镜片可提供的功能

Functions that Wafer lens can provide

**安装有透镜的传感器的小型化，生产效率的提高**

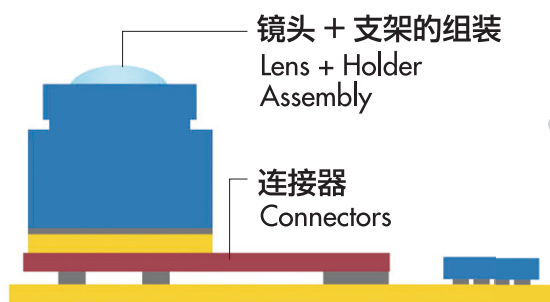
可实现中心/外壁不同厚度以及复杂形状  
优异的耐热性,可进行回流焊安装(300度)

Downsize Lens Implemented sensor\*Improve productivity  
Capability of Uneven thickness at Center/Edge, and Complex shape  
Capability to reflow soldering process with high heat resistance (300°C)

\*Cameras, light sources, 3D sensing, etc.

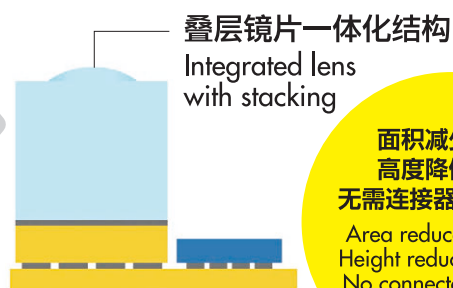
## 使用其他公司镜头的传感器

Sensor with the other companies' lens



## 使用本公司镜头的传感器

Sensor with Our company Lens



面积减少20%  
高度降低10%  
无需连接器,降低成本  
Area reduced by 20%  
Height reduced by 10%  
No connector required  
Cost reduction

## 晶圆镜片的功能及特点

Functions and Features of Wafer lens



### 耐化学性强

High chemical resistance

不易受酒精，洗涤剂，  
生活环境等影响  
Less susceptible to alcohol and  
detergents in living environments



### 无双折射

No birefringence

由于偏振光不受影响，  
因此也可用于偏光镜片  
No disturb polarization,  
applicable to polarized lenses



### 耐划伤

Scratch-resistant

铅笔硬度超于2H，  
无需硬涂层即可日常使用  
Harder than 2H pencil hardness stands for  
everyday use without extra hard coating



### 光利用效率高

Efficient light use

可实现角半径1.0  $\mu\text{m}$ 以下的微  
纬度成型，提高光利用效率  
Fine molding with sharp edge, less than  
R1.0um, improve light utilization efficiency

\*このレンズは耐熱性樹脂を用い、ウエハレベルレンズ成型技術で製造されておりガラスハイブリッドレンズや射出成型レンズと違った特長を有します“Crystavvy” (特許・商標取得済み)  
\*These lenses are made of heat-resistant resin and manufactured using wafer-level lens molding technology, which is different from glass hybrid lenses and injection-molded lenses “Crystavvy” (Patented and trademarked)



# 大赛璐可为您提供服务

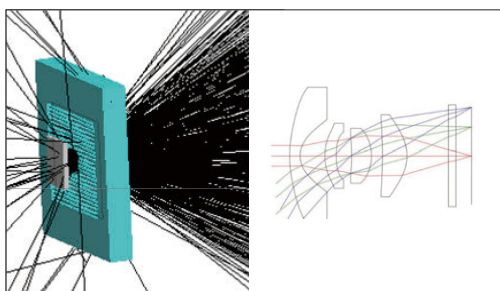
"What" Daicel can offer

我们可提供从光学设计，  
材料设计到～模具加工～成型～后加工～售后支持的全流程服务！  
拥有多种分析设备，可在短时间内迅速分析缺陷并解决问题

We can handle the entire process of optical design, material design, mold machining, molding, post-processing, and after-sales support!  
We have a variety of analyzers and can analyze defects and solve problems in a short period!

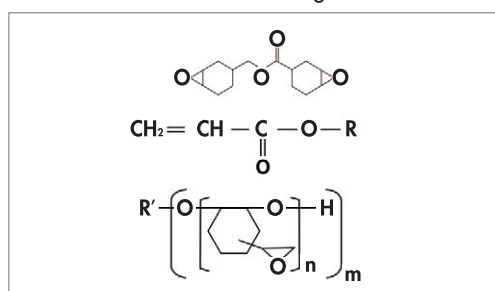
## 光学设计

Optical Design



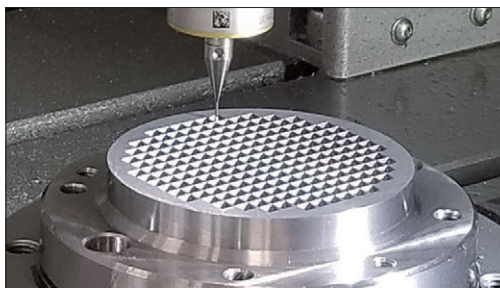
## 材料设计

Material Design



## 模具加工

Mold Processing



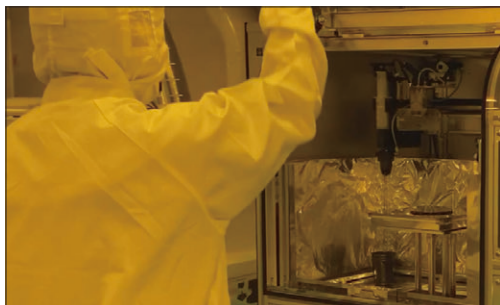
## 成型

Mold



## 涂层加工

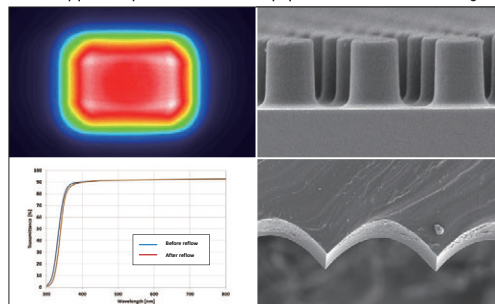
低反射，遮光  
Coating(AR,BPR...)



## 售后支持

光学评价设备，各种测试仪器

After-sales Support, Optical evaluation equipment, various measuring instruments



联系我们

E-mail : [daicel-opticallens@jp.daicel.com](mailto:daicel-opticallens@jp.daicel.com)

HP : <https://www.daicel.com/smart/product/opticalparts/>

