

# 歡迎參訪

製造分析實驗室

**M**anufacturing **A**nalysis **L**aboratory

精密製造實驗室

**P**recision **M**anufacturing **L**aboratory

研究生：葉敬賢

指導老師：陳炤彰 教授  
[artchen@mail.ntust.edu.tw](mailto:artchen@mail.ntust.edu.tw)



## ➤ 實驗室簡介

- 成員
- 研究方向

## ➤ 實驗設備

- 主要實驗設備
- 射出成形機
- 光彈量測儀
- 模流分析軟體

## ➤ 射出成形技術

- 複合式光學元件
- 薄型導光板
- 光學均勻器
- 隱形眼鏡殼模
- 二次光學元件



# 實驗室簡介



## 陳炤彰 教授

美國威斯康辛大學麥迪遜分校機械博士

博士後研究員：1 位

博士生：2 位

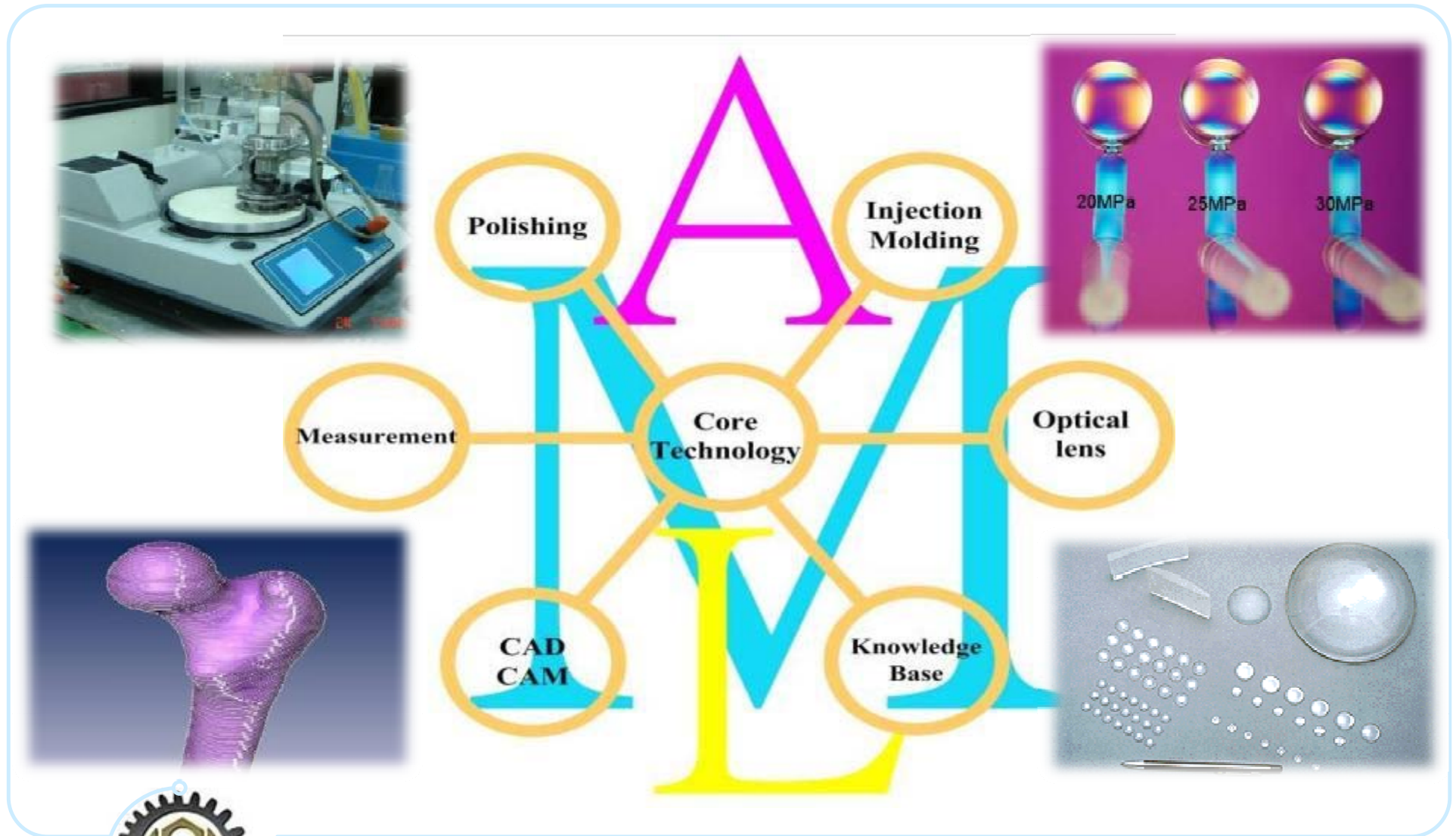
碩二學生：5 位

碩一學生：7 位

(實驗室成員包含在職生共約20位)

<http://www.me.ntust.edu.tw/pml/>





# 實驗設備-射出成形設備

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Injection molding machine



Heater & controller



Mold temperature controller



Mold



Thermometer



Vacuum pump



# 實驗設備-臥式射出機

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製造商：FUNAC

型號：α-15iA 全電式射出機

鎖模力：15 ton

螺桿直徑：16 mm

最大射速：200 mm/s

最大射壓：240 MPa

最大射出體積：11 cm<sup>3</sup>



# 實驗設備-立式射出機

Precision Manufacturing Laboratory

製造商：煜達

型號：YH-25V

鎖模力：25 ton

螺桿直徑：22 mm

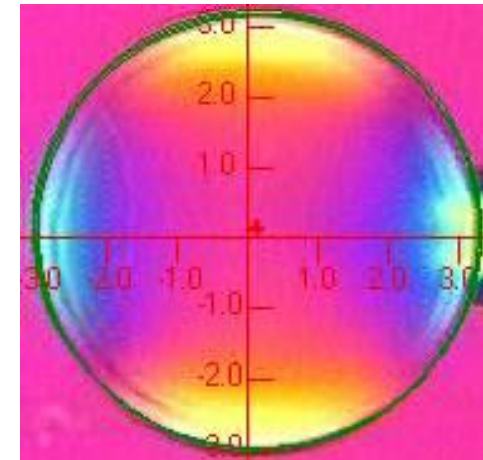
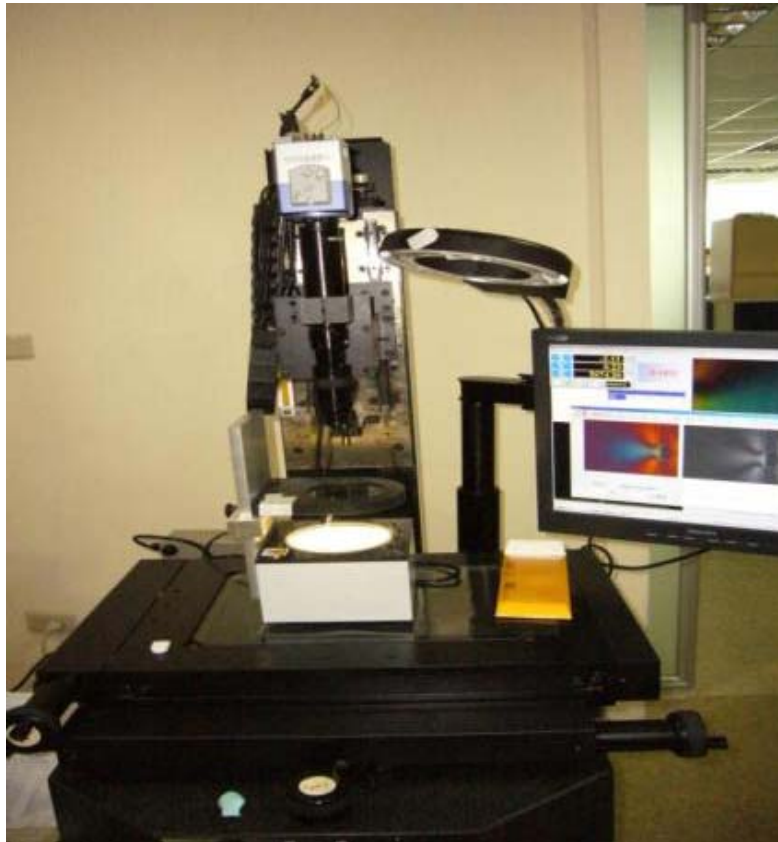
最大射速：33 cc/s

最大射壓：209 MPa

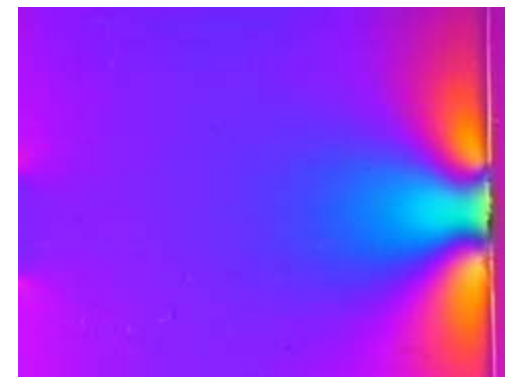
最大射出體積：36 cm<sup>3</sup>



## ➤ Polarimeter System



Optical Lens

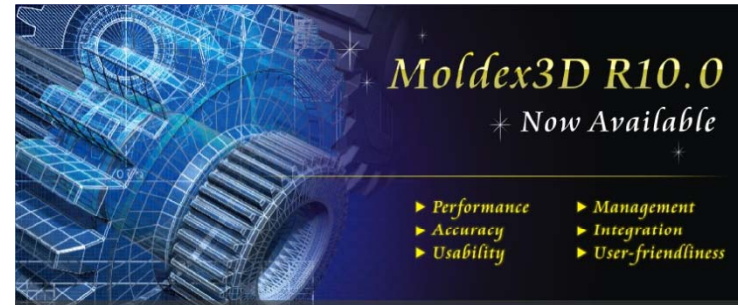


Light Guide Plate



- **Moldex3D R10**

- Solid
- Shell

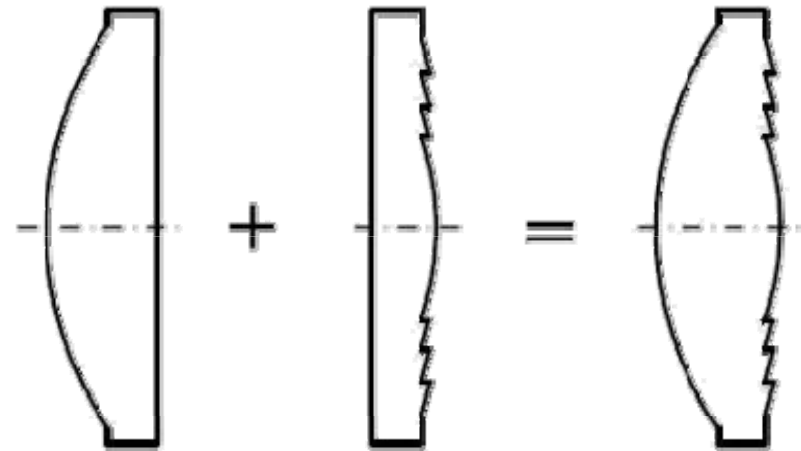
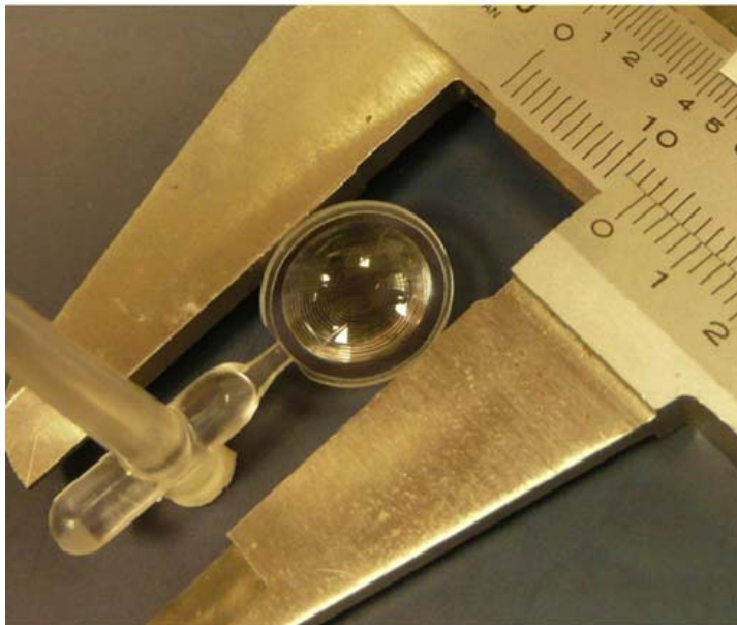


- **Autodesk Moldflow Insight 2010**

- Midplane mesh
- Dual Domain mesh
- 3D mesh



## ► Hybrid Optical Elements

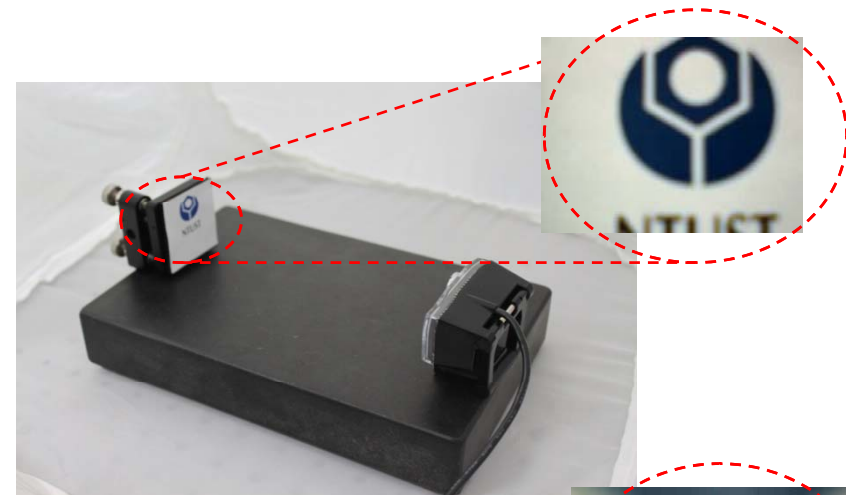
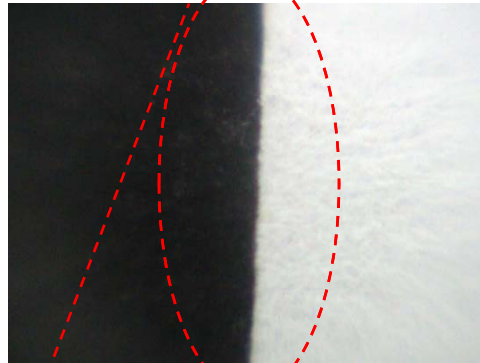
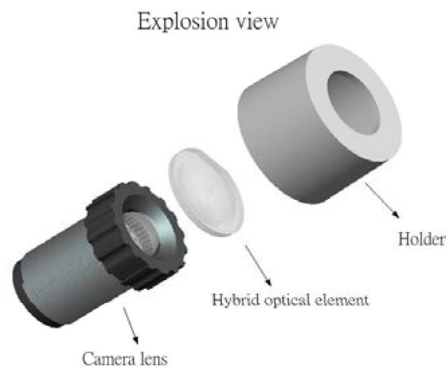


Aspheric Lens + Fresnel Lens = Hybrid optical lens

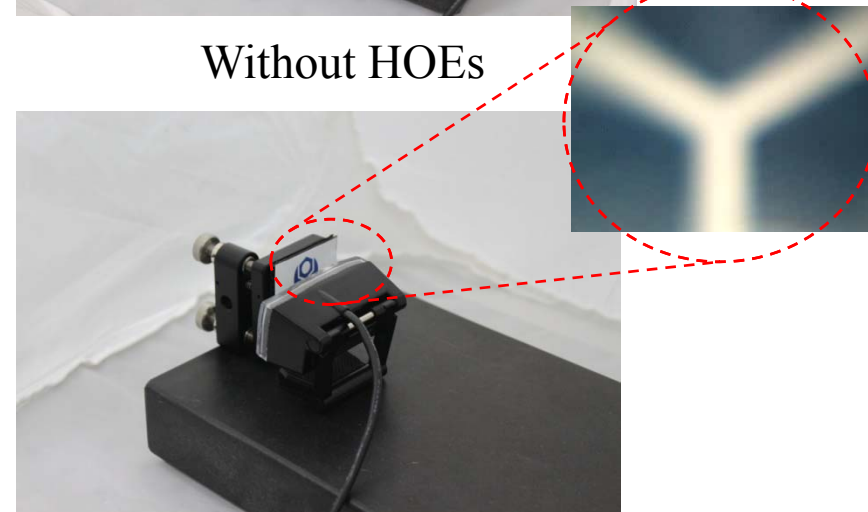


# 光學成像結果

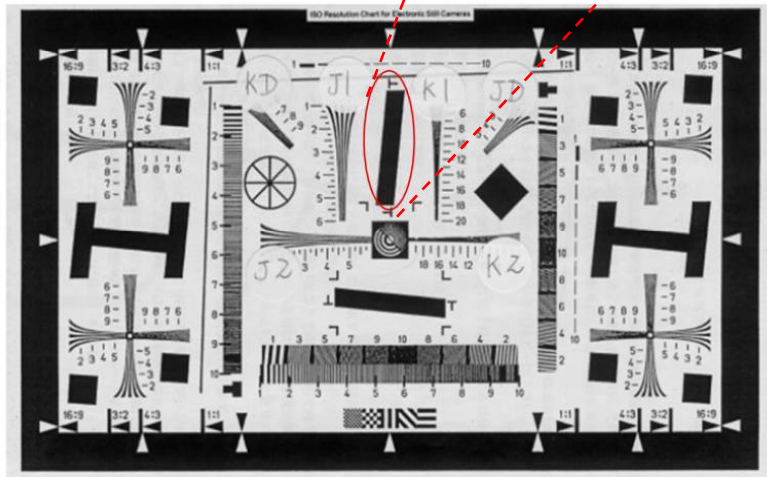
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Without HOEs



With HOEs



ISO12233



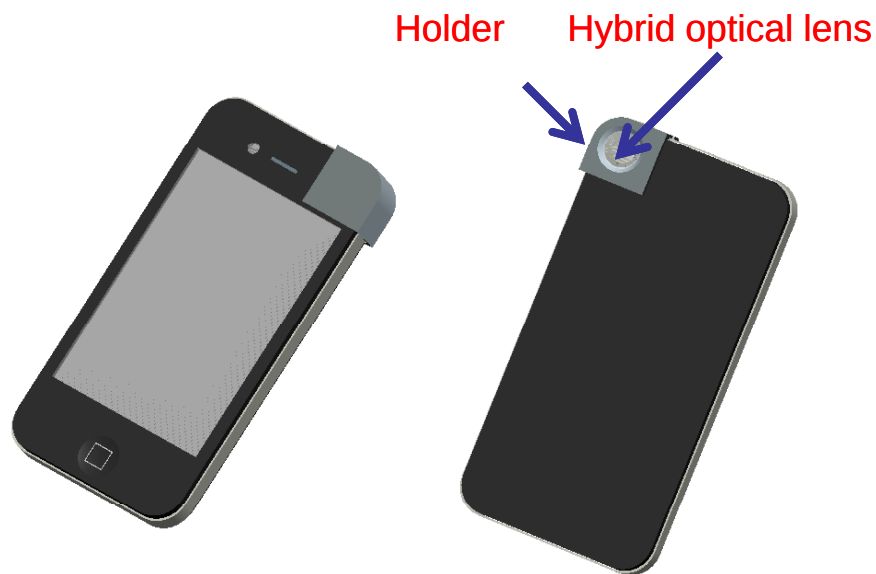


拍攝過程示意

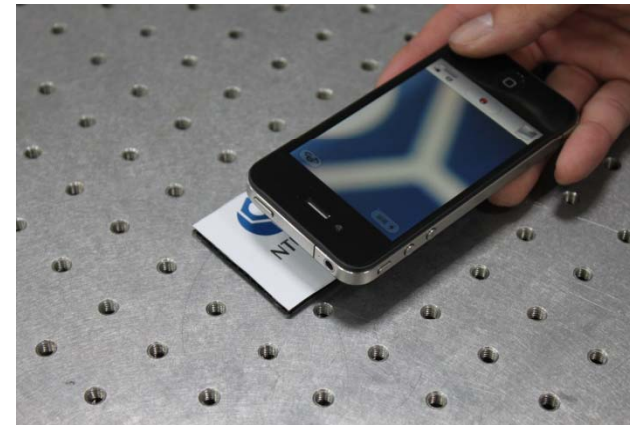


# 光學成像結果

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複合光學鏡片應用於照相手機

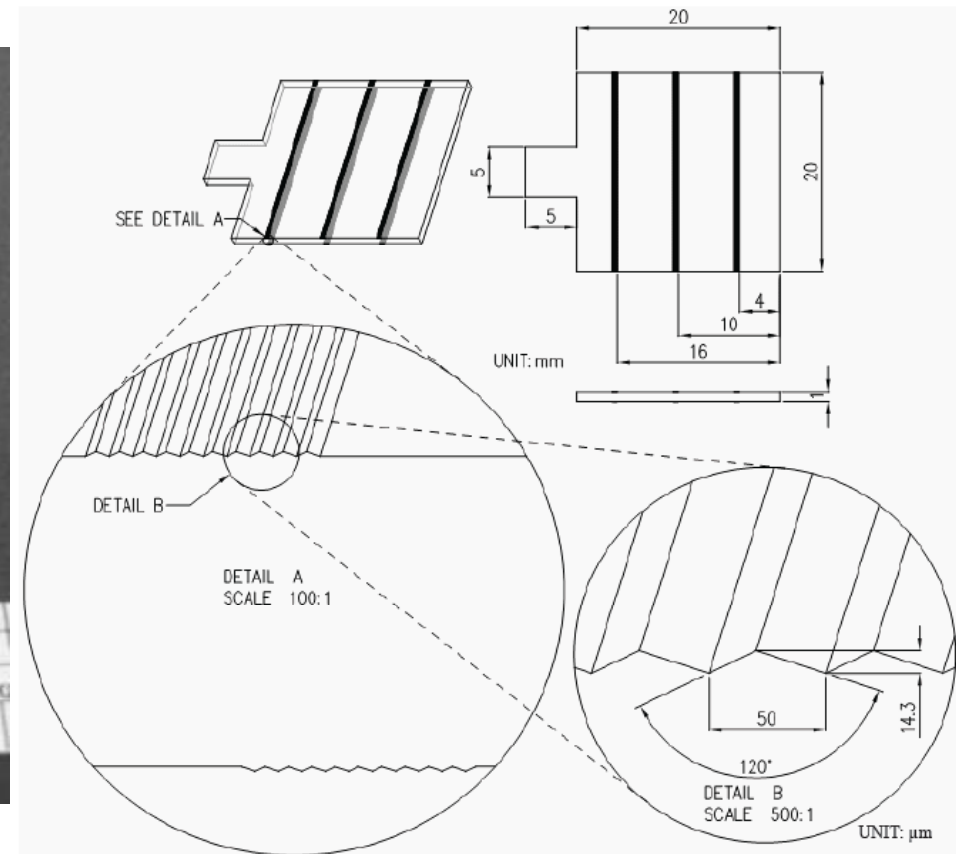
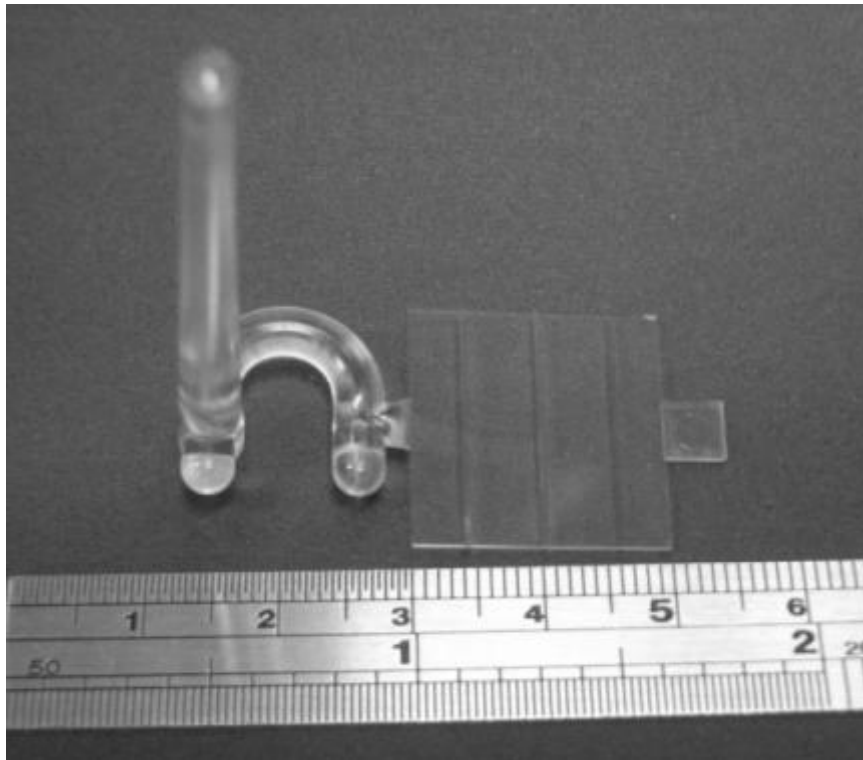


**Without HOEs**



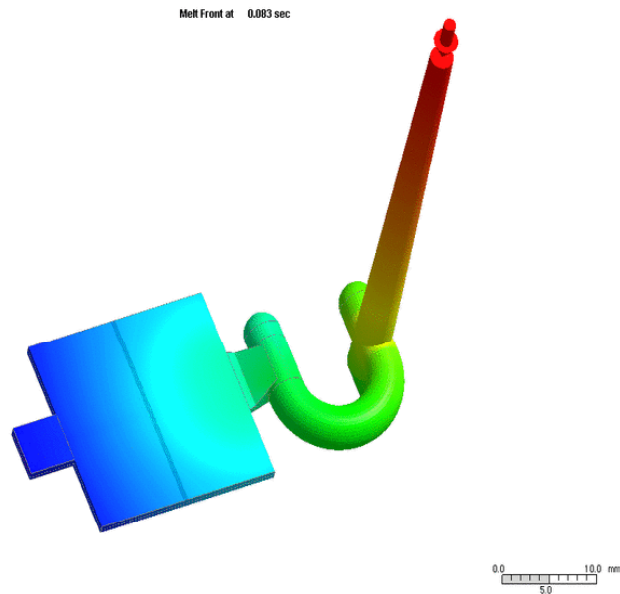
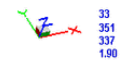
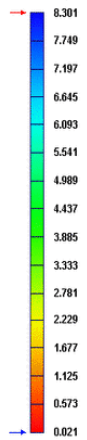
**With HOEs**

## ➤ Double-Side Micro Grooves on Thin Plate



Moldex3D

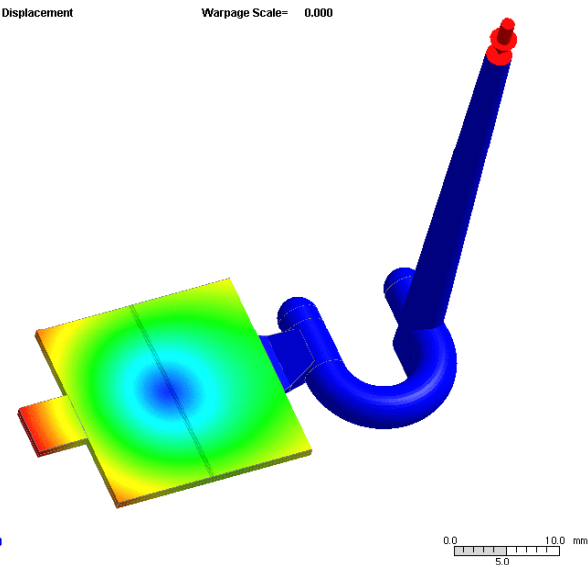
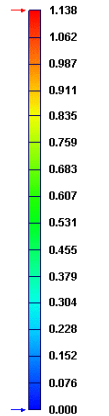
Filling\_Melt Front Time  
 $\times 10^{-2}$  [sec]



Filling: melt front time

Moldex3D

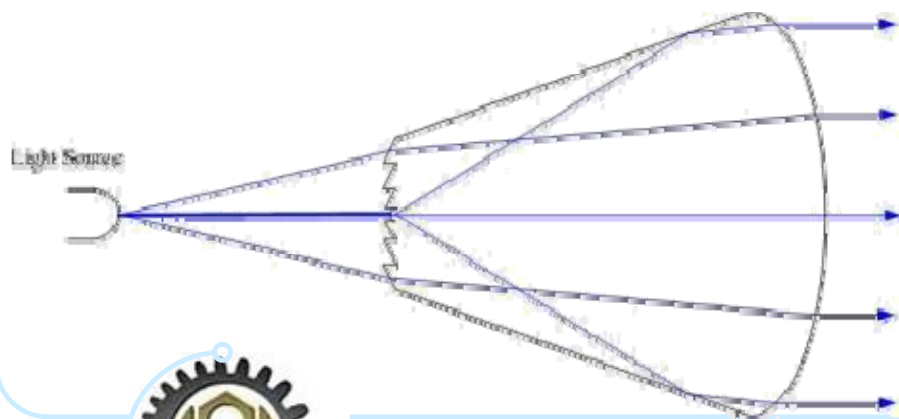
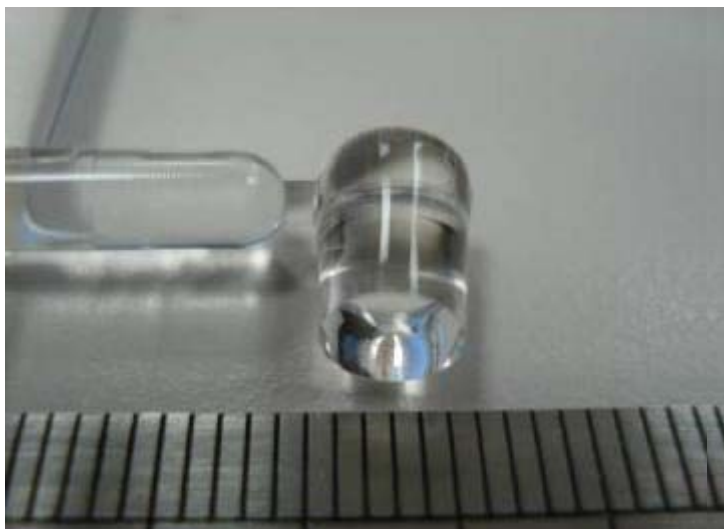
Warpage\_Total Displacement  
 $\times 10^{-1}$  [mm]



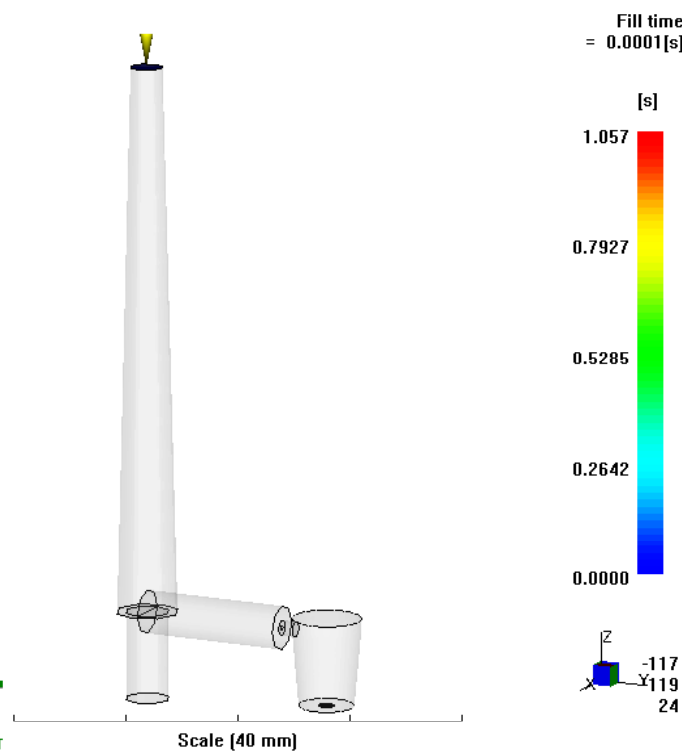
Warpage: total displacement

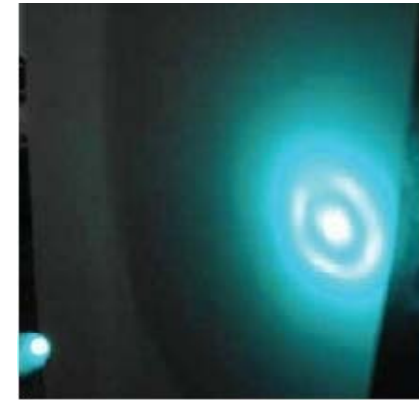


## ➤ Optical Homogenizer

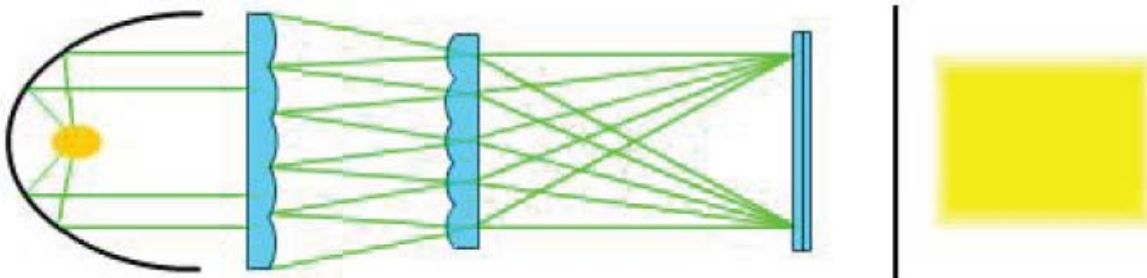


**MoldFlow**  
MOLDFLOW PLASTICS INSIGHT





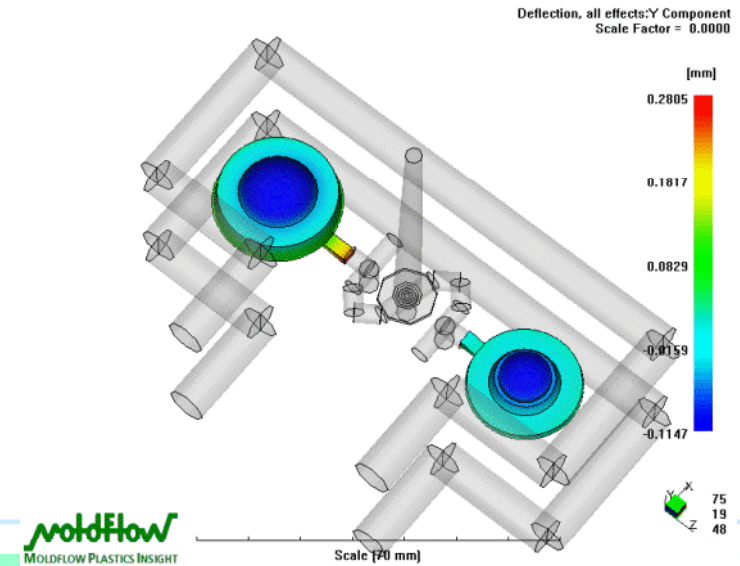
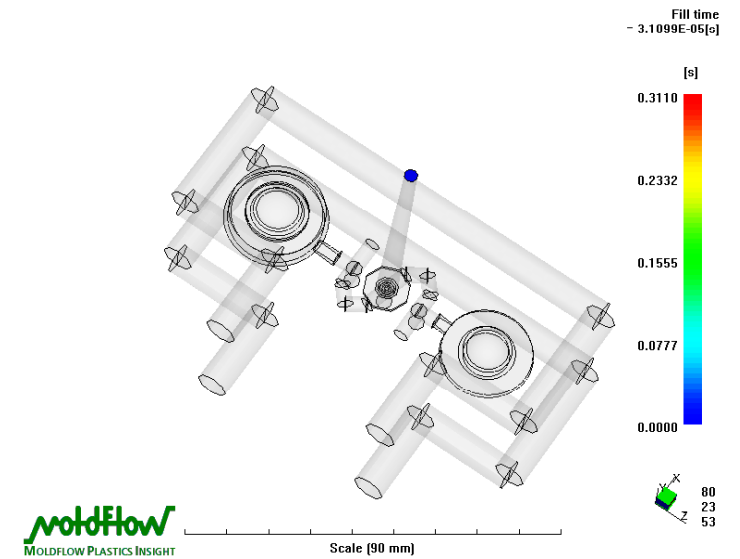
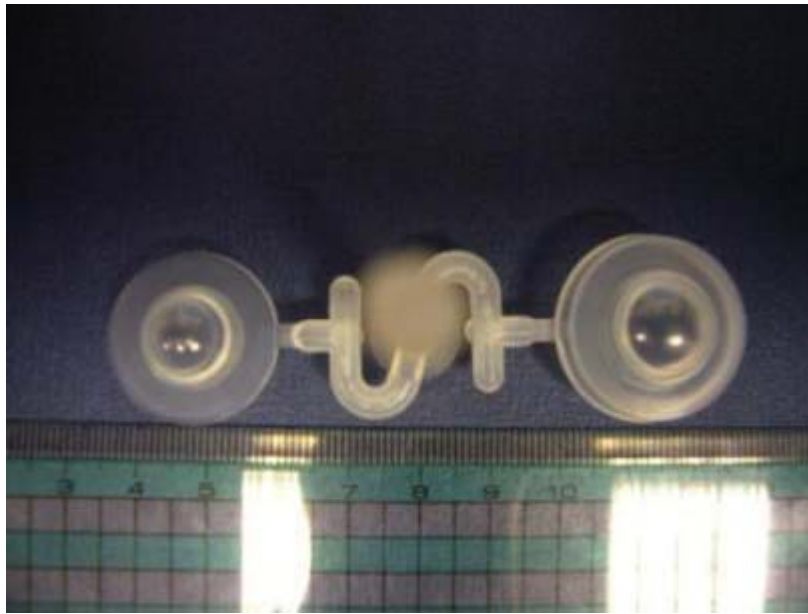
Without homogenizer



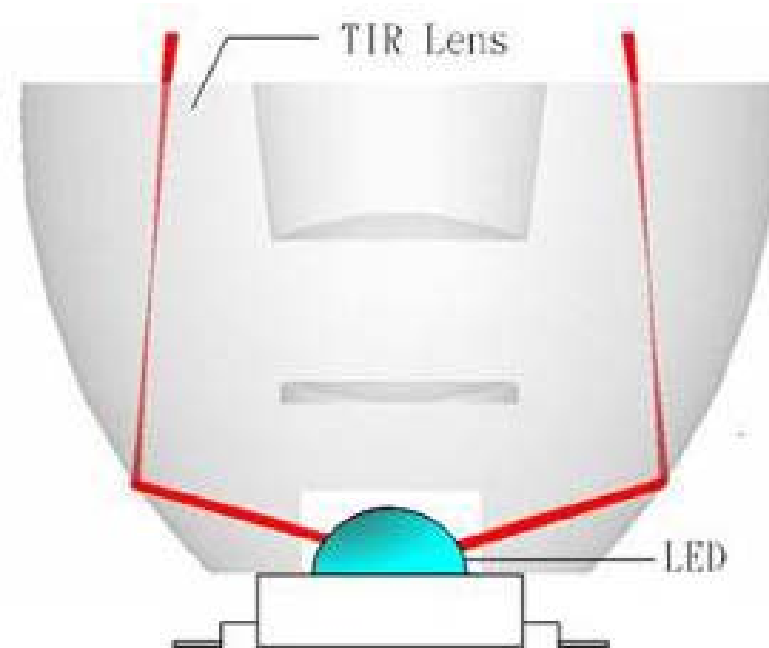
With homogenizer



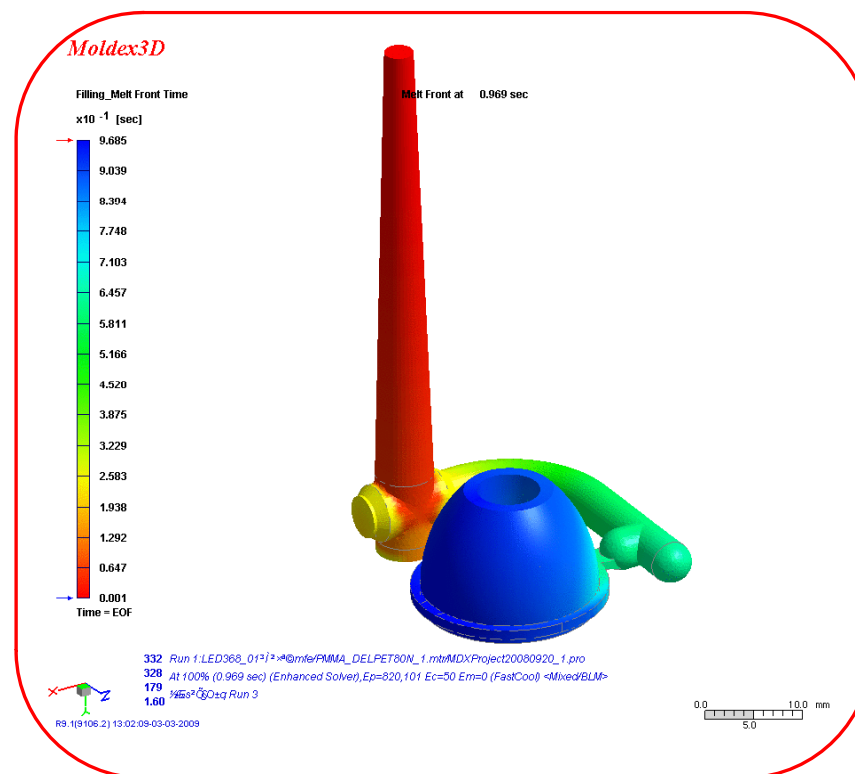
## ➤ Contact Lens Shell Mold

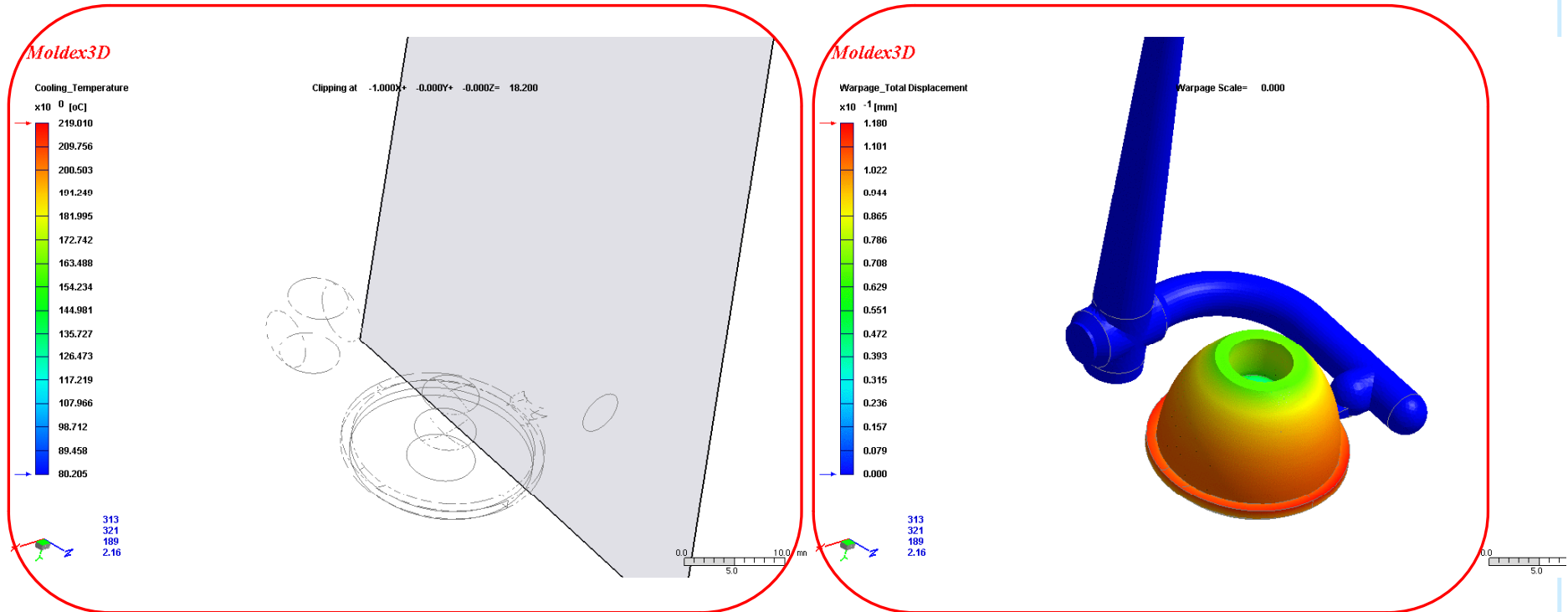


## ➤ Total Internal Reflection Lens (TIR Lens)



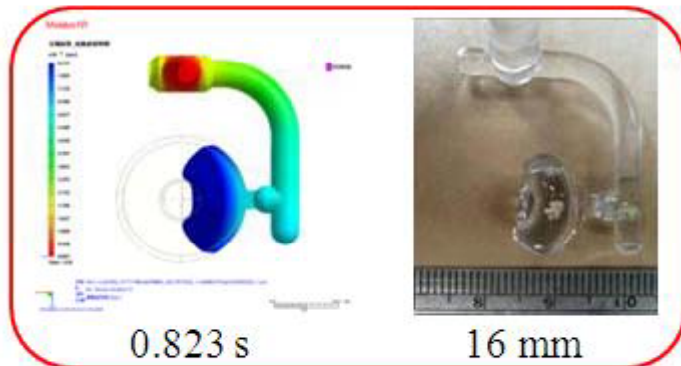
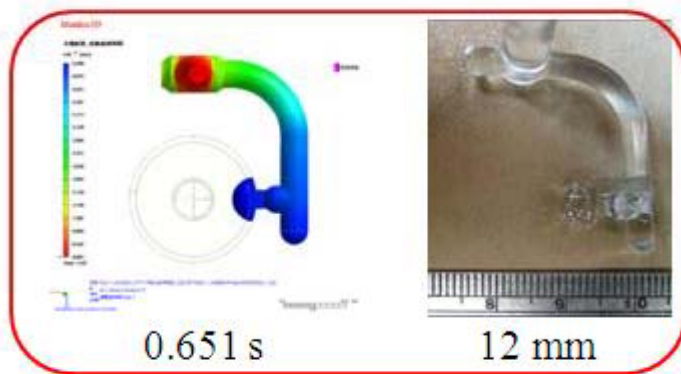
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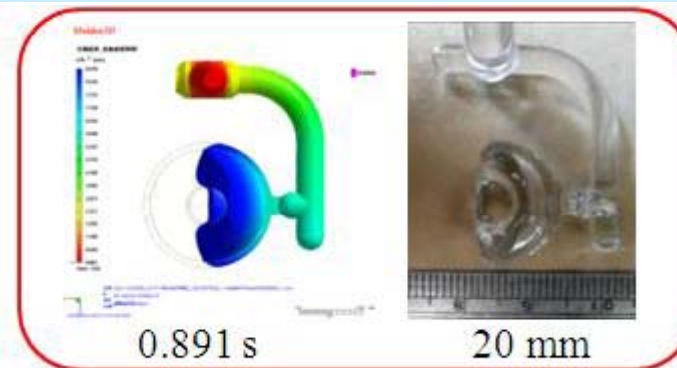


# 模流分析\_短射比對

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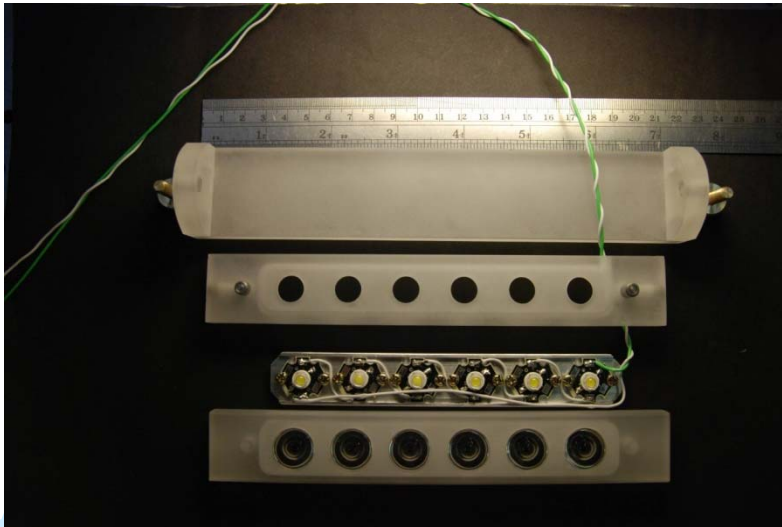
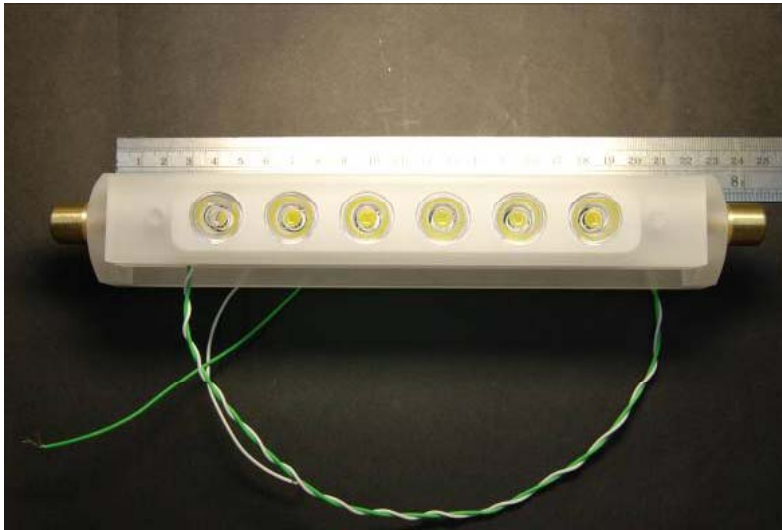


By filling time(s) and  
screw metering position(mm)



# 成品展示

*Precision Manufacturing Laboratory*



# Thanks for your kind attention!

