



Dongguan Yutong Jiuzhou Optical Co., Ltd



A stylized blue logo consisting of the numbers '0' and '1'. The '0' is formed by two thick blue curved lines, and the '1' is a solid blue vertical bar. In the center of the '0' and '1' is the text 'PART ONE' in a black, all-caps, serif font.

PART ONE

# Company Profile

# About Us



YTOT is based on optical products and integrated R&D, production, sales and after-service.

We're professional optical solution provider.

Y2011

Establishment

198k m<sup>2</sup>

Business Area

337m RMB

Capital

610k m<sup>2</sup>

Planned Area

2400

Employee

300m

Annual Capacity



# Organization



Headquarter

Dongguan Yutong Optical Technology Co.,Ltd.

R&D, Sales, After-service, Management, lens assembly, Module assembly, Glass aspheric lens production, Plastic aspheric lens production, etc.

Annual Productivity: 60m

Employees: 1900

Business Area: Approx. 88k m<sup>2</sup>



Joint Stock Company

Dongguan Yutong Jiuzhou Optical Technology Co.,Ltd.

R&D, Production and Sales of automotive lens



Subsidiary

Dongguan Yutong Automotive Vision Technology Co.,Ltd.

R&D, Production and Sales of Lidar components, HUD optical components, Smart automotive light.



Production Base

Shangrao Yutong Optical Technology Co.,Ltd.

Lens assembly, glass spherical lens&plastic aspheric lens production, 32 joint suppliers

Annual Productivity: 240m

Employees: 500

Business Area: Approx. 110km<sup>2</sup>  
(340k m<sup>2</sup> under construction)



Technical School

Jiangxi Yutong Educational Development Technology Co.,Ltd.

Business Area: Approx. 71k m<sup>2</sup>  
(under construction)



Branch XI' an



Branch Hangzhou



Office Taipei

# Market Position



The annual sales volume of YTOT has ranked 1st in the market share of surveillance lens for seven years.



(Source: TSR Lens Market Report 2021)

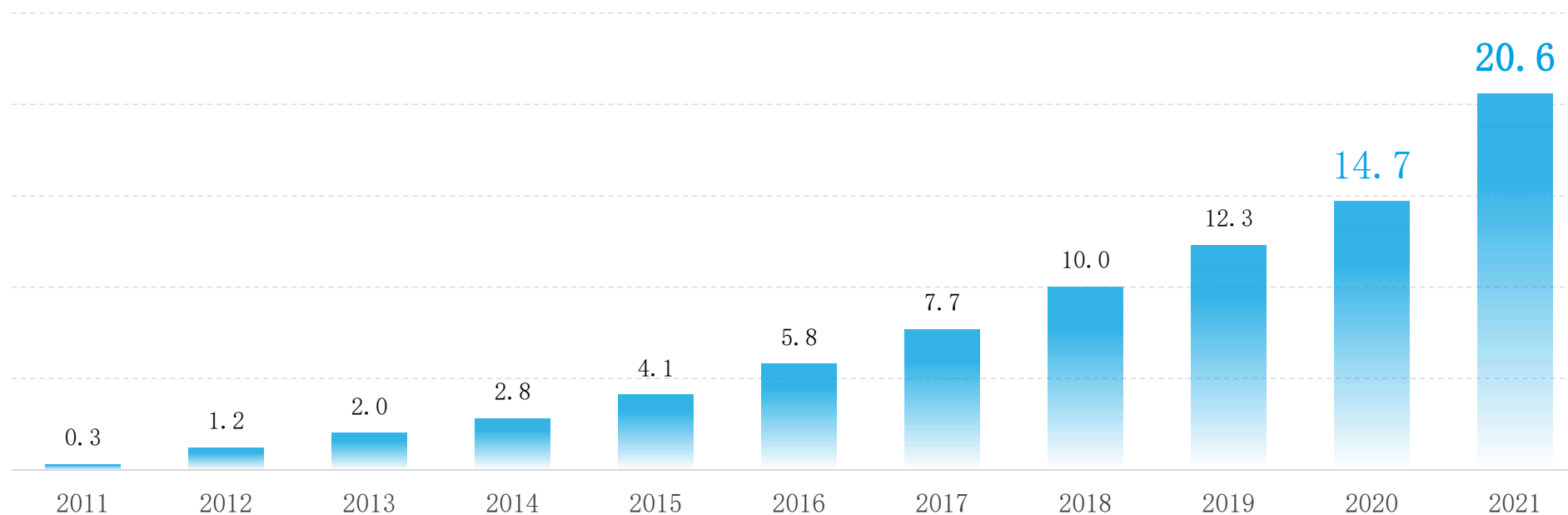
Source: a&s 'Security automation'

In 2021, the revenue was 2.06 billion

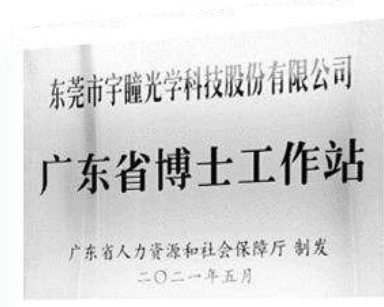
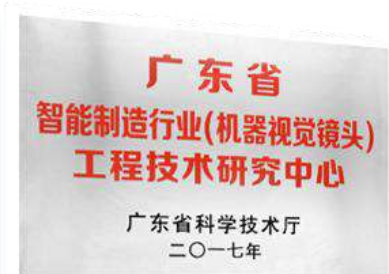
Year-on-year increase of 40.1%

2011-2021 Revenue

Unit: 100m RMB



# Awards and Honours



YTJZ

YTOT | 

YTJZ is a joint stock company subordinated to YTOT, focusing on R&D, manufacturing, sales and after-sales of mold design and manufacturing, automobile lens, precision optical components etc.

Business scope: R&D and design, automobile lens manufacturing, mold design and manufacturing, optical component manufacturing (glass aspheric lens, plastic aspheric lens, etc.)





**Automobile lens capacity plan:**

Y2022 2.6m/month

Y2023 3.2m/month

Y2024 7m/month

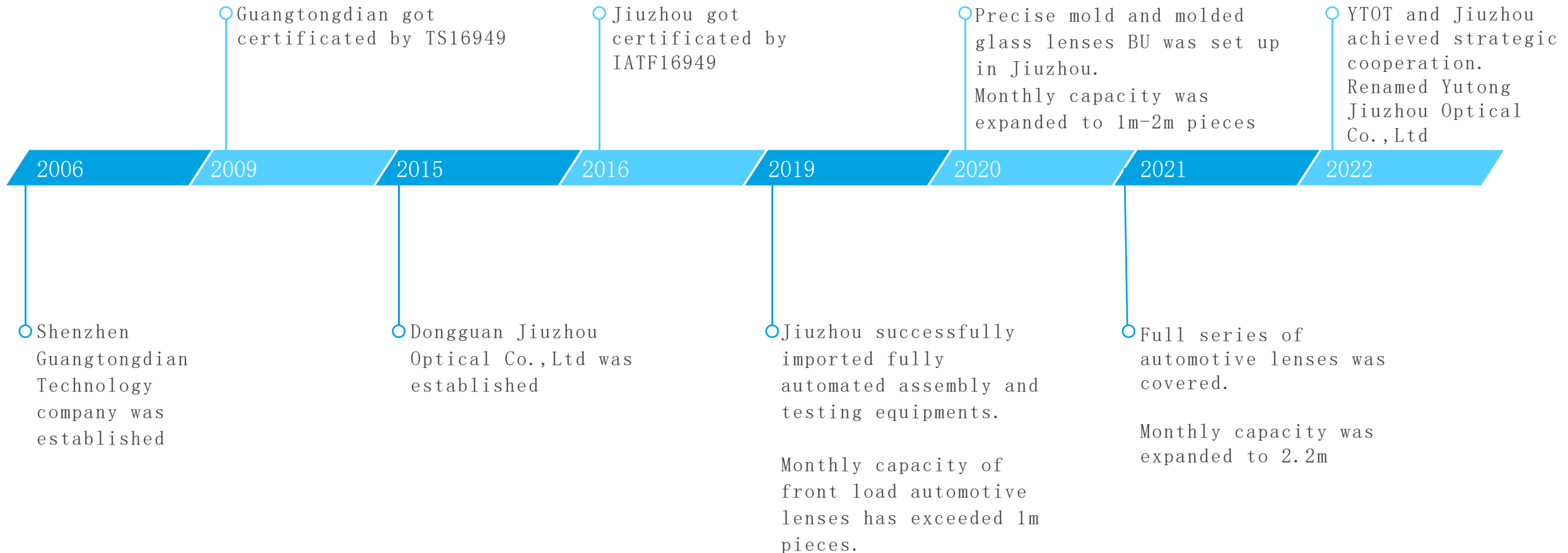


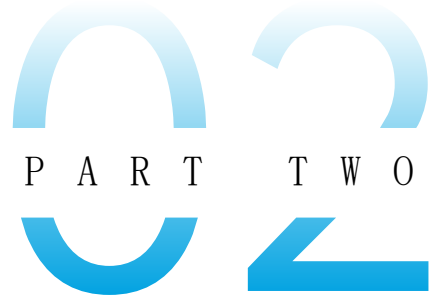
**Mold making capacity:**

Lens mold 30 sets/month

Component mold 10sets/month

# Our History



The image features a central graphic consisting of the numbers '02' in a stylized, blue, sans-serif font. The '0' is a simple open circle, and the '2' has a thick, blocky base. In the center of the '02' graphic, the words 'PART TWO' are written in a smaller, black, all-caps, serif font, with 'PART' and 'TWO' separated by a space.

PART TWO

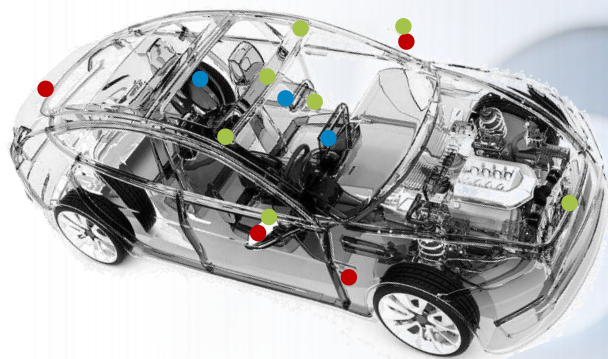
Business Unit

# Automotive Lens



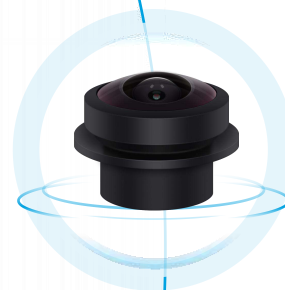
## Empowering Automotive Vision

Offer automotive lens and full lens related optical solutions



### Front view applications

- Forward collision warning
- Lane departure warning
- Traffic Sign Recognition
- Automatic cruise control
- Pedestrian detection



### Rear/surround view applications

- Park Assist
- Panoramic system
- Blind spot monitoring
- Digital rearview mirror



### In cabin applications

- Behavior detection
- Behavior recognition
- Driving records
- Crew monitoring

# Partnership



End users

YTOT | 





R&D Technology

# R&D Technology

Our R&D technology center has always adhered to independent innovation, mastered the core technology of the industry, established the industry-university-research cooperation system, and accelerated the company's technology regeneration and improved the transformation efficiency.



95 persons in R&D team



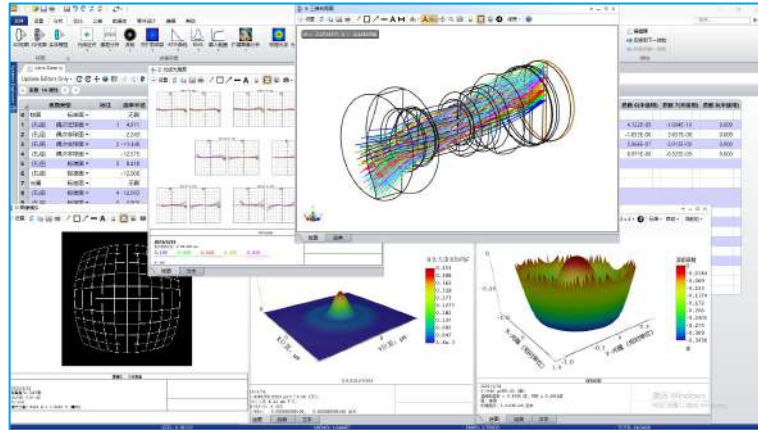
90 patent authorizations obtained

Including 18 invention patents, and 72 utility model patents

	Optical design	Structure design	Production technique	Engineering technique	Intelligent equipment
Staff	7	6	16	20	12
>5 yrs experience	4	2	11	6	5
>10 yrs experience	2	2	6	5	4
Technology consultant	Cooperation with several domestic universities				



# Optical design softwares



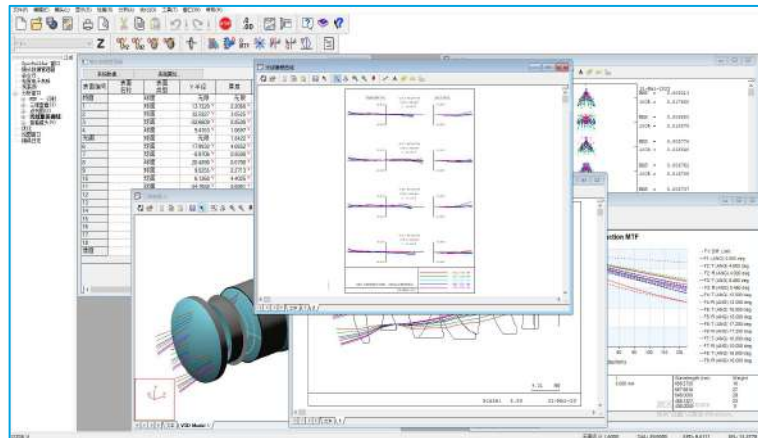
ZEMAX OpticStudio®

Optical, lighting, and laser system design software.

Optical product design and simulation.

Construct complex free-form surfaces and non rotational symmetric systems.

Manufacturing and assembly limitations are incorporated into constraints to ensure manufacturability and production efficiency.



CODE V

Unique global optimization intelligent algorithm

Powerful and efficient beam synthesis propagation algorithm for diffraction analysis

Quickly and accurately build products

Breakthrough innovation and precise beam propagation analysis

Built in extensive optical system models

# Simulation Software~ASAP



ASAP®Powered by ASAP's non sequential ray tracing engine – known throughout the optical industry for its accuracy and efficiency:

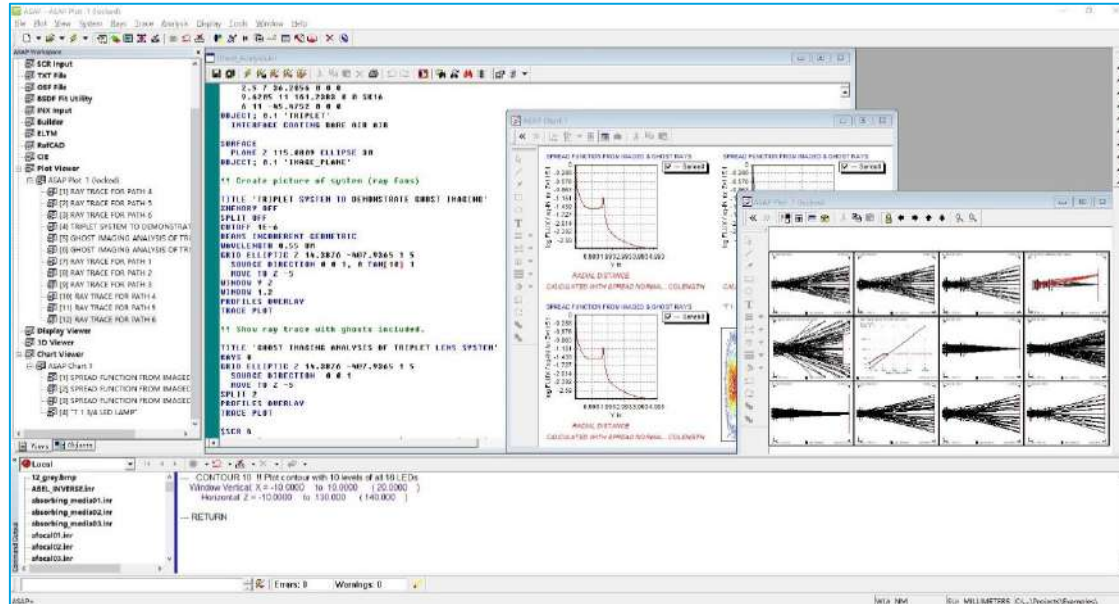
Light can meet the surface in any order and any number of times, with automatic light splitting and/or scattering function.

By optimizing speed through Core Max parallel processing technology, ASAP will track millions of rays in just a few minutes.

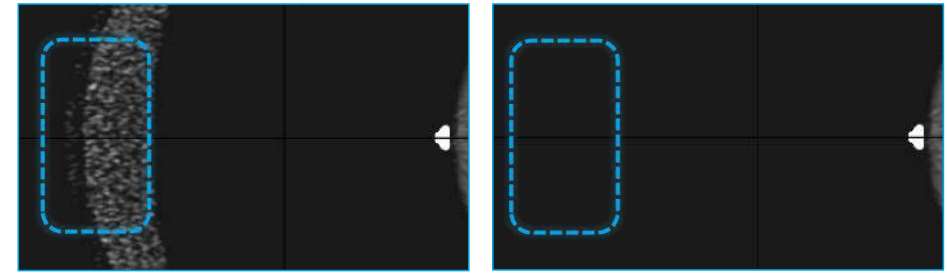
Use ASAP to model complex imaging systems, lighting systems, and spotlight equipment.

Create a highly accurate source model using source images, point lights, ray grids, and ray fans.

Import an XML file or use the BRO proprietary smartIGES™ The CAD converter imports system models from 3D CAD software packages while maintaining fast and efficient ray tracing speed.



Ghost and flare analysis of optical systems, with an accuracy of up to 90% and a predictability of 95%.



Before analysis and improvement

After analysis and improvement

# Simulation Software ~ Ansys

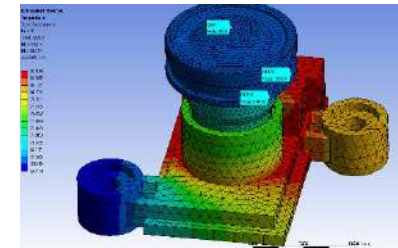
Ansys Mechanical can help to solve complex structural engineering issues, and make better and faster design decision. With the finite element analysis (FEA) solver provided in the kit, you can customize and automate solutions to structural mechanics problems, and parameterize them to analyze multiple design solutions.

Easy to use, multi-functions tool

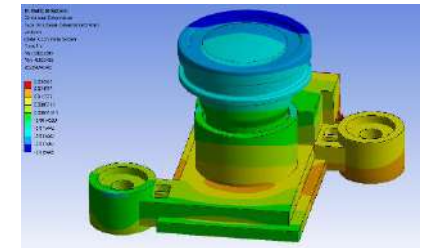
Durable, reliable, precise solver

Dynamic and integrated platform

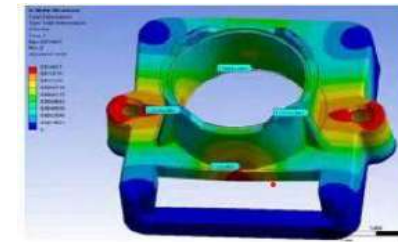
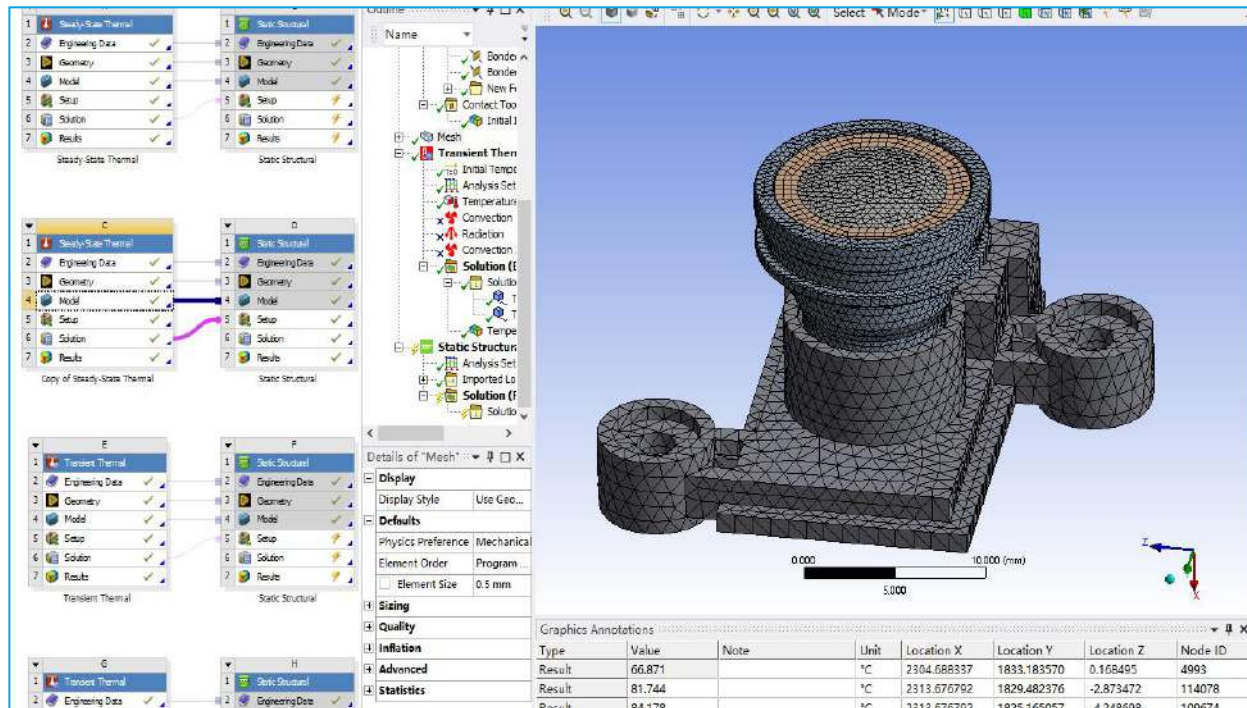
Powerful nonlinear and linear solvers



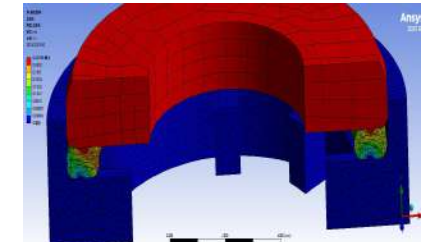
Thermal analysis



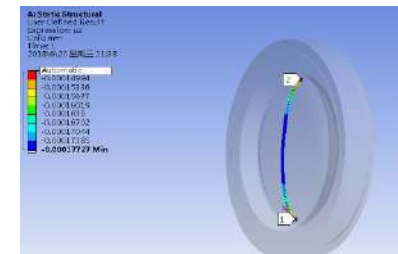
Stress analysis



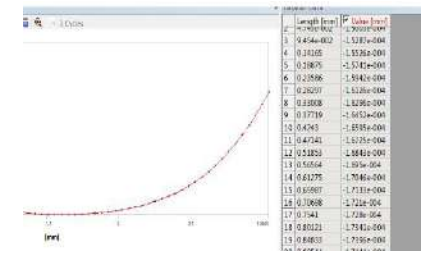
Stress analysis of the base



Stress analysis of sealing ring



Stress analysis of plastic lens



Stress analysis of plastic lens



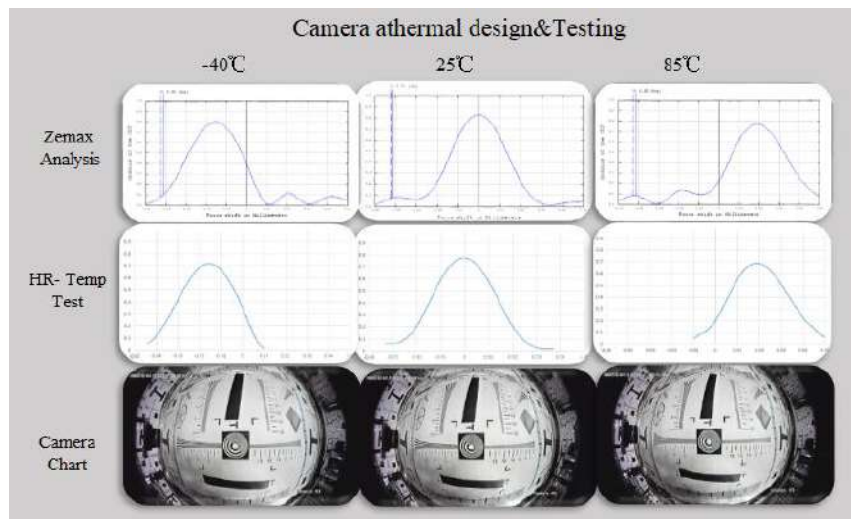
## ImageMaster® HR TempControl

Many optical systems are used under very wide temperature range (such as lens and module) and must always keep the full functionality and performance. Athermal design should minimize the thermal impact on optomechanical parameters as much as possible.

Athermal optical design function test

Temperature range: standard:  $-10\text{ }^{\circ}\text{C}$  to  $120\text{ }^{\circ}\text{C}$ , promotion:  $-40\text{ }^{\circ}\text{C}$  to  $120\text{ }^{\circ}\text{C}$

To measure optical performance of a set of parameters



Temperature range: standard:  $-10\text{ }^{\circ}\text{C}$  ~  $100\text{ }^{\circ}\text{C}$  promotion:  $-40\text{ }^{\circ}\text{C}$  ~  $120\text{ }^{\circ}\text{C}$

Max off axis angle:  $\pm 70^{\circ}$

Max image height:  $\text{Min} \pm 25\text{mm}$

EFL of sample: 2.5mm

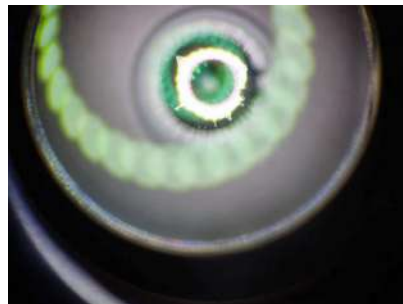
Non rotatable wavelength of Azimuth VIS:  $450 \sim 750\text{nm}$  Middle wave

infrared:  $3 \sim 5\mu\text{m}$

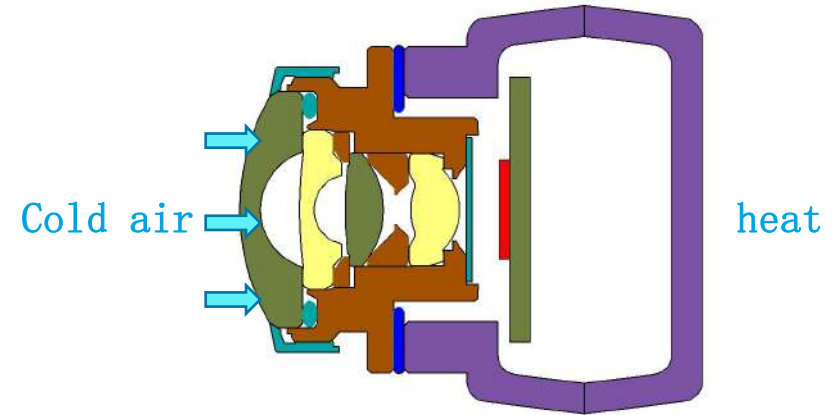
# Defogging technology ~ Coating solution



Normal coating lens



Lens with anti-fog coating



	NO.	Test condition	Time of spreading ice water	Result		
				Visual test	Observe by microscope	Real shot
Plastic base + plastic barrel	1#	+85°C 85%RH & 100H	10s	OK	flat water spot	slight blurry at center(<9min)
	2#			OK	flat water spot	slight blurry at center(<8.5min)
	3#			OK	flat water spot	slight blurry at center(<9.5min)
	4#	+55°C 93%RH & 100H	5s	OK	flat water spot	slight blurry at center(<3.5min)
	5#			OK	flat water spot	slight blurry at center(<4min)
	6#			OK	flat water spot	slight blurry at center(<4min)

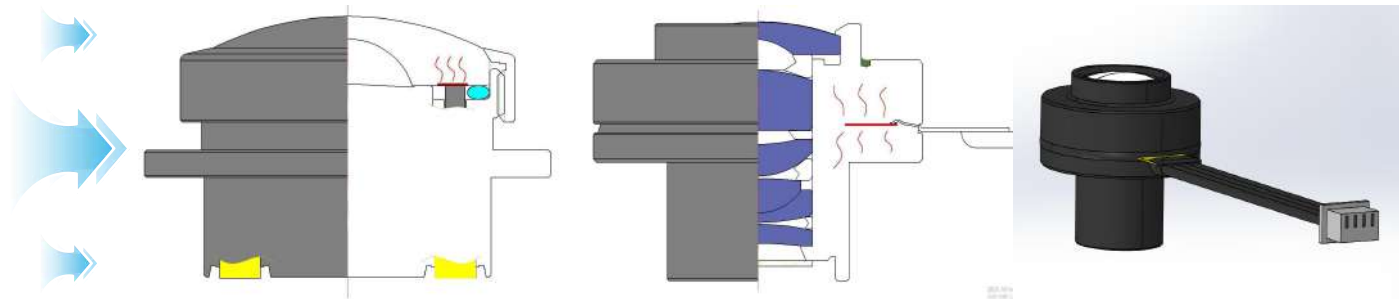
# Defogging technology ~ Heat solution



Frost









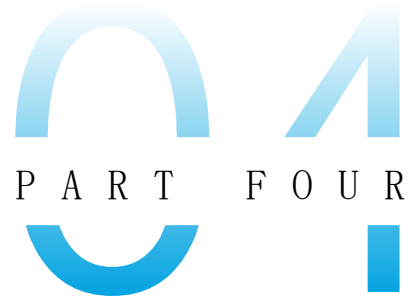
Ice



G1 lens heat solution

Lens cap heat solution

Heat type	Test temperature	Voltage	Time of defrosting		
Lens cap heat solution	-40°C	2.4W			120s
	-30°C	1.0W			240s
G1 lens heat solution	-30°C	1.0W			140s

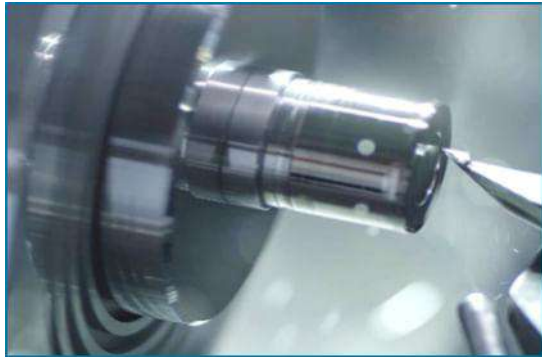
A stylized blue logo consisting of the numbers '0' and '4'. The '0' is formed by two thick blue curved lines, and the '4' is formed by two thick blue straight lines.

PART FOUR

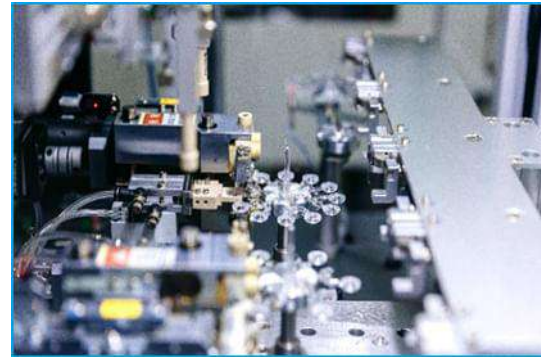
P r o d u c t i o n  
M a n a g e m e n t

# Fully industrial chain capacity

Lens and lens element are manufactured fully in house



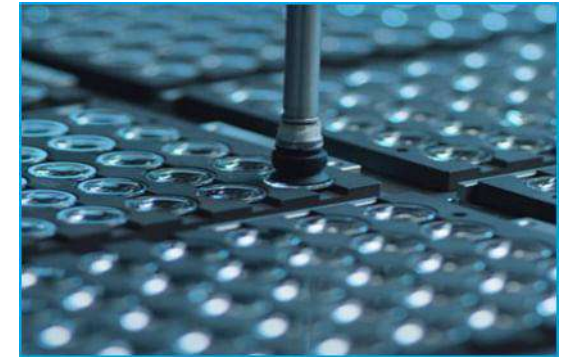
Precise mold manufacturing



Plastic aspherical lens



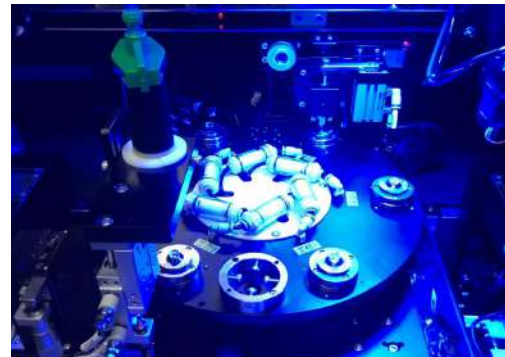
Component forming



Glass aspherical lens



Coating



Glueing



Inking



Automated production



# Ultra precise mold center

Import world-class advanced mold processing equipments

Ensure the precision of optical components from beginning

30+ advanced mold processing equipments

Equipment	Supplier	Origin	Precision
Ultra precision single point diamond lathe	INNOLITE	German	Ultra high-speed free form surface, surface shape PV<0.5 μm
Ultra precision aspheric processing lathe	Toshiba	Japan	Mold core PV0.15 μm, surface roughness 7~10nm
NC processing center	ROKU-ROKU	Japan	±1 μm, surface roughness<50nm
Hauser coordinate grinder	Hardinge	Swiss	roundness 0.3, cylindricity 0.7 μm
NC internal and external grinding machine	SEIBU motor	Japan	roundness 0.3, cylindricity 0.5 μm
Precision automatic grinding machine (large water mill)	Okamoto	Japan	Parallelism, flatness<1 μm



# Automated production of plastic aspherical lens



Capacity  
80m/month

Yield  
99.99%

Dust free plant  
10000 level

Equipments  
Mechanical arm,  
automatic  
cutting machine

FANUC  
161pcs of  
injection  
machines

Sodick  
150pcs of  
injection  
machines

Automated production of glass aspherical lens



100+ sets

Precision molding  
automation equipment

Above 2m

Monthly capacity

# Coating capacity for lens



Dust free  
plant  
1000/10000 class

Capacity  
80m/month

Yield  
98%

Transmittance  
Max 99. X%

Equipment  
OPTORUN, HITACHI

Software  
TFC、 Macleod

Coating  
Diameter  
Max  $\Phi$ 1700mm

Mixed coating  
AR, UV/IR-cut and  
ITO



# Assembly Process



①Automatic assembly



②Cap locking



③Looseness test



④Apperance



⑤Cap glueing



⑥Roast



⑦Air tight test



⑧IR assembly



⑨IR glueing



⑩IR UV



⑪Flare test



⑫MTF test



⑬Lens coding



⑭QC appearance



⑮QA apperance



⑯Lens packing

The logo consists of the numbers '0' and '5' in a stylized, blue, sans-serif font. The '0' is formed by two thick blue arcs, and the '5' is formed by two thick blue arcs. The background features a series of concentric, light blue circles that create a tunnel-like effect.

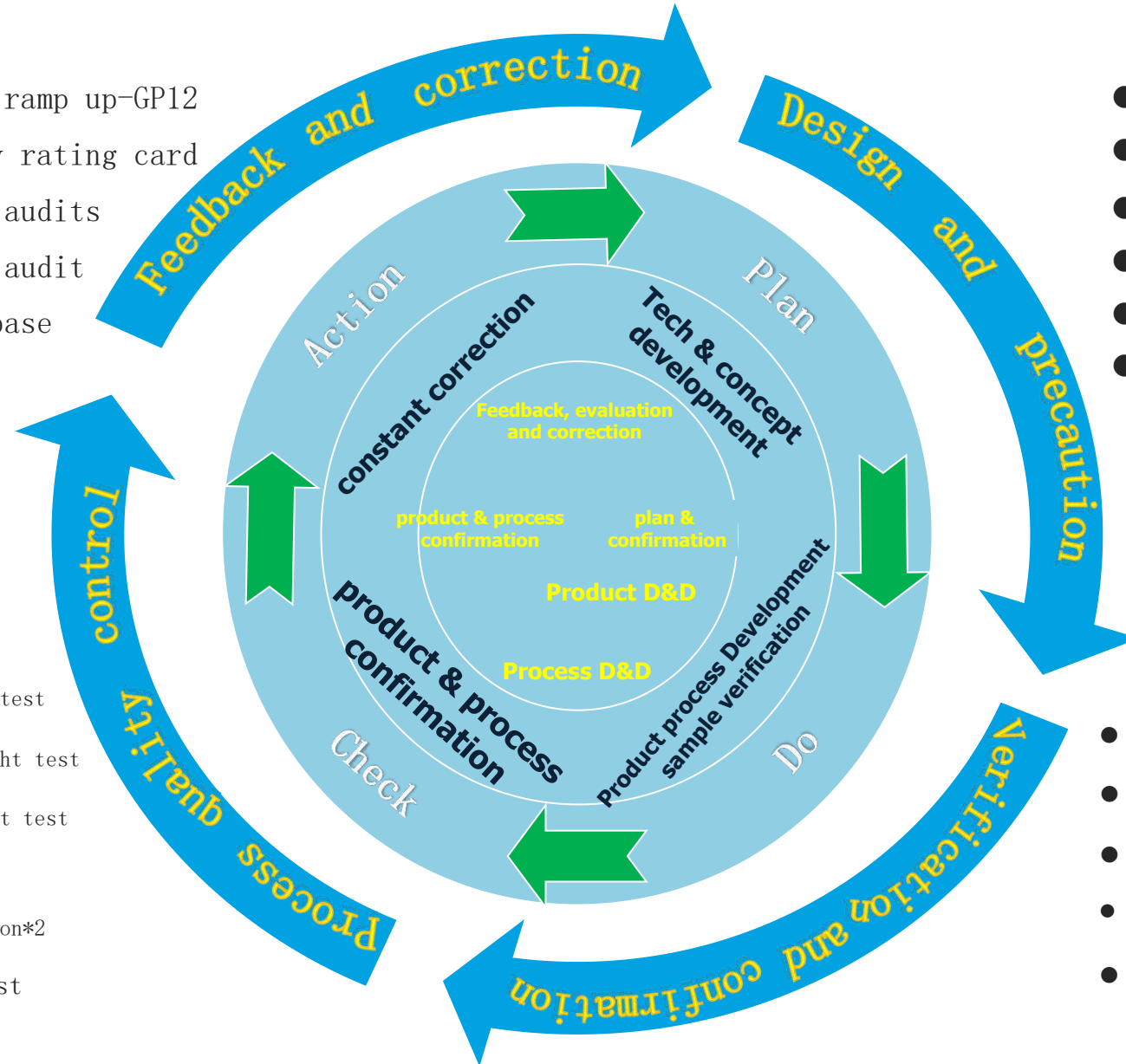
05

PART FIVE

Quality Management

# Full process and orientation quality control loop **YTOT**

- Mass production ramp up-GP12
- Customer quality rating card
- Regular product audits
- Regular process audit
- Experience database



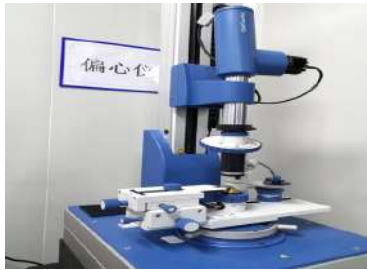
- FMEA
- Flare and ghost analysis
- Athermal Analysis
- FEA
- GD&T analysis
- Moldflow Analysis

- 100% automatic height test
- 100% automatic air tight test
- 100% visual water tight test
- 100% MTFtest \*2
- 100% lighting inspection\*2
- 100% appearance test

- DOE design and verification
- Zeiss 3D measurement
- Trioptics MTF、OC3D measurement
- Corner integral evaluation of flare and ghost
- Automotive regulation DV verification

# Testing equipment and capacity

Imported world first-class equipment and professional team  
Provide comprehensive high-precision testing



High precision test equipment	Brand	Model	Qty	Testing Functions
UV/Visible/Near Infrared Spectrophotometer	Hitachi	UH-4150	2	Spectral range of UV/visible/near-infrared spectroscopy detection: 240nm-2600nm
Eccentric testor	Trioptics	OptiCentric 100	6	Lens center deviation and curvature radius Lens group center deviation, lens spacing, and center thickness
Refractive index measuring instrument	Shimadzu	KPR-3000	1	optical material refractive index evaluation(transmitting plastic and glass)
Ultra high-precision 3D optical testor	Panosonic	PED-1610H302UA3P-300 etc	6	Lens surface shape, inter face eccentricity, sagittal height, surface roughness, outer circle eccentricity, inner diameter, outer diameter, R-value, coaxiality, true roundness, perpendicularity, etc
Ultra high-precision 3D optical testor	Panosonic	UA3P-400T	4	Lens surface shape, inter face eccentricity, sagittal height, surface roughness, outer circle eccentricity, inner diameter, outer diameter, R-value, coaxiality, true roundness, perpendicularity, etc
3 coordinate measure machine	Zeiss	MICURA CONTURA	3	Geometric dimension, parallelism, perpendicularity, coaxiality, flatness, assembly supporting role, concentricity, etc
Lens stress tester	Ryokosha	WPA-200	1	Lens optical stress layout
Temperature controlled MTF measuring instrument	Trioptics	ImageMaster HR TempControl	5	On axis optical transfer function MTF, off axis optical transfer function MTF, defocused optical transfer function MTF, effective focal length EFL, main beam angle, distortion, astigmatism, field curvature and other temperature ranges: -40~120°C
Optical transfer function measuring instrument	Trioptics	ImageMaster HR	2	On axis optical transfer function MTF, off axis optical transfer function MTF, defocused optical transfer function MTF, effective focal length EFL, phase transfer function PTF, line spread function LSF, main beam angle, relative illumination, field of view angle, distortion, astigmatism, etc
Industrial CT testor	Zeiss	METROTOM800/130KV	1	CT non-destructive scanning, geometric measurement, CAD digital analog comparison, reverse engineering can scan plastic parts, low-density metals, output 3D data



# Reliability experiment equipment and capacity



The reliability laboratory is in CNAS trial operation, providing various reliability experiments required by the vehicle regulations for our products to ensure their stability and development.



Thermal shock testor



Vibration testor



IPX9K waterproof testor



Xenon lamp aging machine

High precision equipment	Model	Qty	Test functions
Constant temperature and humidity testor	HYB-TH-80DH-3 ...	25	High and low temperature duration high temp and humidity, temp and humidity circulation
Thermal shock testor	JD-10/300X300/SBM-3、15-1200G、WHTST-100L-40-2W...	7	Thermal shock, fast speed temp
Light aging testor	W-UV3、HYB-1021	2	Xenon lamp aging (including spray) UV accelerated aging
Salt spray testor	W-CS60、W-CS90E	4	Neutral salt spray test Acid salt spray test
IPX9K water proof testor	IPX9K	1	IPX9K water proof test
IPX78 rain testor	W-LYX78	1	IPX7 water proof test
Sand and dust testor	W-SC500-IP6	1	Lens film friction resistance test
Crushed stone impact testor	HYJ-SS01	1	Lens film friction resistance test Lens strength test
Three comprehensive vibration testor	JD-300/SZ300/TH-180DH	2	Vibration test
High acceleration impact testor	JD-10/300X300/SBM-3、Qualmark 2.5	2	Normal vibration test Vibration test with thermal condition
Single arm drop testor	HY1050	1	Drop test
Steam aging testor	W-ZQ1	1	Lens film adhesive test
Lens friction resistance testor	R-NMC-1	1	Mane brush test, film hardness test

# FA analysis capacity

## Appearance and inner appearance

High power electron microscope, industrial CT-inner visible

## Optical precision test

Performance of flare and ghost under general working conditions or in dark rooms or strong light conditions

Multiple Trioptics devices comprehensively detect the optical parameters of the lens, such as real-time tracking of MTF variables under temperature changes

## Reliability test

Multiple experiments on the interaction between temperature and relative humidity

Light aging, mechanical shock and vibration

Sealing test, chemical reagent resistance test

## Professional and orderly dismantle

Dismantle malfunction product piece by piece, measure and record each part

Minitab and other analysis tool, to find out the rule and generality

## Recover malfunction product

Duplicate malfunction product

Simulate malfunction working condition, show the appearance of the malfunction through duplication

To offer theory support for malfunction reason

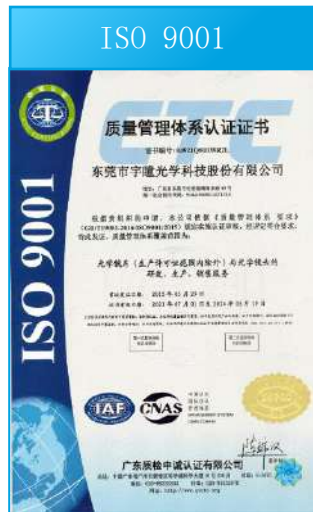
## Ascertain the true cause

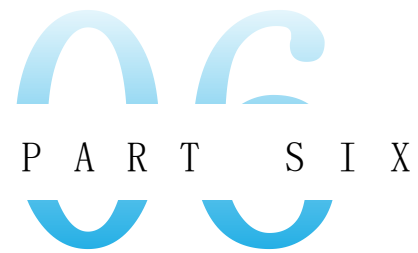


# Management system certification



Our company has passed management system certification in areas such as **quality**, **environment**, **automobiles**, **occupational health**, **social responsibility**, **hazardous substances**, **intellectual property**, etc.

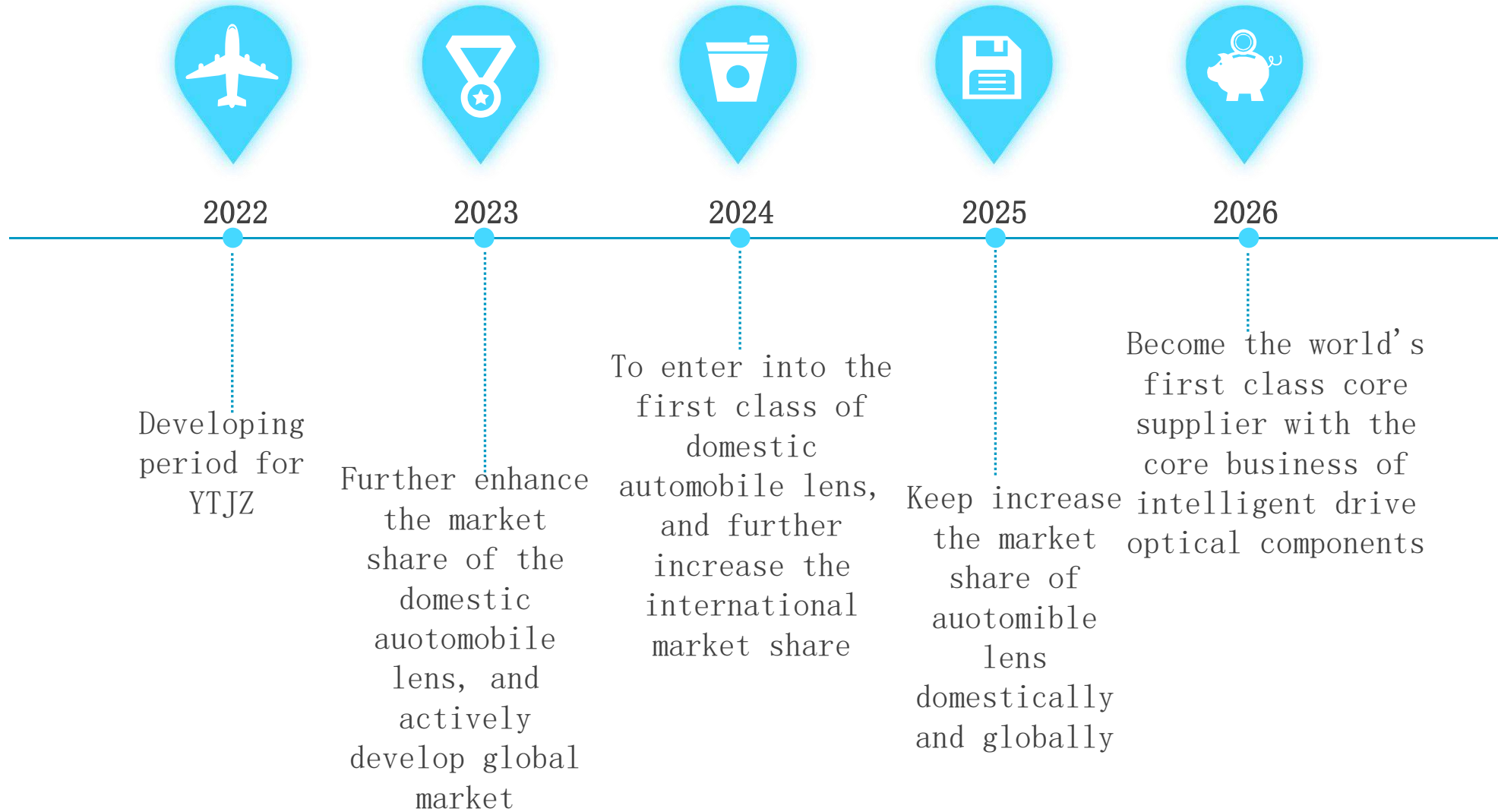




P A R T S I X

Future plan

# Future plan



YTOT | 

# 宇纳百川 瞳观四海 超越眼界 遇见未来

E m b r a n c e t h e w o r l d V i e w t h e u n i v e r s e  
e x c e e d t h e l i m i t o f e y e s f o r e s e e t h e f u t u r e

[www.ytot.com](http://www.ytot.com)

