POLISH UP the WORLD!

Crystal Optics

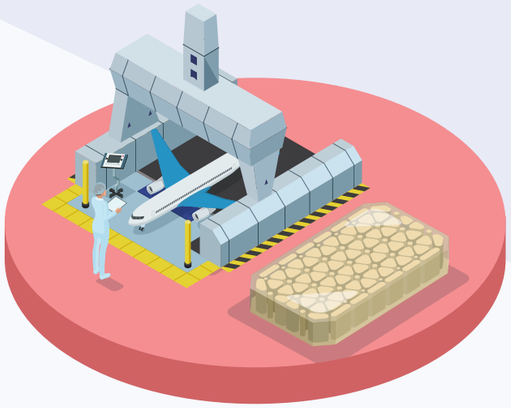
Crystal Optics

CORPORATE PROFILE



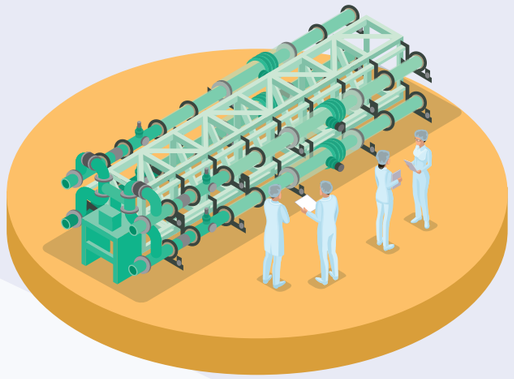


POLISH UP the WORLD!



SPACE INDUSTRY / AIRCRAFT EQUIPMENT

P.03



NEW ENERGY

P.04



SEMICONDUCTOR / FLAT PANEL DISPLAY / ELECTRIC BATTERY

P.05

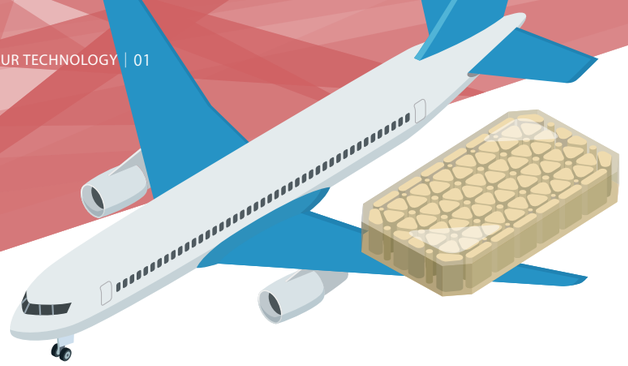


OPTICS / MEDICAL CARE

P.06

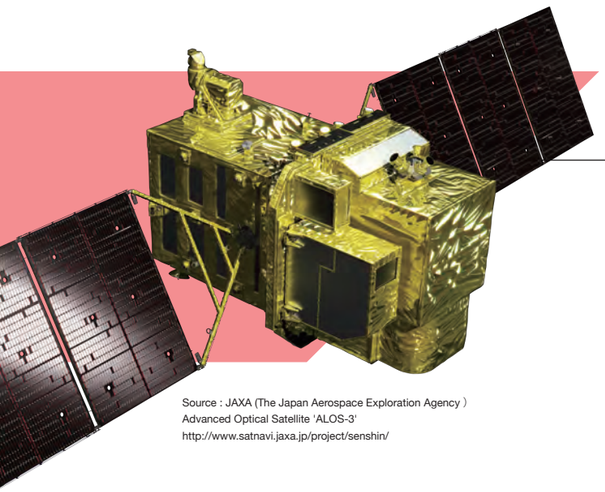






SPACE INDUSTRY / AIRCRAFT EQUIPMENT

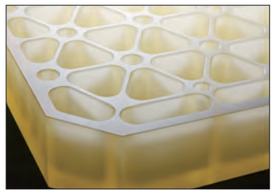
Ultra-processing technique
for next-generation space observations



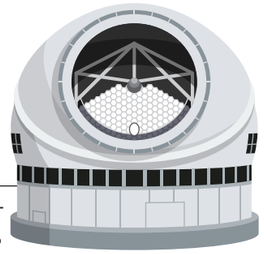
Source : JAXA (The Japan Aerospace Exploration Agency)
Advanced Optical Satellite 'ALOS-3'
http://www.satnavi.jaxa.jp/project/senshin/

01 | Optical Satelite

We produced Large Diameter Mirror, which was loaded into Advanced Optical Satellite (ALOS-3) of JAXA.
We measured length among mirrors and adjusted alignment.

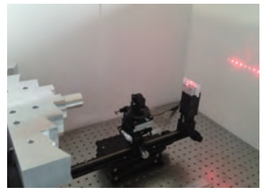


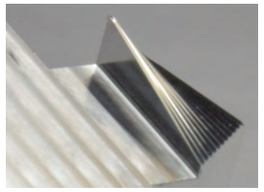
Glass rib structure processing

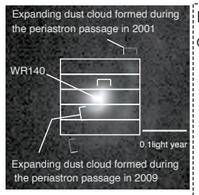


02 | The Thirty Meter Telescope International Observatory

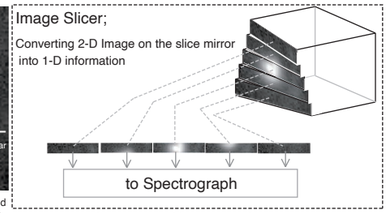
A trial production of a large-format image slicer unit studied for a thermal infrared instrument concept for the TMT
(co-developed with Dr. Itsuki Sakon Assistant Professor Department of Astronomy, Graduate School of Science, University of Tokyo) Source : University of Tokyo







The periodic dust formation site around evolved massive star Wolf-Rayet 140



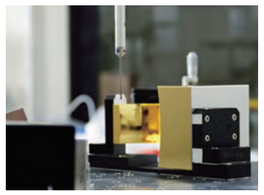
→ Valid integral field unit technique in the mid-infrared

03 | The University of Tokyo Atacama Observatory Project (TAO)

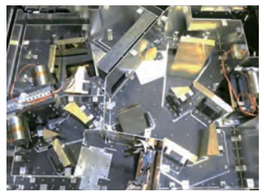
Producing MIMIZUKU : Mid Infrared Multi-field Imager for gaZing at the UnKnown Universe
(co-developed with Dr.Takashi Miyata Professor Institute of Astronomy, University of Tokyo) Source : TAO project,University of Tokyo



MIMIZUKU loaded into Subaru Telescope.



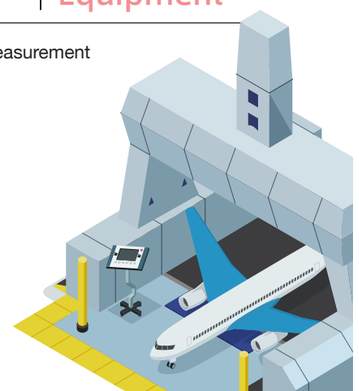
MIMIZUKU assembles mirrors on-machine, measuring and adjusting optical path .

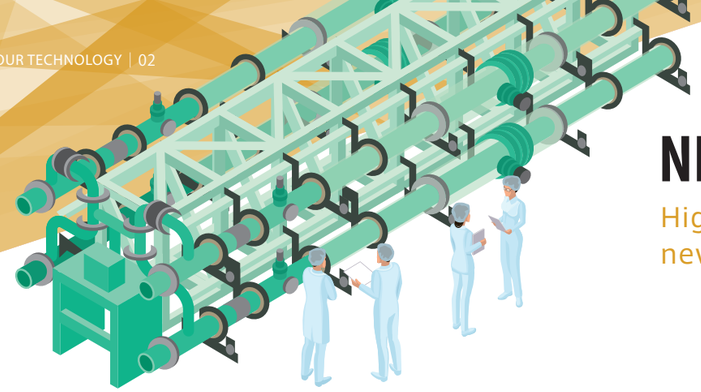


We processed 50 mirrors including plane mirror, aspherical mirror, freeform mirror.

04 | Aircraft Equipment

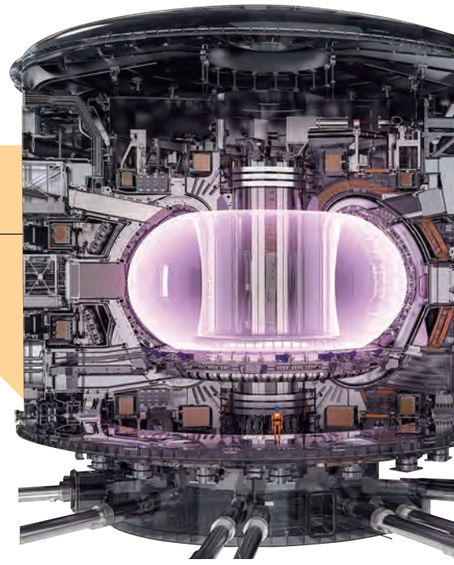
Measurement





NEW ENERGY

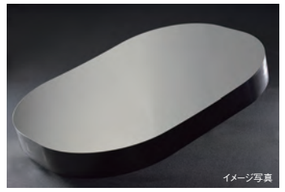
High-precision polishing creates
new energy technology



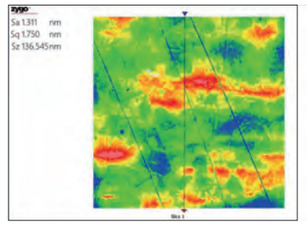
Credit ©ITER Organization, http://www.iter.org/

01 | Development mirror for ITER
"International Thermonuclear Experimental Reactor" project

We made a high precision metal mirror using as a measuring instruments.



Toroidal mirror
Material : SUS316L
Size : 400x300mm



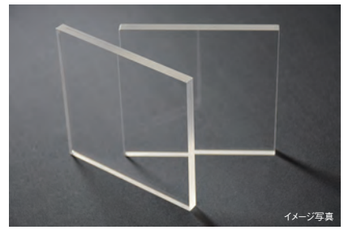
Surface roughness : Sa 1.31nm RMS 1.75nm
Measurement instrument : Zygo NewView8300

02 | Institute of Laser Engineering, Osaka University GEKKO XII LFEX
(Laser for Fast Ignition Experiment)

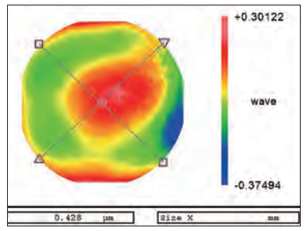
Double-side polishing of LBO single crystal substrate for LFEX.
(co-developed with Dr. Yasunobu Arikawa Assistant Professor Institute of Laser Engineering, Osaka University) Sorce : Institute of Laser Engineering, Osaka University



GEKKO XII



Large LBO single crystal substrate
Size : 100x100x2mm



Form accuracy : PV 0.42μm
Measurement instrument : Zygo Verifire ATZ

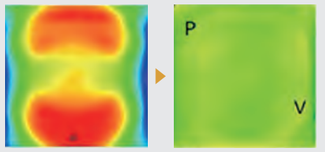
We succeeded in polishing the largest LBO single crystal substrate in the world.

Ultraprecision polishing for freeform surface

MRF (Magneto Rheological Finishing)

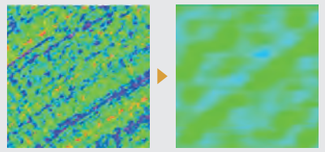
This polishing technique attracts more attention as a cutting-edge technology which improves finished surface roughness and shape correctness.

Shape correction



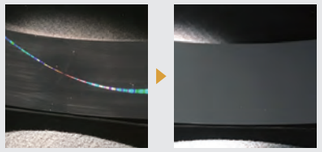
RMS 0.40μm RMS 0.04μm
Measurement instrument : Panasonic UA3P-4

Improvement of the profile irregularity



Ra 1.4nm Ra 0.4nm
Measurement instrument : Zygo NewView8300

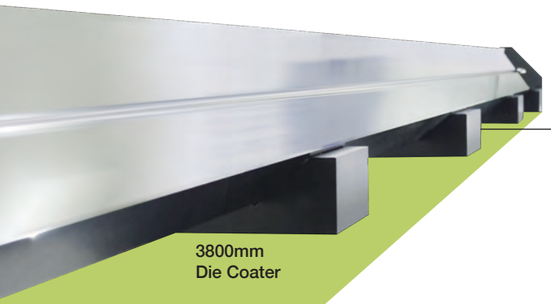
The removal of rainbow marks





SEMICONDUCTOR / FLAT PANEL DISPLAY / ELECTRIC BATTERY

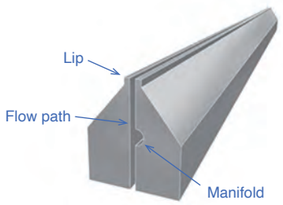
Our die coater and polishing technique lead to technological innovation

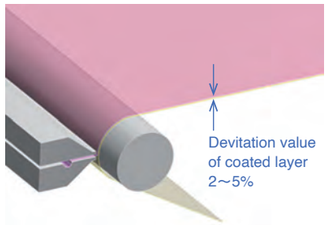


3800mm
Die Coater

01 | Die Coater

We process flow path and lip with high accuracy, which enable to coat uniformity across the length/width of the coating surface.

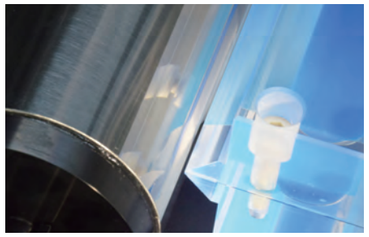




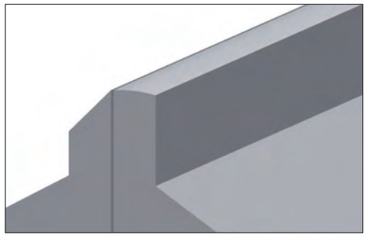
Multilayer Die



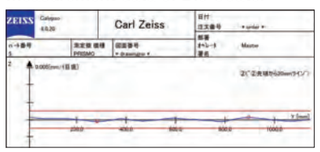
Glass Die (Die made of glass)



R-shaped Die Tip



Measurement data of Die Coater

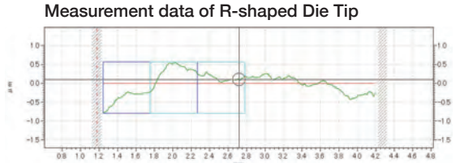


Straightness of inner surface 1.1μm
Measurement instrument :Carl Zeiss PRISMO10



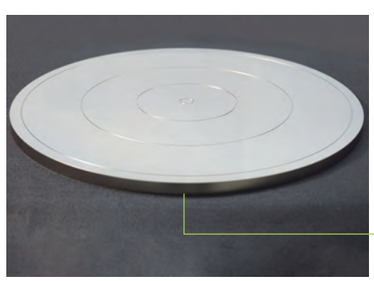
Straightness of the edge 2.2μm
Measurement instrument :Carl Zeiss PRISMO10

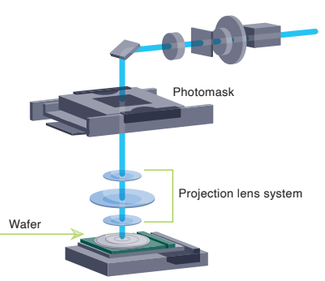
Measurement data of R-shaped Die Tip



Form accuracy:PV 1.3μm
Measurement instrument :AMETEK Form Talysurf

02 | Vacuum Wafer Table







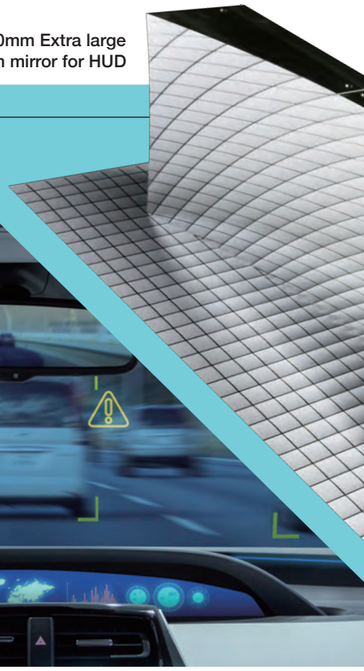
Flatness:1.1μm
Measurement instrument :TOKYO SEIMITSU XYZAX SVA600



OPTICS / MEDICAL CARE

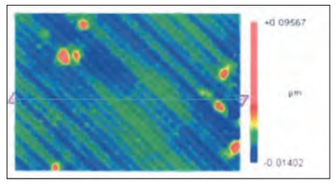
We develop leading edge technology

600x200mm Extra large freeform mirror for HUD

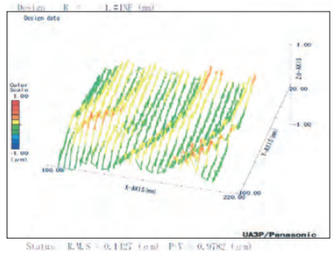


01 | Head-Up Display

Our freeform mirror is used for developing technologies for Head-Up Display, which projects data such as speed and navigation directions onto the windshield.



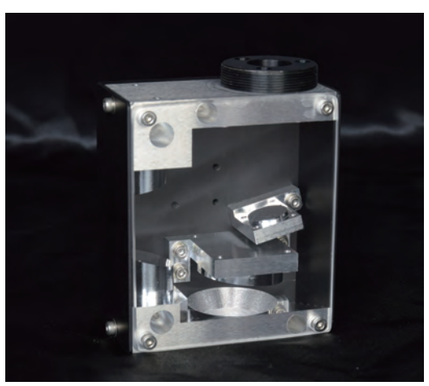
Surface roughness : Ra 3.0nm
Measurement instrument :Zygo NewView7200

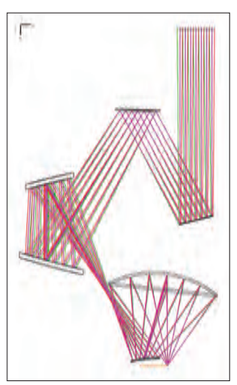


Form accuracy:PV 1.0μm
Measurement instrument :Panasonic UA3P-4

02 | Eccentric all-reflective objective unit

Designed for focusing and irradiation of femtosecond-laser pulses.
(co-developed with Dr. Atsushi Kubo, Faculty of Pure and Applied Sciences, University of Tsukuba)

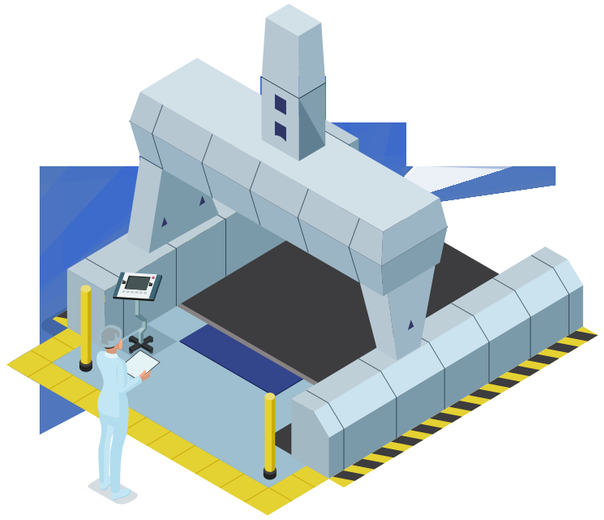




03 | Instrument for Medical Research and Development

We support research and development of medical instrument for advanced technology such as regenerative medicine.

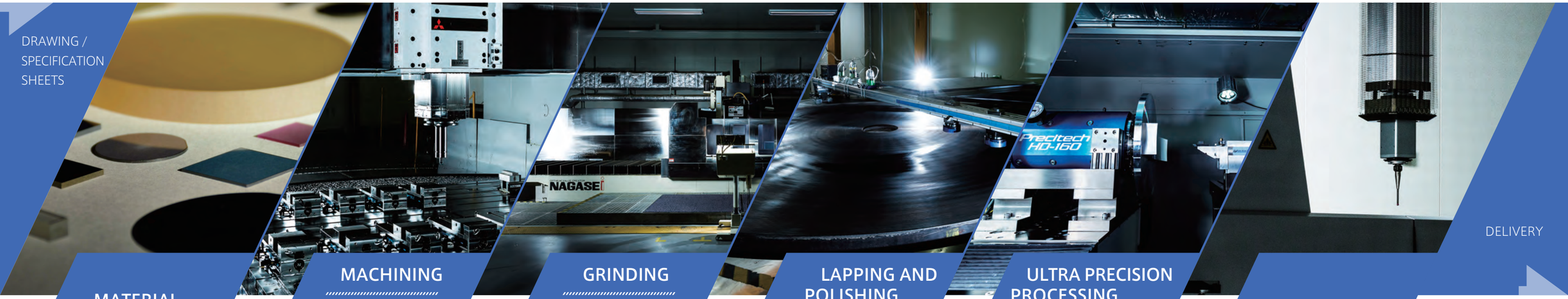




CRYSTAL OPTICS QUALITY

Our consist ent production system

High precision machining and Quality assurance process



DRAWING / SPECIFICATION SHEETS

MATERIAL PROCUREMENT

MACHINING

Double Column Type 5-face milling machine

Model:MVR45
(Mitsubishi Heavy Industries)

GRINDING

Super Precision Forming Surface Grinder

Model:SGC-408S4-N3
(Nagase Integrex)

LAPPING AND POLISHING

Large-scale Lapping System

Model:EJW-300F-GNC
(ENGIS JAPAN)

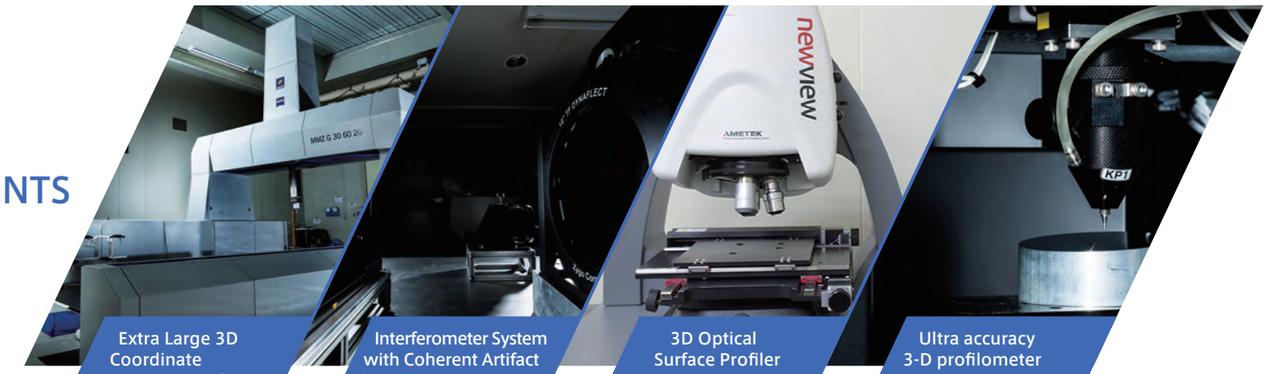
ULTRA PRECISION PROCESSING

Nanoform700Ultra
(Precitech)

MEASUREMENT

DELIVERY

MEASUREMENT INSTRUMENTS



Extra Large 3D Coordinate Measuring Machines

Model:MMZ-G30/60/20
(Carl Zeiss)
Measuring range
3,000×6,000×2,000mm

Interferometer System with Coherent Artifact Suppression

Model:Verifire ATZ
(Zygo)
Measuring range φ300mm

3D Optical Surface Profiler

Model:New View8300
(Zygo)
Magnificationx
1.375～x100：(6x6mm) /
(0.08x0.08mm)

Ultra accuracy 3-D profilometer

Model:UA3P-4
(Panasonic)
Measuring range
100×100×35mm

COMPANY CREED

Looking ahead to the future



President's Message

Shigeru Kirino

技匠人



Our company has started in my garage in the spring of 1985. It has been grateful and honored for your kind support and patronage.

At that time, we hand-lapped optical single crystal which could be polished only by an experienced engineer under a strictly temperature and humidity controlled environment. Processing this extremely delicate material, we applied our polishing skill to various materials, and accumulated experience and expertise step by step. We now have pride in our polishing work.

Today, we process all kinds of materials such as metals, non-metals, ceramics as well as optical crystal materials. We polished only palm-size parts at the beginning, but now we are able to handle large-size parts, up to 8m.

We focus on integrated production with 6 major fields, such as cutting, grinding, polishing, ultra precision processing, surface treatment (passivation treatment / electrolytic polishing), and measuring, to achieve higher precision processing in short delivery time. We engage for whole process from material procurement to quality assurance with just a drawing.

Our manufacturing policy is being "craftsman group" to aim for producing large-scale and high-precision products. As above, the foundation of our technology is "craftsmanship skill", which enables us to go through any difficult process.

And then we digitize "craftsmanship skill" into objective numerical data precisely with cutting-edge measuring instruments to visualize it. This is how we inherit the skills and improve speed and quality. We share this craftsmanship and improve our skill to be "craftsman group".

In 2011, we opened the Kyoto Plant with a concept of "A fusion of tradition and forefront" in "Kyoto Shin-Koetsu Village" for further space development. Furthermore, we introduced a new 5-axis composite machining center to engage aerospace industry In November 2014.

Research and development is progressing day and night in the world pursuing better efficiency and higher precision. With a concept of "Looking ahead to the future", we keep challenging higher level of processing and coming technologies, and also we improve and expand the optical related field.

We appreciate your continuous support and cooperation in the future as well.

COMPANY PROFILE

Corporate Name	Crystal Optics Inc.
Offices and Facilities	**[Headquarters]** 3-4-25, Imakatata, Otsu-shi, Shiga 520-0241, Japan TEL：+81-077-573-2288　FAX：+81-077-573-6766 **[Otsu factory (sales contact)]** 1-458, Manoono, Otsu-shi, Shiga 520-0235, Japan TEL：+81-077-572-4848　FAX：+81-077-572-3368 **[Kyoto factory]** 47, Uriunokyotoshinkouetsumura, Sonobe-cho, Nantan-shi, Kyoto 622-0021, Japan TEL：+81-0771-63-6188　FAX：+81-0771-63-6288 **[Kumamoto factory]** 1124-1, Futa, Nishihara-mura, Aso-gun, Kumamoto 861-2403, Japan TEL：+81-096-279-3808　FAX：+81-096-279-3801 **[Shin-Yokohama Sales Office]** Nisso Building　No18 Shin-Yokohama Expert Office #535,3-7-18 Shin-Yokohama, Kohoku-ku, Yokohama-shi, Kanagawa 222-0033, Japan TEL：+81-045-594-6568　FAX：+81-045-594-6578
Founded	Founded : April 1985　Incorporated : March 1990
Capital	60,000,000 yen
President	Shigeru Kirino
Number of Employees	180（as of Aug.2018)
Our Banks	The Bank of Kyoto, Ltd.／THE KYOTO SHINKIN BANK／MUFG Bank, Ltd.／ The Shoko Chukin Bank, Ltd.／Japan Finance Corporation／THE SHIGA BANK, LTD.／ Resona Bank, Limited
Certification	ISO 9001 JQA-QMA14790 JISQ 9100 JQA-AS0108 KES Step2
URL	https://www.crystal-opt.co.jp

Crystal Optics

Crystal Optics

Crystal Optics

❶ Headquarters



3-4-25, Imakatata, Otsu-shi,
Shiga 520-0241, Japan
TEL: +81-077-573-2288
FAX: +81-077-573-6766

MAP▶

❷ Otsu factory (sales contact)



1-458, Manoono, Otsu-shi,
Shiga 520-0235, Japan
TEL:+81-077-572-4848
FAX:+81-077-572-3368

MAP▶

❸ Kyoto factory



47, Uriunokyotoshinkouetsumura,
Sonobe-cho, Nantan-shi,
Kyoto 622-0021, Japan
TEL:+81-0771-63-6188
FAX:+81-0771-63-6288

MAP▶



❹ Kumamoto factory



1124-1, Futa, Nishihara-mura,
Aso-gun,
Kumamoto 861-2403, Japan
TEL:+81-096-279-3808
FAX:+81-096-279-3801

MAP▶

❺ Shin-Yokohama Sales Office



Nisso Building No18
Shin-Yokohama Expert Office #535,
3-7-18 Shin-Yokohama,
Kohoku-ku,Yokohama-shi,
Kanagawa 222-0033, Japan
TEL:+81-045-594-6568
FAX:+81-045-594-6578

MAP▶

www.crystal-opt.co.jp

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