



mitsui OPTICAL MANUFACTURING Co., LTD.

Corporate Profile

25 Nov 2014



History of 60 years

- 1951 Mr. Genzo Mitsui, a founder of the company, started mirror surface polishing business at the present headquarters location.
- 1952 Began production of porro prisms for binoculars.
- 1953 Began production of porro-prism binoculars for export. Incorporated as Mitsui Optical Manufacturing Co., Ltd.
- 1962 Began production of high-performance prisms.
- 1973 Established Fukushima Factory
- 1980 Completed headquarters building.
- 1991 Established Akita Factory
- 2005 Acquired ISO14001
- 2006 Acquired ISO9001
- 2007 Installed optical coating system
- 2014 Installed Sensor adherence machine system



Profile

Officer

Takeshi Mitsui (Chairman)

Tatsuro Mitsui (CEO)

Ayako Mitsui (CFO)

Hirokoko Mitsui (Advisor)

Number of employees

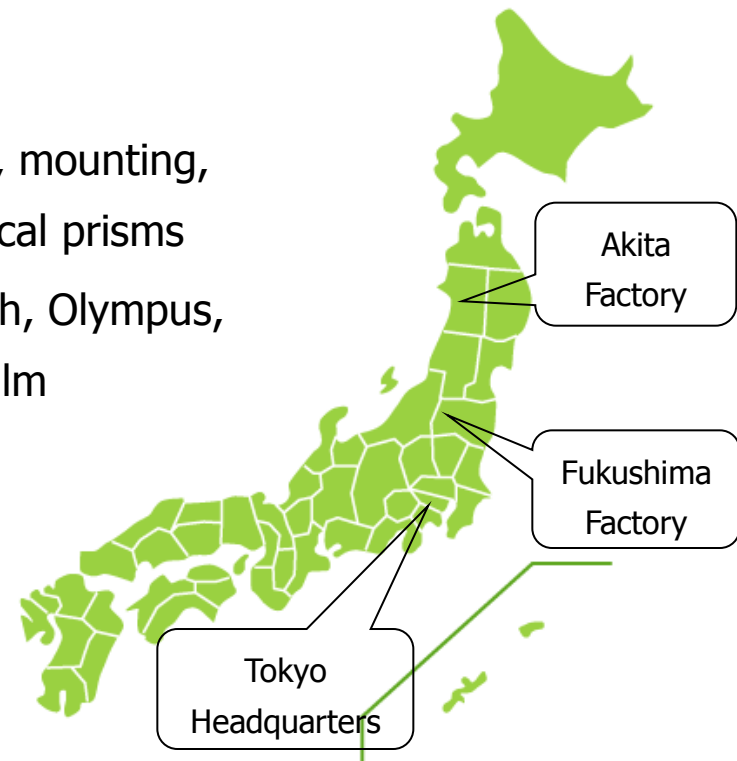
82

Production Capability:

designing, polishing, coating, mounting,
and assembly of various optical prisms

Main customers

ARRI, Panasonic, Sony, Ricoh, Olympus,
Nikon, Konica Minolta, Fuji Film



Fukushima Factory

Established in 1973. Performing a process to grind raw materials

Equipment

- Processing machines
 - cutter
 - surface grinder
- Inspection machines
 - autocollimator
 - 2D measurement unit
 - sizer unit



Akita Factory①

Established in 1991, performing designing, polishing, coating, cementing and assembly.

Equipment

●Equipment

- Cutter
- Surface Grinder
- Oscar Polisher
- Lapping machine
- Double side polisher
- Ultrasonic washer
- Sputter
- Vacuum deposition
- Sensor adherence machine



Akita Factory②

Established in 1991, performing designing, polishing, coating, cementing and assembly.

Equipment

- Inspection machines
 - Auto Collimator
 - Optical Axis Inspection Units
 - 2DI Measurement unit
 - Sizer unit
 - Projector
 - Laser Interferometers
 - 3D Measuring unit
 - Spectrophotometer
 - Electron Microscope



Processing Technology

- Applied Materials:

optical glass, fused silica, Pyrex, crystal, ceramic,

- Precision Plane Polishing

right angle prism, argument prism, color separation prism, flat board

- Cementing and Assembling

Beam Splitter , Dichroic prism for Color separation (Air-Gap type) ,

Dichroic prism for Color separation (Non-Air-Gap type) ,

Dichroic prism for Color composition (Air- and Non-Air-Gap types)

- Coating

ARND and AR

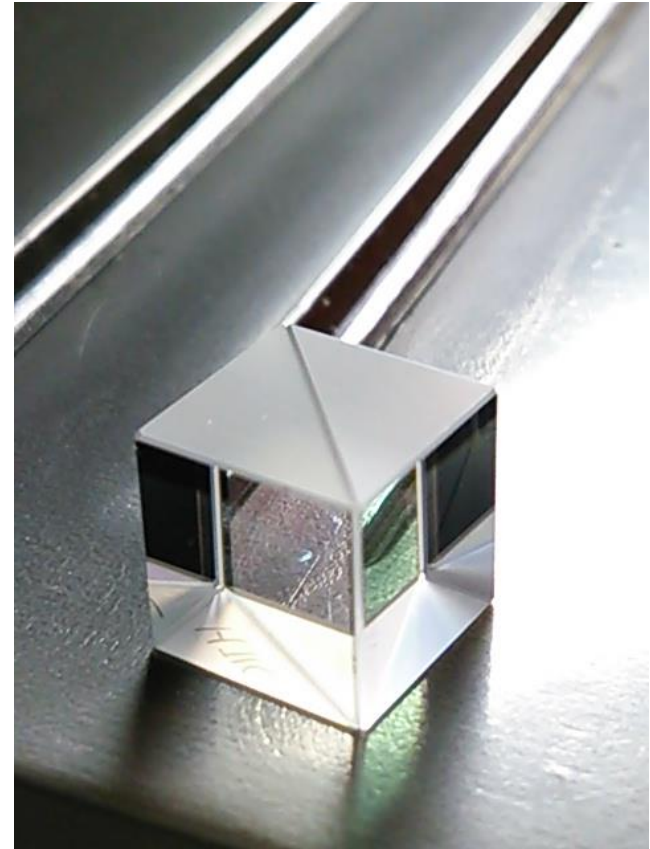
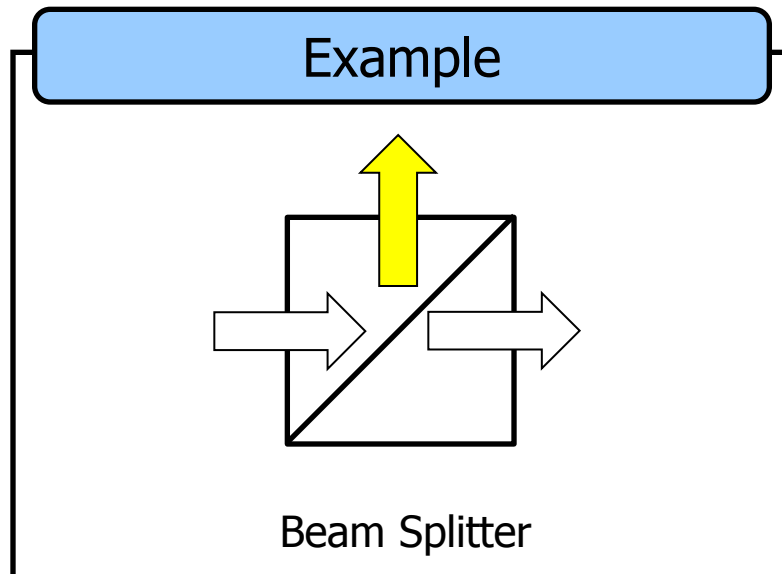
Dielectric multilayer coating(AR, Dichroic , IR-cut, UV-IR, Ultraviolet Mirror Coating)



Polishing Technology ①

Special glass material

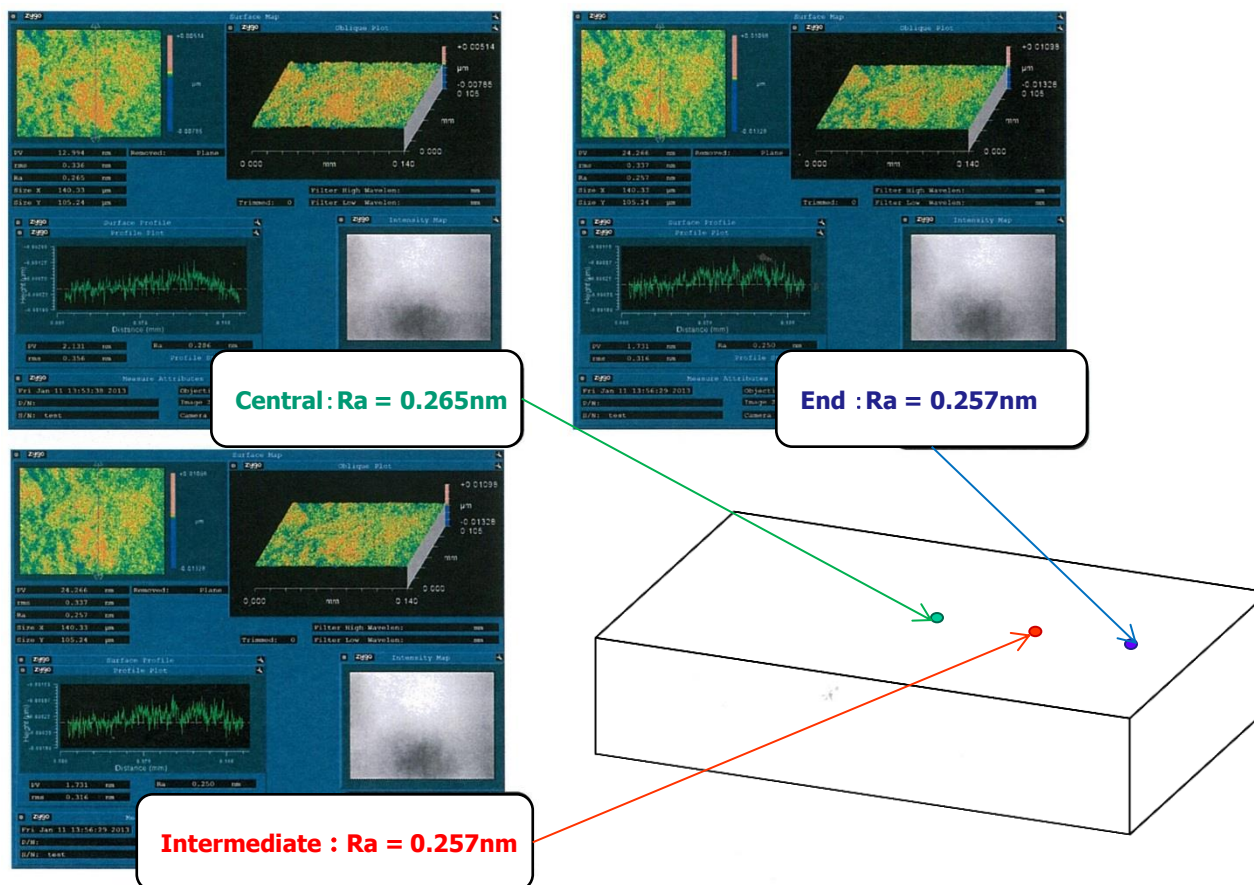
- Polishing know-how of lead optical materials (ex. PBH56 by OHARA)
 - Anti pollution facility provided



Polishing technology ②

Unique advancement of precision surface polishing by Mitsui

Overall smoothness :0.26 Ra[nm] (Pyrex Size : 150 × 200 × 20t)

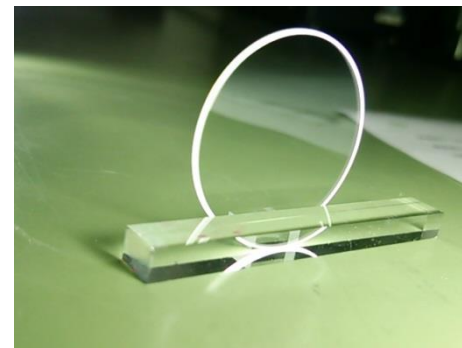


Coating①

Dielectric multilayer coating

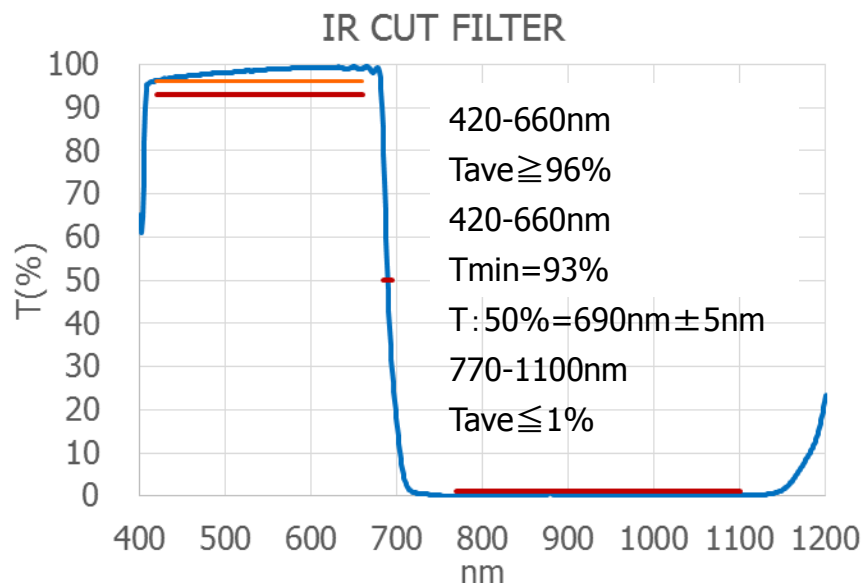
- Sputtering and IAD(Vapor deposition machine)

Coating Range from UV to IR



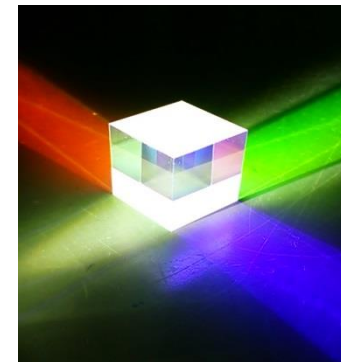
Coating Capability

- AR coating
- IR cut coating
- UV-IR cut coating
- Total reflection mirror coating
- Dichroic coating
- Beam Splitter coating
- Ultraviolet mirror coating

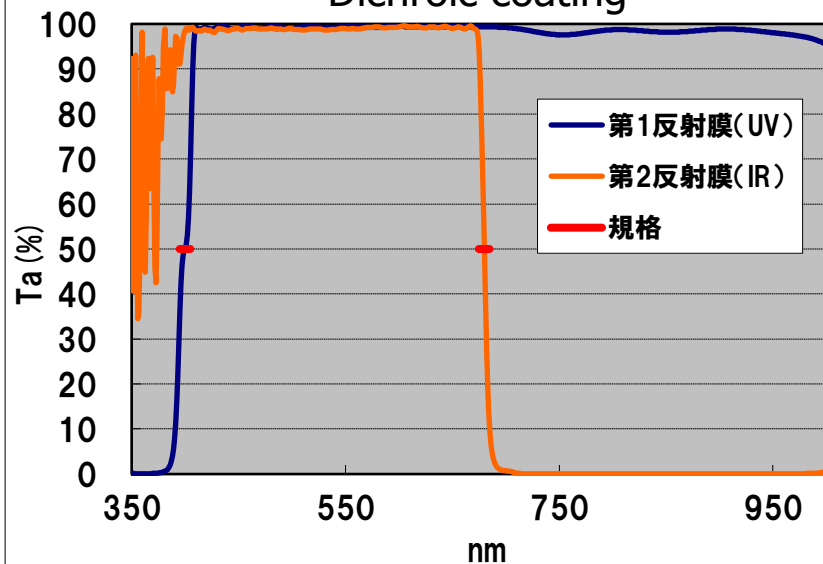


Coating ②

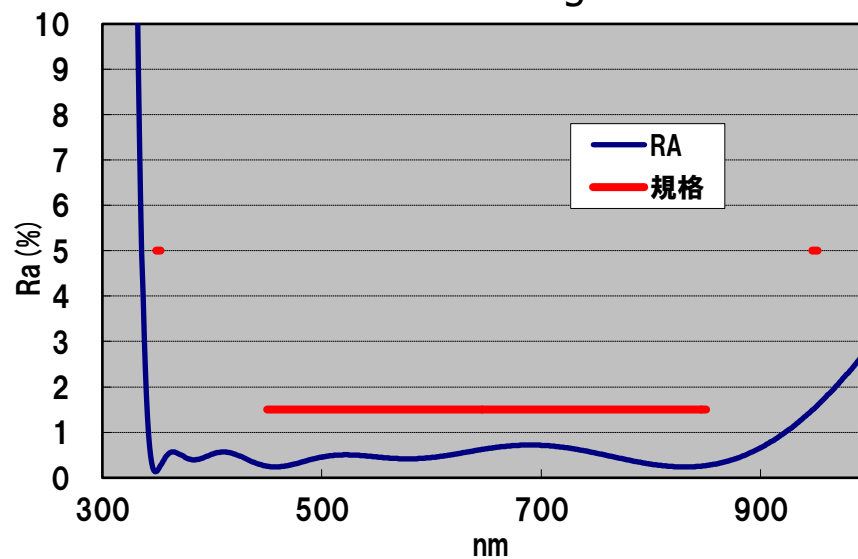
Dielectric multilayer coating (Simulation data)



Dichroic coating



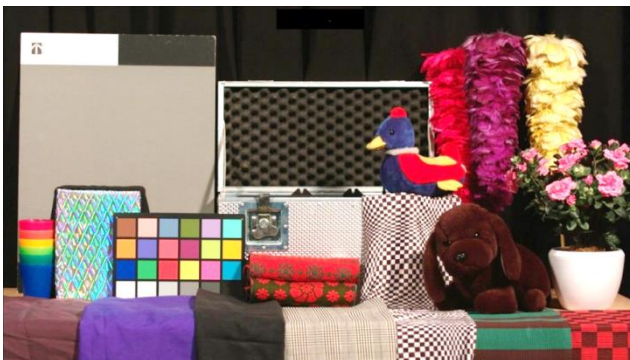
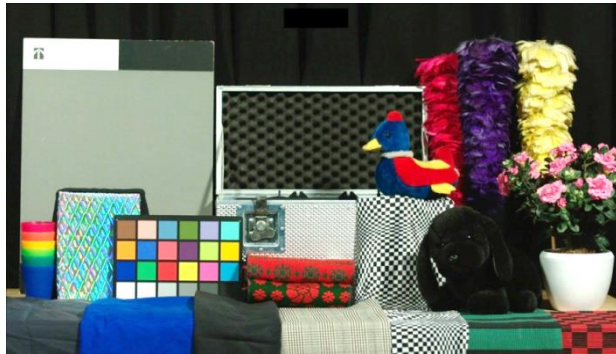
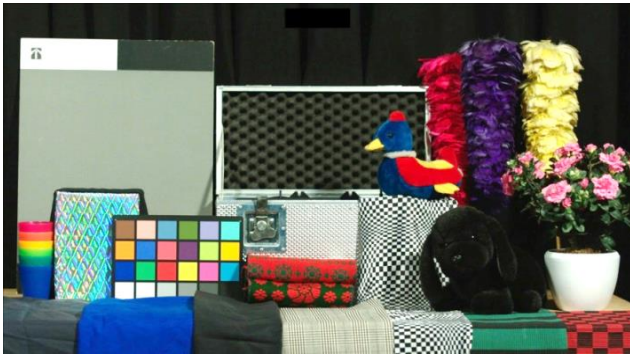
AR coating



ARND Coating ②

ND Filter Comparison -2

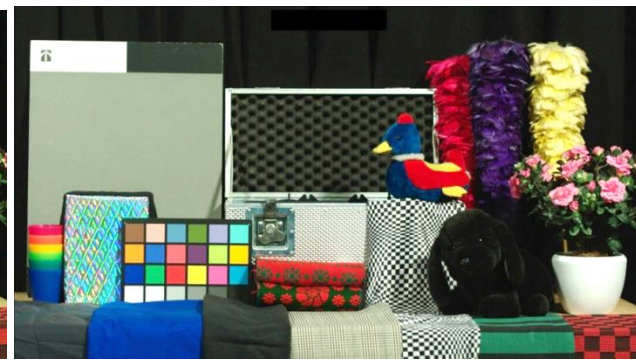
No Filter



Classic Film ND



IRND



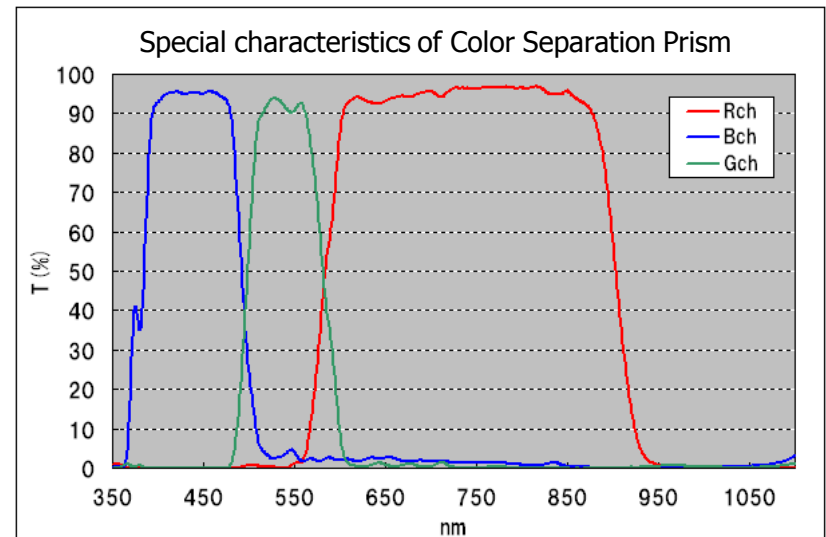
Mitsui ARND

Prism Unit①

- Produced by a total internal processing system at Mitsui throughout polishing, coating and cementing.

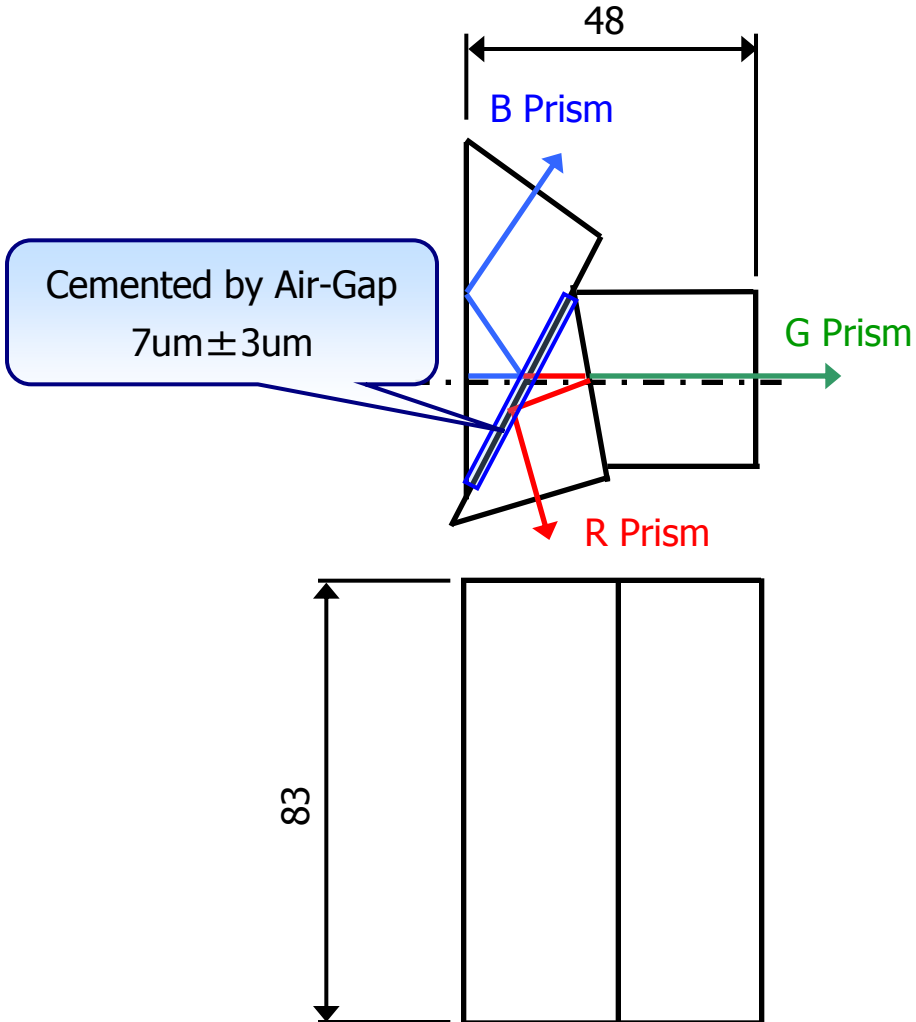
Assembled Unit Lineups

- Beam Splitter
- Dichroic prism for Color separation (Air-Gap Type)
- Dichroic prism for Color separation (Non-Air—Gap Type)
- Dichroic prism for Color separation



Case Study (P company)

3 sensor type prism units for DLP



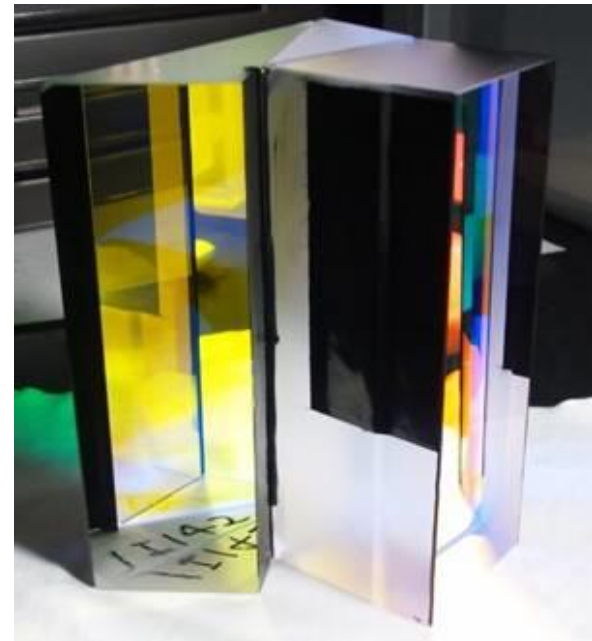
Glass Type: BK7

Air-Gap(Interval): $7\mu\text{m} \pm 3\mu\text{m}$

Air-Gap(Parallelism degree) : less than $2\mu\text{m}$

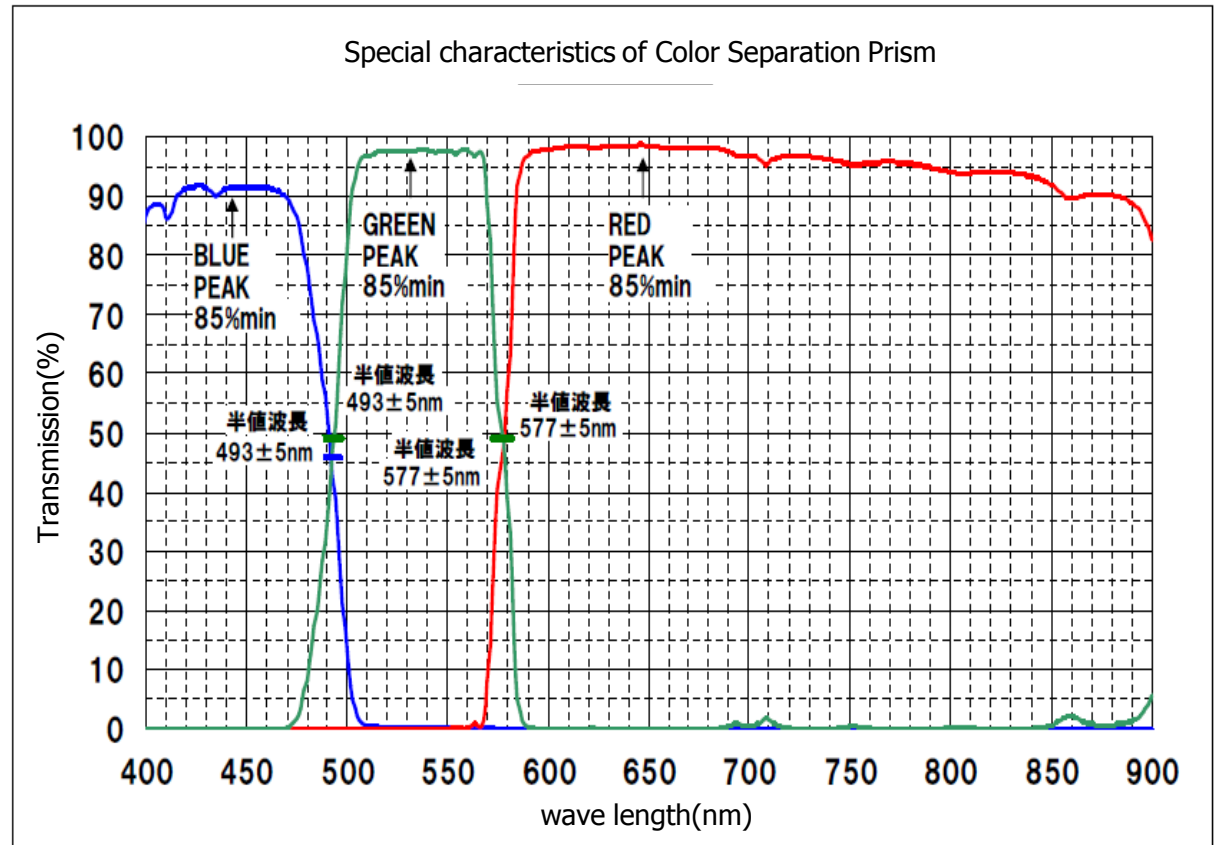
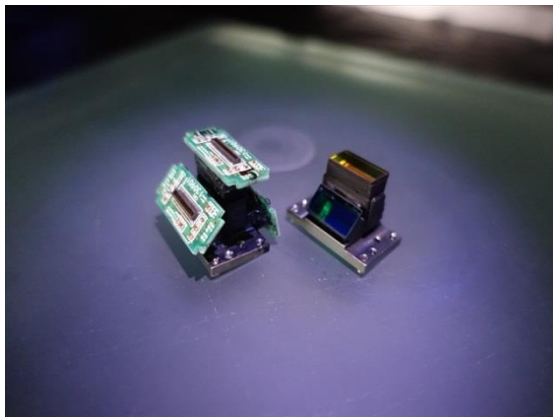
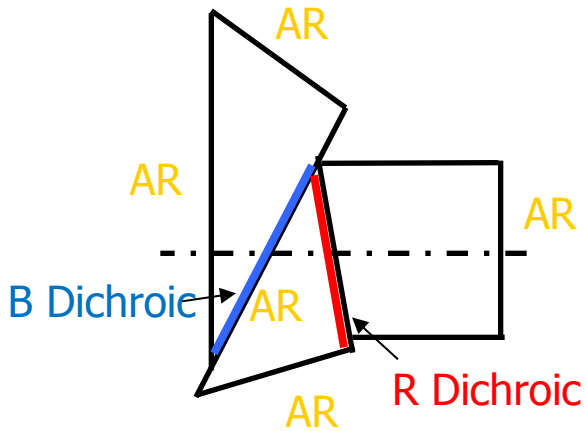
Flatness: less than λ

Surface precision degree : (Ra): less than 0.8nm



Case Study (I company)

Applying Mitsui Standard

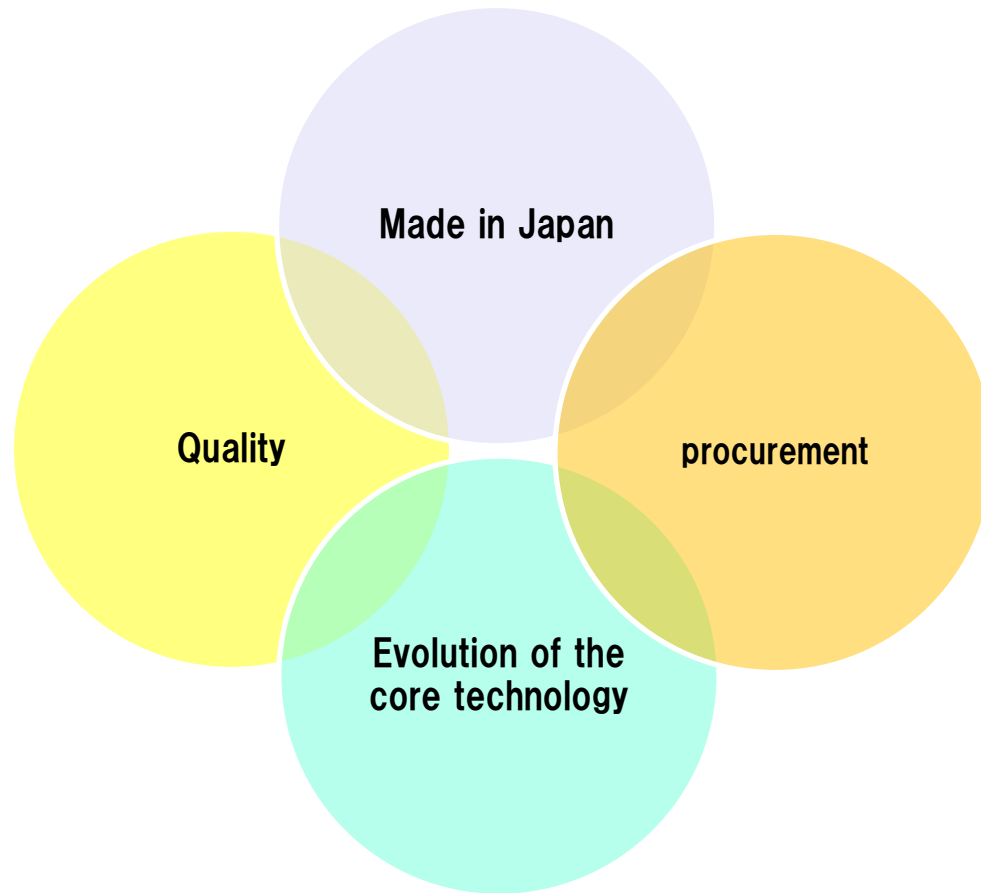


Environmental Test

- ① Use temperature range
–10°C~+60°C humidity \leq 90% (under environment of dew condensation)
- ② High temperature high humidity examination
+60°C humidity:90% 120H
- ③ High temperature examination
+60°C 120H
- ④ Low temperature examination
-20°C 120H
- ⑤ Vibration test standard
2.2G, vibration test between 7Hz and 30Hz for five minutes and 3 way test for 15 minutes.
- ⑥ Impact test standard
3 way test with 50G, 8ms impact.



Business development ①



Business development ②

60 years of experience in optical industry in Japan made us possible to give us a confidence to meet every requirement from the OEM customers.

We are confidence to supply quality products, "Performance Beyond Price".

