

# TAE YOUNG OPTICS

Optical instrument and components



# INDEX MATCHED ITO

Index Matched ITO Coating is widely used for electrical heating and electro magnetic shielding. The coating material "Indium-Tin Oxide(ITO)" provides equalized sheet resistance, high transmittance and great durability. The coated surface also has a property of anti-reflection. TaeYoung Optics(TYO) has latest techniques for the adhering various bus bars.



## ◆ FEATURES

- Index Matched ITO to Air
- Average Transmission 94% @ from 400nm to 700nm
- Resistivity 10ohm/SQ
- Index matched ITO to 1.52
- Average Transmission 90% @ from 425nm to 675nm
- Resistivity 4ohm/SQ

## ◆ TYPE OF ITO WINDOW

Type	Structure of Window			Reflectance after bonded on LCD
Heater + EMI	Surf1	Heater	IMITO 10Ω/ bus bar To bus bar	Specular R <1.0% Diffuse R <0.05%
	Surf2	EMI	IMITO 4Ω/ sqare	
Heater + EMI	Surf1	Heater	IMITO 20Ω/ bus bar To bus bar	Specular R <0.8% Diffuse R <0.04%
	Surf2	EMI	IMITO 8Ω/ bus bar To bus bar	
Heater	Surf1	AR	Multi Layer Anti-reflective	Specular R <0.7% Diffuse R <0.03%
	Surf2	Heater	IMITO 20Ω/ bus bar To bus bar	

## ◆ GENERAL SPECIFICATION

- **Thermal Cycling** : MIL - C - 48497, 4.5.4.1
- **Salt Solution** : MIL - C - 48497, 4.5.5.2.
- **Humidity Cycling** : MIL - C - 48497
- **Coating adhesion was tested** : ASTM D 3359-83 method B

## ◆ TYPICAL APPLICATIONS

- Electro-Magnetic Shielding
- Electrical Heating
- Liquid Crystal based polarization devices
- Aerospace/Defense
- Marine
- Automotive
- Instrumentation
- Electronic Displays
- Heater Panels for Ruggedized Displays
- Outdoor Displays

# NIR, FIR Coating & Optics

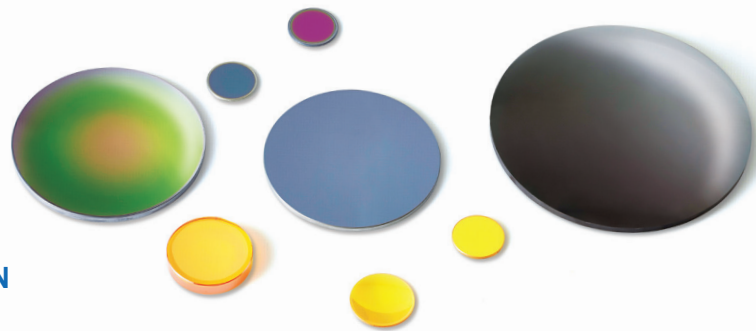
TaeYoung Optics(TYO) has been trying to develop a variety of products for many years. Based on new coating materials and technologies, we are supporting many essential products for space and defense industries. Our technologies with the IR coating are near infrared(NIR), far infrared(FIR) for anti-reflection, beamsplitters, mirrors and filters. Specific coating requirements are totally customizable. With our progressive technologies, we believe we can satisfy customers' demands for the product. We are ready to offer you standard IR range optics(3-5um, and LWIR: 8-12um) with reasonable price, regardless of the quantity.

## ◆ STRONG POINT

- Custom-designed coating for any required quantity by using state of the art coating equipment
- High quality satisfying military use
- Strict test covering Mil Spec and internal regulations for stable durability
- High damage-threshold & low absorption laser coatings

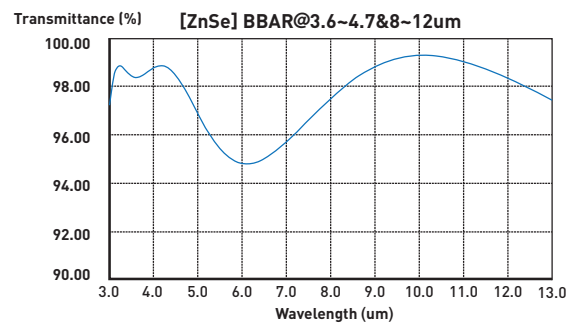
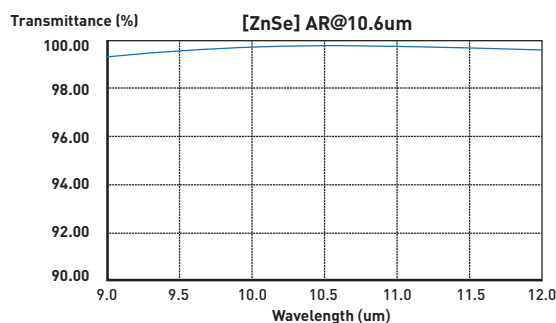
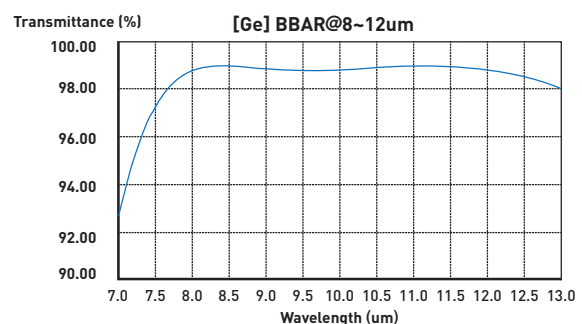
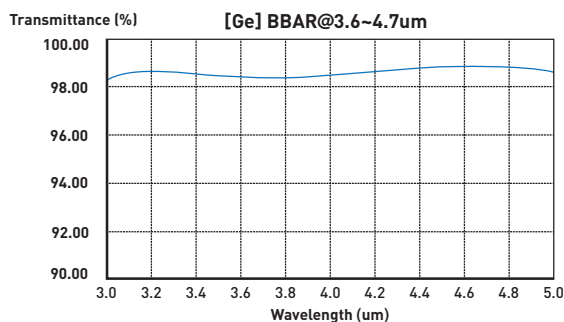
## ◆ SUBSTRATES

- germanium
- silicon
- zinc selenide
- zinc sulfide



## ◆ GENERAL SPECIFICATION

- MIL-C-675C
- MIL-C-48497A
- MIL-F-48616



# COATING, LENS & PRISM

## COATING

Thanks to accumulated technologies and experiences of decades, TaeYoung Optics(TYO) has supplied high-quality products coated with optical thin film which matched to each bandwidth (UV/VIS/NIR/FIR) of the whole spectrum.

### ◆ ANTI REFLECTION

- Single Layer AR, Multi-Layer AR, Multi-wavelength AR

### ◆ DICHRONIC FILTER

- Narrow Bandpass Filter, Broad Bandpass Filter, Multi-Bandpass Filter, Edge Filter(SWPF & LWPF)  
Polarizing Beamsplitter, Non-Polarizing Beamsplitter, Color Separation Filter, NVIS Filter

### ◆ MIRROR

- Protected Metal Mirror, Enhanced Metal Mirror, Hot and Cold Dielectric Mirror, Half & Partial Mirror

### ◆ TRANSPARENT CONDUCTIVE

- Index Matching ITO, Heater Window, EMI Window

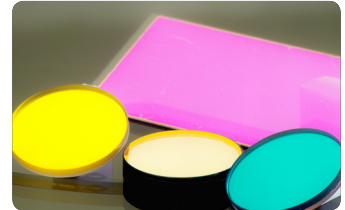
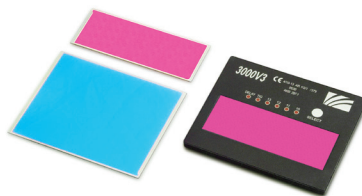
### ◆ GENERAL SPECIFICATION

• MIL-C-675C

• MIL-C-48497A

• MIL-F-48616

• MIL-M-13508C

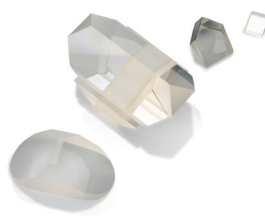


## LENS

Lens is an optical component which can transmit, reflect, converge or diverge light. A simple lens consists of a single optical element. A compound lens is an array of a plurality of lenses (elements), it is possible to improve an optical aberrations to a greater extent than a single lens. The lens can be made by using various materials of 200 or more.

## PRISM

In general, the prism is a product to reflect light. At least two of the flat surfaces must have an angle between them and the traditional geometrical shape is that of a triangular prism with a triangular base and rectangular sides. Some types of optical prism are not in the shape of geometric prisms. A dispersive prism can be used to disperse the light incident on the component.



# FREE FORMED MIRROR

Collaborating with the companies who have a high precision modling technology, TaeYoung Optics(TYO) has been supplying high quality Free Formed mirror to major customers.

## ◆ APPLICATION

- Head Up Display, Head Mounted Display, Projector, etc.

## ◆ SUBSTRATES

- **COC(Cyclic Olefin Copolymer):** ZEONEX, ARTON, APEL, etc.
- **GLASS:** B270, BK7, etc.

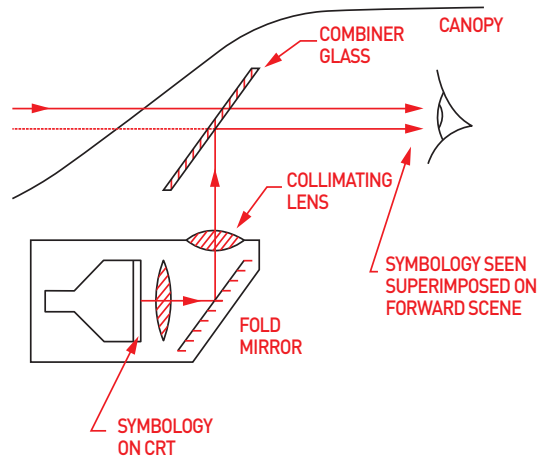
## ◆ HEAD UP DISPLAY(HUD)

Head Up Display(HUD) is widely adapted for increasing safety and convenience of motorist and pilot. HUD provides various kinds of information to driver effectively. Current driving vehicle's status such as current location, speed of vehicle, fuel statement, space of the vehicle ahead, unexpected situation, etc, is shown to driver through front window of the vehicle. It helps motorist or pilot to recognize current situation promptly and easily.

## ◆ DURABILITY STANDARDS OF HUD FOR AUTOMOBILE

	TEST ITEM	TEST STANDARD
1	Low Temperature	-40°C / 1000h
2	High Temperature	120°C / 100h
3	High Temperature and High Humidity	85°C / 85% / RH1000h
4	Temperature Cycles	-35°C / 85°C × 30Cycles
5	Thermal Shock	-40°C / 105°C(8h) × 6Cycles

## ◆ SCHEMATIC OF HUD



Projector & Many Kinds Of Mirror



HUD Mirror For Automobile

# LENS ASSEMBLY

TaeYoung Optics(TYO) designs the lens assembly depending on customers' needs. TYO has it's own abilities to design, process, assemble and evaluate the products to present optimized solution to customers.



## ◆ DESIGN AREA

- Camera Lens design
- Laser Line Beam design
- F-theta Lens design
- FLIR Lens design
- Beam Expender design
- Zoom Lens design
- Optics Mount Design

## ◆ STANDARD TELECENTRIC LENS SPECIFICATION

Model	WD [mm]	Magnification	Resolution [um]	Depth of Field[mm]	Working F/#	Largest Compatible
TML53D-C36	53.3	X3.6	3.45	0.11	18.66	1/2"
TML65D-SC40	66	X4.0	4.3	0.128	25.5	1/2"
TML81D-C08	81.1	X0.8	9	1.3	10.8	1/2"
TML98D-C06	98	X0.6	9	1.8	8.1	1/2"
TML110D-C20	112	X2.0	11.1	0.66	32.9	2/3"

## ◆ STANDARD TELECENTRIC LINESCAN LENS SPECIFICATION

Model	WD [mm]	Magnification	Resolution [um]	Depth of Field[mm]	Working F/#	Optical Distortion
TML50D-CL50	51.5	X5.0	3.3	0.08	24.6	< 0.1%
TML65D-CL20	65	X2.0	4.2	0.25	12.5	< 0.1%
TML70D-CL10	70.9	X1.0	6.7	0.80	9.91	< 1.1%
TML76D-BT10	76.1	X1.0	3.5	0.41	5.20	< 0.01%
TML90D-BT10	90	X1.0	2.2	0.27	3.30	< 0.01%



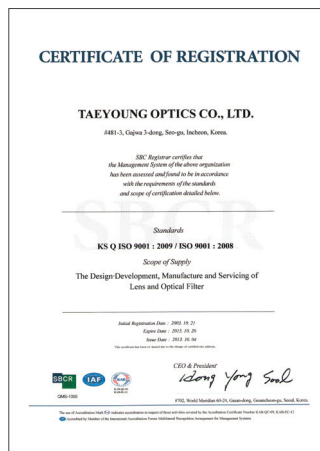
# ABOUT US

TaeYoung Optics(TYO) is a company specialized in manufacturing optical components and products called "the eye of the industry". TYO provides customers with various optical products by using its own reliable processes. For continuous advanced product development and quality improvement, TYO established R&D center to meet expectation of customer and provide for a variety of optical products with high technology. TYO have got a wide recognition from many local and overseas companies with high quality products and competitive prices.

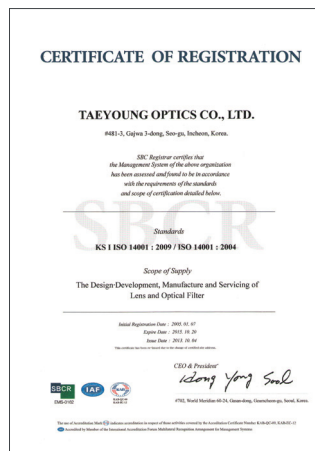
## FURTHER INFORMATION

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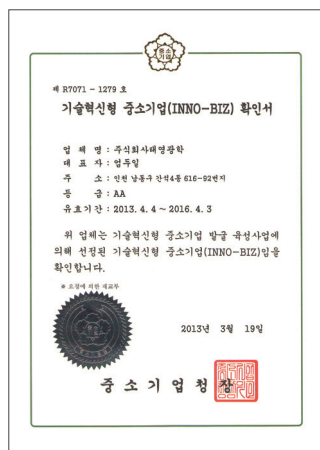
## CERTIFICATION



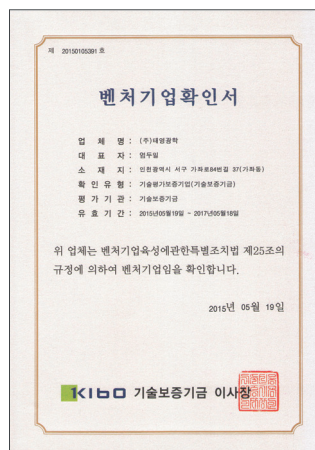
ISO 9001



ISO 14001



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