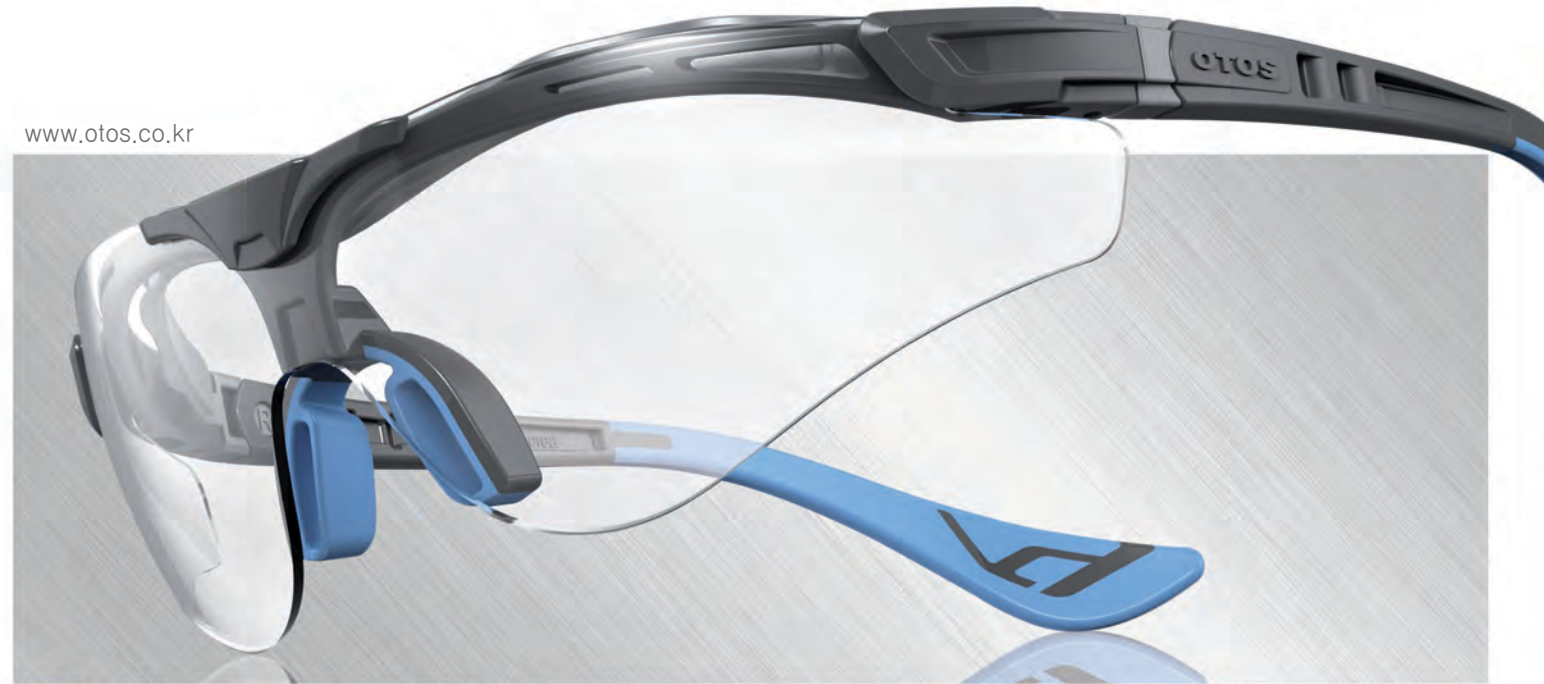




The Grand Slam

www.otos.co.kr



Technology for Eye Protection

OTOS

Eye and Face Protection Product Catalogue 2016



OTOS

OTOS is a newly-coined word from the shape of frame and temples of spectacles.



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Globally achieved the Grand Slam

of design awards for eye protective gears for the first time.

OTOS has done it in 35 years.

The auto-darkening welding helmet AEGIS won **the world's most respectable design award IDEA, iF, and reddot design** awards in 2016, and has earned the honor of the industry's first Grand Slam.

Korea's safety gear manufacturing technology has developed significantly, and achieved the world's highest level.

OTOS achieved the Grand Slam for the 1st time in **100year Korean Safety Gear Industry's history**, and this will be our turning point to earn the world's recognition as a powerful supplier of safety gears.

OTOS will stay ahead to be on top of the world's safety protective gear industry.

The Grand Slam

OTOS will not manufacture or sell any product that is not the best in the world.

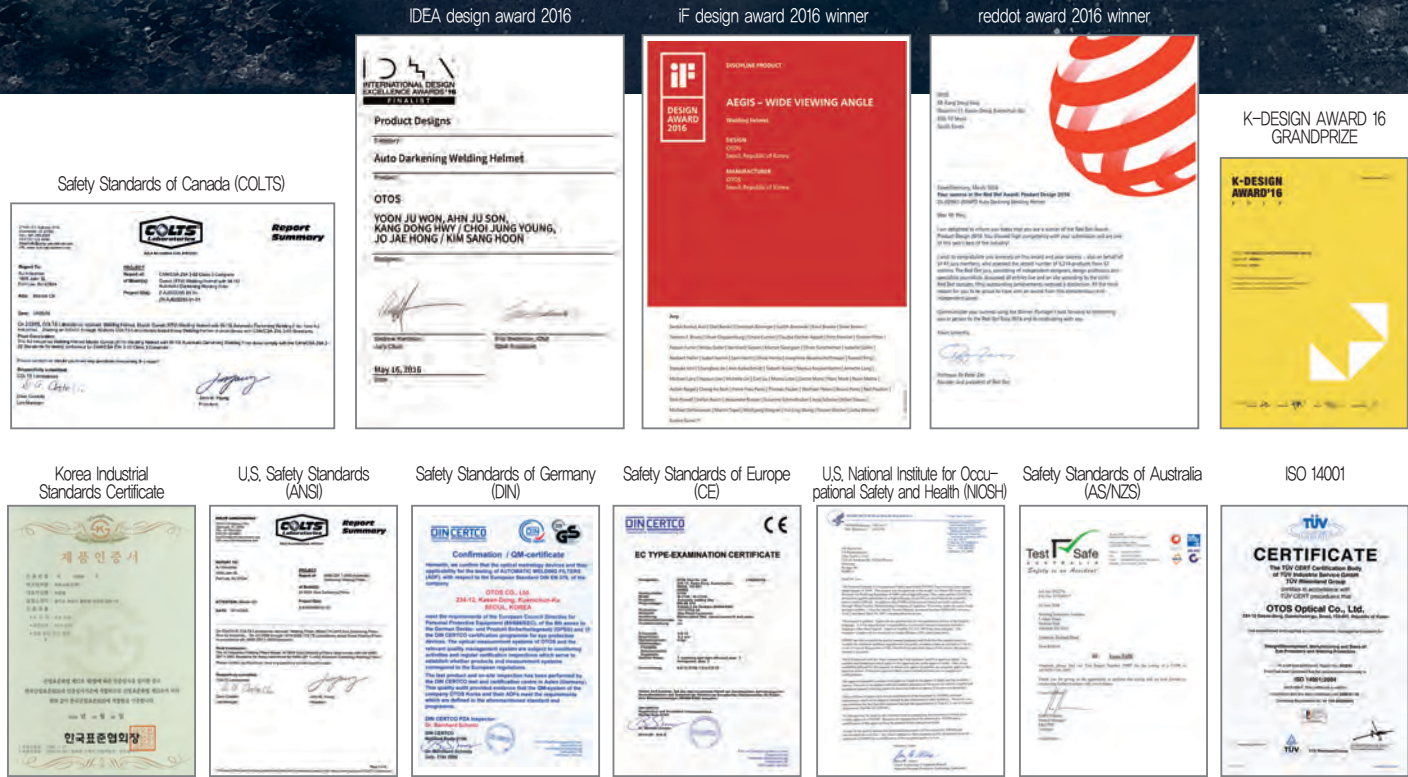
We have acquired the KCS Mark of Korea Occupational Safety Health Agency for safety spectacles and UV protective glasses, welding helmets, face shields, supplied air respirators, and powered air purifying respirators, and four areas of the KS Mark of Korea Industrial Standards for eye protective glasses, UV protective gears, welding helmets, and eye protective gears for drivers. We have also acquired the Design Packaging Development Institute's GD (Good Design) Mark, the ANSI Z87.1 Mark of America's safety standards (5th time in the world and first-time in Asia for auto-darkening welding helmets in March 1998), the NIOSH Mark of the U.S. National Institute for Occupational Safety and Health (first-time in Asia), the DIN mark of Germany's safety standards (5th time in the world and first-time in Asia for auto-darkening welding helmets in July 2006), the CE Mark of European safety standards (5th time in the world and first-time in Asia for auto-darkening welding helmets in February 1999), the COLTS CSA Z94.3 Mark of Canadian safety standards (first-time in Asia for auto-darkening welding helmets in September 2004), and the AS/NZS Mark of Australian safety standards (first-time in Asia). We have acquired many standard marks for the first-time in Korea, and moreover Asia. We have challenged the world market having not been satisfied with the reputation of being Korea's No. 1 manufacturer in the eye protection industry. As a result, we are exporting to 38 developed countries and have settled down as top brand. We are still devoting our fullest efforts to new technology development to stay being the world's top.



Instead of advertisement for specified products, this is a brochure for the promotion of our company.

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Safety Spectacles

※ The weights in this catalog show the average weights with ±2% errors.

※ [KS P 8147 / In accordance with the Notice from the Ministry of Employment and Labor Notice].
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use as safety spectacles.

Caution in wear
1) Do not take off safety spectacles while working.
2) Wear with safety helmets when handling chemicals or working in the presence of falling matters.
3) Use caution as the safety spectacles cannot completely protect your eyes from every accident.

1 Purpose of Use

- A required item for use at the operation area where particles and dust particles from metalwork involving polishing, cutting and refining, and processing stone materials, and pulverizing and processing plastic and wood.
- The use of double-layered protection in the helmet is recommended for safety in the operation where there may be impact particles as a result of operation.



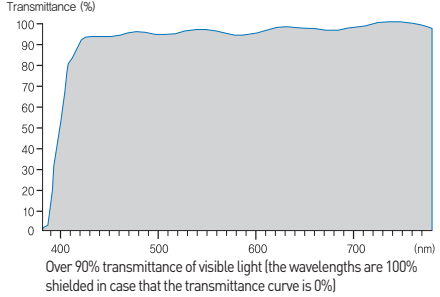
2 Characteristics of OTOS PC Lens

- It is a polycarbonate resin lens that is coated with wear-resistant coating on the surface with high-shock resistance that is 20 times more durability than other lens of same thickness.
- It has outstanding transmittance and refraction capacity with its fulfillment of the \odot E^+ specifications.
- It has excellent cold-resistance, heat-resistance, and durability.

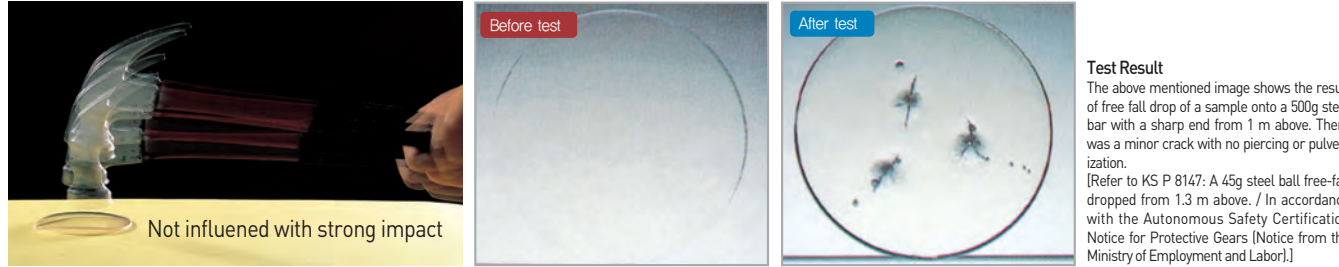
3 Example for Ordering the Safety Spectacles / UV Protective Glasses

B	- 810	B	S	F	(#2)
Frame type	Model name	Lens type	Feature 1	Feature 2	UV shielding capacity of lens
B: Plastic frame M: Steel frame C: Clip type A: Attachment for safety helmet		A: Transparent B: UV shielding X: UV rays	S: Plastic frame ~ Adjustable leg angles and length Steel frame ~ Protective side panels G: Gray Y: Yellow B: Blue light shield	F: Anti-fog M: Mirror G: Leg cushion pad P: Polarized	Shielding lens mark : #1,2, #1,4, #1,7, #2, #3, #4, #5, #6

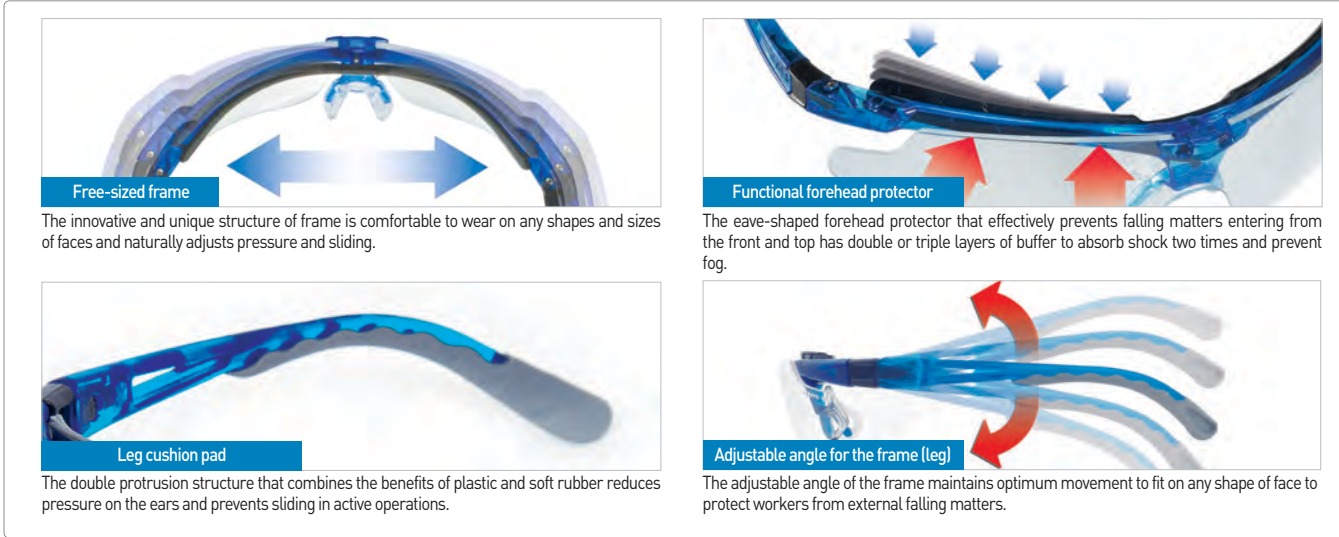
4 Transmittance Test of PC Lens



5 Impact resistance Test of PC Lens



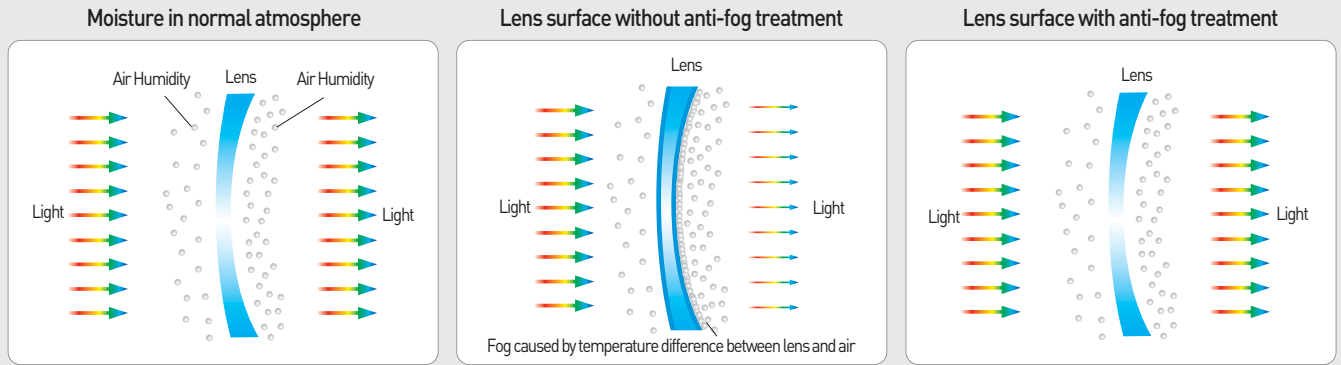
6 Major Characteristics



Anti-fog Lens

1 What is anti-fog?

Fog on the lens refers to the water droplets that form on the lens surface when you wear the glasses in a humid place (in case of severe temperature changes). Fog is formed in cold winter or humid summer due to the difference with the indoor temperature, breathing, increasing body temperature, or perspiration. Anti-fog treatment disperses water droplets on the lens surface and absorbs moisture with the layer of coating to prevent fog.



2 Characteristics of Anti-Fog Lens

Sectional surface of lens 	<ul style="list-style-type: none">• Anti-fog coating performance - PC lens Anti-UV There is Anti-UV material Anti-fog prevents moisture from forming on the lens surface to block eyesight with anti-fog coating on the lens surface.• Anti-Scratch This anti-fog lens is more wear-resistant than ordinary plastic lens and has a great value.• Anti-Static OTOS coating technology prevents static electricity on the surface of lens so no impurity (fine dust that naturally sticks to polycarbonate resin, etc.) sticks to the lens.• Anti-UV There are anti-UV matters in the lens to protect the eyes from the harmful UV rays.
--------------------------------------	--

3 Need for Anti-Fog Lens

OTOS advanced coating technology, prevent fogging up and strong against scratches.
Anti-fog coating is essential will be essential for the polycarbonate resin lens of the safety spectacles in worksites where fog often blocks the eyesight.

4 Durability of anti-fog lens

In the winter with sudden temperature changes and in the summer with high humidity (especially in the rainy season), the lens of your safety spectacles is exposed to a large level of humidity due to the wet and humid climate or perspiration. In this case, the moisture absorber of anti-fog coating will be saturated to form fog on the lens surface. In this case, dry the lens in natural air. However, this may not be a permanent solution.

5 Anti-fog corrective lens

Industrial prescribed lens can be treated for anti-fog performance in two ways: anti-fog coating instead of anti-reflection coating and anti-fog solution sprays on the lens for temporary anti-fog performance. However, neither of these methods is satisfactory, so we do not recommend it.



Welding Glasses

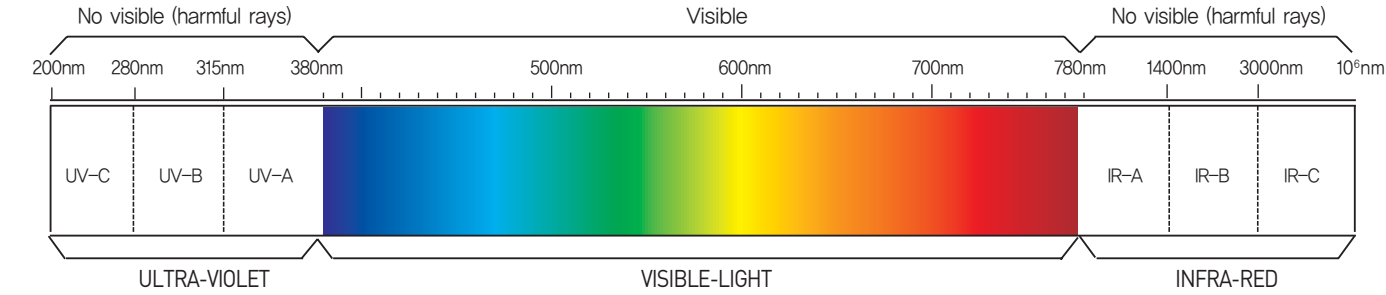
※ [KS P 8147 / In accordance with the Notice from the Ministry of Employment and Labor Notice].
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use as safety spectacles.

※ The weights in this catalog show the average weights with $\pm 2\%$ errors.



Caution in wear
1) Do not take off UV protective glasses while working.
2) Wear with safety helmets when handling chemicals or working in the presence of falling matters.
3) Use caution as the UV protective glasses cannot completely protect your eyes from every accident.
4) Choose the lens with optimum UV protection number for the harmful rays.
5) Never use UV protective glasses to protect from laser.

1 Light (Types of electromagnetic waves)



2 Selecting shading number of shading protection lens (KS P 8141: UV Protective Gear Standards)

Purpose		UV Protection	1.2	1.4	1.7	2	3	4	5	6
Work around welding site			○	○	○	○	○			
Arc welding	Covered arc welding	~30A							○	○
	Gas shield arc welding	Work nearby	○	○	○	○	○			
	Arc air gouging	Work nearby	○	○	○	○	○			
Gas welding cutting	Heavy metal welding and soldering (1)	~ 70ℓ						○		
		70~200ℓ							○	
		200~800ℓ								○
	Welding by radiant flux (3) (light metal)	~ 70ℓ (4d)						○		
		70~200ℓ (5d)							○	
		200~800ℓ (6d)								○
	Oxygen cutting(2)	900~2000ℓ							○	
		2000~4000ℓ								○
Heated work	Work around plasma cutting		○	○	○	○	○			
	Pelletizing in furnace or heating, etc.						○			
	Furnace work						○	○	○	
	Electric furnace work									○

Note (1) Does of acetylene per hour [ℓ]. (2) Oxygen capacity per hour [ℓ]. (3) Intense light of 589 nm sodium is radiated when flux is used for gas welding or soldering.
Combine the filters [d] that selectively absorb this wavelength. Example) 4d refers shading number 4 combine d filter.

3 Shading protection table for shading lens (Industrial Standards of Korea Occupational Safety Health Agency)- Protective Gear Safety Certification Notice [Note from the Ministry of Employment and Labor]

UV protection number	Maximum spectral transmittance of UV rays($\tau(\lambda)$)		Luminous transmittance(T_v)		IR ray transmittance
	313nm (%)	365nm (%)	Maximum (%)	Minimum (%)	
1.2	0.0003	50	100	74.4	69
1.4	0.0003	35	74.4	58.1	52
1.7	0.0003	22	58.1	43.2	40
2	0.0003	14	43.2	29.1	28
3	0.0003	2.8	17.8	8.5	12
4	0.0003	0.95	8.5	3.2	6.4
5	0.0003	0.30	3.2	1.2	3.2
6	0.0003	0.10	1.2	0.44	1.7

※ **Remarks**
• In case of $210\text{nm} \leq \lambda \leq 313\text{nm}$, spectral transmittance should not exceed 313nm.
• In case of $365\text{nm} \leq \lambda \leq 380\text{nm}$, transmittance should not exceed luminous transmittance.

• In case of $313\text{nm} \leq \lambda \leq 365\text{nm}$, transmittance should not exceed 365nm.
• In case of $380\text{nm} \leq \lambda \leq 480\text{nm}$, transmittance should not exceed the measured value of 480nm.

※ Shading lens of **OTOS** has acquired all specifications of

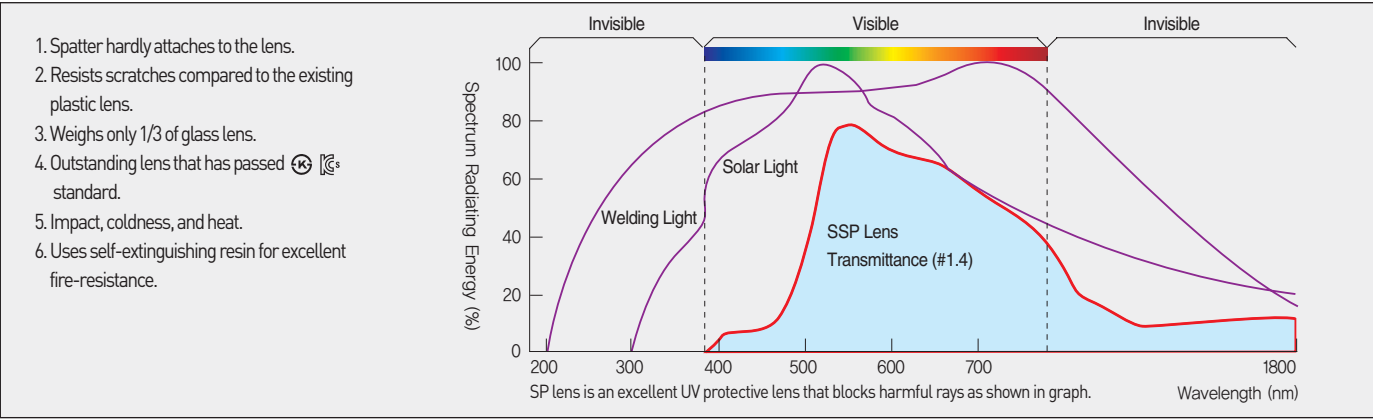
4 Efficacies of shading lens

Around the operating area where emits harmful rays i.e ultra violet, infra red or staring glar, shading lens protects wearer's eyes from those harmful rays.

1. Because of reducing harmful glaring rays from arc or furnace, it makes possible to see the status of phogen.
2. Blocking harmful UV, IR emits from arc.
3. Decreasing harmful blue light from the visible light.
4. Disclude harmful UV and IR comes from arc and furnace.
5. Not only operator but also another around operator around operator, visitor may be affected by harmful rays Therefore it is highly recommended to wear protective spectacles.



5 Characteristics of OTOS SP Lens



6 Lens for Metal Furnaces (Glass Lens)

	This lens complies with the and specifications and blocks harmful rays (UV rays, IR rays) with strict quality control and inspection using our best SPECTROPHOTOMETER (best spectrophotometer used by manufacturers in Korea and abroad).
	Used to measure temperature of refining around 1550°C~1600°C. [Caution: It is impossible to block harmful UV rays and IR rays. It must never be used by anyone other than certified users.]

7 Gold Mirror Coated Lens

	Our SP lens has been treated with gold mirror coating to reflect and absorb intense visible rays, UV rays, and IR rays to protect your eyes and secure visibility to be able to see objects clearly. Welding helmets or UV protective glasses with high UV protection used to be worn for protection while working around arc welding or plasma work and our Gold Mirror Coated Lens can reduce glare, block UV rays and IR rays, and secure pleasant eyesight.
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8 Sample colors of SP UV protective lens (Lens with the UV protective numbers on the following table can be applied to all frames of our products.)

OTOS 1.2	OTOS 1.4	OTOS 1.7	OTOS 2	OTOS 3	OTOS 4	OTOS 5	OTOS 6

• Sample colors show the density of UV protective numbers that comply with KS and Ministry of Labor specifications. They may appear different from actual colors of product due to printing.

Examples of product performance(Pictogram) Same for safety spectacles / welding glasses / UV protective glasses / prescription safety spectacles.		 Adjustable frame (leg) angle Top and bottom angles of frame (leg) are made adjustable to fit various shapes of faces and protect workers from external falling matters.
 Adjustable leg length Legs can be easily adjusted in several steps.	 Side protective panels Classified into fixed type and detachable type and detachable type can be used selectively whenever needed to block flying matters that may enter through the sides.	 Combined safety spectacles May be worn on corrective glasses, so it can be worn by those with poor visual acuity.
 Closable safety spectacles When anyone who is wearing prescribed glasses needs the UV protective lens, clip-type UV protective lens can be attached onto the existing prescribed glasses.	 Spring legs Very small springs are used and they are very lightweight, invisible, and comfortable to wear.	 Detachable safety spectacles for helmets Detachable safety spectacles with lens that can be adjusted into forward / Backward. Compatible with helmets with long and short visors.
 Forehead protector The eave-shaped forehead protector that effectively prevents falling matters and top has double or triple layers of buffer to absorb shock two times and prevent fog.	 Adjustable nose pad Adjustable to fit various shapes of noses to prevent discomfort or pressure when worn for a long time. The soft material relieves external impact and is comfortable to wear.	 Leg cushion pad The double protrusion structure with cushion at the end of legs reduces pressure on the ears with comfort and prevents sliding in active operations.
 Anti-fog Spreads water drops on the surface of lens and absorbs moisture with the layer of coating to prevent fog.	 Polarized lens Permeates the light coming in parallel to the eyes to effectively block the reflecting glare.	 Free-sized frame The innovative and unique structure of frame is comfortable to wear on any shapes and sizes of faces and naturally adjusts pressure and sliding.



Safety Spectacles / Welding Glasses

※ The weights in this catalog show the average weights with ±2% errors.

B-813AS

23g

- The innovative and unique structure of frame allows for a comfortable wear on any shapes and sizes of faces and naturally adjusts pressure and sliding.
- The double-protruded urethane nose pad works as a cushion to be adjusted to fit the user's nose and prevents the sliding of frame.
- Functional double-buffer forehead protector
- Soft nose pad
- Nose pad with adjustable height
- Leg cushion pad • Adjustable leg angle
- Replaceable lens • PC lens
- Anti-scratch
- **Optional: Anti-fog lens**



Model	B-813BS
Purpose	UV Protective Glasses
Lens Color	#1.2~#6
Weight	25.5g



Model	B-813XRB
Purpose	UV Protection
Lens Color	Mirror(Blue) / #3
Weight	25g



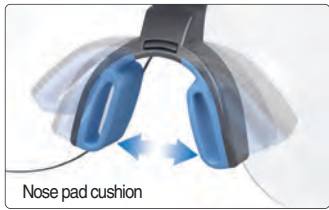
Model	B-813XGM
Purpose	UV Protection
Lens Color	Mirror(Gray) / #3
Weight	25g



Model	B-813XRO
Purpose	UV Protection
Lens Color	Mirror(Orange) / #3
Weight	25g



Model	B-813XGP
Purpose	UV Protection (Polarized)
Lens Color	Gray / #4
Weight	25.4g



B-810AS

24.2g

- The innovative and unique structure of frame allows for a comfortable wear on any shapes and sizes of faces and naturally adjusts pressure and sliding.
- Functional trio-buffer forehead protector
- Soft nose pad
- Nose pad with adjustable height
- Leg cushion pad • Adjustable leg angle
- Replaceable lens • PC lens
- Anti-scratch
- **Optional: Anti-fog lens**



Model	B-810BS
Purpose	UV Protective Glasses
Lens Color	#1.2~#6
Weight	29.3g



Model	B-810XRB
Purpose	UV Protection
Lens Color	Mirror(Blue) / #3
Weight	29g



Model	B-810XGM
Purpose	UV Protection
Lens Color	Mirror(Gray) / #3
Weight	29g



Model	B-810XRO
Purpose	UV Protection
Lens Color	Mirror(Orange) / #3
Weight	29g



B-811AS

18.9g

- Double soft forehead protection • Soft nose pad • Adjustable leg angle • Replaceable lens • PC lens • Anti-scratch
- **Optional: Anti-fog lens**



Model	B-811BS
Purpose	UV Protective Glasses
Lens Color	#1.2~#6
Weight	22.2g



Model	B-811VSF
Purpose	UV Glasses
Lens Color	Yellow
Weight	19.5g



Model	B-811XGP
Purpose	UV Protection (Polarized)
Lens Color	Mirror(Gray) / #4
Weight	20.4g



Model	B-811XG
Purpose	UV Protection
Lens Color	Mirror(Gray) / #25
Weight	20.4g



B-803AS

30.2g

- Double soft forehead protection • Soft nose pad • Leg cushion pad
- Adjustable leg angle • Replaceable lens • PC lens • Anti-scratch
- **Optional: Anti-fog lens**



Model	B-803XGP
Purpose	UV Protection (Polarized)
Lens Color	Gray / #4
Weight	34.2g



Model	B-803BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	34.2g



B-707AS

25.6g

- Soft nose pad • Leg cushion pad • Adjustable leg angle • Replaceable lens
- PC lens • Anti-scratch • **Optional: Anti-fog lens**



Model	B-707BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	27.6g



Adjustable nose pad



B-710AS

26.9g

- Double buffer forehead protection • Soft nose pad • Leg cushion pad (double protruded)
- Adjustable leg angle • Replaceable lens • PC lens • Anti-scratch
- **Optional: Anti-fog lens**



Model	B-710BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	27g



B-903ASF

26.8g

- Soft nose pad • Leg cushion pad (double protruded) • Adjustable leg angle
- PC lens • Anti-scratch • **Optional: Anti-fog lens**



Model	B-903XGMF
Purpose	UV Protection
Lens Color	Mirror(Gray) / #2.5
Weight	29.2g



Model	B-903XGF
Purpose	UV Protection
Lens Color	DarkGray / #34
Weight	29.2g






Safety Spectacles / Welding Glasses

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1) Do not take off UV protective glasses while working.
2) Wear with safety helmets when handling chemicals or working in the presence of falling matters.
3) Use caution as the UV protective glasses cannot completely protect your eyes from every accident.
4) Choose the lens with optimum UV protection number for the harmful rays.
5) Never use UV protective glasses to protect from laser.



B-622A | 39.6g

• Made of polycarbonate that is strong against impact and the simple and compact design is comfortable and light to wear for a long time.
• Overglasses available. • Single lens - Broad angle of eyesight
• forehead protection • PC lens • Anti-scratch
• **Optional: Anti-fog lens**

Model **B-622B**
Purpose UV Protective Glasses
Lens Color #1.2, #1.7, #2, #3
Weight 41.1g



B-618AS | 47.1g

• Single lens - Broad angle of eyesight • Combined safety spectacles • Adjustable legs
• forehead protection • PC lens • Anti-scratch • **Optional: Anti-fog lens**

Model **B-618BS**
Purpose UV Protective Glasses
Lens Color #1.7, #2, #3
Weight 48.5g



B-904XGF | 24g

• Double soft forehead protection • Soft nose pad • Leg cushion pad (double protruded)
• Adjustable leg angle • PC lens • Anti-scratch • Anti-fog lens
• Anti-UV • Lens Color : Gray / #2.5



B-623ASF | 25.5g

• Single lens with good visibility and simple shock-resistant design suitable for labs and semiconductor processes. • Combined safety spectacles
• Single lens - Broad angle of eyesight • PC lens • Adjustable leg angle
• Anti-scratch



Model **B-622B**
Purpose UV Protective Glasses
Lens Color #1.2, #1.7, #2, #3
Weight 41.1g



Model **B-618BS**
Purpose UV Protective Glasses
Lens Color #1.7, #2, #3
Weight 48.5g



B-621A | 29.4g

• Soft nose pad • Replaceable lens • PC lens • Anti-scratch
• **Optional: Anti-fog lens**

Model **B-621B**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 31.8g



B-701AS | 32.8g

• Soft nose pad • Adjustable leg angle • Adjustable leg length
• Replaceable lens • PC lens • Anti-scratch
• **Optional: Anti-fog lens**

Model **B-701BS**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 36g



B-406AF | 24.4g

• Soft nose pad • PC lens • Replaceable lens • Anti-scratch • Anti-fog lens



B-407A | 24.4g

• Safety spectacles similar to sports goggles (lens attached to frame).
• Elastic legs and cushion pad. • Light of Weight. • PC lens
• **Optional: Anti-fog lens**

Model **B-407B**
Purpose UV Protective Glasses
Lens Color #1.7, #2, #3
Weight 25.2g



Model **B-621B**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 31.8g



Model **B-701BS**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 36g



B-619AS | 34.2g

• Adjustable leg angle • Adjustable leg length • Replaceable lens
• PC lens • Anti-scratch
• **Optional: Anti-fog lens**

Model **B-619BS**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 37.6g



B-612AS | 33.7g

• Adjustable leg angle • Adjustable leg length • Replaceable lens
• PC lens • Anti-scratch
• **Optional: Anti-fog lens**

Model **B-612BS**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 37.3g



B-408AF | 26.4g

• Safety spectacles similar to sports goggles (lens attached to frame).
• Elastic legs and cushion pad. • Light of Weight. • PC lens.
• Anti-fog lens



C-712A | 12.7g

• Clip-type glasses.
• Attached to prescribed glasses.
• Anti-scratch • Double closure.
• PC lens.
• **Optional: Anti-fog lens**

Model **C-712B**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 15.2g



Model **B-619BS**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 37.6g



Model **B-612BS**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 37.3g



Model **C-712B**
Purpose UV Protective Glasses
Lens Color #1.2 ~ #6
Weight 15.2g

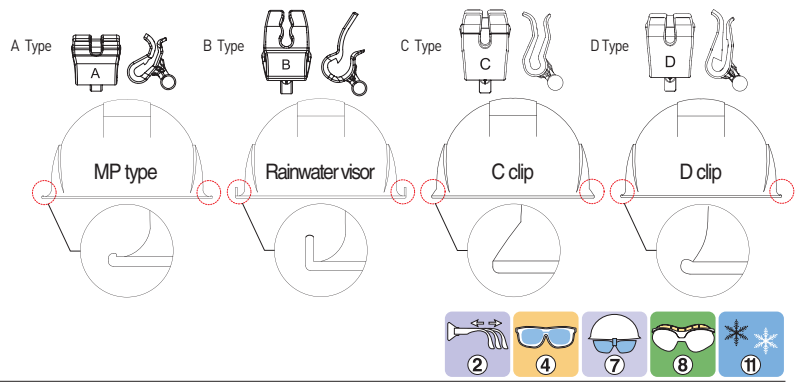


Safety Spectacles / Welding Glasses

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Caution
1) Do not take off UV protective glasses while working.
2) Wear with safety helmets when handling chemicals or working in the presence of falling matters.
3) Use caution as the UV protective glasses cannot completely protect your eyes from every accident.
4) Choose the lens with optimum UV protection number for the harmful rays.
5) Never use UV protective glasses to protect from laser.

< Type of clip for safety helmets & shapes of visors on safety helmets >



A-645A | 33.1g
• May be attached to safety helmets (any type). • Light with no glare compared to the one attached to safety helmet. • Adjustable distance. • Replaceable lens. • Adjustable legs.
• Flip-up feature. • Soft nose pad. • **Optional: Anti-fog lens, forehead protective cushion (premium)**

Model	A-645B	Model	A-645XG
Purpose	UV Protective Glasses	Purpose	UV Protection
Lens Color	#1.7	Lens Color	Gray / #2.5
Weight	35.6g	Weight	35.6g

Model	A-645XY	Model	A-645XGM
Purpose	UV Protection	Purpose	UV Protection
Lens Color	Yellow / #1.2	Lens Color	Mirror(Gray) / #3
Weight	34.6g	Weight	34.6g

Model	A-645XGP
Purpose	UV Protection (Polarized)
Lens Color	Gray / #4
Weight	35g



Double forehead protection (premium)



A-644A | 25.3g
• Inserted into helmet visor. • Available to be combined with prescribed glasses.
• Soft double forehead protection • Soft nose pad • Adjustable front and back.
• Compatible with helmets with long and short visors. • **Optional: Anti-fog lens**

Model	A-644B	Model	A-644XG
Purpose	UV Protective Glasses	Purpose	UV Protective Glasses
Lens Color	#1.7	Lens Color	Gray / #2.5
Weight	25.3g	Weight	25.3g



A-642 | 30.4g
• Inserted into helmet visor. • Adjustable front and back. • Anti-UV
• Compatible with helmets with long and short visors. • Lens Color: #3 / #4 / #5 / #6 / #7

Model	A-642
Purpose	UV Protective Glasses
Lens Color	Cobalt Blue / #5
Weight	30.4g



M-651AS | 31g
• Replaceable lens • PC lens • Detachable side panel. • Anti-scratch
• **Optional: Anti-fog lens**

Model	M-651BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	32.9g



M-653AS | 22.7g
• Replaceable lens • PC lens • Detachable side panel. • Anti-scratch
• **Optional: Anti-fog lens**

Model	M-653BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	26.5g



M-612AS | 30g
• Replaceable lens • PC lens • Detachable side panel. • Anti-scratch
• **Optional: Anti-fog lens**

Model	M-612BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	32.3g



M-652AS | 30.3g
• Replaceable lens • PC lens • Detachable side panel. • Anti-scratch
• **Optional: Anti-fog lens**



Model	M-652AS(S)
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	28.1g



Model	M-652BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	30g



Model	M-652BS(S)
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	28.2g



M-611AS | 32.1g
• Replaceable lens • PC lens • Detachable side panel. • Anti-scratch
• **Optional: Anti-fog lens**

Model	M-611BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	35g



M-615AS | 25.3g
• Replaceable lens • PC lens • Detachable side panel. • Anti-scratch
• **Optional: Anti-fog lens**

Model	M-615BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	27.3g





Safety Spectacles / Welding Glasses



M-643AS | 28.7g

- Unisex • Replaceable lens • PC lens
- Detachable side panel. • Anti-scratch • **Optional: Anti-fog lens**

Model	M-643BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	30.7g



M-631AS | 48.2g

- Available lens lid up and down • Replaceable lens • PC lens
- Detachable side panel. • Anti-scratch • **Optional: Anti-fog lens**

Model	M-631BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	50.7g



M-622AS | 36.6g

- Available lens lid up and down • Replaceable lens • PC lens
- Detachable side panel. • Anti-scratch • **Optional: Anti-fog lens**

Model	M-622BS
Purpose	UV Protective Glasses
Lens Color	#1.2 ~ #6
Weight	39.1g



M-633B | 35g

- Available lens lid up and down • Replaceable lens • Uni Lens
- Anti-UV • Lens Color: #3 / #4 / #5 / #6 / #7



Blue light Shield Spectacles (Option - prescription lens)



B-201XB | 17.3g



B-202XB | 17.5g



B-203XB | 17g



B-204XB | 17g



B-205XB | 17.8g

• Purpose of Use

Developed to protect eyes from the blue light emitted from computer, smartphone and LED lights. Especially **shields blue light in the night working lights** *Helps in maintaining the melatonin release. Moreover, OTOS Blue Light Shield Lens provides clear sight without distortion like a transparent lens as a result of the special coating method.

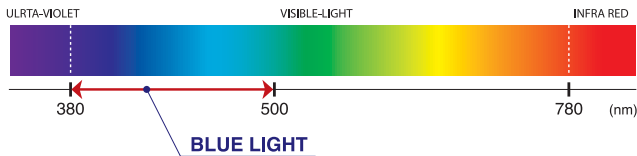
• Melatonin

Melatonin controls the sleep in living body. It also acts in removing the active oxygen. There is an increased risk of breast cancer occurrence and active oxygen with the suppression of melatonin hormone release as a result of exposure to the night lighting. According to Cancer Epidemiology, the reduction in the release of melatonin hormone increases the chance of breast cancer and cardiovascular disease.

• Risk factors of Night Workers

According to a research on nurses from 1989, nurses who had night shifts for over 20 years had 79% greater occurrence of breast cancer, and shiftwork had been classified as 2nd class carcinogen (Denmark applies the industrial accident to women with breast cancer who had work in shift change for long term)

Furthermore, night workers tend to have inhibited cognitive ability and capability during the work hour. Hence, the night working hours are the most critical times when it is difficult to remain focused. Many safety accidents occur at this time.



• Color of Light and Melatonin

Green and red lights have no effect on the generation of melatonin, but the blue light has most suppression on melatonin. Long-term exposure to the blue light leads to dryness in the eye, tiredness in the eye, headache, macular degeneration acceleration and biorhythms. Blue light shield spectacle is a requirement in working in the night conditions.

[UV, Blue light - Shield]



※ The Blue Light Shield Spectacle provides no protection from diseases and to the eyes in all accidents.



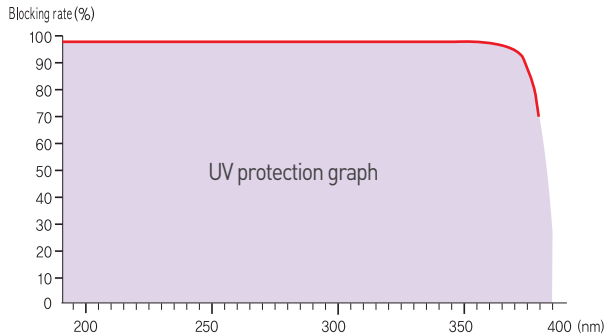
UV Protective Glasses

※ [KS P8147 / In accordance with the Notice from the Ministry of Employment and Labor Notice]
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use as safety spectacles.

1 Purpose of UV Shield Spectacles

This is a product for use in protection for the eyes from the working environment with an exposure from the ultraviolet rays.

※ Do not operate in the fire-using working environment such as welding and oxygen cutting.



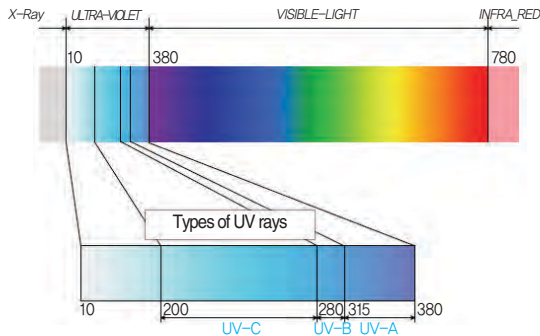
2 Types of UV Shield Lens

Lens Types	Purpose	Polarized lens (optional)
Dark Gray	This is a common UV shielding lens color that allows the wearer distinguish even in same color and reduces light intensity for the outdoor working environment.	<input type="radio"/>
Standard Gray		<input type="radio"/>
Mirror	This is a mirror coating lens that allows the protection from the light intensity in the outdoor and comfort in the indoor which makes it suitable for working in both indoor and outdoor.	<input checked="" type="radio"/>
	Color Mirror revo blue revo orange	
Yellow	Yellow colored lens reduces the light intensity and shields from blue light (450nm) that may lead to dispersion yellow color lens makes it easy to have sight in the distance even in the foggy or rainy weather conditions.	<input checked="" type="radio"/>

3 Shielding Ability of UV Filter

Shielding capacity (Shielding number)	UV maximum spectral transmittance (τ(λ))		Luminous transmittance(Tv)	
	313nm (%)	365nm (%)	Maximum (%)	Minimum (%)
1.2	0.0003	10	100	74.4
1.4	0.0003	9	74.4	58.1
1.7	0.0003	7	58.1	43.2
2	0.0003	5	43.2	29.1
2.5	0.0003	3	29.1	17.8
3	0.0003	2	17.8	8.5
4	0.0003	0.8	8.5	3.2
5	0.0003	0.3	3.2	1.2

4 Harmfulness of UV



• The harmful UV rays to the living body has been classified as UV-A(315nm~380nm), UV-B(280nm~315nm), and UV-C(200nm~280nm). The UV-A and UV-B which are not absorbed in the ozone layer are not only harmful to the skin of the living body but they also inflict serious damage to the eyes. UV-A surpasses the eye's cornea and lens and damages retina that may lead to chemical changes and serious damages leading to diseases such as cataract and snow blindness. UV-B is absorbed through the cornea that the damaging wavelength energy will lead to amblyopia and diseases such as snow blindness and cornea burning, and also lead to serious damage to the cornea and eventual sight loss in exposure for a long-term. UV-C is mostly absorbed through the ozone layer and does not reach the Earth's surface. It is, however, seriously damaging in areas where the ozone layer has been destroyed. It is necessary to wear UV shield spectacles in the outdoor working environment, UV sterilization area and other UV emittance working area.

Leader in the industrial eye protection gear OTOS

Cover lens to protect prescribed lens



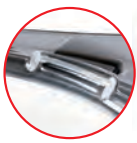
B-7100AS



One-touch assembly structure



B-7300AS



One-touch assembly structure

P-710A Cover Lens 7.8g



P-710XY Cover Lens 7.8g



P-710XB Cover Lens 7.8g



P-710XG Cover Lens 7.8g



P-710XM Cover Lens 7.8g



P-730XG Cover Lens 8.25g



P-730XM Cover Lens 8.25g



P-730A Cover Lens 8.25g



P-730XY Cover Lens 8.25g



P-730XB Cover Lens 8.25g



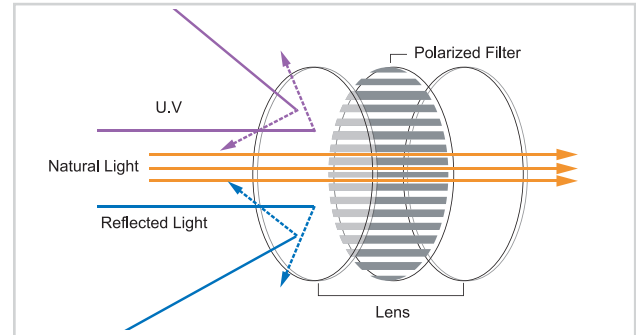
- Prescribed lens protection cover filter
- Prescribed safety spectacles may be assembled or disassembled in one-touch.
- Protect the lens from foreign particles such as paint and splatter.
- Proud to present the world's lightest at 7.8g / 8.25g.
- Possible with variety of lens selection (UV shield) that suits the working environment.



Polarized Lens

※ [KS P 8147 / In accordance with the Notice from the Ministry of Employment and Labor Notice.]
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use as safety spectacles.

1 Polarized Lens?



• Polarization refers to the specific direction in which light vibrates. We recognize objects from the light that reflects on the objects in wavelengths within the visible light spectrum (380-780nm), and have serious glares and diffused reflections depending on the angle in which the light has been reflected. Normal sunglasses lens may reduce the glaring, but it may not completely shield the problem. Light that has been reflected on the surface such as the road, snow and water are about 10 times the intensive than the normal light and may cause difficulty in recognizing object's color and depth. Polarized lens shields the vertical wavelengths of light and resolves the glaring issue from the surface reflections of water, snow, road, ground, and metal. As a result, it allows for clarity in sight.

2 Characteristics of Polarized Lens

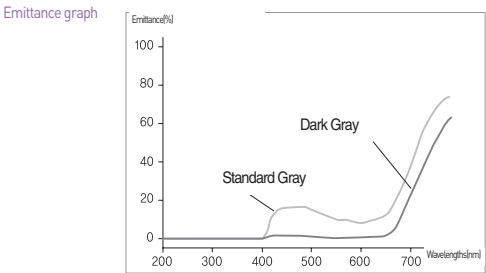
• The performance of the polarized safety spectacles relies on the excellent optical performance of the polarization and lens. The polarized lens is produced by our company with strict quality control using the spectro photometer and precision optical equipment.

① Polarity:

$$\sqrt{\frac{\text{longitudinal emittance} - \text{transverse emittance}}{\text{longitudinal emittance} + \text{transverse emittance}}} \times 100$$

※ Ensure to select the polarity based on the user's purpose and work.

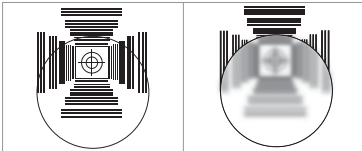
color	Polarity	Visible Light	UV protection	
			313nm	365nm
Standard Gray	99%	17.8~8.5% (#3) 8.5~3.2% (#4)	0.0003% Blow	2% Blow 0.8% Blow
Dark Gray	99%	3.2~1.2% (#5)	0.0003% Blow	0.3% Blow



② Optical performance of polarized lens :

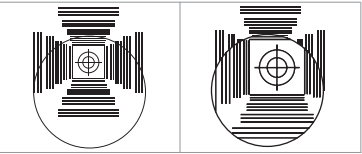
Resolution

This is a measurement of the ability to form an image clearly away from two nearby objects through the lens. The measurement is done with a telescope with a minimum diameter of 19mm and 8 times magnification.



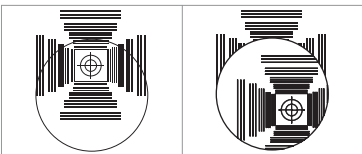
Les Refractive power

The ability to focus of the light through lens is measured and displayed in diopter (D). Having sphere diopter and astigmatism refractive index refers to more distortion, which may lead to serious dizziness.

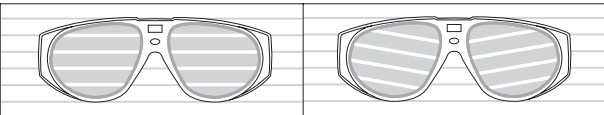


Degree of parallelization

This is a measurement of the difference in angle for the emittance through the lens. It is measured in Prism diopter (Δ), and 1 prism diopter is equal to the 1cm difference in 1m distance.



Polarization (horizontal angle below 2 degrees)



* Material: PC / thickness : 1.7T / impact resistance: Above the standard by the Korea Occupational Safety and Health Agency

3 Purpose of Use

UV rays from extreme sunlight in the outdoor may result in damaging the operator's cornea or it may lead to serious tiredness and decrease the operator's productivity. OTOS Polarized safety spectacle is proven to be the world's best and excellent with the its production of safety polycarbonate polarized lens, and it has been certified by the Korea Occupational Safety Health Agency of the Ministry of Employment and Labor.

- Industrial: a reduction in diffused reflection and light from the outdoor work such as equipment adjustment, outdoor construction work, road, harbor, and aircraft and work environment involving metallic or metal structures, nonferrous metals and sand.
- Leisure sports: cycling, fishing, driving, boat, tennis and skiing



4 Caution in wear

1. You must wear the shadingsafety spectacles in normal fire-involving working environment involving oxygen cutting, welding and dangerous emittances.
2. Do not soak in water for a long term.
3. Extreme temperature changes or high temperature above 70°...may result in decreasing the performance of the polarized filter.
4. Some LCD may be viewed in more darkened state depending on the angle in which the user the views the LCD as a result of the principles of polarization and not defect.



N

B-813XGP | 25.4g



- The innovative and unique structure of frame allows for a comfortable wear on any shapes and sizes of faces and naturally adjusts pressure and sliding.
- The double-protruded urethane nose pad works as a cushion to be adjusted to fit the user's nose and prevents the sliding of frame.
- Soft double forehead protection • Soft nose pad • Adjustable leg angle
- Replaceable lens
- PC lens
- Anti-scratch
- Anti-UV
- lens Color : Gray / #4
- lens Type : Polarized



nose cushion pad



B-811XGP | 20.4g



- Performance safety spectacles with natural fit and without pressure in colorful sport design using high elastic material
- Soft double forehead protection • Soft nose pad
- Adjustable leg angle • Replaceable lens
- PC lens • Anti-scratch • Anti-UV
- lens Color : Gray / #4 • lens Type : Polarized



B-803XGP | 30.2g



- Double soft forehead protection • Soft nose pad • Leg cushion pad
- Adjustable leg angle • Replaceable lens • PC lens • Anti-scratch
- Anti-UV • lens Color : Gray / #4 • lens Type : Polarized



Double forehead protection



S-301XGP | 22.7g




- Replaceable lens • PC lens • Anti-scratch • Anti-UV
- lens Color : Gray / #4 • lens Type : Polarized




S-302XGP | 24.7g




- Replaceable lens • PC lens • Anti-scratch • Anti-UV
- lens Color : Gray / #4 • lens Type : Polarized




S-303XGP | 22.4g



- Replaceable lens • PC lens • Anti-scratch • Anti-UV
- lens Color : Gray / #4 • lens Type : Polarized



S-305XGP | 21.2g



- Replaceable lens • PC lens • Anti-scratch • Anti-UV
- lens Color : Gray / #4 • lens Type : Polarized



Power Safety Spectacles

※ The weights in this catalog show the average weights with ±2% errors.

Caution in wear
1) Do not take off UV protective glasses while working.
2) Wear with safety helmets when handling chemicals or working in the presence of falling matters.
3) Use caution as the UV protective glasses cannot completely protect your eyes from every accident.



Excellence of Super phoenix II lens

OTOS super phoenix II lens collects only the benefit from the existing lens i.e glasses, CR-39, PC. As state of art lens it is the world best lens offers impact-resistance, chemical resistance and high quality clarity. Considering its function we can proudly say it is the world best lens and **OTOS** is the first company in Korea providing industrial safety prescription lens

Sectional surface of lens

1,2,3 Urethane coating for 3 times
4 Scratch resistant coating for 2 times
5 Multi-coating for 2 times

強 The shock resistance has been greatly improved by 10 times the standard of the Ministry of Employment and Labor with the bullet-proof material, which had been a newly developed material.

明 There is an excellent clarity than previous PC lens with the Abbe number at 45, and its emittance has been improved to 99.5% with the anti-reflection coating.

輕 Weight at 1.1 makes it the lightest prescription lens available.

清 Water-resistance coating prevents foreign particles such as dust, oil and finger prints on the lens surface.

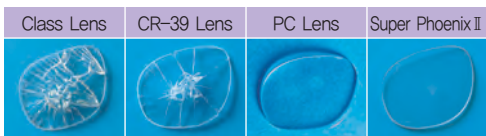
熱 Specially treated heat-resistance coating allows the lens surface to withstand above 130°

Dangerous normal corrective lens

Any metal parts inside the eye may be easily found using the X-rays, and may be removed using magnets. It is, however, difficult to remove plastic and glass parts. Upon an x-ray test for foreign particles inside the eye, it has been found that particles with diameter above 2m/m may be found if the roentgen image is excellent. Even with today's medical technology and surgical techniques, any nonmagnetic particles that infiltrate into the eye has no certainty in its progress. It is the reality of any user that one must wear normal glasses only 12mm away from the eye in working environment with the possibility that the lens may be easily broken into sharp pieces to pierce the eye.

Impact resistance of prescription lens

The prescribed lens that is currently sold in the market ignores the performance and comfort of corrective lens, and shock resistance of corrective lens. These normal corrective lenses are easily damaged by the lens shock resistance test (free-fall drop of steel ball with diameter 22mm and weight 45g at height 130cm) set forth by the Ministry of Employment and Labor in the safety gear self-safety test, and fall below the Ministry's standards.

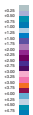


Comparison analysis for lens type.

Lens type	category	shock resistance	durability	weight	Refraction	Abbe number
Glass		-7	10H	2.5	1.6	45
PC		+23	1H	1.23	1.58	30
CR-39		-3	2H	1.32	1.49	52
Superphoenix II		+30	3H	1.12	1.53	45

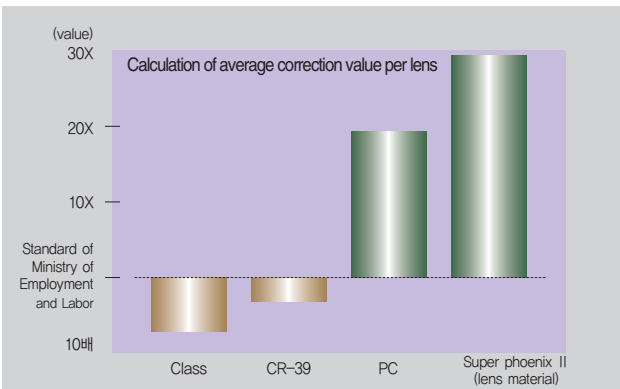
※ Abbe number: object's viewed with more clarity with the number increasing.

※ Multifocal lens



Multifocal lens uses both farsighted and nearsighted for the aged, OTOS designed a lens that performs for far, middle and near distance. OTOS supplies industrial multifocal lens for the first time in Korea.

Comparison of impact resistance of myopia lens



Prescription safety spectacles with 2 step adjustable frame range



B-7100IVAS | 25.2g

- Provides comfort in wear without any pressure with the adjustable frame range in 2 levels.
- double-buffer forehead protector
- Soft nose pad
- Leg cushion pad (double protruded)
- Frame of prescription lens
- Anti-scratch
- Clip-type glasses: C-710II
- Lens Color : #1.2/#1.7/#2/#3



B-7300AS | 25.5g

- The innovative and unique structure of frame allows for a comfortable wear on any shapes and sizes of faces and naturally adjusts pressure and sliding.
- double-buffer forehead protector
- Frame of prescription lens
- Replaceable lens
- Anti-scratch
- Clip-type glasses : C-730B
- Lens Color : #1.2/#1.7/#2/#3
- Optional: Anti-UV lens



B-7200AS | 32.7g

- The double-protruded urethane nose pad works as a cushion to be adjusted to fit the user's nose and prevents the sliding of frame.
- Double soft protection
- Soft nose pad
- double-buffer forehead protector
- Adjustable leg angle
- Frame of prescription lens
- Replaceable lens
- Anti-scratch
- Clip -Type Classes : C-710II
- Lens Color : #1.2/#1.7/#2/#3
- Optional: Anti-UV lens



B-7100IIAS | 31.4g

- double-buffer forehead protector
- Soft nose pad
- Leg cushion pad (double protruded)
- Adjustable leg angle
- Frame of prescription lens
- Replaceable lens
- Anti-scratch
- Clip-type glasses : C-710II
- Lens Color : #1.2/#1.7/#2/#3
- Optional: Anti-UV lens



B-7100I AS | 31.1g

- double-buffer forehead protector
- Soft nose pad
- Leg cushion pad (double protruded)
- Adjustable leg angle
- Frame of prescription lens
- Replaceable lens
- Anti-scratch
- Clip-type glasses : C-710II
- Lens Color : #1.2/#1.7/#2/#3
- Optional: Anti-UV lens





Power Safety Spectacles

※ The weights in this catalog show the average weights with ±2% errors.



Caution in wear
1) Do not take off UV protective glasses while working.
2) Wear with safety helmets when handling chemicals or working in the presence of falling matters.
3) Use caution as the UV protective glasses cannot completely protect your eyes from every accident.



B-7030A | 37.5g

- Soft nose pad • Leg cushion pad (double protruded) • Adjustable leg length
- Frame of prescription • Replaceable lens • Anti-scratch
- LensType :



B-6430 | 23.3g

- Frame of only prescription lens • Light weight • Detachable side panel
- Anti-scratch
- Clip-type glasses : C-642B
- Lens Color : #1.2/#1.7/#2/#3
- **Optional: Anti-UV lens**

〈C-642B〉



M-6520AS | 30g

- Replaceable lens • Detachable side panel • Anti-scratch
- **Optional: Anti-UV lens**



M-6530AS | 22.7g

- Replaceable lens • Detachable side panel • Anti-scratch
- **Optional: Anti-UV lens**



B-7010AS | 32.8g

- Soft nose pad • Adjustable leg length
- Anti-scratch
- Clip-type glasses : C-701B
- Lens Color : #1.2/#1.7/#2/#3
- **Optional: Anti-UV lens**

〈C-701B〉



M-6510AS | 32.1g

- Replaceable lens • Detachable side panel • Anti-scratch
- **Optional: Anti-UV lens**



M-6520AS(S) | 25.3g

- Replaceable lens • Detachable side panel • Anti-scratch
- **Optional: Anti-UV lens**



Laser Eye Protectors

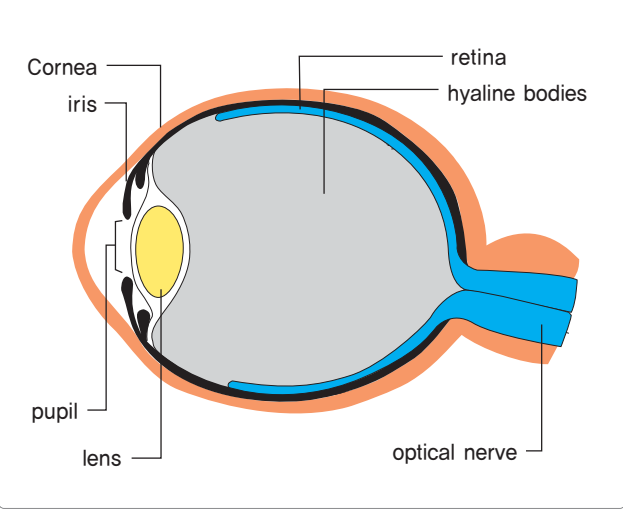
1. Need for the use of laser protection glasses

Laser focuses massive energy into a small area which intensifies the energy and inflicts serious damage onto the living body. There must be caution especially for the eye which has low regeneration compared to other organs. The eye's cornea and lens are transparent organs that the intensity of the laser into the fundus that becomes 10,000 times than the surface. A suitable laser protection glasses must be worn in working with laser as the laser may reach into the eye's fundus.

2. Effect of excessive laser on the skin

An exposure to high-intensity laser causes blister, burn, and carbonization.

3. Structure of Eye



4. Effect of excessive laser on the eye

Absorption into the eye	Wavelengths parameter of CIE	Effect and damage on the eye
	200nm	Optical effect on the cornea, heat effect on the cornea, serious pain from inflammation of the cornea
	UV-C	
	280nm	
	UV-B	Heating effect on the cloudiness of lens (cataract)
	315nm	
	UV-A	
	380nm	Disability from the optical effect of visible light Retina damage from optical effect, heating effect and shock effect
	Visible light area	
	780nm	
	IR-A	Cornea burn and cataract from heating effect
	1,400nm	
	IR-B	
	3000nm	
	10 ⁶ nm	

5. Complete absorption type

Laser type		Type and use of laser protection glasses					
Type	Wavelengths (nm)	Model	Applied wavelengths parameter (nm)	OD values	Lens color	Lens material	Glasses frame color
Excimer	199 ~350	L-707EX L-702EX	190 ~ 394	5 +	Clear	CR	White White
Ar KTP	488 514.5 325 442	L-707AR L-702AR	190 ~ 449 450 ~ 532	5 + 6 +	Orange	PC	Grayish Blue White
He-Ne Kr	633 647	L-707HE L-702HE	190 ~ 380 606 ~ 694	5 + 5 +	Blue	PC	Dark Blue White
Ruby Diode	694 780 ~	L-707RD L-702RD	190 ~ 400 675 ~ 850 680 ~ 710 740 ~ 835	5 + 5 + 6 + 6 +	Light Gray	PC	White White
Nd : YAG	1064	L-707YGII L-702YGII	190 ~ 534 910 ~ 1070 850 ~ 1070	6.5 + 6 + 5 +	Amber	PC	Dark Blue White
		L-707YG L-702YG	190 ~ 400 1064 950 ~ 1070 840 ~ 950	5 + 7 + 7 + 5 +	Green	PC	Grayish Blue White
		L-702VF	950~1050 1050~1500 1500~2300 2900~5200 10600	4 + 5 + 4 + 4 + 5 +	Tint Blue	GLASS	White
Alexandrite	755 809	L-707AL L-702AL	190 ~ 400 720 ~ 840 755 809	5 + 6 + 7 + 7 +	Pink	PC	White White
Alexandrite Nd : YAG	755 1064	L-707AY L-702AY	190 ~ 435 730 ~ 1085 755 1064	5 + 5 + 7 + 7 +	Yellow Green	PC	Black White
Dye	585	L-707DY L-702DY	576 ~ 600 585 ~ 595	5 + 6.5 +	Purple	CR	Black White
CO ₂	10600	L-707V L-702V	5300~10600	5 +	Green	PC	Dark Blue White
IPL	550/1200	L-707IPL L-702IPL	550 ~ 1100 620 ~ 1050	1.5 + 3 +	Green	PC	Grayish Blue White
		I-03	550 ~ 1200	4 +	Light Gray	GLASS(LCD)	Black

※ L-702YGII C € EN207 Certificated. L-702V, L-702VF, L-702HE, L-702AY C € DIN CERTCO Certificated.

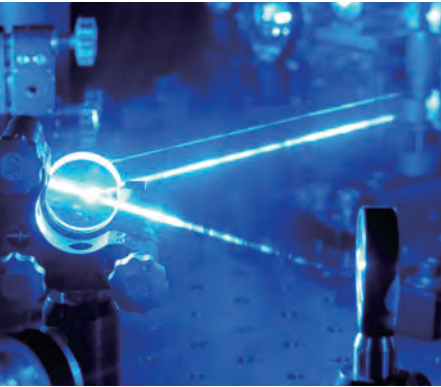


Laser Eye Protectors

※ The weights in this catalog show the average weights with ±2% errors.



- Caution** in wearing the laser protection glasses
- 1) Do not use any other laser type than the laser rays.
 - 2) Do not take off the laser protection glasses during operation.
 - 3) Do not look directly into the laser even with the laser protection glasses (this may result in damage to the eye or lens).
 - 4) Do not use welding or shielding safety spectacles.



※ Selecting the laser protection glasses

- (1) Select the laser protection glasses based on the most damaging exposure
 - (2) Wearing the laser protection glasses may deteriorate sight and view, hence there must be considerate understanding of the potential dangers.
 - (3) You must be able to protect yourself from the effect of the laser's wavelengths upon understanding the wavelengths of the laser equipment.
- ※ The product must display the OD Value (Optical Density) which is the damping ratio of the laser's wavelength.

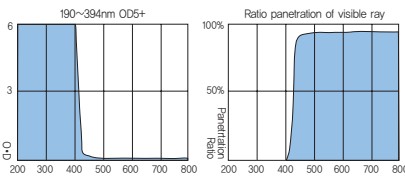
※ Reference for inquiry (Refer to the items listed below for selection of the laser protection glasses as there is difficulty in selection without the items referenced)

Laser type	Continuous Wave • Pulse wave			
Wavelength	What is the laser wavelength parameter of your equipment?			
Output	What is the laser output parameter of your equipment?			
Pulse	Output of 1 pulse	V	Output of 1 pulse	second Hz
Daily operation time	minute			

L-707EX



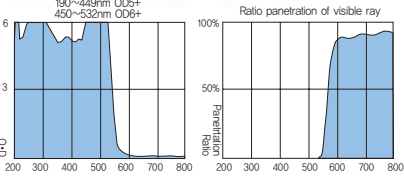
• EXCIMER



L-707AR



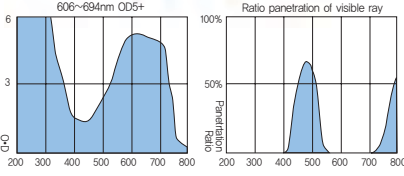
• Ar



L-707HE



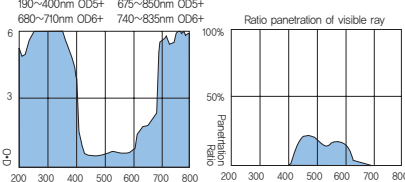
• He-Ne



L-707RD



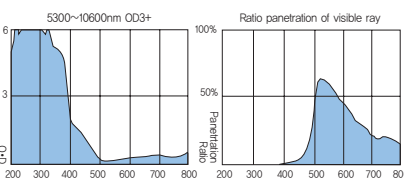
• Ruby / Diode



L-707V



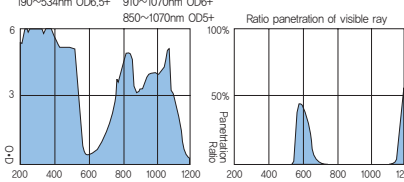
• CO₂



L-707YG II



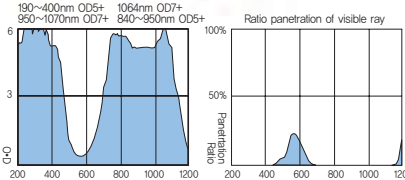
• Nd : YAG



L-707YG



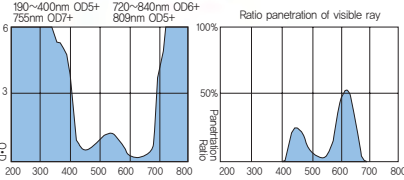
• Nd : YAG



L-707AL



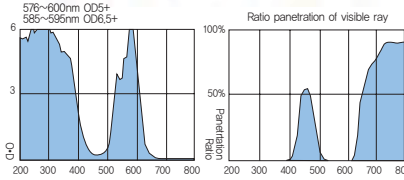
• Alexandrite



L-707DY



• Dye



IPL Auto Darkening Safety Spectacle



Shading pad

(IPL Auto Darkening Safety Spectacle)

I-03 | 101.2g



- Automatic function (Before shading, after #2.5, during shade #11)
- Auto-on (Auto-off (Auto On) function)
- Delay time control 0.1~0.5 seconds (5 levels)
- Switching speed of 1/14,000 (0.00007s) seconds
- Low battery consumption (About 18months (8hours per day) LED for exchange alerts)
- Function for self-diagnostics for any error
- Malfunction prevention from optical signals of lighting and visible light
- Possible to wear along with prescription glasses (Use shading pad)

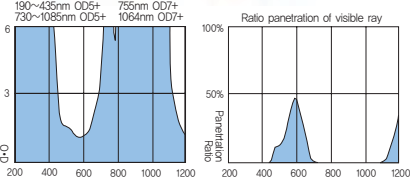


- Delay time select display lamp
- Delay time select button (5-level selection)
- Battery replacement signal display

L-702AY



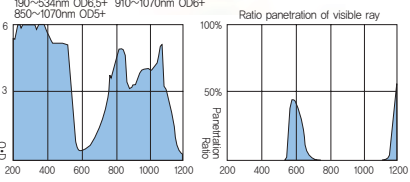
• Alexandrite, Nd : YAG



L-702YG II



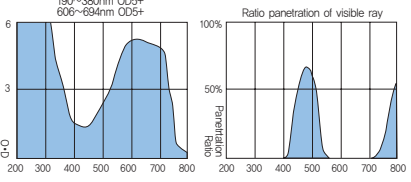
• Nd : YAG



L-702HE



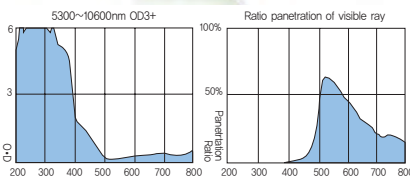
• He-Ne



L-702V



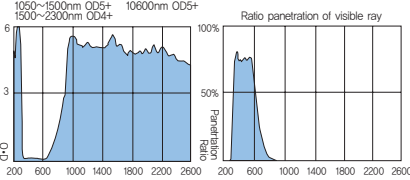
• CO₂



L-702VF



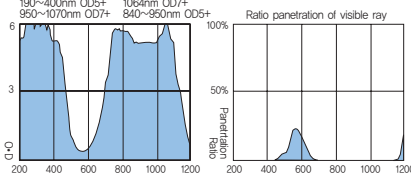
• Nd : YAG

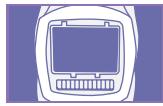


L-702YG



• Nd : YAG





Auto Darkening Welding Helmet

※ [KSP 8142 / Protective Gear Safety Certification Notice (Note from the Ministry of Employment and Labor)]
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use in welding.

※ The weights in this catalog show the average weights with $\pm 2\%$ errors.



Caution wearing the welding helmets
1) Use the shielding capacity that fit the welding type and intensity.
2) Do not remove the welding helmet.
3) Do not operate using the welding helmet without the lens protection panel.
4) Ensure to keep the battery recharged for certain time [Refer to the manual].
5) Stop immediately in case of any odd occurrence and refer to the manual or contact the Head Office.

AEGIS

Super Wide Window Auto Darkening Welding helmet

weight : 648g $\pm 2\%$

The Grand Slam of world design awards

<IDEA design award 2016 finalist / iF design award 2016 winner / reddot award 2016 winner>

OTOS' AEGIS, becoming the first in the Safety Helmet industry to win awards at all three of the grand slam of design awards in the year of 2016..



reddot award 2016



150iw Cartridge – INFOTRACK



High-quality lens with 30% increase in size from originally I45gw, D32gw (97mmx60mm) to (112mmx78mm) has increased the welding view and minimizes the movement required in operation, hence increasing the operation efficiency through the increased wide welding view.



Accumulated working time display
Function for displaying the accumulated time that the welding has been operated.



Current time display function
Displays the time control.



Timer function
Function for timer that has been set for a specified time.



Alarm function
Function for alarm at any time of choice.



Multilanguage function
Function for viewing the help in Korean or English. (6 languages)



Help function
Function for instruction of control the cartridge. (Multi languages available)

- 4MODE cartridge - welding (WELD), cutting (CUTTING), grinding (GRIND), x-mode(X-MODE)
- Setting InfoTrac function with the JOG KEY
- 30% wider super large LCD (previous large I45gw standard)
- Decreased glaring and tiredness to the eye with the high-purity display scattering light shade lens
- Internal shade control: #8~#13
- 4 independent sensors for welding signal for every 1/25,000 seconds
- DC Inverter TIG Welding may operate in welding condition below 5A

- Little battery consumption (3000 hours in operation under MIG welding condition)
- LED for exchange alert
- Adjustable Sensitivity control / ensitive -sensitive, dull - dull
- Grinding function: Shade #3
- Delay time control 0.1~1.0 seconds
- Install function for the welding magnifier
- Excellent durability and light as new material (nylon) has been used as material
- Flextech headband II

1 World's leader in auto-darkening welding helmet OTOS

- **World's leader with the excellent cartridge technology** (World Patent - ① Temperature compensation function, ② X-MODE, ③ InfoTrac function)
World's first 4-Mode cartridge that has evolved from the previous cartridge function with WELD, CUTTING, GRIND, X-MODE that allows for safety, comfort and productivity
- **World's leading design** — OTOS auto-darkening welding helmet has its innovative design (World's first attempted decal) to lead the global market and currently export to 38 developed nations.
- **World's No. 2, Asia's Best Switching speed** — Excellent product with switching speed of 1/25,000 seconds (0.00004 seconds) for welding and block harmful rays to ensure the user's safety.
- **Lightest**— Specially enhanced material for the best welding condition in providing heat-resistance, shock-resistance and shielding, and decreased tiring on the user's neck with excellent comfort.

2 Increased productivity by 40%

- There is no complication in opening and closing the helmet faceshield. Any new user can easily use the helmet.
- Both hands may be freely used, allowing for flexible operation even in insecure areas.
- The starting point for welding is definitely visible, which allows for more precision. This allows for improved product quality.



ACE

Wide Window Auto Darkening Welding helmet ACE Series

I45gw Cartridge-InfoTrack Function(InfoTrack™)

- External grinding function -The grinding function switch button is placed in the exterior, and this allows for easy(handy) grinding without removing the helmet.
- Accumulated working time display function - Function for displaying the accumulated time that the welding has been operated. Displays up to 99:59.
- Current time display function-Displays the time control.
- Timer function - Function for timer that has been set for a specified time. Timer set up to 99:59.
- Alarm function - Function for alarm at any time of choice.

World's best technology in a package -

ACE - W Plus

Reputation continues with upgraded function -

ACE I Plus Decal



I45gw(5MODE) Cartridge

- 4MODE cartridge –welding (WELD), cutting (CUTTING), grinding (GRIND), x-mode(X-MODE)
- Button-operated cover structure (Patent)
- Decreased glaring and tiredness to the eye with the high-purity display scattering light shade lens
- 30% wider super large LCD
- Internal shade control: #8~#13
- 4 independent sensors for welding signal for every 1/25,000 seconds
- DC Inverter TIG Welding may operate in welding condition below 5A
- Low battery consumption (3000 hours in operation under MIG welding condition)
- Adjustable Sensitivity control: Sensitive - sensitive, dull - dull
- Grinding function: shade #3
- Delay time control 0.1~1.0 seconds
- Install function for the welding magnifier
- Excellent durability and light as new material (nylon) has been used as material
- Flextech headband II
- Weight: 602g $\pm 2\%$

D32gw Cartridge

- Decreased glaring and tiredness to the eye with the high-purity display scattering light shade lens
- 30% wider super large LCD
- Internal shielding shade: #8~#13
- 4 independent sensors for welding signal for every 1/25,000 seconds
- DC Inverter TIG Welding may operate in welding condition below 5A
- Low battery consumption (3000 hours in operation under MIG welding condition)
- Adjustable Sensitivity control: Sensitive - sensitive, dull - dull
- Grinding function: shade #3
- Delay time control 0.1~1.0 seconds
- Install function for the welding magnifier
- Excellent durability and light as new material (nylon) has been used as material
- Flextech headband II
- Weight: 560g $\pm 2\%$
- **External grinding function (D32gw cartridge) is used to freely change to grinding function without having to remove the helmet.**



Auto Darkening Welding Helmet

※ [KSP 8142 / Protective Gear Safety Certification Notice (Note from the Ministry of Employment and Labor)]
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use in welding.

※ The weights in this catalog show the average weights with $\pm 2\%$ errors.



Cautionin wearing the welding helmets
1) Use the shielding capacity that fit the welding type and intensity.
2) Do not remove the welding helmet.
3) Do not operate using the welding helmet without the lens protection panel.
4) Ensure to keep the battery recharged for certain time [Refer to the manual].
5) Stop immediately in case of any odd occurrence and refer to the manual or contact the Head Office.

Chameleon

Auto Darkening Welding helmet Chameleon Series

N



Chameleon VII

| Weight : 470g $\pm 2\%$

D27iw Cartridge

- Info Function**
- Accumulated number of welding spot display function
 - Function that detects the welding spots and display the number.
 - Accumulated working time display function
 - Function for displaying the accumulated time that the welding has been operate. Displays up to 99:59.
 - Current time display function - Displays the time control.

- 4MODE cartridge –welding (WELD), cutting (CUTTING), grinding (GRIND), x-mode(X-MODE)
- Auto-on auto-off (Auto On) function
- Decreased glaring and tiredness to the eye with the high-purity display scattering light shade lens
- Internal shade control: #8-#13 • 2 independent sensors for welding signal for every 1/25,000 seconds
- DC Inverter TIG Welding may operate in welding condition below 5A
- Adjustable Sensitivity control: Sensitive - sensitive, dull - dull • Grinding function: shade #3
- Delay time control 0.1-1.0 seconds • Install function for the welding magnifier



Chameleon IV Plus

| Weight : 566g $\pm 2\%$

D25gw Cartridge

- Auto-on auto-off (Auto On) function
- Decreased glaring and tiredness to the eye with the high-purity display scattering light shade lens
- Internal shade control: #8-#13 • 2 independent sensors for welding signal for every 1/25,000 seconds
- DC Inverter TIG Welding may operate in welding condition below 5A
- Adjustable Sensitivity control: Sensitive - sensitive, dull - dull
- Grinding function: shade #3
- Delay time control 0.1-1.0 seconds • Install function for the welding magnifier
- Excellent durability and light as new material (nylon) has been used as material • Flextech headband II
- External grinding function (D25gw cartridge) is used to freely change to grinding function without having to remove the helmet.



Chameleon II N Plus

| Weight : 484g $\pm 2\%$

A21gw Cartridge

- Auto-on auto-off (Auto On) function
- Decreased glaring and tiredness to the eye with the high-purity display scattering light shade lens
- Internal shade control: #8-#13 • 2 independent sensors for welding signal for every 1/25,000 seconds
- DC Inverter TIG Welding may operate in welding condition below 5A
- Adjustable Sensitivity control: Sensitive - sensitive, dull - dull
- Grinding function: shade #3
- Delay time control 0.1-1.0 seconds • Install function for the welding magnifier
- Excellent durability and light as new material (nylon) has been used as material • Flextech headband II
- External grinding function (D21gw cartridge) is used to freely change to grinding function without having to remove the helmet.

Mach

Auto Darkening Welding helmet Mach Series



Mach II Plus

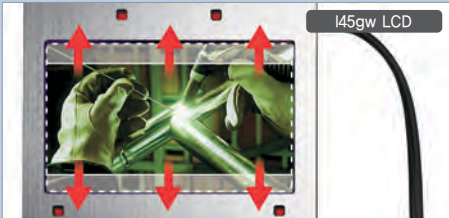
| Weight : 552g $\pm 2\%$

A21vw Cartridge

- Auto-on auto-off (Auto On) function
- Decreased glaring and tiredness to the eye with the high-purity display scattering light shade lens
- Internal shade control: #8-#13 • 2 independent sensors for welding signal for every 1/25,000 seconds
- DC Inverter TIG Welding may operate in welding condition below 5A
- Adjustable Sensitivity control: Sensitive - sensitive, dull - dull • Grinding function: shade #3
- Delay time control 0.1-1.0 seconds • Install function for the welding magnifier
- Excellent durability and light as new material (nylon) has been used as material • Flextech headband II

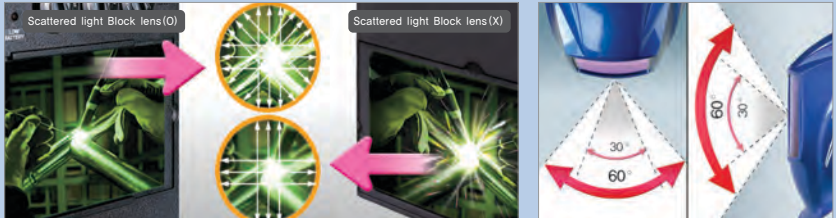
I45gw/D32gw super large LCD

30% larger LCD can increase the efficiency with the minimum movement and wide view.



High-purity display scattering light shade lens

High-purity display scattering light shielding lens expands the view by 2 times (30° \rightarrow 60°) and blocks the scattering light while increasing the lens brightness, hence decreasing the and light glaring and tiredness to the eye.



WG-01

Auto Darkening Welding Glasses

The innovation of light and comfortable auto-darkening welding glasses



WG-01 function control



- Ⓒ CUTTING function shade: #5, #6
- Ⓜ WELDING function shade: #7-#11
- Ⓔ Adjustable Sensitivity control (5 levels)
- Ⓐ Battery replacement signal display



Cartridge Series

- In high temperature (55°C), the switching speed is 1/25,000 seconds (0.00004 seconds -AEGIS, Ace, Mach, Chameleon) as world's 2nd and Asia's first.
 - Temperature compensation function - World Patent
- Cartridge's interior has temperature compensation function in low temperature (0°C ~ -20°C) and has the world's second switching speed.
- ANSI mark, mark, mark is world's 5th and Asia's first earned, First to earn the mark in Asia
- X-MODE (low current or outdoor welding) function - Patent
 - Auto-on Auto-on function
 - InfoTrac function (Accumulated number of welding spot display function/Accumulated working time display function/current time display function/timer function/alarm function/Multilanguage/help function) - Patent
 - Heat resistant panel -Protection for the cartridge from the heat that occurs from high-current welding

N

D27iw



Classification		Descriptions	
①Cartridge size	116mm × 95mm × 10mm		
②Lens size	102mm × 49mm		
③Shielding speed	Bright → Dark 1/25,000second		
④Function selection	WELD Function	Use in normal welding (Mma, Tig, Mig, CO2, Mag) * Shade #8-#13 * Sensitivity: 0-10 * Delay time: 0-10	GRIND Function Grinding operation permits no shielding capacity, sensitivity and delay time control. * Shade: #3 fixed
	CUTTING Function	Use in cutting and torch operation * Shade: #5-#8 * Sensitivity: 0-10 [Sensitivity 10 – Fixed sensitivity (dark state)] * Delay time: 0-10	X-MODE Function (optional) Improved the issues with the welding function in working environment by detecting and operating in occurrence of magnetic field and welding light in order to minimize the opening from low-current welding, outdoor welding, intense lighting environment and welding angles. * Shade: #8~#13 * Sensitivity: 0-10 * Delay time: 0-10
⑤Optical sensor	2 sensors		
⑥ Operation temperature/Storage temperature	-10℃ ~ +55℃ / -20℃ ~ +80℃		
⑦Power	CR2450 1unit, Solar panel (supplementary power)		
⑧Auto-on/Auto-off function	Auto-on ◀▶ Auto-On function Auto-off: 45±minutes after (high temperature 23℃basis)		
INFO Function	⑨Accumulated number of welding spot display function		
	⑩Accumulated working time display		
	⑪Current time display function		



Auto Darkening Welding Helmet

※ The weights in this catalog show the average weights with ±2% errors.



Caution wearing the welding helmets
1) Use the shielding capacity that fit the welding type and intensity.
2) Do not remove the welding helmet.
3) Do not operate using the welding helmet without the lens protection panel.
4) Ensure to keep the battery recharged for certain time [Refer to the manual].
5) Stop immediately in case of any odd occurrence and refer to the manual or contact the Head Office.

I50iw



Classification		Descriptions
①Cartridge size		116mm × 95mm × 10mm
②Lens size		102mm × 49mm
③Switching speed		Bright → Dark 1/25,000second
④Function selection	WELD Function	Use in normal welding (Mma, Tig, Mig, CO2, Mag) * Shade: #8-#13 * Sensitivity: 0-10 * Delay time: 0-10
	CUTTING Function	Use in cutting and torch operation * Shade: #5-#8 * Sensitivity: 0-10 [Sensitivity 10 -Fixed sensitivity (dark state)] * Delay time: 0-10
	GRIND Function	Grinding operation permits no shielding capacity, sensitivity and delay time control. * Shade: #3 fixed
	X-MODE Function (X-MODE)	Improved the issues with the welding function in working environment by detecting and operating in occurrence of magnetic field and welding light in order to minimize the opening from low-current welding, outdoor welding, intense lighting environment and welding angles. * Shade: #8~#13 * Sensitivity: 0-10 * Delay time: 0-10
⑤Optical sensor		4 sensors
⑥Operationtemperature/Storage temperature		-10℃ ~ +55℃ / -20℃ ~ +80℃
⑦Power		CR2450 2unit, Solar panel (supplementary power)
⑧Auto-on/Auto-off function		Auto-on ◀▶ Auto-On function Auto-off: 45±minutes after (high temperature 23℃basis)

I50iw Cartridge	Multilanguage/ Help function	⑨language : Help functionfor viewing the help in Korean or English. ⑩Help function : Function for explanation for the cartridge control
		⑪Accumulated working time display
	INFO Function	⑫Current time display function
		⑬Timer function
		⑭Alarm function

I45gw



Classification		Descriptions
①Cartridge size		132mm × 115mm × 10mm
②Lens size		97mm × 60mm
③Switching speed		Bright → Dark 1/25,000second
④Function selection	WELD Function	Use in normal welding (Mma, Tig, Mig, CO2, Mag) * Shade: #8-#13 * Sensitivity: 0-10 * Delay time: 0-10
	CUTTING Function	Use in cutting and torch operation * Shade: #5-#8 * Sensitivity: 0-10 [Sensitivity 10 -Fixed sensitivity (dark state)] * Delay time: 0-10
	GRIND Function	Grinding operation permits no shielding capacity, sensitivity and delay time control. * Shade: #3 fixed
	X-MODE Function (X-MODE)	Improved the issues with the welding function in working environment by detecting and operating in occurrence of magnetic field and welding light in order to minimize the opening from low-current welding, outdoor welding, intense lighting environment and welding angles. * Shade: #8~#13 * Sensitivity: 0-10 * Delay time: 0-10
⑤Optical sensor		4 sensors
⑥Operationtemperature/Storage temperature		-10℃ ~ +55℃ / -20℃ ~ +80℃
⑦Power		CR2450 2unit, Solar panel (supplementary power)
⑧Auto-on/Auto-off function		Auto-on ◀▶ Auto-On function Auto-off: 45±minutes after (high temperature 23℃basis)

I45gw Cartridge	⑨External grinding function	External grind button on the helmet is used to freely change to grinding function without having to remove the helmet.
		⑩Accumulated working time display
	INFO Function	⑪Current time display function
		⑫Timer function
		⑬Alarm function

D32gw



Classification		Descriptions
①Cartridge size		132mm × 115mm × 10mm
②Lens size		97mm × 60mm
③Switching speed		Bright → Dark 1/25,000second
④Function selection	WELD Function	Use in normal welding (Mma, Tig, Mig, CO2, Mag) * Shade: #8-#13 * Sensitivity: 0-10 * Delay time: 0-10
	CUTTING Function	Use in cutting and torch operation * Shade: #5-#8 * Sensitivity: 0-10 [Sensitivity 10 -Fixed sensitivity (dark state)] * Delay time: 0-10
	GRIND Function	Grinding operation permits no shielding capacity, sensitivity and delay time control. * Shade: #3 fixed
⑤Optical sensor		4 sensors
⑥Operationtemperature/Storage temperature		-10℃ ~ +55℃ / -20℃ ~ +80℃
⑦Power		CR2450 2unit, Solar panel (supplementary power)
⑧Auto-on/Auto-off function		Auto-on ◀▶ Auto-On function Auto-off: 45±minutes after (high temperature 23℃basis)
⑨External grinding function		External grind button on the helmet is used to freely change to grinding function without having to remove the helmet.

D25gw



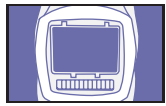
Classification		Descriptions
①Cartridge size		120mm × 113mm × 10mm
②Lens size		97mm × 47mm
③Switching speed		Bright → Dark 1/25,000second
④Function selection	WELD Function	Use in normal welding (Mma, Tig, Mig, CO2, Mag) * Shade: #8-#13 * Sensitivity: 0-10 * Delay time: 0-10
	CUTTING Function	Use in cutting and torch operation * Shade: #5-#8 * Sensitivity: 0-10 [Sensitivity 10 -Fixed sensitivity (dark state)] * Delay time: 0-10
	GRIND Function	Grinding operation permits no shielding capacity, sensitivity and delay time control. * Shade: #3 fixed
⑤Optical sensor		4 sensors
⑥Operationtemperature/Storage temperature		-10℃ ~ +55℃ / -20℃ ~ +80℃
⑦Power		CR2450 2unit, Solar panel (supplementary power)
⑧Auto-on/Auto-off function		Auto-on ◀▶ Auto-On function Auto-off: 45±minutes after (high temperature 23℃basis)
⑨External grinding function		External grind button on the helmet is used to freely change to grinding function without having to remove the helmet.

A21gw / A21vw



Classification	Descriptions
①Cartridge size	110mm × 90mm × 10mm
②Lens size	97mm × 47mm
③Switching speed	Dark → Bright 1/25,000second
④Shade	A21gw - dark state : #8 ~ #13, light state : #3(23℃ Standard) A21vw - dark state : #9 ~ #13, light state : #4(23℃ Standard)
⑤Control for Sensitivity of GRIND fution	Control for shade state of the lens Sensitive - Sensitive, Dull - dull GRIND - #3(A21gw), #4(A21vw)

Classification	Descriptions
⑥Alarm	Dark → Bright 0.1second ~ 1second control
⑦sensors	2 sensors
⑧Operationtemperature/Storage temperature	-10℃ ~ +55℃ / -20℃ ~ +80℃
⑨Power	CR2450 1unit, Solar panel (supplementary power)
⑩Auto-on/Auto-off function	Auto-on ◀▶ Auto-On function Auto-off: 20±2minutes after (high temperature 23℃basis)
⑪A21gw Cartridge	External grinding function Fix



Auto Darkening Welding Helmet

※ The weights in this catalog show the average weights with $\pm 2\%$ errors. 있습니다.



Caution in wearing the welding helmets

- 1) Use the shade that fit the welding type and intensity.
- 2) Do not remove the welding helmet.
- 3) Do not operate using the welding helmet without the lens protection panel.
- 4) Ensure to keep the battery recharged for certain time (Refer to the manual).
- 5) Stop immediately in case of any odd occurrence and refer to the manual or contact the Head Office.

N Flextech head band II

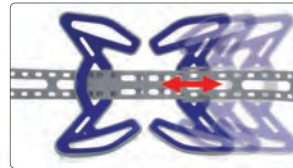
I 129g

Rotational Upper head band

The 2-line designed upper head band prevents any shaking and lessens the slippage while wearing a hairband as it fits to the user's head. Also, the rear of the upper head band allows for the sizing to make it more naturally fitting to the user's head.

Top headgear cushion

High elastic impact absorbent function evenly disperses the weight of the welding helmet on the user's head, and urethane dual cushion prevents the welding helmet from slipping. The width of the cushion may be adjusted to fit the user's head and still maintain the comfort and fit.



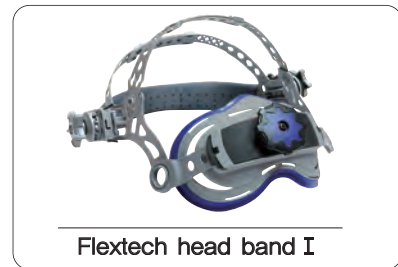
Adjustable width of cushion

Easily distance controlled rail function that is detachable

The 6-level rail system controls the distance between the cartridge and eyes and allows the user to control for comfort and fit. The one-touch head band may be easily separated.

Rotational cushion pad connection area

The connection area of head band and cushion pad is produced to rotate for the user to control the angle of the cushion pad.



Flextech head band I

Rotational Upper head band II

Triangular shape of the wide cushion is the long time independent research of OTOS. It will provide the ultimate comfort that no one has felt before.

- ① Release the tension from the weight of the welding helmet to the rear neck wear with the optimal curvature of the cushion that fits to the user's head. The center of gravity for the welding helmet is also placed in the rear head that the user has better control over the helmet and has no interference with the safety gear leaning towards the forward, preventing any potential slip-off.
- ② High elastic urethane cushion has been produced to prevent any slip or fall in the top or bottom part in putting on or taking off the gear, and fits onto the user's head.



Passive Welding Helmet



W-81 | 482g

- Shade lens black glass/PC/CR-600 optional (separate purchase)
- Material: nylon is light and unbreakable
- Headband with adjustable head width and depth
- Adjustable 4-level angles of sides
- Expanded protection area of the head
- Strengthened bib for neck protection



W-86AN | 500g

- Shade lens black glass/PC/CR-600 optional (separate purchase)
- Headband with adjustable head width and depth
- Adjustable 3-level angles of sides
- color : silver • Depth of helmet



W-82 | 435g

- Shade lens black glass/PC/CR-600 optional (separate purchase)
- Material: nylon is light and unbreakable



W-86HN | 438g

- Shade lens black glass/PC/CR-600 optional (separate purchase)
- Helmet attachable • Expanded shielding lens
- Ensure to wear the safety helmet with the brim area to the rear
- color : silver

Welding Headband Safety Connector



Installed to the welding helmet using the safety helmet connector

Safety helmet connector assembly



Safety helmet connector A (Installation slot exists)

Safety helmet connector B (No installation slot)

1. Welding magnifier



Chameleon II N, 4 / Mach II/Ace, Ace-W Magnifier Assembly



Welding magnifier may be attached for any user with presbyopia having difficulty in recognizing the welding area. (Magnifying power: +0.75D, +1.00D, 1.25D, +1.50D, +1.75D, +2.00D, +2.25D, +2.50D)

2. Splatter prevention neck protection



- Protect the user's neck with natural leather with heat resistance.
- Protect the neck area from direct welding spark.
- Protect the neck from the welding heat.
- All OTOS welding helmets allow installation /assembly.

• Assembly easily without any tools

3. Lens protection panel



(External lens protection panel)



(Internal lens protection panel)

※ Available for purchase from Head Office and wholesale dealer.

- Optional: anti-fog lens protection panel (internal - small (小))

4. Cartridge battery



※ Available for purchase from Head Office and wholesale dealer.

- Optional: anti-fog lens

Welding protection filter (PC)

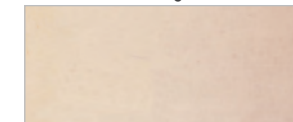


(Class)

(CR-600)

- Long-term use is capable with barely any welding spark that disables the user's view (25 times less spark than the glass).
- Excellent safety performance with impact resistance for the shade lens
- Excellent heat and chemical resistance

Gold mirror coating lens



Lens size(50 x 105mm)

Shade lens black glass



Lens size(50 x 105mm)



Safety Goggles

※ [KS P 8142 / Protective Gear Safety Certification Notice (Note from the Ministry of Employment and Labor)]
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use in welding.

※ The weights in this catalog show the average weights with $\pm 2\%$ errors.



Caution in wearing the goggle
1) Do not remove the goggle safety spectacles in operation.
2) Dry the goggle with any occurrence of fog or condensation on the lens surface after long-term operation.
3) Ensure to use safety helmet in combination in order ensure protection to the face from the chemical agents.

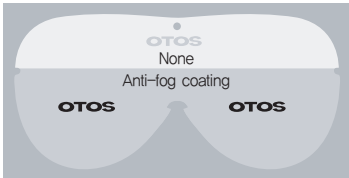
1 Characters of type and Purpose of Use

A Type			Structural holes on the top and bottom of frame. - Environment with minor falling dust (grinder, polishing, abrasion, woodwork, drilling and lab testing)
B Type			Attaching the respirator for air filtration. - Environment with falling particles (grinder, polishing, abrasion, woodwork and drilling) - Environment with falling and flying particles (cement, powder chemical, agricultural chemical, painting, cleansing operation)
C Type			No respirator attachment or hole in the product. - Use in environment for purification and organic gas.
V Type			Attaching respirator with filtration control function on the product's top - Environment with falling particles (grinder, polishing, abrasion, woodwork and drilling) - Environment with falling particles (grinder, polishing, abrasion, woodwork and drilling) - Use in environment for purification and organic gas.

2 Lens type

OTOS goggle lens consists of CP material for heat resistance and PC material for shock resistance and anti-fog that suitably fit to different working environment.

3 Anti-fog coating (NEW Anti-fog lens)



OTOS has been producing with an improved anti-fog coating technology with the adoption of matured manufacturing technology in a new method since 2001. This matured manufacturing technology allows for more depth to the lens absorption layer, increased absorption effect and absorption duration time.
Moreover, the lowering of the transmittance from the anti-fog treatment has been improved. "New" anti-fog lens has no fog or condensation storing for a duration of 2-3 minutes in $-5^{\circ}\text{C}\sim 20^{\circ}\text{C}$ environment and waiting in an environment of $10\sim 20^{\circ}\text{C}$ after.

4 Characteristics and Function



Filtration control function
(250% increase/S-502 standard)
Respirator (filtration control device) is easily adjustable by the user that fit the working environment, hence allowing clean and clear sight (World Patent).



Prevention of diffused reflection
Frame has been abrasion treated for the prevention of diffused reflection for another improve level of view.



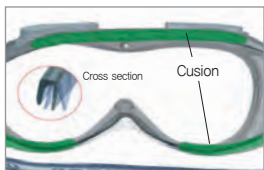
Belt ring rotation/Bent function
Free rotation to the left and right bent function of the belt ring allows comfort and fit to different facial features especially when wearing safety helmet and mask together.



Improved sight
(10% increase /S-502 standard)
There is more safety with widened sight and view compared to other previous products.



Combined use with Prescription glasses
As designed for combined use, any corrective glasses may be worn for users with limited sight.



Dual cushion function
Comfort and fit have been greatly improved for the forehead and cheeks with the cushioning.



Ventilation and cushion function
Side and bottom ventilation holes along with the top area's ventilation control device allows for the control of the airflow, and the cushion provides comfort and fit to the user.

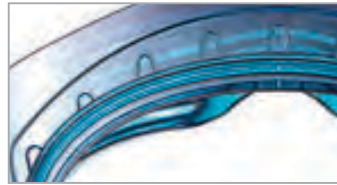


S-520AX

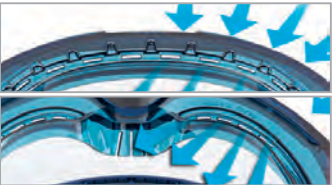
76.7g

- Crease in the top area allows for various facial features to flexibly fit and provide impact absorbent effect.
- Two air channels (ventilation system) in the top and bottom area minimizes the fog effect with natural air flow.
- Suitable in combined use with glasses with the widened lens, wide sight and minimized curvature
- Top and bottom rotational belt ring that may be adjusted for compatibility with other safety gear
- Super Anti-coating (super anti-fog coating) provide excellent anti-fog effect and has hard coating in the lens for scratch proof.
- Protection with the ultimate fit in wearing mask and glasses.

• Bellows design



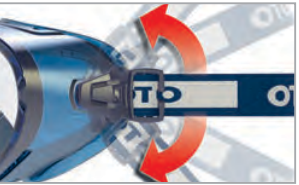
• Ventilation system



• Wide view



• Adjustable



- Structured ventilation holes in the top and bottom of the frame
- Maximization of comfort with the dual cushion structure that provide fit with contact areas of forehead and cheek
- Prevention of derangement with the belt ring rotation and left-right bent function for combined wearing of other safety gear (safety helmet, mask, corrective glasses)
- Anti-fog (Prevention of fog or condensation) lens
- Prevention of slip-off of the goggle with the silicon treatment in the strap's interior



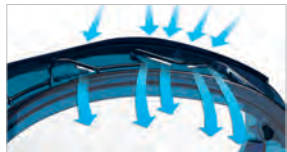
S-509P

78.5g

• Adjustable



• Ventilation system



• Ventilation system



• Non-slip straps(silicone)



- Structured ventilation holes in the top and bottom of the frame
- Maximization of comfort with the dual cushion structure that provide fit with contact areas of forehead and cheek
- Prevention of derangement with the belt ring rotation and left-right bent function for combined wearing of other safety gear (safety helmet, mask, corrective glasses)
- Anti-fog (Prevention of fog or condensation) lens
- Prevention of slip-off of the goggle with the silicon treatment in the strap's interior





Safety Goggles

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Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use in welding.

※ The weights in this catalog show the average weights with $\pm 2\%$ errors.



Caution in wearing the goggle
1) Do not remove the goggle safety spectacles in operation.
2) Dry the goggle with any occurrence of fog or condensation on the lens surface after long-term operation.
3) Ensure to use safety helmet in combination in order ensure protection to the face from the chemical agents.



Silicone Goggle

- ▶ Silicon material that has chemical resistance, heat resistance and no electrostatic, dust particle and allergy.
- ▶ Suitable for sterilization (high pressure condensation sterilization) in 20 minutes under with the exception for the lens
- ▶ Decreases the tiredness of the eye and increases safety with the widened view and frame
- ▶ Provides excellent anti-fog prevention with the super Anti-Fog coating
- ▶ Detachable one-touch band

S-6000 | 91.2g

- Silicon material (frame, strap)
- Wide sight
- Combined use with Prescription glasses, safety spectacles, mask and safety helmet
- Anti-Fog lens
- Replaceable lens

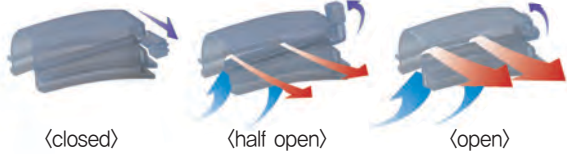


S-506V (Premium) | 72.5g

- Circulation control through the ventilation hole control
- Side ventilation hole cross section
- Maximization of comfort with the dual cushion structure that provide fit with contact areas of forehead and cheek
- Prevention of derangement with the belt ring rotation and left-right bent function for combined wearing of other safety gear (safety helmet, mask, prescription glasses).
- Anti-Fog lens
- Replaceable lens



• Structural ventilation holes



• Side ventilation hole cross section



• Bottom ventilation hole

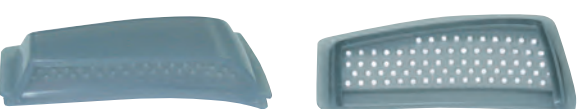


S-506B | 70.1g

- Frame up and side ventilation hole cross section
- Maximization of comfort with the dual cushion structure that provide fit with contact areas of forehead and cheek
- Prevention of derangement with the belt ring rotation and left-right bent function for combined wearing of other safety gear (safety helmet, mask, prescription glasses).
- Anti-Fog
- Replaceable lens

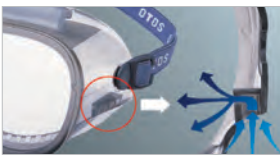


• Structural ventilation holes

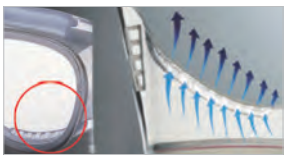


(Cross section)

• Side ventilation hole cross section



• Bottom ventilation hole



S-508V (with mask) | 61.6g

- Circulation control
- Anti-Fog lens
- Replaceable lens
- With mask(half face)
- Comfortable with light weight even wearing mask
- Small size can be comfortable to women
- Protect disorder with rotating belt ring wearing other equipments.



• open



• closed



S-5300 (Premium) | 74.5g

- Wide sight
- Combined with mask
- Anti-Fog lens
- Replaceable lens
- Better wearability and adhesion with face form
- Wide band fixes stably, easily removal one touch clip type



S-501 | 86.4g

- Wide sight
- Combind with mask, safety helmet
- Anti-Fog lens
- Replaceable lens



S-502A | 56.6g

- Anti-Fog lens
- Replaceable lens



S-502B | 70.7g

- Anti-Fog lens
- Replaceable lens



S-502C | 65.4g

- Anti-Fog lens
- Replaceable lens



S-503A | 76g

- Anti-Fog lens
- Replaceable lens
- Belt ring rotation



S-503B | 85.8g

- Anti-Fog lens
- Replaceable lens
- Belt ring rotation



S-503C | 76.8g

- Anti-Fog lens
- Replaceable lens
- Belt ring rotation





Safety Goggles

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Caution in wearing the goggle

- 1) Do not remove the goggle safety spectacles in operation.
- 2) Dry the goggle with any occurrence of fog or condensation on the lens surface after long-term operation.
- 3) Ensure to use safety helmet in combination in order ensure protection to the face from the chemical agents.



S-504A | 56.4g

- Anti-Fog lens
- Replaceable lens



S-504B | 61.7g

- Anti-Fog lens
- Replaceable lens



S-504C | 57.4g

- Anti-Fog lens
- Replaceable lens



S-505A | 59.4g

- Anti-Fog lens
- Replaceable lens
- Belt ring rotation



S-505B | 69.7g

- Anti-Fog lens
- Replaceable lens
- Belt ring rotation



S-401 | 48.9g

- Sports style goggle
- Anti-Fog lens
- Forehead protection and Soft nose pad
- Improved adhesion with a band



A-5100 Gogglering | 67.2g

- Applied goggles / S-503, S-505
- Applied to safety helmet
- Belt ring rotation



A-5200 Gogglering | 62.5g

- Applied goggles / S-502, S-504
- Applied to safety helmet
- No belt ring rotation



A-6100 Goggles Bandclip | 8.1g

- Applied to all goggles
- Applied to MP type safety helmet

○ White
● Yellow



A-6200 Goggles Bandclip | 9.3g

- Applied to all goggles
- Applied to rainwater safety helmet

○ White
● Yellow



A Type

Filter the air with structural holes in the top and bottom of the product



B Type

Attached ventilator that circulates the air in top and bottom of the product (structure that does not permit foreign particles)



C Type

Closed structure where no air may circulate



V Type

Ventilation may be controlled with the ventilation control device is attach in working environment (structure that does not permit foreign particles)



Combined wearing

Other safety gear such as corrective glasses, mask, safety helmet may be worn together



Face Shields

※ In accordance with the Notice from the Ministry of Employment and Labor Notice]. Any operation outside the above mentioned regulations shall be decided by consumers. Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use as face shields

1 Excellence of OTOS safety spectacle lens

- Polycarbonate material that has excellent impact resistance, durability and heat resistance.
- No roughness from the lens as JIS standard passed.
- Capable of producing ultra-heat resistant lens as an option with the same depth with the fulfillment of the thin depth, excellent impact resistance, durability and heat resistance.
- Unlike the plan lens that has been manufacture in curvature, heat has no effect on form and curvature (with an exception for XL lens).
- Wearable with other safety gear (safety glasses, goggle, mask and safety helmet).

2 Purpose of Use

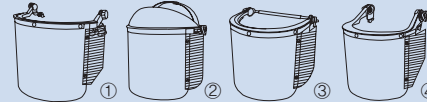
- Environment in large flying objects with shock energy (metal cutting, drilling, mining, electronic weeding, electronic woodwork)
- Environment with frequent occurrences of flying objects (grinding, machined manufacturing, woodwork, sawmill)
- Environment with heat and flying objects from smelting (smelting furnace, metalwork, nonferrous metal, glass and other heat working environment)
- Environment with chemical drug, cement, agricultural chemicals, painting, cleansing

3 Purchase Order for helmet: example

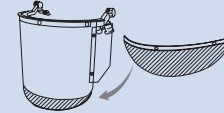
F-61N	A	S	G	▼
Model name	Lens type	Lens size	Surface treatment	Side safety panel form
	A: transparent B: shade (#3~#7) N: improved, wire mesh	XS, S, M, L, R, XL, refer to the lens classification W: wide (wire mesh)	G: gold mirror F: anti-fog H: hard coating	Neck protection

Side expansion protection panel

(Special order for special size possible)



Neck protection



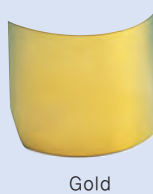
4 Lens type Anti-fog (condensation prevention) treated lens/chemical resistant lens (Material: Propionate) order specification

Lens type classification						
	XS	S	M	L	R	XL
Material	PC	PC	PC	PC	PC	PC
width x height x depth(mm)	300×170×1.8	300×200×2	360×190×3	385×230×1.9	415×220×2	430×280×2
weight(g)	98	140	235	220	200	290
emittance area	transparent	transparent	transparent	transparent	transparent	transparent
	shade		shade #3,4,5,7			
processing	injection molding	injection molding	injection molding	injection molding	injection molding	order production
Characteristics (all materials have shock and heat resistance)	Lightweight lens (optional)	Lightweight lens (optional)	Super heat resistance lens	Wide protection area	Improved protection area designed along the shoulder line	Super large lens

※ Purchase order for all types possible

5 3D(3-dimensional) curved surface lens type

Lens type classification			
	S(F-71 only)	XS(F-71 only)	S(F-72 only)
Material	PC	PC	PC
width x height x depth(mm)	216×194×1.7	216×170×1.7	215×210×1.7
Weight(g)	122	97	110
emittance area	transparent	transparent	transparent
	shade		shade lens
processing	injection molding	injection molding	injection molding
Characteristics (all materials have shock and heat resistance)	increased protection area with the 3D curved surface lens	increased protection area with the 3D curved surface lens	Increased protection area with the 3D curved surface lens



Gold mirror coating lens

- Gold mirror coated to the previous safety spectacle that the heat is reflected away from the face to decrease heating effect.
- Gold mirror coating protects the user from powerful rays and also allows the working area to be more visible from the inside.
- Dark lens #5 and gold mirror coating
- Lens type S, M, L
- Gold mirror coating lens may be suitable for all F-61, F-62, F-63, F-64 and F-65 frames.



Side protection panel/Neck protection

- Expands the protection area of the previous neck protection with the side protection panel by adding onto the neck protection
- Applies to all F-61, F-62, F-63, F-64 and F-65 frames.

※Special order for the special size of side protection panel



Caution in wearing the goggle
1) Do not remove the goggle safety spectacles in operation.
2) Dry the goggle with any occurrence of fog or condensation on the lens surface after long-term operation.
3) Ensure to use safety helmet in combination in order ensure protection to the face from the chemical agents.

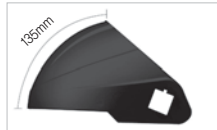
6 Helmet classification (complete product)

Product type	Applied safety helmet	lens size	lens type	side expansion protection panel attached	neck protection	characteristics
F-61NA	All types of safety helmet are attachable	XS, S, M, L, R, XL	transparent lens	○	○	• High heat operation • Dark lens open and close type
F-61NB		S	shade #3, 4, 5, 7	○	○	
F-61NC		XS, S, M, R, XL	shade #4, 5, 6, 7, 1/2, 1/4 size	○	○	
F-62AN	Headband type (Bare head)	XS, S, M, L, R, XL	transparent lens	○	○	• Working environment with no wearing of safety helmet • Lightweight
F-62BN		S	shade #3, 4, 5, 7	○	○	
F-62NN		wire mesh	•	×	×	
F-62NW		wire mesh	•	×	×	
F-63A	All types of safety helmet are attachable	XS, S, M, L, R, XL	transparent lens	○	○	• Operation with falling particles • All types of safety helmet are attachable
F-63B		S	shade #3, 4, 5, 7	○	○	
F-63N		wire mesh	•	×	×	
F-64A	Only possible for safety helmet with installation slot	XS, S, M, L, R, XL	transparent lens	○	○	• Operation with falling particles • Attachable on the safety helmet
F-64B		S	shade #3, 4, 5, 7	○	○	
F-64N		wire mesh	•	×	×	
F-65A	Headband type (Bare head)	XS, S, M, L, R, XL	transparent lens	○	○	• Operation with falling particles • Wider protection for head
F-65B		S	shade #3, 4, 5, 7	○	○	
F-65N		wire mesh	•	×	×	
F-66A	All types of safety helmet are attachable	S	transparent lens	○	○	• Operation with falling particles • All types of safety helmet are attachable
F-66NW		wire mesh	•	×	×	
F-71AS	Only possible for safety helmet with installation slot	XS, S	transparent lens	×	×	• 3-dimensional curved surface lens • Use in narrow work environment • Lightweight • Detachable to the safety helmet
F-72A	Headband type (Bare head)	S	transparent lens	×	×	• 3-dimensional curved surface lens • Dark lens open and close type (F-72C)
F-72B		S	shade #3, 4, 5, 7	×	×	
F-72C		S	transparent lens, clip type shade lens shade #3, 4, 5, 7	×	×	
F-73NW	Only possible for safety helmet with installation slot	wire mesh	•	×	×	• For forestry and weeding • Lightweight



F-72A | 329g

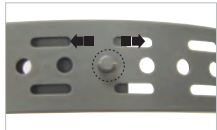
- 3-dimensional curved surface lens • Polycarbonate • Bare head
- Adjustable size of height and round of headband
- Improved with wider view and protection area in 3-dimensional curved surface design that fit to the facial curves • Lens type: S



- Protection area in the head has been expanded.
(F-62 : 73mm → F-72 : 135mm)



- Adjustable headband height
- Adjust the height by operating the adjustment panel left-right.



- Use after controlling by turning the left
- right to adjust the Flex Cushion headband to the head size.



F-72B | 329g

- 3-dimensional curved surface lens
- Polycarbonate
- Bare head
- Adjustable size of height and round of headband
- Protection surface strengthened with the 3-dimensional curved surface
- Lens type: dark lens
- shade: #3
- Flex cushion headband



F-72C | 401g

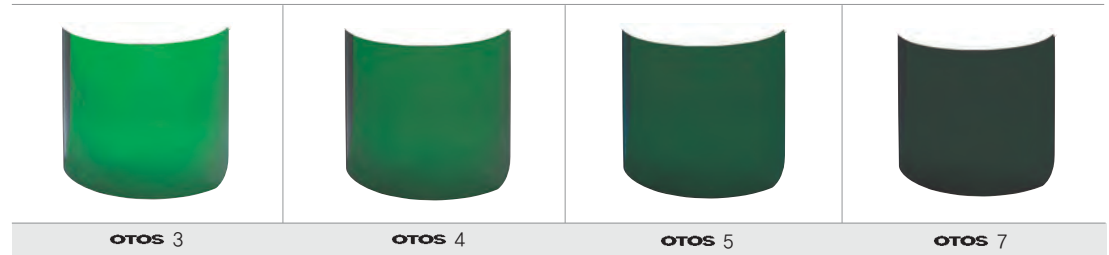
- 3-dimensional curved surface lens
- Detachable with the clip type shielding lens and attachable at desired location
- Polycarbonate
- Bare head
- Adjustable size of height and round of headband
- Lens type: S
- shade: #5
- Flex cushion headband



Clip type shade lens | 72g

- One-touch
- 3-dimensional curved surface lens, detachable
- Material: Polycarbonate(PC)
- shade : #5
- Size : 230mm×118mm×1.7mm

Sample color of OTOS SP shade lens



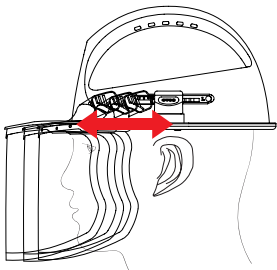
※ Sample color is the intensity of the shielding number from KS, Ministry of Employment and Labor. ※ The actual color may differ from the print.



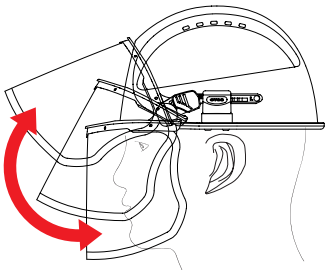
F-73NW | 487g (Wire mesh type) Wire mesh size (367mmx165mm)

- For forestry and weeding • Type for assembly using the installation slot in the safety helmet • Adjustable distance before and after • Flip-up • Wire mesh replacement • Wire mesh lens

◁Adjustable distance before and after▷



◁Flip-up▷



F-71AS | 139g

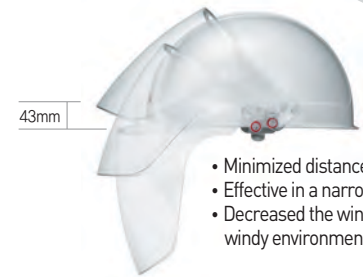
- 3-dimensional curved surface lens • Polycarbonate(PC)
- Only attachable to helmet's with installation slot
- Improved with wider view and protection area in 3-dimensional curved surface design that fit to the facial curves
- Lens type: S

한국전력공사 (KEPCO)
Cooperation research development product



F-71AXS | 122g

- 3-dimensional curved surface lens
- Polycarbonate(PC)
- Only attachable to helmet's with installation slot
- Lens type: XS
- Super light



- Minimized distance with the safety helmet to 43mm
- Effective in a narrow space or with obstacles.
- Decreased the wind effect with the side removed in windy environment



- Attach into the direction of the arrow into the attachment slot of the safety helmet as shown in the image



- Push the attachment pin into each side until it makes a "click" sound.



Face Shields

※ The weights in this catalog show the average weights with ±2% errors.



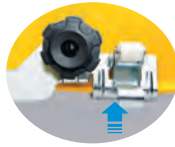
Caution in wearing the goggle

- 1) Do not remove the goggle safety spectacles in operation.
- 2) Dry the goggle with any occurrence of fog or condensation on the lens surface after long-term operation.
- 3) Ensure to use safety helmet in combination in order ensure protection to the face from the chemical agents.



F-61NA | 255g

- Polycarbonate (PC)
- Detachable helmet one-touch metallic
- Aluminum lens band
- Lens type: XS, S, M, L, R, XL



F-61NB | 255g

- Polycarbonate (PC)
- Detachable helmet one-touch metallic
- Aluminum lens band
- S shade lens



F-61NC | 305g

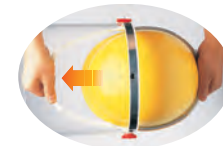
- Polycarbonate (PC)
- Detachable helmet one-touch metallic
- Aluminum lens band
- Shade lens #4, 5, 6, 7/1/2, 1/4 size



※ Heat resistant

F-63A | 246g

- Polycarbonate (PC)
- Detachable helmet
- Aluminum lens band
- Detachable structure for all helmets
- Lens type: XS, S, M, L, R, XL



F-63B | 246g

- Polycarbonate (PC)
- Detachable helmet
- Aluminum lens band
- Detachable structure for all helmets
- S Dark lens



F-63N | 199g (Wire mesh Type)

- Wire mesh, plating, coating
- Detachable helmet
- Detachable structure for all helmets
- Wire mesh lens



F-62AN | 304g

- Polycarbonate (PC)
- Bare head
- Adjustable headband height, width control
- Lightweight with the use of plastic protection brim
- Lens type: XS, S, M, L, R, XL



- Adjustable headband height
- Adjust the height by operating the adjustment panel left-right.

- Use after controlling by turning the left
- right to adjust the Flex Cushion headband to the head size.

F-62BN | 304g

- Polycarbonate (PC)
- Bare head
- Adjustable headband height, width control
- Lightweight with the use of plastic protection brim
- S shade lens
- Flex cushion headband



F-62NN | 265g (Wire mesh Type)

- Wire mesh, plating, coating
- Bare head
- Adjustable headband height, width control
- Wire mesh lens
- Flex cushion headband



F-62NW | 227g (Wire mesh Type)

- Polycarbonate (PC)
- Bare head
- Adjustable headband height, width control
- Lightweight with the use of plastic protection brim
- Wire mesh lens
- Detachable structure for all helmets
- Flex cushion headband



※ Exchangeable with typical lens

F-66A | 241g

- Polycarbonate (PC)
- Detachable helmet
- Detachable structure for all helmets
- Lens type: S



F-66NW | 157g (Wire mesh Type)

- Wire mesh, plating, coating
- Detachable helmet
- Detachable helmet one-touch metallic
- Wire mesh lens
- Lightweight with the use of plastic protection brim





Face Shields

※ In accordance with the Notice from the Ministry of Employment and Labor Notice.)
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use as safety spectacles.



F-64A | 211g

- Polycarbonate (PC)
- Only attachable to helmet's with installation slot
- Aluminum lens band
- Lens type: XS, S, M, L, R, XL



F-64B | 211g

- Polycarbonate (PC)
- Only attachable to helmet's with installation slot
- Aluminum lens band
- S Dark lens



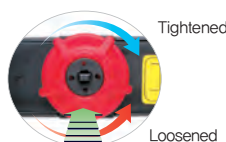
F-64N | 162g (Wire mesh Type)

- Wire mesh, plating, coating
- Detachable helmet
- Only attachable to helmet's with installation slot
- Wire mesh lens



F-65A | 272g

- Polycarbonate (PC)
- Bare head
- Aluminum lens band
- Adjustable size of height and round of headband
- Expanded protection area with the brim covering more than $\frac{1}{2}$ of the head
- Excellent heat resistance with the use of glass material mixed in the nylon material
- Lens type: XS, S, M, L, R, XL



F-65B | 272g

- Polycarbonate (PC)
- Bare head
- Aluminum lens band
- Expanded protection area with the brim covering more than $\frac{1}{2}$ of the head
- Excellent heat resistance with the use of glass material mixed in the nylon material



F-65N | 225g (Wire mesh Type)

- Wire mesh, plating, coating
- Bare head
- Expanded protection area with the brim covering more than $\frac{1}{2}$ of the head
- Wire mesh lens



Powered Air Purifying Respirators

※ The weights in this catalog show the average weights with $\pm 2\%$ errors.

※ In accordance with the Notice from the Ministry of Employment and Labor Notice.)
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use as PAPR

Airwing I[®] electric respirator

AIR WING[®]I



1 Airwing electric respirator

Supply of fresh and filtered air from the exterior in an environment with welding fume, hazardous dust and hazardous odor that may have respiratory infectious contagion.

2 Airwing electric respirator filter ※ Optional: Mixed filter



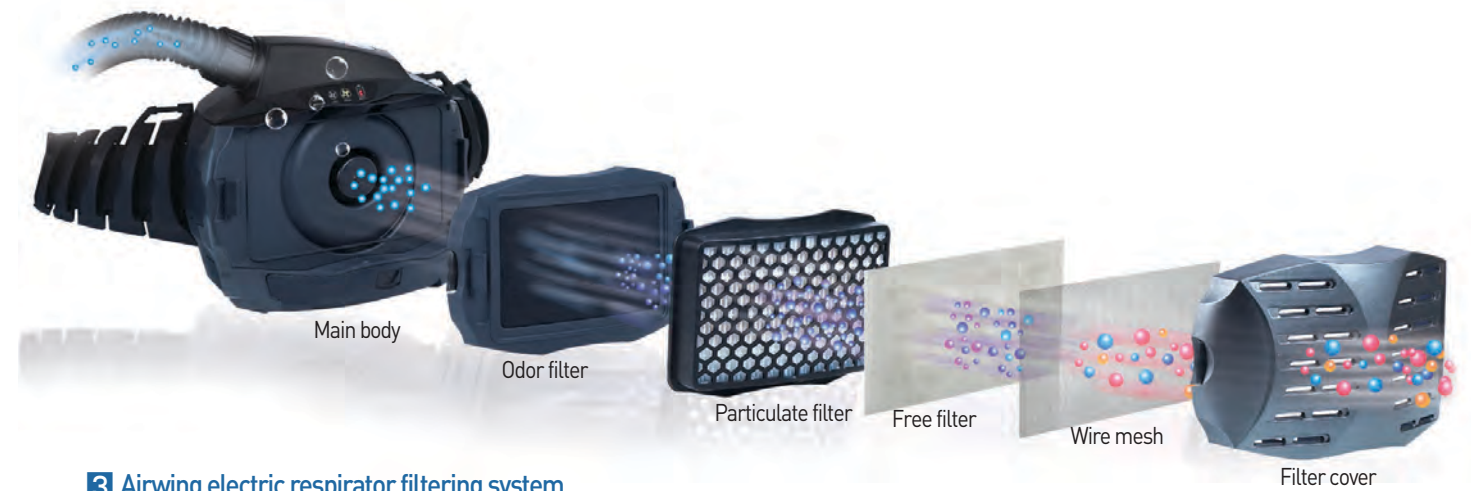
Particulate filter

Particulate filter is capable of filtering out the microscopic particles that effectively allows air to filter while hazardous agents such as welding fume, hazardous dust, all sorts of polluted material, agricultural chemicals and respiratory contagions.



Odor filter

Odor filter is capable of filtering foul smell and odor that may be hazardous through the air.



3 Airwing electric respirator filtering system

Polluted air → filter cover → wire mesh → free filter → dispersion filter → odor filter → main body → purified air

Electric respirator protection hood (Compatible with Airwing I, Airwing II)



• Hard hat

Assembled with electric respirator and hood in the safety helmet. Filters the polluted external air that may be odorous from the working environment and supplies clean air. Allowed to be used with welding helmet as needed.
※ Applied environment: welding, grinding, sanding



• For welding

Protects the face and head in an environment of welding or grinding operation
※ Applied environment: welding, grinding, sanding



• For safety spectacle

Protects the neck, face and head areas in an environment where there is an occurrence of liquid flowing/flying material and shock with excellent anti-fog. Suitable to replace the hood in case of pollution or deformity.
※ Applied environment: grinding, sanding, painting, agricultural chemicals, pharmaceutical, research lab, normal dust occurrence environment, environment with the occurrence of respiratory contagions



• For chemical-resistant

Polluted materials that flow in the air such as organic chemicals, inorganic chemicals, acid and ammonia. Protects the neck, face and head areas in an environment where there is an occurrence of polluted materials
※ Applied environment: electronic, semiconductor, clean room, pharmaceutical, research lab, environment with the occurrence of respiratory contagions, normal dust occurrence environment



• Type A

Protects the neck, face and head areas in an environment where there is an occurrence of liquid flowing/flying material and dust or shock. It is possible to use after wash in case of being polluted.
※ Applied environment: medical, painting, pharmaceutical, research lab, normal dust occurrence environment, environment with the occurrence of respiratory contagions



• For asbestos (Direct connection mask)

This may be operated in an environment where there is a plenty of oxygen and occurrence of asbestos removal operation or airborne dust, hazardous material and respiratory contagions.
※ Applied environment: asbestos, dust, hazardEnvironment with the occurrence of material particle dust and other pollutants, respiratory contagions



PAPR & Supplied Air Respirators

※ The weights in this catalog show the average weights with $\pm 2\%$ errors.

※ In accordance with the Notice from the Ministry of Employment and Labor Notice,]
Any operation outside the above mentioned regulations shall be decided by consumers.
Please inquire with our Head Office for more detailed information.
※ Do not use this product for any purpose other than use as safety spectacles.

Airwing II[®] electric respirator

AIR WING[®] II

1 Airwing II electric respirator

Supply of fresh and filtered air from the exterior in an environment with welding fume, hazardous dust and hazardous odor that may have respiratory infectious contagion.

2 Airwing II electric respirator filter



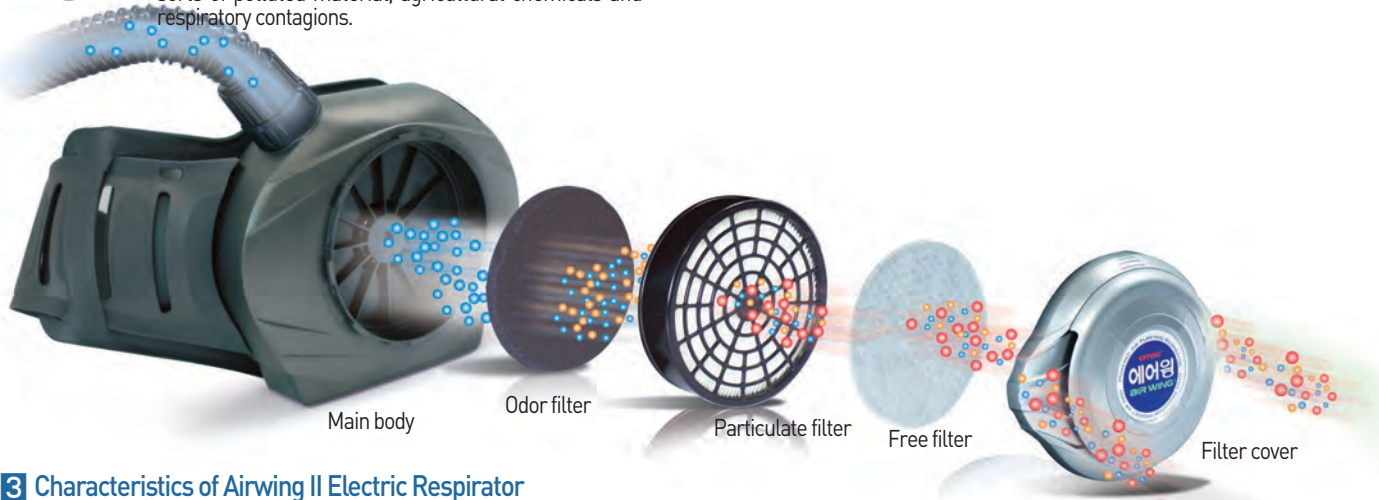
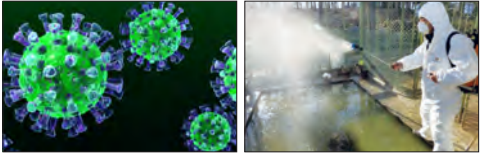
Particulate filter

Particulate filter is capable of filtering out the microscopic particles that effectively allows air to filter while hazardous agents such as welding fume, hazardous dust, all sorts of polluted material, agricultural chemicals and respiratory contagions.



Odor filter

Odor filter is capable of filtering foul smell and odor that may be hazardous through the air.



3 Characteristics of Airwing II Electric Respirator

- 1 **Excellent filtering effect** – Suitable to protect against normal dispersion of aerosol and respiratory contagion, increase productivity through special filtration for clean air from the polluted external air.
- 2 **Lightweight** – OTOS technology allows for the world's lightweight electric respirator.
- 3 **Excellent comfort** – Improved productivity through the maximum comfort and lessening of tiredness in use for long term with the belt cushion.
- 4 **Danger warning system** – The user is alerted with warning sound in case of danger (filter blockage, low current)
- 5 **Simple operation system** – One-touch style to operate, stop and control.
- 6 **Various hood and compatibility** – Various hood as compatible may be selected for the working environment.

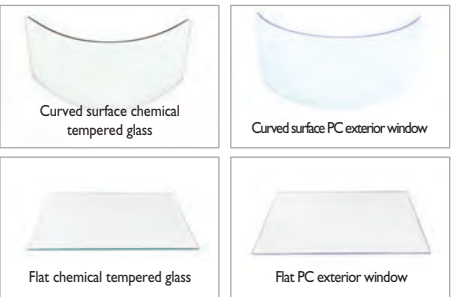
Air supplied respirator



ABE safety helmet type

“Protected from polluted air and innovatively decreased noise”

New manifold



New manifold



Coating and Finishing compatible type

- Exterior window: Coating-Flat Chemical Tempered Glass
Finishing-Flat PC window
- Applied environment: grinding business, organic solvent using business



Finishing type

- Applied business: grinding business
- Replaceable PC interior window, exterior PC curved surface window, flame resistant base



Coating and Finishing compatible type

- Exterior window: Coating-Flat Chemical Tempered Glass
Finishing-Flat PC window
- Applied environment: grinding business, organic solvent using business



PAPR Spare Parts

*each parts purchasing available

1 Airwing electric respirator -Particulate filter

Descriptions	Airwing I (AW-100-3S)	Airwing II (AW-200-3S)
• Particulate filter (special) • Welding fume, microscopic dust, respiratory contagion, agricultural chemical agents filtered		

2 Airwing electric respirator -Odor filter

Descriptions	Airwing I (AW-100-2)	Airwing II (AW-200-2)
• Excellent in filtering the harmful agents and deodorizing the odor and foul smell in the air using the particulate filter		

3 Airwing electric respirator - Filter cover

Descriptions	Airwing I (AW-100-6)	Airwing II (AW-200-6)
• Contamination prevention of particulate filter • Protection from flying objects		

4 Airwing electric respirator - Free filter

Descriptions	Airwing I (AW-100-4)	Airwing II (AW-200-4)
• Filters any contaminants or serious particles in the air		

5 Airwing I electric respirator - Standard Battery/Extended Battery

Descriptions	Standard Battery(AW-100-7)	Extended Battery(AW-100-13)
• Standard Battery: Li-ion 4 cell 14.8V 2800mA • Extended Battery: Li-ion 8 cell 14.8V 5600mA		

Airwing II electric respirator - Standard Battery/Extended Battery

Descriptions	Standard Battery(AW-200-7)	Extended Battery(AW-200-13)
• Standard Battery: Li-ion 4 cell 14.8V 2800mA • Extended Battery: Li-ion 8 cell 14.8V 5600mA		

7 Airwing electric respirator - Complex gas filter

This product has been produced in accordance with the European safety standard EN 12941 as a safety certified protective gear.



Test Passed Agents

TMAH (25%), Sulfuric acid (50%), hydrochloric acid (36%), nitric acid (50%), formic acid (50%), hydrofluoric acid (40%), sodium hydroxide (40%), hydrogen peroxide (30%), toluene (99.5%), acetone (99.5%), methanol (99.5%), hexane (95%).

Test Passed Agents

Clean room, coating room, pharmaceutical, research lab, any working environment in treatment of respiratory contagion, disease site and harmful chemical agents

In installing the gas filter

the filter case must be used combined.

8 Airwing electric respirator - Welding



Safety guaranteed by the protection of the face and head in working with welding or grinding.

※ Applicable working environment: welding, grinding



Eye Wash & Accessory



• Size: width x height x depth
72 X 72 X 210mm

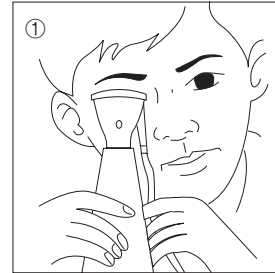
• Protective side panels

• Glasses pouch

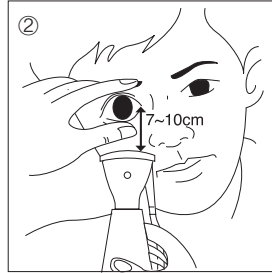


■ Eye Wash

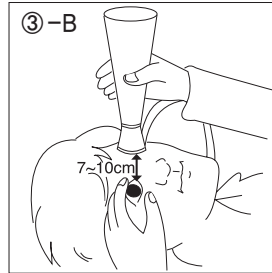
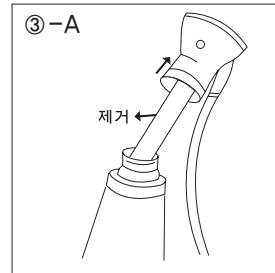
① Minor infiltration by foreign particles



② Serious infiltration by foreign particles





③ Extreme infiltration by foreign particles






Certificate & Patent

OTOS does not produce any other than that of world's best standards.
OTOS does not sell any other than that of the world's best standards.

Foreign certification status (June, 2016, Standard)

	Product	Acquisition	note
	ACE3 etc	19	Certification
	Product	Acquisition	note
	AEGIS etc	54	Certification
	Product	Acquisition	note
	Air Wing1 etc	9	Certification

	Product	Acquisition	note
	AEGIS etc	51	Certification
	Product	Acquisition	note
	AEGIS etc	38	Certification
	Product	Acquisition	note
	Air wing2 etc	5	Certification



Certification status (June, 2016, Standard)

Standard	No.	Certification body
Eye protection gears for drivers	KS G 7002/ Certification No. 12052	Korean Standards Association
Shading equipment	KS G 7002/ Certification No. 12052	Korean Standards Association
Welding Helmet	KS G 7002/ Certification No. 12052	Korean Standards Association
Safety glasses	KS G 7002/ Certification No. 12052	Korean Standards Association

Product	KCS	KOSHA (Korea Occupational Safety and Health Agency)
Plastic safety glasses	138 case	
Shade safety glasses	321 case	
General Face Shield	126 case	
Weldig face Shield	32 case	
Corrective lens Safety glasses	358 case	
Air Supplied Respirator	11 case	
PAPR	14 case	
Protection Suit	2 case	

Patents (June, 2016, Standard)

Patent (Application/82 counts, Registration/60 counts)

International	Patent application	33
	Patent registration	23
Domestic	Patent application	49
	Patent registration	37

Utility Model (Application/20 counts, Registration/20 counts)

International	Utility Model application	6
	Utility Model registration	6
Domestic	Utility Model application	14
	Utility Model registration	14

Design (Application/39 counts, Registration/34 counts)

International	Design application	20
	Design registration	17
Domestic	Design application	19
	Design registration	17

Trademark (Application/10 counts, Registration/10 counts)

International	Trade mark application	3
	Trade mark registration	3
Domestic	Trade mark application	7
	Trade mark registration	7

■ Head straps and ear protection

• Head straps and ear protection



Head straps



ear protection(span)



ear protection(cilicon)



Head straps



ear protection(span)

