



## Laser protective goggles 200-540nm visible light transmittance 40%



### ● Product Description

Laser safety goggles are a kind of efficient and safe goggles made of polymer materials and light absorbing materials. Its optical safety performance fully meets the European standard EN207A1: 2002. Laser safety goggles are comfortable, beautiful, safe and reliable to wear. They adopt the absorption principle: they are not selective for the incident angle of the light source and can fully protect lasers and strong light in specific bands.



## ● Product features

Typical laser wavelength: 980&1064&1320 nm、 light transmittance: 40%、  
 O.D optical density: 800-1700nm O.D 4+900-1100nm O.D 5+、 L-Rating(EU  
 standard): 800-1400nm DIR LB4 , 1400-1700nm DI LB3 、 SEM-EP laser  
 protective goggles 、 Protective range: 800-1700nm 、 Applicable laser  
 wavelength: 808nm, 980nm,1064nm,1320nm,1470nm etc

## ● Part Number

MP-SEM-EP-4

## ● Application area

Semiconductor laser debugging and ND:YAG laser protection、 We now have  
 the following types of laser protective goggles for you to choose from

## ● Core parameters

Protective Wavelength Range(nm)	Visible Light Transmittance(%)
200-540	40

## ● General Parameters

Advantages and disadvantages of absorption and reflection laser protective  
 goggles:

Reflective laser protective goggles are coated with multiple layers of reflective medium on the surface of the base optical glass.

#### Advantages:

1. Simple process;
2. High visible light transmittance;
3. High attenuation rate;
4. Fast light reaction time <math><10^{-9}</math> seconds;

#### Disadvantages:

1. It has serious selectivity for light sources. The incident light source must be facing the protective mirror surface (the normal direction of the incident light mirror surface) to maximize its protective effect and vice versa;
2. The reflective medium layer is easy to fall off and it is not easy to observe with the naked eye after falling off. This is also the most dangerous. The reflective medium layer in China generally falls off in about a year. The higher the light attenuation rate, the thicker the dielectric layer, and the easier it is to fall off.

Absorption protective goggles add special wavelength absorbers to the base material PMMA or P.C.

#### Advantages:

1. No selectivity for light sources, can safely protect various diffuse reflected lights;



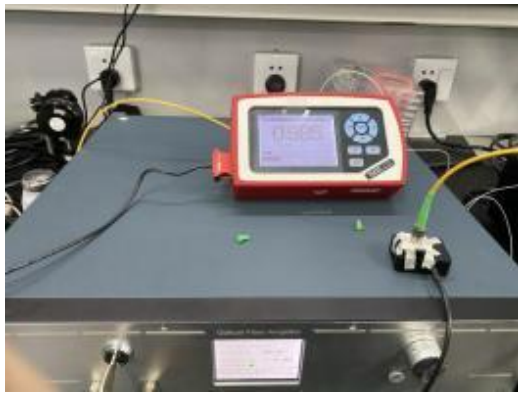
2. High attenuation rate;
3. The surface is not afraid of wear and tear, even if there are scratches, it does not affect the safety protection of light;
4. Fast light reaction <math><10^{-9}</math> seconds;

Disadvantages: Low visible light transmittance.

## We now have the following types of laser protective goggles for you to choose from

Protective goggles PN#	protective wavelength range(nm)	For typical laser	Typical laser wavelength (nm)	Optical density	Visible light transmittance (%)
MP-SE M-EP-1	200-540	Frequency-doubled Nd:YAG laser	532	4+	50
		Ion laser	514	4+	
MP-SE M-EP-2	600-700	He-Ne laser	632.8	4+	30
MP-SE M-EP-3	800-1100	Nd:YAG laser	1064	4+	40
MP-SE M-EP-4	200-540 800-1100	Ion laser	514		40
		Frequency-doubled Nd:YAG laser	532	4+	
		Semiconductor laser	808、810、904、980	4+	
		YAG laser	1064		
MP-SE M-EP-5	10600	CO <sub>2</sub> laser	10600	4+	60
MP-SE M-EP-8	800-1700	Semiconductor laser Fiber laser	1510、1530、1610、 1550、1350	4+	40

## SEM-EP-8 transmission power test (taking 1578nm semiconductor DFB 1W laser test as an example)



Power before laser protective goggles



Power after laser protective goggles

## Laser standard and classifications

US laser safety standard ANSI Z136.1

ANSI Z136.1 standard: measured by optical density (OD). The logical relationship between optical density OD and transmittance T:  $D = -\log_{10} T$ .

European laser safety standard EN207/EN208

EN207/EN208 standard: consider optical density OD, and also consider damage threshold (power/energy density changes over time).

According to the US laser safety standard ANSI Z136.1 and the European laser safety standard EN207/EN208, lasers can be classified according to the following standards.

Class	Definition	Suggestion
1	Non-hazardous	Laser protective goggles are not required



Class	Definition	Suggestion
1M	Visible laser (400-700nm) safe for goggles, without optical magnification	Laser protective goggles are not required
2	Visible laser (400-700nm) safe for blinking within 0.25 seconds	Laser protective goggles are not required
2M	Visible laser (400-700nm) safe for blinking within 0.25 seconds with optical magnification	Laser protective goggles are recommended
3R	It may be unsafe to look directly at the laser, the maximum permissible exposure (MPE) is 5 times that of Class 2 laser in the visible light part and 5 times that of Class 1 laser in the invisible light part	Laser protective goggles are recommended
3B	It is unsafe to look directly at the laser, and diffuse laser should be avoided as much as possible	Laser protective goggles are recommended
4	It is unsafe to look directly at the laser and its diffuse laser	Laser protective goggles must be used

Optical Density	Transmission%	Attenuation Factor
0	100%	1
1	10%	10
2	1%	100
3	0.1%	1000
4	0.01%	10000
5	0.001%	100000
6	0.0001%	1000000
7	0.00001%	10000000



## Laser protective goggles selection guide

1. **Laser characteristics:** output wavelength and power density of the laser.
2. **Optical Density (OD):** The larger the OD value, the stronger the protection ability of laser protective goggles.
3. **Visible Light Transmittance (VLT):** When the VLT value is less than 20%, laser protective goggles need to be used in a well-lit environment.
4. **Frame:** Whether wearing myopia goggles, facial contour.

## Ordering Information

**PN#: MP-SEM-EP-1 Name: Laser protective goggles Unit price: 1350 yuan/piece**

**Stock quantity: 20 pieces**

**Description:**

**Protection wavelength range (nm): 200-540; For typical lasers: ion lasers; frequency-doubled Nd:YAG lasers,**

**Typical laser wavelengths: 514, 532nm; Optical density: 4+; Visible light transmittance (%) 50**

**PN#: MP-SEM-EP-2; Name: Laser protective goggles; Unit price: 1450 yuan/piece;**

**Stock quantity: 20 pieces**

**Description:**



**Protection wavelength range (nm): 600-700; For typical lasers: He-Ne lasers;  
Typical laser wavelengths: 632.8nm; Optical density: 4+; Visible light  
transmittance (%) 30**

**PN#: MP-SEM-EP-3; Name: Laser protective goggles; Unit price: 1350 yuan/piece;**

**Inventory quantity: 20 pieces**

**Description:**

**Protective wavelength range (nm): 800-1100; For typical lasers: Nd:YAG laser;  
Typical laser wavelength: 1064nm; Optical density: 4+; Visible light  
transmittance (%) 40**

**PN#: MP-SEM-EP-4; Name: Laser protective goggles; Unit price: 1750 yuan/piece;**

**Inventory quantity: 20 pieces**

**Description:**

**Protective wavelength range (nm): 200-540, 800-1100; For typical laser types  
and wavelengths: ion laser Light 514nm; frequency-doubled Nd:YAG laser  
532nm; semiconductor laser: 808, 810, 904, 980nm; YAG laser  
optical: 1064nm; optical density: 4+; visible light transmittance (%) 40**

**PN#: MP-SEM-EP-5; Name: laser protective goggles; unit price: 1350 yuan/piece;**

**inventory quantity: 20 pieces Description:**



**Protection wavelength range (nm): 10600; for typical lasers: CO2 lasers; typical laser wavelength: 10600nm; Optical density: 4+; Visible light transmittance (%) 60**

**PN#: MP-SEM-EP-8; Name: Laser protective goggles; Unit price: 1450 yuan/piece;**

**Stock quantity: 20 pieces**

**Description:**

**Protective wavelength range (nm): 800-1700; For typical lasers: semiconductor lasers, fiber lasers; Typical**

**Laser wavelengths: 1510, 1530, 1610, 1550, 1350nm; Optical density: 4+; Visible light transmittance (%) 40**