

ACCESSORIES

Laser Safety Eyewear
Frame Styles



Safety is the most important factor when working with lasers.

Here at LASER COMPONENTS we believe that laser safety eyewear should protect you to the highest possible level, but can also be stylish and comfortable.

To help you with choosing the correct pair of laser safety frames we have prepared this booklet outlining the different styles and their features.



Laser Components (UK) Ltd.

Goldlay House, 114 Parkway
Chelmsford, Essex, CM2 7PR
United Kingdom

Tel: +44 1245 491 499

Fax: +44 1245 491 801

info@lasercomponents.co.uk

CONTENTS

Laser Safety	3 - 6
Navigation	7
Frame Types	8
Frame Styles	9 - 42
Wraparounds	9 - 21
Over-Specs	22 - 33
Goggles	34 - 39
IPL	40 - 42
'Request-a-quote' form	43 - 44

LASER SAFETY

Selecting Laser Safety Eyewear

Why wear laser safety eyewear?

Your eyes are the most delicate feature you have and unlike safety eyewear these can't be replaced. In the past lasers were the property of large institutions, but over the years they have been improved and are now a common sight in a large variety of industries from aerospace component manufacturers to timber yards. With this increased use there is a higher exposure to laser radiation which can be harmful to the human eye.

The use of lasers in industrial applications must be heavily monitored to ensure the safety of the user, but sometimes accidents do happen where laser energy has been mistakenly misdirected towards the user's face. This scenario could end with the user having their eyes permanently damaged or even blinded! Laser safety eyewear is the last line of defence protecting oneself from these incidents and can save a user's sight if the worst was to occur.

Avoiding exposure to a visible beam is in theory simple as you can see it, but there are many laser sources with wavelengths outside the visible spectrum which can damage your eyes and you would not even notice until it is too late!

LASER COMPONENTS highly recommends the use of laser safety eyewear whenever a laser is present in your workspace, and can help you choose the correct protection for your application.

What kind of eyewear do I need?

Laser safety eyewear is specified to one of two standards; EN 207:2009, or EN 208:2009. The standard of protection depends on your application and can be answered in one question: Do you *need* to see the laser beam?

The EN 207:2009 full protection eyewear standard is designed to protect your eyes from 180nm-10.6µm and is able to withstand direct illumination from the laser beam. The beam will not be visible through the filter and the protection level is specified using the filter optical density, duration of the laser pulse, the power and the energy density of the laser beam.



Custom Products

If you have a unique requirement, your LASER COMPONENTS' safety specialists are always here to help.

EN 207:2009 table

Scale Number	Maximum Spectral transmittance	Power and energy density (E, H) for testing laser safety eyewear								
		180nm - 315nm			>315nm - 1400nm			>1400nm - 1000µm		
		For pulse duration (s)								
		D	I,R	M	D	I,R	M	D	I,R	M
		>3x10 ⁴	10 ⁻⁹ to 3x10 ⁴	<10 ⁻⁹	>5x10 ⁻⁴	10 ⁻⁹ to 5x10 ⁻⁴	<10 ⁻⁹	>0.1	10 ⁻⁹ to 0.1	<10 ⁻⁹
LB 1	10 ⁻¹	10 ⁻²	3x10 ²	3x10 ¹¹	10 ²	5x10 ²	1.5x10 ³	10 ⁴	10 ³	10 ¹²
LB 2	10 ⁻²	10 ⁻¹	3x10 ³	3x10 ¹²	10 ³	5x10 ¹	1.5x10 ²	10 ⁵	10 ⁴	10 ¹³
LB 3	10 ⁻³	1	3x10 ⁴	3x10 ¹³	10 ⁴	5	1.5x10 ¹	10 ⁶	10 ⁵	10 ¹⁴
LB 4	10 ⁻⁴	10	3x10 ⁵	3x10 ¹⁴	10 ⁵	50	1.5	10 ⁷	10 ⁶	10 ¹⁵
LB 5	10 ⁻⁵	10 ²	3x10 ⁶	3x10 ¹⁵	10 ⁶	5x10 ²	15	10 ⁸	10 ⁷	10 ¹⁶
LB 6	10 ⁻⁶	10 ³	3x10 ⁷	3x10 ¹⁶	10 ⁷	5x10 ³	1.5x10 ²	10 ⁹	10 ⁸	10 ¹⁷
LB 7	10 ⁻⁷	10 ⁴	3x10 ⁸	3x10 ¹⁷	10 ⁸	5x10 ⁴	1.5x10 ³	10 ¹⁰	10 ⁹	10 ¹⁸
LB 8	10 ⁻⁸	10 ⁵	3x10 ⁹	3x10 ¹⁸	10 ⁹	5x10 ⁵	1.5x10 ⁴	10 ¹¹	10 ¹⁰	10 ¹⁹
LB 9	10 ⁻⁹	10 ⁶	3x10 ¹⁰	3x10 ¹⁹	10 ¹⁰	5x10 ⁶	1.5x10 ⁵	10 ¹²	10 ¹¹	10 ²⁰
LB 10	10 ⁻¹⁰	10 ⁷	3x10 ¹¹	3x10 ²⁰	10 ¹¹	5x10 ⁷	1.5x10 ⁶	10 ¹³	10 ¹²	10 ²¹

What does the EN 207:2009 LB-rating mean?

The LB-rating of a laser safety filter is the protection level it provides. The LB-rating is commonly written like this:

700-760 D LB5

Where 700-760 is the wavelength range (nm) the goggle will protect you against, D is the laser type (see below for laser types), and LB5 represents protection level 5 for the laser type at this wavelength.

Working Mode	Letter	Pulse Length
Continuous Wave (CW)	D	>0.25s
Pulsed	I	1µs – 0.25s
Giant Pulsed	R	1ns – 1µs
Mode-Locked	M	<1ns



Care

- » LASER COMPONENTS' laser safety eyewear utilises specialist filters to provide maximum protection and it is vital that these are well maintained to guarantee the safety rating.
- » Filters may be absorbing glass or tough plastics which can also have delicate optical coatings.
- » Purely absorbing filters are scratch resistant but care should still be taken when cleaning them. Always use a lens cleaning cloth.
- » For tougher dirt or grease on the filter use a lens cleaning solution and wipe gently in one direction, repeat until the filter is clean.

What is the difference between OD and EN 207:2009 LB-rating?

The optical density is the attenuation of light that is able to pass through the filter. Increasing the optical density decreases the amount of light that is able to penetrate through the filter and reach your eyes.

An optical density rating is the absolute protection of the filter, whereas the EN 207:2009 states the protection level is a combination of the filter protecting AND the frames of the eyewear. Using the previous example protection level:

700-760 D LB5
(Filter OD=6)

The optical density of the filter is level 6 meaning the filter itself has a high protection rating, but the LB-rating is only level 5. This would be because the frame only protects up to a level of 5. This lower rating could be due to the material of the frame.

According to EN 207:2009 both the filter AND the frame must be accounted for when specifying the safety level, therefore, the lower of the two is used.

OD	Transmittance (%)
0	1×10^{-3}
1	1×10^{-4}
2	1×10^{-5}
3	1×10^{-6}
4	1×10^{-7}
5	1×10^{-8}
6	1×10^{-9}
7	1×10^{-10}
8	1×10^{-11}
9	1×10^{-12}

EN208:2009

The EN 208:2009 alignment eyewear standard is used when users need to see the beam to perform alignment and adjustment tasks. Laser filters specified to this standard will allow a small amount of light to pass through (equivalent to a class II laser beam) and are able to withstand direct illumination from the laser beam. EN 208 filters are specified using a scale number, and will protect your eyes at wavelengths 400-700nm (visible radiation) up to 100W.

EN208:2009 Table

Scale Number	Maximum Power [W]	Maximum Energy [J]
	(Duration > 2 x 10 ⁻⁴ s)	(Pulses 10 ⁻⁹ to 2 x 10 ⁻⁴ s)
RB 1	0.01	2 x 10 ⁻⁶
RB 2	0.1	2 x 10 ⁻⁵
RB 3	1	2 x 10 ⁻⁴
RB 4	10	2 x 10 ⁻³
RB 5	100	2 x 10 ⁻²

What should I look for when selecting laser safety eyewear?

Second to the protection level is comfort, an important factor when choosing the correct laser safety eyewear.

LASER COMPONENTS offers a large range of frames which are available with adjustable arms or head straps, comfort pads to reduce pressure on the temples, and designs to accommodate spectacles behind them.

When looking for laser safety eyewear it is important to make sure that the frames do not affect your line of sight and are not a hindrance to your work. LASER COMPONENTS provides a range of sizes and fits, including paediatric goggles, to ensure maximum comfort and protection.



Care

- » Before using any eyewear, check for any mechanical damage such as small scratches and breaks or colour changes to the filter. Replace if required.
- » Keep your eyewear in the case it came in when not in use.
- » Always check the correct wavelength and safety levels are suitable for the laser you are operating.
- » Never look directly into the beam even when wearing safety eyewear.



info@lasercomponents.co.uk

Tel: +44 1245 491 499

Fax: +44 1245 491 801

NAVIGATION

How to Navigate the Catalogue

Step 1. Choose your preferred frame styles.

Step 2. Complete our 'Request-a-quote' form with your laser information.

Step 3. Submit to your LASER COMPONENTS' Technical Sales Engineer who will be in touch shortly with an appropriate filter specification.



Note

» Filters shown are for photographic purposes only. Filter colour will vary dependent on the required protection level.

Tab

Use the tabs to navigate through the different frame types; wrap arounds, over specs, goggles and frames for Intense Pulsed Light (IPL).

Key Features

Here you will find information on the special features of this frame.

Frame Number

The first two numbers after G denotes the frame number. Some frames will feature a letter to show additional options (G=goggle strap, L=legs, etc.)

20 The modular style of this frame enables you to adjust multiple points for optimum comfort during use.

FRAME STYLES

The light frame enables you to wear your laser safety eyewear for prolonged periods of time.

The temples are adjustable in both length and inclination, allowing you to fit the glasses in a secure manner.

Black
Grey

15 | www.lasercomponents.co.uk

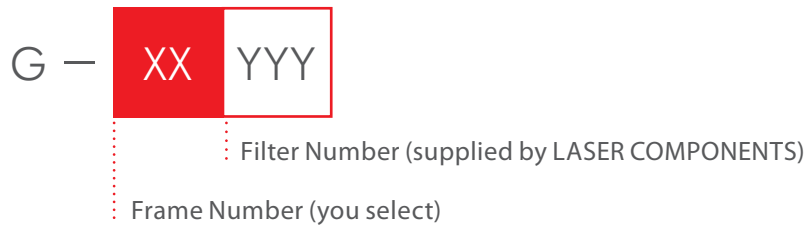
Colour Options

If your chosen style is available in a variety of colours they will be listed here.

Choosing Your Frame Type

FRAME TYPES

Nomenclature:



Wraparound

Wraparound frames are the most common style. With a wide range of shapes and sizes, this style is suitable for most available filters whilst also providing a lightweight and low profile design.



Goggles / Masks

Goggle and mask frames are used to accommodate thicker filters when a higher level of protection is required. These robust frames utilise a head strap and padding for maximum comfort.



Over spectacles

Over spectacle frames are designed to accommodate prescription glasses underneath. This style provides lots of room for most prescription frames without obscuring the field of view.



Patient protection, IPL

Patient protection frames are small and lightweight, ideal for medical and cosmetic laser applications. These frames are suitable for deep blocking filters for Intense Pulsed Light (IPL) and other bright light treatments.



FRAME STYLES

01

This contemporary styled frame is light but strong with an ergonomic, low-profile design.

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



Adjustable nose-piece pads provide a comfortable fit and relieve pressure build up.



Slim arms combined with a lightweight body give maximum protection and a sleek look.

As shown

This stylish design combines the best of high level laser protection, user comfort, and style, in one single frame.

11

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOOGLES

IPL



As shown



Designed with comfort in mind; this frame is built to be worn all day.



The temples can be shaped for an improved face-form fit.

12

The wrap around style of these frames is designed to fit closely to your face, and cushions every point of contact for all day use.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



A soft elastic brow guard and flexible nose bridge fingers ensure comfort during use.



The wrap-around design allows for uninterrupted peripheral vision.

As shown

A classic frame style which is made of a high quality polymer ensuring a robust design.

13

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

As shown



This frame style allows you to wear your laser safety eyewear for prolonged periods of time.



An adjustable draw string is included for comfort of use and quick removal and accessibility without putting them down.

14

A universal design constructed from metal for high level laser protection.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



This frame is designed to have a very good fit around the entire eye area.



An adjustable draw string is included for comfort of use and quick removal and accessibility without putting them down.

As shown

A contemporary and stylish frame designed for comfort and a high safety rating.

15

FRAME STYLES



- White/ Grey 
- White/ Gun Metal 



A soft, hypoallergenic nose pad is fitted to the frame.



Adjustable temples are standard for a comforting fit.

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

20

The modular style of this frame enables you to adjust multiple points for optimum comfort during use.

FRAME STYLES

WRAP-AROUNDS

OVER-SPECS

GOGGLES

IPL



The light frame enables you to wear your laser safety eyewear for prolonged periods of time.



The temples are adjustable in both length and inclination, allowing you to fit the glasses in a secure manner.

Black
Gray

A modern wraparound style designed for comfort during prolonged use.

23

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

Black



This frame features comfort-fit temples and nose pads.



These goggles feature an insert for a secondary filter or prescription lenses.

24

A minimalist take on the wraparound style frame.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



This frame design enables you to work with a large field of view.



The temple lengths and angles are adjustable for a face-form fit.

 Black

This frame is designed to provide a comforting wraparound style for full protection and comfort.

35

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



White/
Grey



Anti-slip rubber nose pad ensures your laser safety eyewear will not fall from your eyes.



Over-moulded temples ensure comfort during long-term use.

37

A medium sized modern wraparound style.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



This frame provides a large field of view during use.



This frame features comfort-fit temples and a face-form fit.

 Black

A light-weight contemporary style designed for a wide field of view.

42

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

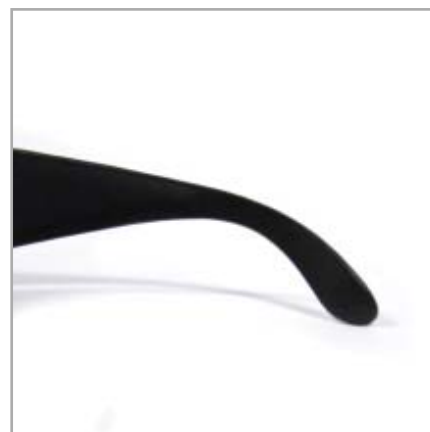
GOGGLES

IPL

Black



The sleek design is both comfortable and stylish.



Ergonomically shaped arms provide long-lasting comfort.

46

A small frame designed for slender faces and children.

FRAME STYLES

WRAP-AROUNDS

OVER-SPECS

GOGGLES

IPL



The wrap-around design ensures the glasses will not slip and will be comfortable during use.



The frame is very lightweight; ideal for children in the laboratory environment.

 Black

This frame features metal accents that provide a high level of laser protection with a stylish look and feel.

06

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

As shown



The detachable and flexible nose bridge enables you to adjust the frame.



This frame style is designed to fit comfortably over the majority of prescription eyewear.

07

This is a robust frame style that is available with polymer filters.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



The polymer material provides a lightweight frame for comfortable use over long periods of time.



This frame style is designed to fit comfortably over the majority of prescription eyewear.

As shown

This frame's one-piece style provides you with an excellent field of view during use.

10

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

Black



The contoured frame fits to your forehead providing orbital coverage.



This frame style is designed to fit comfortably over prescription eyewear.

17

This frame includes pads to increase comfort during use.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



This frame style is designed to fit comfortably over prescription eyewear.



This contemporary styled frame is light but strong, which can be fully adjusted for you to create a personalised comfortable fit.

- White/ Grey
- White/ Gun Metal

This frame is designed to accept both glass and polycarbonate filters.

19

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

Grey/
Black



A soft, hypoallergenic, adjustable nose pad is fitted to the frame.



The wired frame is adjustable at the temples enabling you to form it to your facial profile.

FRAME STYLES

21

The universal fitting style of this frame enables you to comfortably work with a full field of view. This style is available in [21] small (140x132x50mm) or [27] extra-large (148x140x54mm).

27

WRAP
AROUNDS

OVER-SPECS

GOGGLES

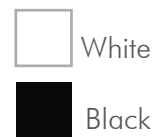
IPL



The side filters in this frame allow for an unparalleled field of view.



This frame style is designed to fit comfortably over prescription eyewear.



A medium sized frame style designed with comfort-fit temples.

22

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOOGLES

IPL

White

Black



This frame features large filters to provide a large field of view.



This frame style is designed to fit comfortably over prescription eyewear.

FRAME STYLES

25

The universal fitting style of this frame enables you to comfortably work with a full field of view.

This style is available in [25] medium (142x135x49mm) or [26] large (144x145x50mm).

26

WRAP
AROUNDS

OVER-SPECS

GOGGLES

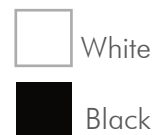
IPL



Light weight frame with transparent side area for a greater field of view.



This frame style is designed to fit comfortably over prescription eyewear. The frame is adjustable.



This frame was designed to be worn over prescription eyewear without compromising comfort.

31

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

White/
Grey



This frame weights only 42g, and its soft pads ensure a comfortable and secure fit.



This is an adjustable frame with a style designed to fit comfortably over prescription eyewear.

FRAME STYLES

36

The universal fitting style of this frame enables you to comfortably work with a full field of view. This style is available in [36] medium (141x145x45mm) or [38] large (145x145x50mm).

38

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



This frame style is designed to fit comfortably over prescription eyewear.



This frame features a rubber grip to improve stability whilst wearing prescription glasses.



This retro styled frame is designed to provide comfort during use.

41

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

Black



These goggles feature an insert for a secondary filter or prescription lenses.



This frame style is designed to fit comfortably over prescription eyewear.

FRAME STYLES

43

A classic laboratory style of laser safety eyewear; the entire frame is made from the protective filter material. This style is available in [43] medium (145x145x54mm) or [44] large (150x148x56).

44

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



This frame style is designed to fit comfortably over prescription eyewear.



This design is lightweight, making it ideal for long periods of use.

Filter
Dependant

This goggle style frame features an indirect ventilation system designed to enhance your comfort during use.

03

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

Black



This wide band strap provides a secure and comfortable fit.



The silicon flange on these frames will ensure long lasting comfort and a customised fit.

05

This frame style is designed to fit comfortably over prescription eyewear.

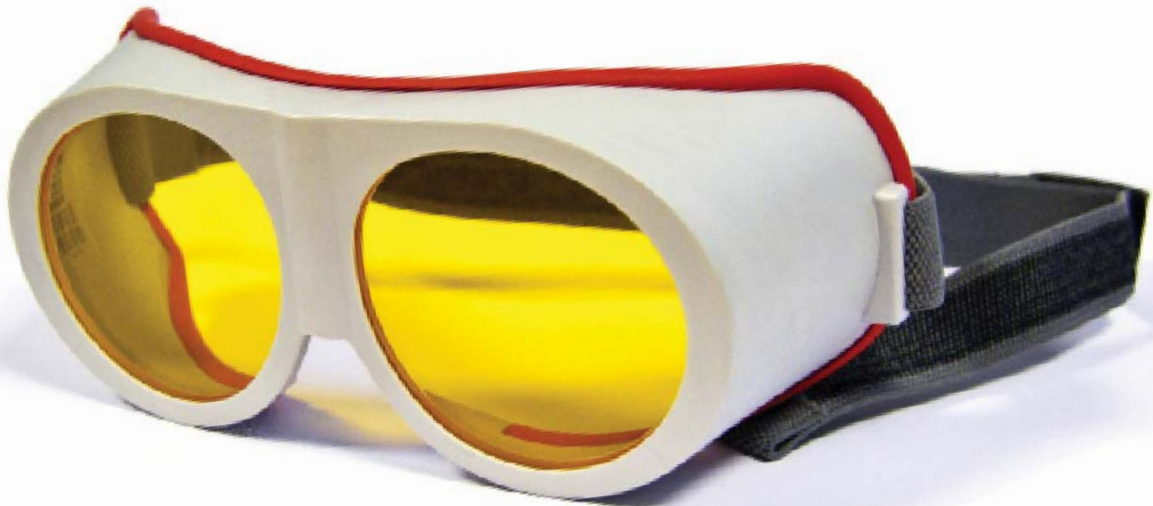
FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



The large lenses offer a large field of view during your application.



This goggle style frame is constructed of a robust and lightweight polymer with an easily adjustable strap.

As shown

This frame is constructed from aluminium to ensure a high level of laser protection.

08

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

As shown



The large lenses offer a large field of view during your application.



The comfortable strap provides a secure fit.

30

A universally fitting goggle style frame with an anti-fog venting design.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



These goggles feature an insert for a secondary filter or prescription lenses.



An adjustable strap allows you to secure your laser safety eyewear whilst maintaining comfort.

 Black

This frame is designed to provide the maximum protection available. Constructed out of 2mm aluminium its protection is unrivalled.

34L

The 34G frame is fitted with a removable strap which distributes the weight of the goggles evenly around your head, providing a high level of comfort.

34G

FRAME STYLES



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

White/
Grey



This frame style is designed to fit comfortably over prescription eyewear



The 34L frame features fully adjustable temples in length and inclination with soft pads.

45

A classic goggle look that features an adjustable strap and foam pads to cushion your laser safety eyewear.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



The anti-fog venting design provides a free flow of air from bottom to top ensuring a cool comfortable fit.



This intuitive strap design allows for quick adjustment.



As shown

04

Reusable patient protection for laser based surgery and procedures; this style is easy to wear and protects the patient's eyes whilst allowing access to all surrounding areas.

- » Wire design allows you to adjust the fit to the patient's face ensuring a secure fit.
- » Unobstructed access to bridge, brow, and temples.

FRAME STYLES

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



As shown



FRAME STYLES

29

Reusable patient protection for laser based surgery and procedures, designed to fit securely with the adjustable nose piece and headband.

29B

- » Can be sterilised by autoclave
- » Adjustable to different facial sizes for patients.

WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL



As shown

Frame 29B is solid to block all incoming laser light.

Lightweight alloy patient eye protection.

- » This laser safety eyewear can be sterilised by autoclave.
- » The protective surfaces are easy to clean.

48

FRAME STYLES



As shown



WRAP
AROUNDS

OVER-SPECS

GOGGLES

IPL

Request-a-quote

Name Address

Company

Contact Number

Email Postcode

REQUEST- A-QUOTE

Already know what protection level you need?

Do you have your lasers make and model number?

Tell us about you application?

Preferred frame styles in order of preference:

EN 207:2009

Fully blocked

Wavelength [nm]

Beam dimensions

Beam diameter

Divergence (half angle)

Power (Continuous) [μ M, mW, W, kW]

Power (Pulsed)

Pulse energy [nJ, μ J, mJ, J]

Frequency [Hz, kHz]

Pulse duration [ns, ms]

Average power

EN 208:2009

Alignment

Wavelength [nm]

Power (continuous) [μ M, mW, W, kW]

Pulse energy [nJ, μ J, mJ, J]

Quantity? 207..... 208.....

OEM customer?

Not sure?
See page 3.

You can complete and submit this form and one of our Technical Sales Engineers will be in touch shortly with more laser safety eyewear information.



How to Fill in the Request-a-quote Form

Filling out the Request-a-quote form is a quick and handy way to tell us what you need. This guide is to help you fill in the 'Request-a-quote' form:

REQUEST-A-QUOTE

Name and company information

When you send us your information remember to include how we can contact you with the options available.

Do you know what laser you are using?

If so tell us and we'll see if we can find its specification and let you know what is available.

EN 207:2008

We will need to know the following parameters:

- » Wavelength
- » If the laser is continuous we only need to know the power
- » If the laser is pulsed we will need to know the pulsed energy, frequency, pulse duration and average power.

Preferred frame styles

Laser frame styles available are dependent on the required filter. If you have a preference to a certain frame or style write this down and we will do our best to match the filter to the frame.

Already know your protection level?

If you know what protection you need just write this on the form and send it to us – we'll get in touch shortly with a range of options for you.

EN 208:2009

All we need to know is the wavelength, and either the continuous power or the pulse energy.

Original Equipment Manufacturer (OEM)?

If you require a large quantity or are looking at a continued requirement, depending on the frame we can ship the laser safety eyewear with your company's logo.

Request an engineer's help

If you don't know all of the information required, fill in what you can and a Technical Sales Engineer will call you to help.

LASER COMPONENTS is pleased to advise the most suitable safety eyewear for your specific application, in compliance with EN207:2009 and EN208:2009. The required protective level shall be in any case defined by consulting your laser safety officer. Incorrect data will lead to wrong protection levels. The responsibility and liability for injuries due to the use of unsuitable means of protection lies with the customer. All Laser safety eyewear is subject to our standard terms and conditions. However, this does not include a return or refund based on the aesthetics of the eyewear, which will include customer preferences of eyewear designs.



We make every effort to ensure the information printed is correct, however, we cannot accept any liability for the accuracy or any consequential loss that might be incurred by using this information.



Laser Components (UK) Ltd.

Goldlay House, 114 Parkway
Chelmsford, Essex, CM2 7PR
United Kingdom

Tel: + 44 1245 491 499

Fax: + 44 1245 491 801

info@lasercomponents.co.uk

