DATASHEET AND OPERATING GUIDE
Laser Safety Eyewear
CE-Certified for Laser Protection

FEATURES

- CE certified to EN207 or EN208
- Lightweight polycarbonate eyewear
- High optical density
- Wrap-around or Over frame eyewear
- Infrared, Visible, and Ultraviolet filters
- Light transmittance and optical density data
- OD and LB ratings for specific wavelength ranges
- Polymer and glass filter material

Laser Safety Eyewear with uniquely engineered filters that help protect people against the dangerous effects of laser light. These safety glasses were designed by working directly with laser manufacturers to develop proprietary filters that meet all quality and industry standards.

ORDERING INFORMATION

PART NO	DESCRIPTION
LSE-ARG-WRAP	ARG VIS Filter Wraparound Eyewear
LSE-ARG-OVER	ARG VIS Filter Fitover Eyewear
LSE-DBD-WRAP	DBD IR, VIS Filter Wraparound Eyewear
LSE-DBD-OVER	DBD IR, VIS Filter Fitover Eyewear
LSE-DBY-WRAP	DBY IR, VIS Filter Wraparound Eyewear
LSE-DBY-OVER	DBY IR, VIS Filter Fitover Eyewear
LSE-DI2-WRAP	DI2 IR Filter Wraparound Eyewear
LSE-DI2-OVER	DI2 IR Filter Fitover Eyewear
LSE-DI4-WRAP	DI4 IR, VIS Filter Wraparound Eyewear
LSE-DI4-OVER	DI4 IR, VIS Filter Fitover Eyewear
LSE-DIA-WRAP	DIA VIS Filter Wraparound Eyewear
LSE-DIA-OVER	DIA VIS Filter Fitover Eyewear
LSE-EC2-WRAP	EC2 IR, UV Filter Wraparound Eyewear
LSE-EC2-OVER	EC2 IR, UV Filter Fitover Eyewear
LSE-FG1-WRAP	FG1 IR Filter Wraparound Eyewear
LSE-FG1-OVER	FG1 IR Filter Fitover Eyewear
LSE-HOY-WRAP	HOY IR Filter Wraparound Eyewear
LSE-HOY-OVER	HOY IR Filter Fitover Eyewear
LSE-IRD-WRAP	IRD IR Filter Wraparound Eyewear
LSE-IRD-OVER	IRD IR Filter Fitover Eyewear

PART NO	DESCRIPTION
LSE-ML1-WRAP	ML1 IR Filter Wraparound Eyewear
LSE-ML1-OVER	ML1 IR Filter Fitover Eyewear
LSE-PWV-WRAP	PWV VIS Filter Wraparound Eyewear
LSE-PWV-OVER	PWV VIS Filter Fitover Eyewear
LSE-RA3-WRAP	RA3 VIS Filter Wraparound Eyewear
LSE-RA3-OVER	RA3 VIS Filter Fitover Eyewear
LSE-RB2-WRAP	RB2 VIS Filter Wraparound Eyewear
LSE-RB2-OVER	RB2 VIS Filter Fitover Eyewear
LSE-VA1-WRAP	VA1 VIS Filter Wraparound Eyewear
LSE-VA1-OVER	VA1 VIS Filter Fitover Eyewear
LSE-YAD-WRAP	YAD IR, UV, VIS Filter Wraparound Eyewear
LSE-YAD-OVER	YAD IR, UV, VIS Filter Fitover Eyewear
LSE-YG2-WRAP	YG2 IR Filter Wraparound Eyewear
LSE-YG2-OVER	YG2 IR Filter Fitover Eyewear
LSE-YG3-WRAP	YG3 IR Filter Wraparound Eyewear
LSE-YG3-OVER	YG3 IR Filter Fitover Eyewear
LSE-YGN-WRAP	YGN IR, VIS Filter Wraparound Eyewear
LSE-YGN-OVER	YGN IR, VIS Filter Fitover Eyewear
LSE-ZSY-WRAP	ZSY VIS Filter Wraparound Eyewear
LSE-ZSY-OVER	ZSY VIS Filter Fitover Eyewear

CE

406-587-4910
www.teamWavelength.com

WAVELENGTH ELECTRONICS

CONTENTS

FOLLOW ALL SAFETY AND OPERATING INSTRUCTIONS. IT IS NEVER ADVISABLE TO LOOK DIRECTLY INTO LASER BEAMS. THE RESPONSIBILITY AND LIABILITY FOR INJURIES DUE TO THE USE OF UNSUITABLE MEANS OF PROTECTION AND IMPROPER USE LIES WITH THE CUSTOMER.

LASER SAFETY EYEWEAR SELECTION GUIDE

LASER SPECIFICATIONS

Consult your laser's manufacturer's guide for eyewear requirements.

Calculate optical density (OD) and power density requirements based on wavelength, power in watts (or for pulsed systems, using wavelength, power in joules, pulse length in seconds and pulse repetition rate in hertz). OD is the attenuation or reduction of energy transmitted through the lens. The higher the OD value is, the higher the attenuation and the greater the protection level. OD is directly related to wavelength since it measures the ratio of light absorbed to a specific wavelength.

NOTE: Are there engineering controls limiting exposure to the beam? Is partial beam visibility required for alignment of visible beams? Is protection required for intra-beam exposure or is protection primarily for diffuse or scattered energy? For medical applications, are there different eyewear considerations for the Clinician and patient (in terms of VLT-visible light transmittance, full orbital coverage, weight of eyewear)? Will filter color / color rendition affect use? Are there multiple laser systems in the area, or is the eyewear designated for a single system?

DAMAGE THRESHOLD, AND VISIBLE LIGHT TRANSMITTANCE (VLT) REQUIREMENTS

Make sure the filter will reduce possible energy exposure to below the Maximum Permissible Exposure (MPE).

Check the Photopic Visible Light Transmittance (VLT) of the filter. VLT is the percentage of visible light (380 to 720 nm) transmitted through a filter or lens, calculated against the spectral sensitivity of the eye to daylight. The higher the better. VLTs below 20% should be used in well-illuminated working environments.

Consider Absorptive or Interference filters-Absorptive filters may be polymer + dye based or glass, and function by absorbing laser energy. Interference filters employ thin layers of reflective material for protection. Hybrids combine both technologies.

Lightweight polymer filters offer varying VLTs and mid-level damage thresholds for UV, Visible and near IR, with lower damage thresholds for IR.

Polymer filters are cost effective, easy to wear and offer the highest impact resistance, while heavier glass filters can offer higher VLTs and higher damage thresholds at higher expense, and dielectrically coated and hybrids offer the highest VLTs, highest damage thresholds (in that some energy is not absorbed but reflected), at the highest cost.

ADDITIONAL CONSIDERATIONS

Eye protection can only be effective when worn. Laser safety eyewear is of no use if it is sitting on the shelf.

If eye protection is too heavy, poorly fitted, poorly designed or the VLT is too low, users will make the wrong choice: not to wear it. Always wear laser eye protection when operating or when around lasers. You only get two eyes.

NOTE: Actual filter colors may vary with colors shown in this datasheet.

WAVELENGTHS:
INFRARED

DI2 FILTER

LSE-DI2-WRAP & LSE-DI2-OVER

APPLICATIONS: Ultrafast, Medical, Scientific

EN207 Certified
Lens color: Pink Filter material: Polymer

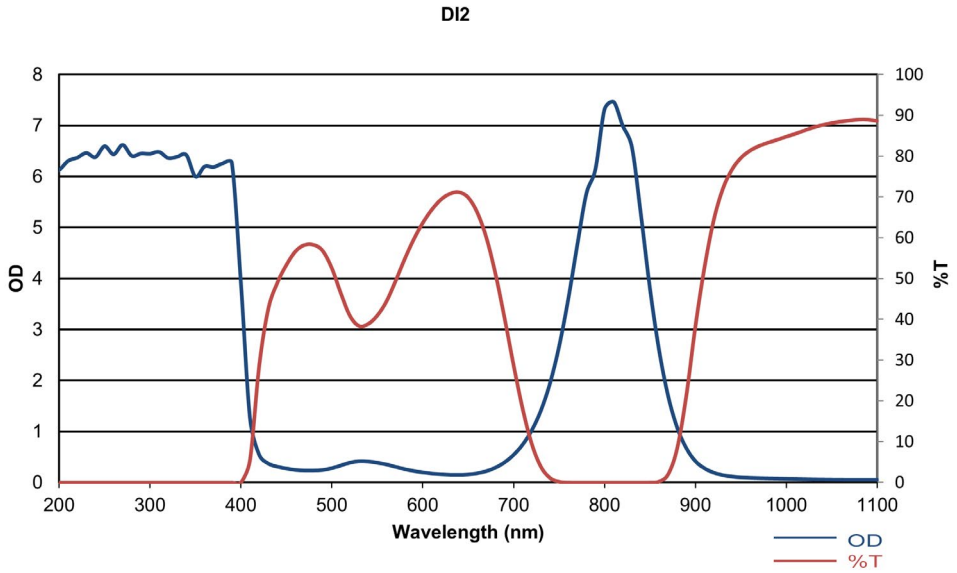
CE RATING

Wavelength (nm)	LB-Ratings
180 - 315	D LB6 + R LB4
>315 - 390	D LB4 + R LB6
785-800 + >818-830	D LB4 + I LB5
>800 - 818	DR LB5 + IM LB6
10600	DI LB2

OPTICAL DENSITY

Wavelength (nm)	OD
180 - 390	6+
785 - 830	5+
800 - 818	6+

Wavelength Type:	Infrared
Luminous Transmittance:	61% Pink



DI2

Figure 1. LSE-DI2-WRAP
Wraparound Frame

Figure 2. LSE-DI2-OVER
Fitover Frame

WAVELENGTHS:
INFRARED

FG1 FILTER

LSE-FG1-WRAP & LSE-FG1-OVER

APPLICATIONS: Industrial, Ultrafast, Medical, Dental, Scientific

CE Certified
Lens color: Clear Filter material: Glass

CE RATING

Wavelength (nm)	LB-Ratings
850 - 900	DIR LB3 + M LB3Y
>900 - 950	DIR LB4 + M LB4Y
>950 - 1000	DIR LB5+M LB5Y
>1000 - 1063	DIR LB6+M LB6Y
>1063 - 1400	D LB6+IR LB7+M LB7Y
>1400 - 1600	DIR LB4+M LB2
>1600 - 2200	DIR LB4
2900 - 3200	DI LB4
9000 - 11000	DI LB4

OPTICAL DENSITY

Wavelength (nm)	OD
850 - 2800	3+
900 - 2600	4+
950 - 1010	5+
>1010 - 1500	7+
>1500 - 2350	5+
>2800 - 10600	5+

Wavelength Type:	Infrared
Luminous Transmittance:	75% Clear

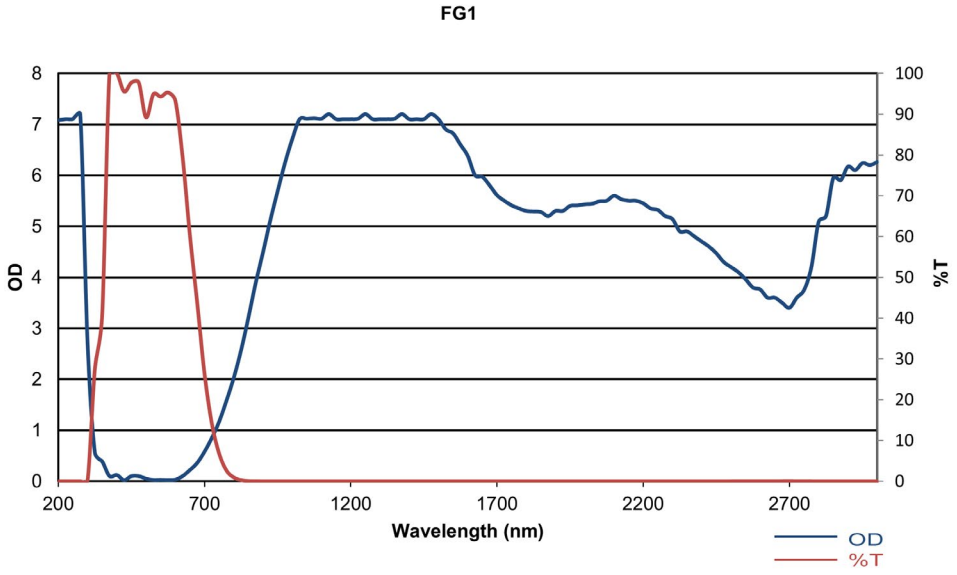


Figure 3. LSE-FG1-WRAP
Wraparound Frame

Figure 4. LSE-FG1-OVER
Fitover Frame

WAVELENGTHS:
INFRARED

HOY FILTER

LSE-HOY-WRAP & LSE-HOY-OVER

APPLICATIONS: Medical, Dental, Scientific, Veterinary

EN207 Certified
Lens color: Grey Filter material: Polymer

CE RATING

Wavelength (nm)	LB-Ratings
1400 - 1450	DI LB1
>1450 - 1650	DI LB2
>1650 - 1800	DI LB3
>1800-3000 + 5200-11000	DI LB4
Wavelength Type:	Infrared
Luminous Transmittance:	41% Grey

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 400	5+
1450 - 1650	2+
>1650 - 1775	3+
>1775 - 3000	4+
1980 - 2550	5+
5200 - 11000	5+
9000 - 10600	6+

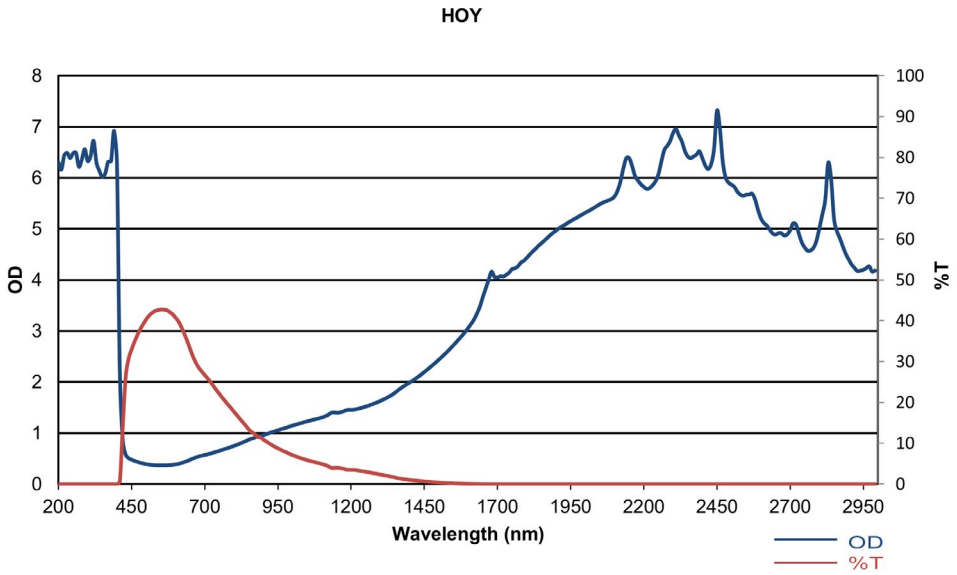


Figure 5. LSE-HOY-WRAP
Wraparound Frame

Figure 6. LSE-HOY-OVER
Fitover Frame

WAVELENGTHS:
INFRARED

IRD FILTER

LSE-IRD-WRAP & LSE-IRD-OVER

APPLICATIONS: Ultrafast, Medical, Scientific

CE Certified
Lens color: Green Filter material: Polymer

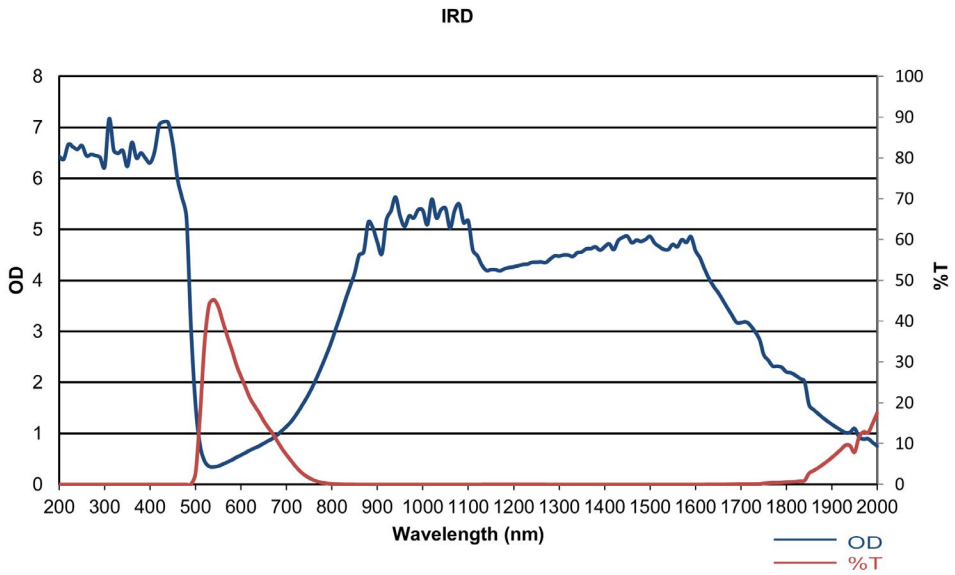
CE RATING

Wavelength (nm)	LB-Ratings
180 - 315	D LB6 + R LB4
>315 - 400	DR LB4
700 - 770	DIR LB1
>770 - 820	DIR LB2
>820 - 865	DIR LB3
>865 - 940	DIR LB4
>940 - 1064	DIRM LB5
>1064 - 1400	DIRM LB4
>1400 - 1840	DI LB2
>1840 - 1950	DI LB1

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 450	6+
700 - 770	1+
>770 - 1840	2+
820 - 1720	3+
870 - 1600	4+
940 - 1070	5+
>1840 - 1950	1+

Wavelength Type:	Infrared
Luminous Transmittance:	19% Green



IRD

Figure 7. LSE-IRD-WRAP
Wraparound Frame

Figure 8. LSE-IRD-OVER
Fitover Frame

WAVELENGTHS:
INFRARED

ML1 FILTER

LSE-ML1-WRAP & LSE-ML1-OVER

APPLICATIONS: Ultrafast, Medical, Dental, Scientific, Therapeutic, Veterinary

CE Certified
Lens color: Green Filter material: Polymer

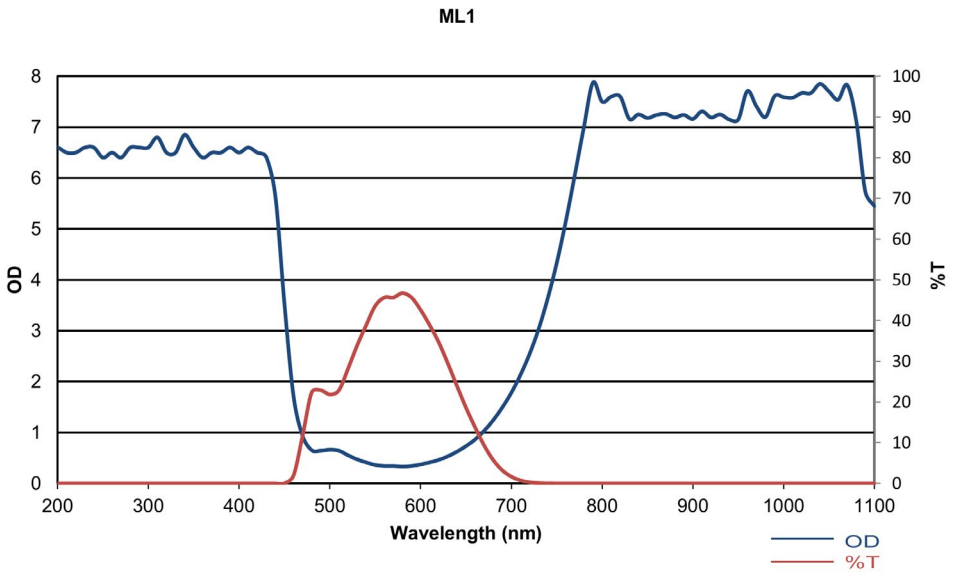
CE RATING

Wavelength (nm)	LB-Ratings
190 - 315	D LB8 + IR LB4
>315 - 420	DIR LB5
>420 - 445	DIR LB4
765 - 1100	DIRM LB5
775 - 1085	D LB5 + IRM LB6
790 - 1080	D LB6 + IR LB7 M LB7Y
950 - 1085	DIRM LB6 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 420	5+
765 - 1100	5+
775 - 1085	6+
790 - 1080	7+

Wavelength Type:	Infrared
Luminous Transmittance:	45% Green



ML1

Figure 9. LSE-ML1-WRAP
Wraparound Frame

Figure 10. LSE-ML1-OVER
Fitover Frame

WAVELENGTHS:
INFRARED

YG2 FILTER

LSE-YG2-WRAP & LSE-YG2-OVER

APPLICATIONS: Ultrafast, Medical, Scientific

EN207 Certified
Lens color: Amber Filter material: Polymer

CE RATING

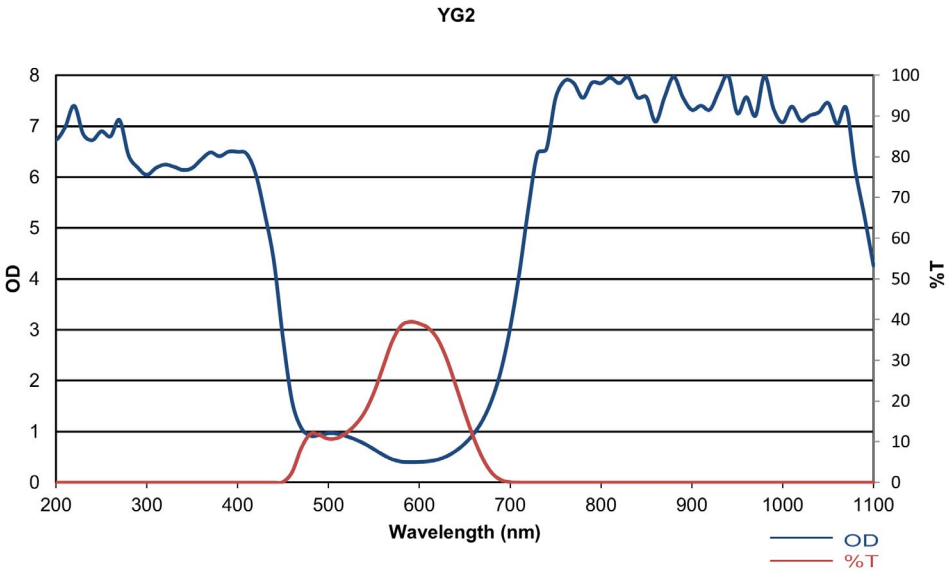
Wavelength (nm)	LB-Ratings
180 - 315 D	D LB6 + R LB4
>315 - 400	DR LB4
720 - 725	DM LB5
720-750 + >1064-1075	IR LB5
>725 - 1075	DM LB6
>750 - 1064	IRM LB7 S

OPTICAL DENSITY

Wavelength (nm)	OD
180 - 400	6+
720 - 1090	5+
750 - 1064	7+

Wavelength Type: Infrared

Luminous Transmittance: 25% Amber



YG2

Figure 11. LSE-YG2-WRAP
Wraparound Frame

Figure 12. LSE-YG2-OVER
Fitover Frame

WAVELENGTHS:
INFRARED

YG3 FILTER

LSE-YG3-WRAP & LSE-YG3-OVER

APPLICATIONS: Ultrafast, Medical, Dental, Scientific, Therapeutic, Veterinary

EN207 Certified
Lens color: Green Filter material: Polymer

CE RATING

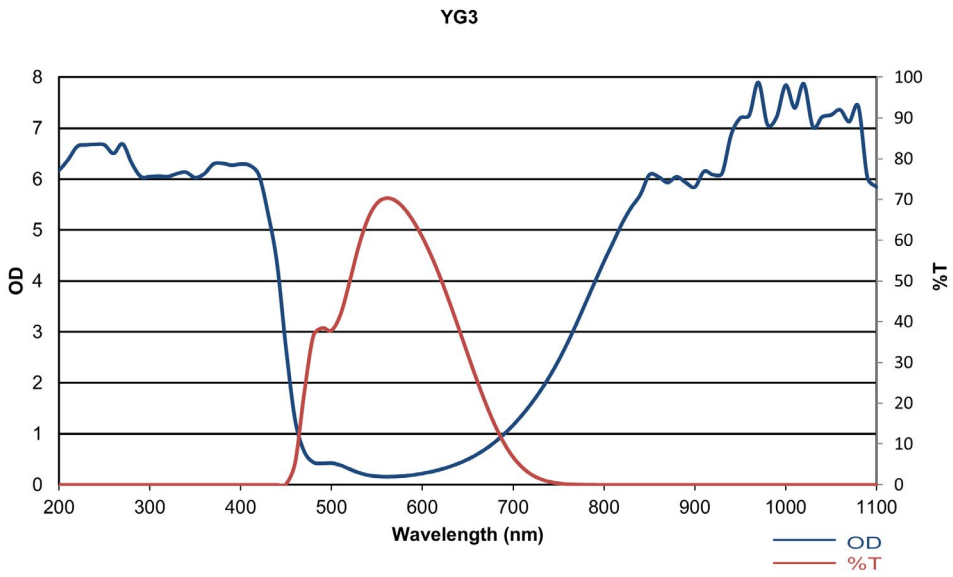
Wavelength (nm)	LB-Ratings
190 - 315	D LB8 + IR LB4 + M LB6Y
>315 - 425	DIRM LB5
790 - <808	DIRM LB3
808 - 840	DIRM LB4
>840 - 950	DIRM LB5
>950 - 1080	D LB6 + IRM LB7
>1080 - 1090	DIRM LB5 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 400	5+
808 - 840	4+
>840 - 950	5+
>950 - 1080	7+
>1080 - 1090	5+

Wavelength Type: Infrared

Luminous Transmittance: 59% Green



YG3

Figure 13. LSE-YG3-WRAP
Wraparound Frame

Figure 14. LSE-YG3-OVER
Fitover Frame

WAVELENGTHS:
INFRARED
ULTRAVIOLET

EC2 FILTER

LSE-EC2-WRAP & LSE-EC2-OVER

APPLICATIONS: Industrial, Ultrafast, Medical, Dental, Scientific

EN207 Certified
Lens color: Clear Filter material: Polymer

CE RATING

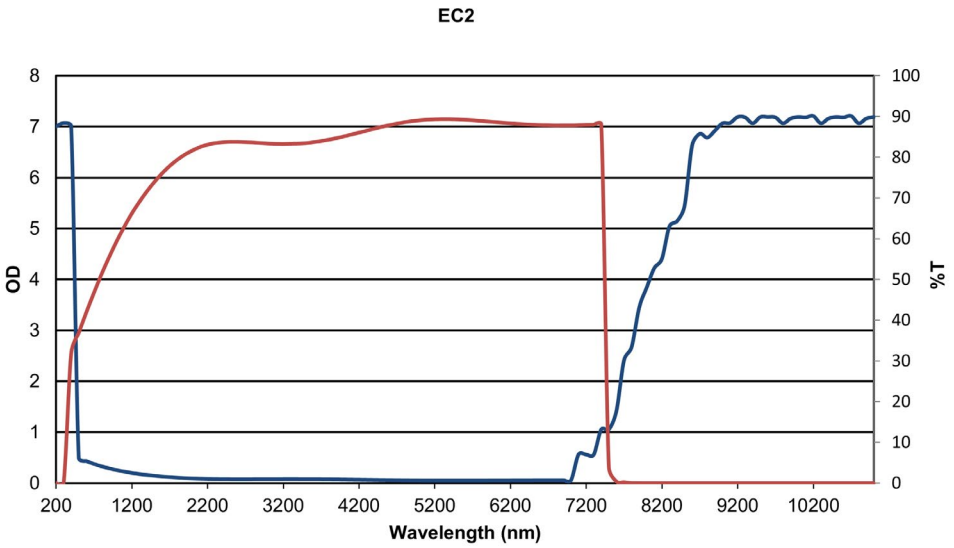
Wavelength (nm)	LB-Ratings
190 - 315	D LB7 + IR LB4
>315 - 398	DIRM LB5
9000 - 11000	DI LB3 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 398	7+
9000 - 11000	7+

Wavelength Type: Infrared, Ultraviolet

Luminous Transmittance: 93% Clear



EC2

Figure 15. LSE-EC2-WRAP
Wraparound Frame

Figure 16. LSE-EC2-OVER
Fitover Frame

WAVELENGTHS:
INFRARED
ULTRAVIOLET
VISIBLE

YAD FILTER

LSE-YAD-WRAP & LSE-YAD-OVER

APPLICATIONS: Ultrafast, Medical, Scientific

EN207 Certified
Lens color: Amber Filter material: Polymer

CE RATING

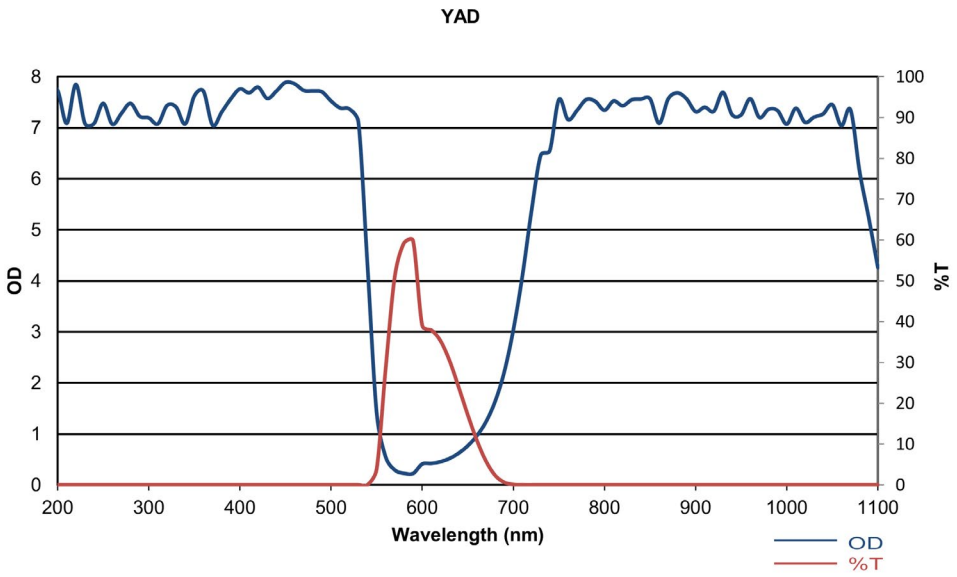
Wavelength (nm)	LB-Ratings
180 - 315	D LB7 + R LB4
>315-534 + 730-740	D LB5 + IRM LB6
>740 - 1070	D LB6 + IRM LB7

OPTICAL DENSITY

Wavelength (nm)	OD
180 - 534	7+
720 - 730	5+
>730 - 740	6+
>740 - 1070	7+

Wavelength Type: Infrared, Ultraviolet, Visible

Luminous Transmittance: 11% Amber



YAD

Figure 17. LSE-YAD-WRAP
Wraparound Frame

Figure 18. LSE-YAD-OVER
Fitover Frame

WAVELENGTHS:
INFRARED
VISIBLE

DBD FILTER
LSE-DBD-WRAP & LSE-DBD-OVER

APPLICATIONS: Industrial, Ultrafast, Medical, Scientific

EN207 Certified
Lens color: Amber Filter material: Polymer

CE RATING

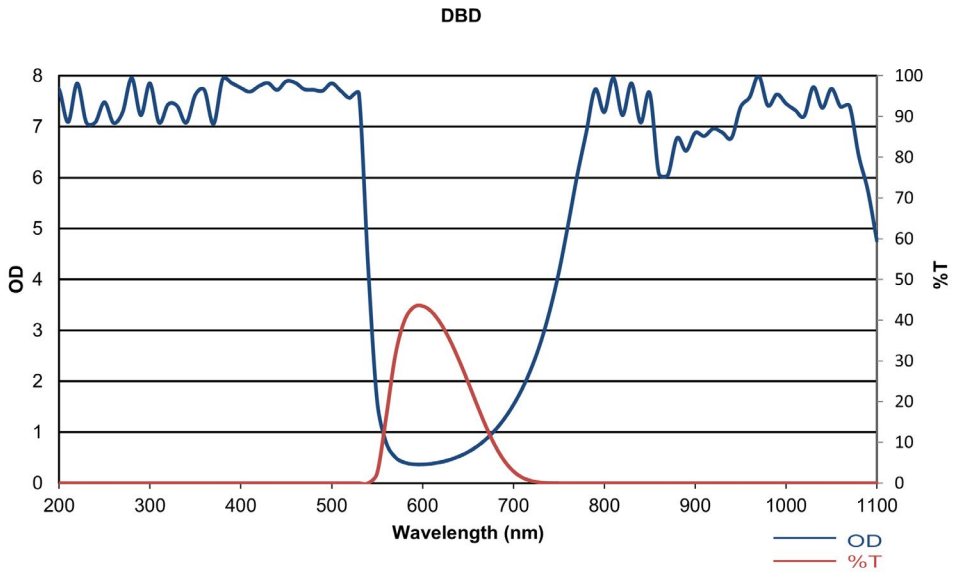
Wavelength (nm)	LB-Ratings
190 - 315	D LB7 + IR LB3
>315 - 532	D LB5 + IRM LB7
760-<770 + >1075-1085	DIR LB5
770-<800 + >820-960	DIRM LB6
>1064 - 1075	DIRM LB6
800-820 + >960-1064	D LB6 + IRM LB7

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 534	7+
760 - 1090	5+
790 - 850	7+
>850 - 960	6+
>960 - 1070	7+

Wavelength Type: Infrared, Visible

Luminous Transmittance: 22% Amber



DBD

Figure 19. LSE-DBD-WRAP
Wraparound Frame

Figure 20. LSE-DBD-OVER
Fitover Frame

WAVELENGTHS:
INFRARED
VISIBLE

DBY FILTER

LSE-DBY-WRAP & LSE-DBY-OVER

APPLICATIONS: Industrial, Ultrafast, Medical, Scientific

EN207 Certified
Lens color: Amber Filter material: Polymer

CE RATING

Wavelength (nm)	LB-Ratings
180 - 315	D LB7 + R LB4
>315 - 534	D LB5 + IRM LB6
850 - 925	DIRM LB5
>925 - 980	D LB5 + IRM LB6
>980 - 1064	D LB6 + IRM LB7
>1064 - 1085	DIRM LB5 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 534	7+
850 - 925	5+
925 - 1070	6+
960 - 1064	7+

Wavelength Type: Infrared, Visible

Luminous Transmittance: 35% Amber

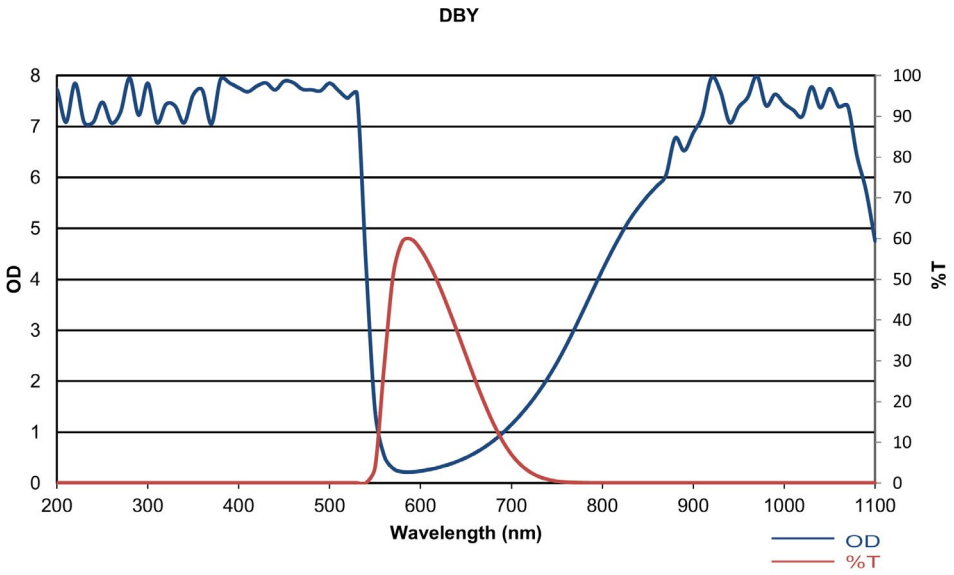


Figure 21. LSE-DBY-WRAP
Wraparound Frame

Figure 22. LSE-DBY-OVER
Fitover Frame

WAVELENGTHS:
INFRARED
VISIBLE

DI4 FILTER
LSE-DI4-WRAP & LSE-DI4-OVER

APPLICATIONS: Medical, Therapeutic, Veterinary

EN207 Certified
Lens color: Blue Filter material: Polymer

CE RATING

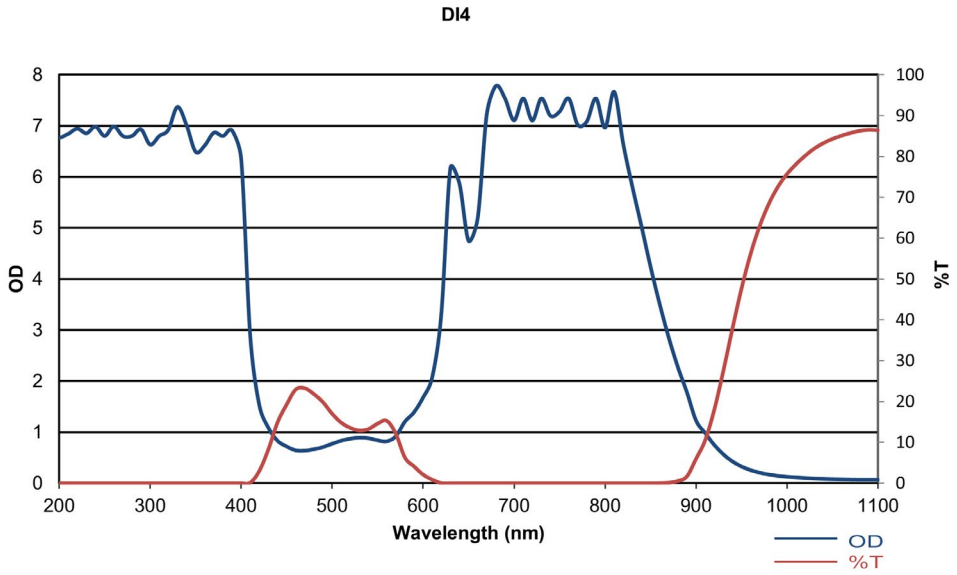
Wavelength (nm)	LB-Ratings
180 - 315	D LB7 + R LB3
>315 - 395	D LB5 + R LB6
625-670 + >800-830	I LB4
625 - 830	DR LB4
>670 - 800	I LB5
>830 - 850	DIR LB3
>850 - 860	DIR LB2
10600	DI LB2 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 400	5+
625 - 850	4+
633	5+
662 - 835	5+

Wavelength Type: Infrared, Visible

Luminous Transmittance: 14% Blue



DI4

Figure 23. LSE-DI4-WRAP
Wraparound Frame

Figure 24. LSE-DI4-OVER
Fitover Frame

WAVELENGTHS:
INFRARED
VISIBLE

YGN FILTER

LSE-YGN-WRAP & LSE-YGN-OVER

APPLICATIONS: Ultrafast, Scientific, Alignment

EN207/EN208 Certified
Lens color: Amber Filter material: Polymer

CE RATING

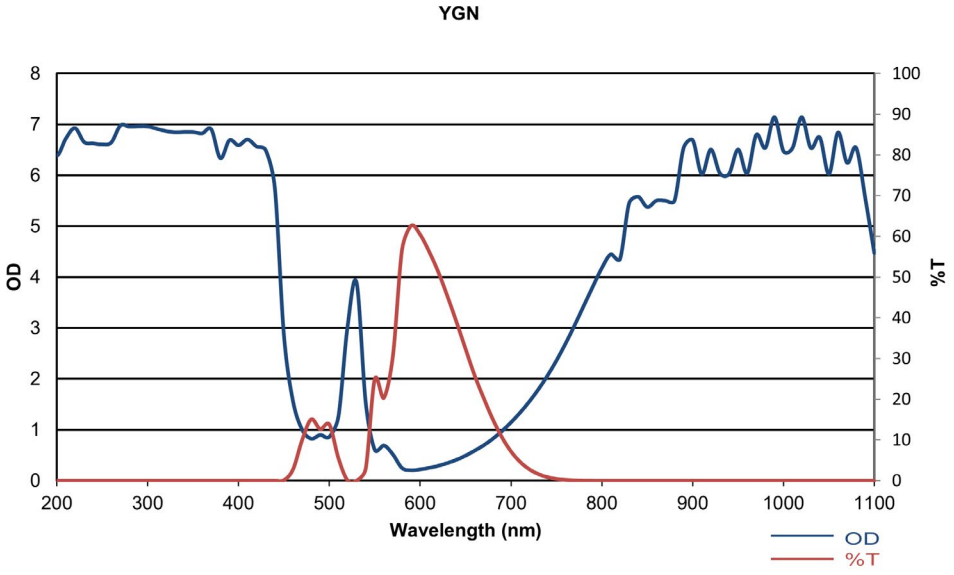
Wavelength (nm)	LB-Ratings
180 - 315	D LB7 + IR LB4
>315 - 390	DIRM LB5
808 - 850	DIR LB4
>850 - 1075	DIR LB5
910 - 1070	DIR LB6 + M LB6Y
1W 2*10E-4J 532	RB3

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 400	5+
532	3+
808 - 850	4+
>850 - 1075	5+
910 - 980	6+
>980 - 1070	7+

Wavelength Type: Infrared, Visible

Luminous Transmittance: 33% Amber



YGN

Figure 25. LSE-YGN-WRAP
Wraparound Frame

Figure 26. LSE-YGN-OVER
Fitover Frame

WAVELENGTHS:
VISIBLE

ARG FILTER

LSE-ARG-WRAP & LSE-ARG-OVER

APPLICATIONS: Industrial, Ultrafast, Medical, Dental, Scientific, Forensic/Fluorescence, Pilot

EN207 Certified
Lens color: Orange Filter material: Polymer

CE RATING

Wavelength (nm)	LB-Ratings
180 - 315	D LB7 + IR LB4
>315 - 532	DIRM LB6 S

OPTICAL DENSITY

Wavelength (nm)	OD
180 - 532	7+

Visible Light Transmittance (VLT): 48% Photopic
9% Scotopic

Wavelength Type: Visible
Luminous Transmittance: 48% Orange

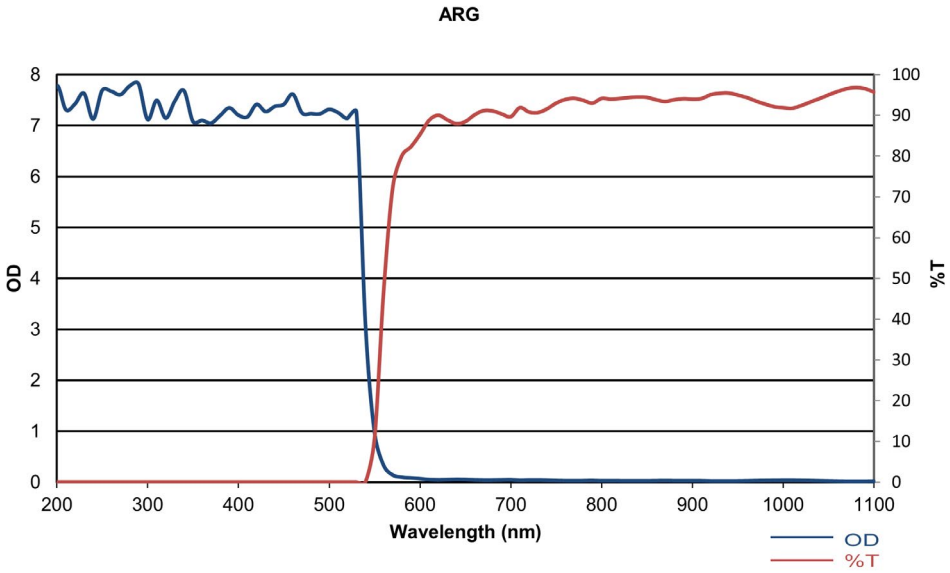


Figure 27. LSE-ARG-WRAP
Wraparound Frame

Figure 28. LSE-ARG-OVER
Fitover Frame

WAVELENGTHS:
VISIBLE

DIA FILTER

LSE-DIA-WRAP & LSE-DIA-OVER

APPLICATIONS: Scientific, Alignment

EN207/EN208 Certified
Lens color: Blue Filter material: Polymer

CE RATING

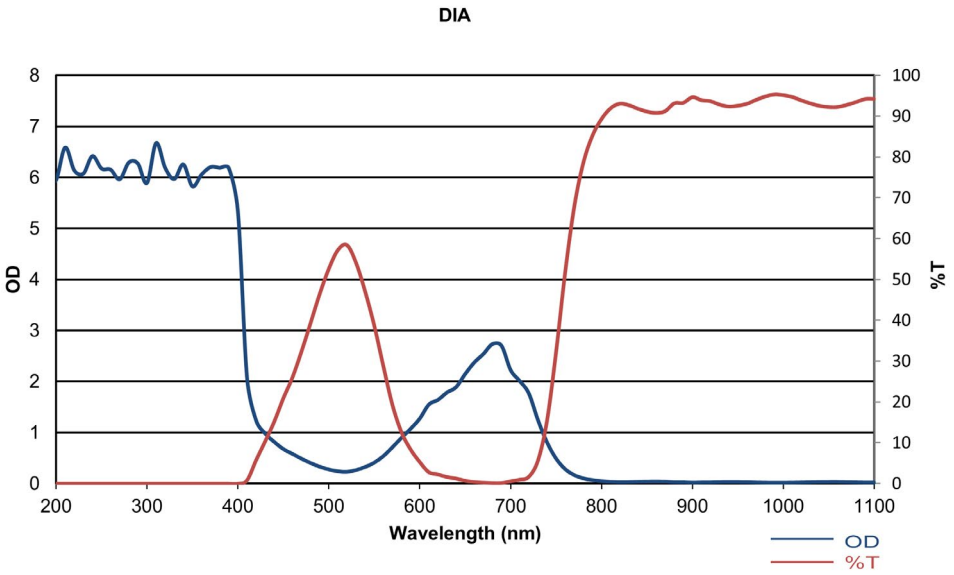
Wavelength (nm)	LB-Ratings
180 - 315	D LB6 + R LB4
>315 - 395	DR LB4
.01W 2*10E-6J 605 - 642	RB1
0.1W 2*10E-5J 648 - 695	RB2 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 380	5+
630 - 700	1.5+

Wavelength Type: Visible

Luminous Transmittance: 39% Blue



DIA

Figure 29. LSE-DIA-WRAP
Wraparound Frame

Figure 30. LSE-DIA-OVER
Fitover Frame

WAVELENGTHS:
VISIBLE

PWV FILTER
LSE-PWV-WRAP & LSE-PWV-OVER

APPLICATIONS: Ultrafast, Medical, Scientific

EN207 Certified
Lens color: Amber Filter material: Polymer

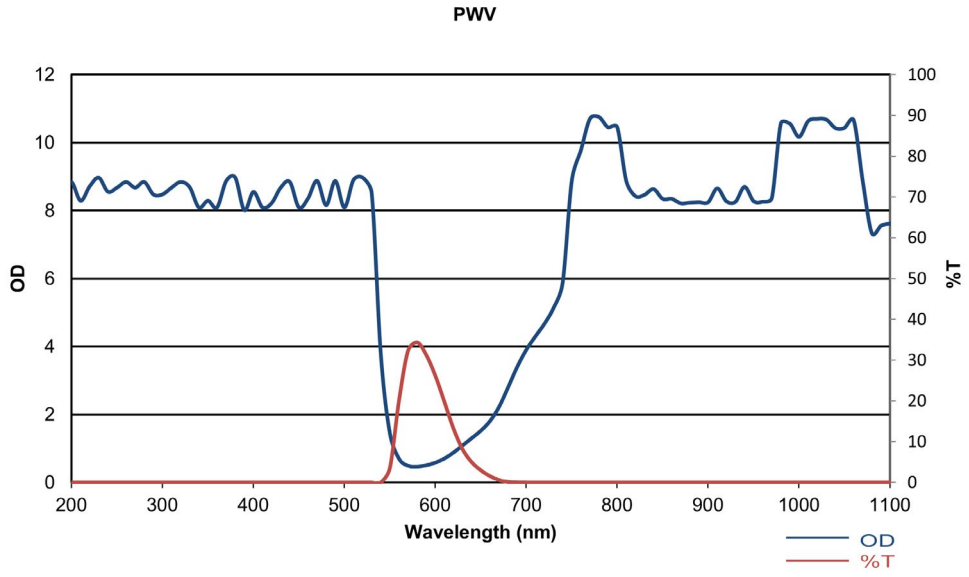
CE RATING

Wavelength (nm)	LB-Ratings
315 - 532	D LB6 + IR LB8 + M LB7Y
533-535 + 730-744	DIRM LB5
745 - 750	DIRM LB6
751 - 754	DIRM LB7
755 - 1100	D LB7 + I LB9 + R LB8 + M LB8Y S

Wavelength Type:	Visible
Luminous Transmittance:	13% Amber

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 532	8+
730 - 1110	5+
745 - 1100	7+
753 - 765	9+
>765 - 800	10+
>800 - 980	8+
>980 - 1065	10+



PWV

Figure 31. LSE-PWV-WRAP
Wraparound Frame

Figure 32. LSE-PWV-OVER
Fitover Frame

WAVELENGTHS:
VISIBLE

RA3 FILTER

LSE-RA3-WRAP & LSE-RA3-OVER

APPLICATIONS: Alignment, Therapeutic

CE Certified
Lens color: Aqua Filter material: Polymer

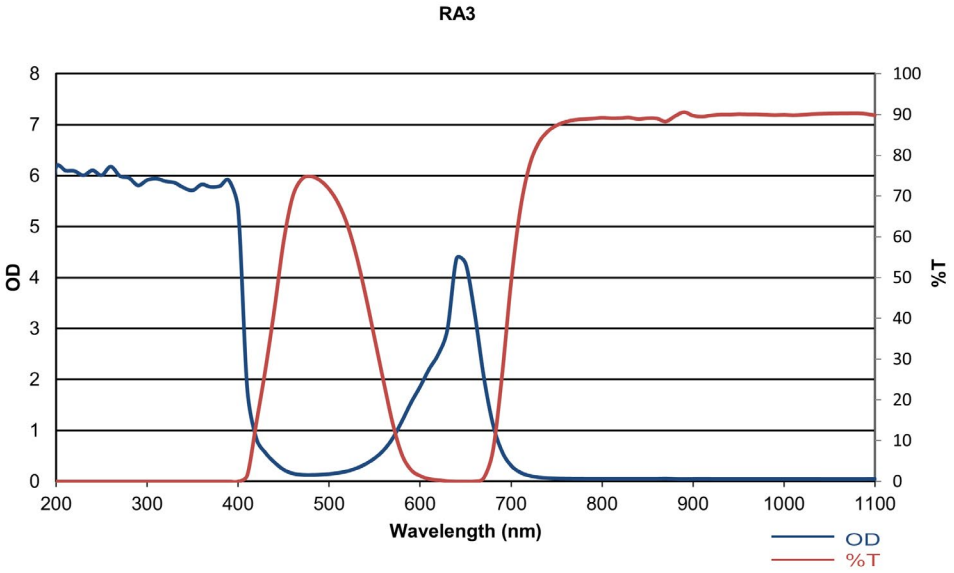
CE RATING

Wavelength (nm)	LB-Ratings
1W 2*10E-4J 632 - 660	RB3 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 400	5+
632 - 660	3+

Wavelength Type:	Visible
Luminous Transmittance:	32% Aqua



RA3

Figure 33. LSE-RA3-WRAP
Wraparound Frame

Figure 34. LSE-RA3-OVER
Fitover Frame

WAVELENGTHS:
VISIBLE

RB2 FILTER

LSE-RB2-WRAP & LSE-RB2-OVER

APPLICATIONS: Medical, Scientific

EN207 Certified
Lens color: Aqua Filter material: Polymer

CE RATING

Wavelength (nm)	LB-Ratings
180 - 315	D LB6 + R LB4
>315 - 400	DR LB4
>615 - 660	DIR LB3
>660 - 665	DIR LB4
>665 - 715	D LB4 + IR LB5
694	IR LB7 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 400	6+
615 - 720	3+
651 - 670	4+
671 - 715	5+
680 - 710	6+
690 - 700	7+

Wavelength Type:	Visible
Luminous Transmittance:	35% Teal

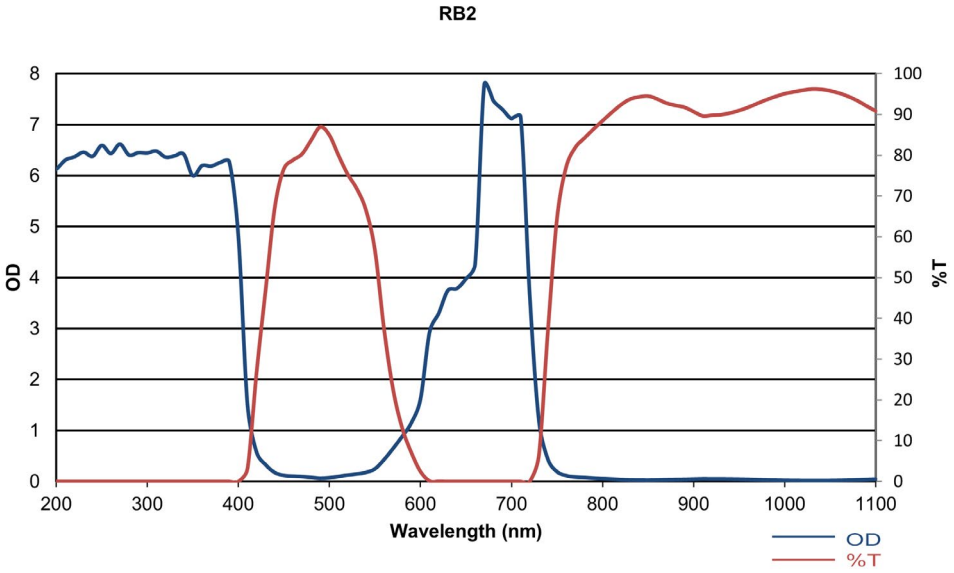


Figure 35. LSE-RB2-WRAP
Wraparound Frame

Figure 36. LSE-RB2-OVER
Fitover Frame

WAVELENGTHS:
VISIBLE

VA1 FILTER

LSE-VA1-WRAP & LSE-VA1-OVER

APPLICATIONS: Scientific, Alignment

EN207/EN208 Certified
Lens color: Grey Filter material: Polymer

CE RATING

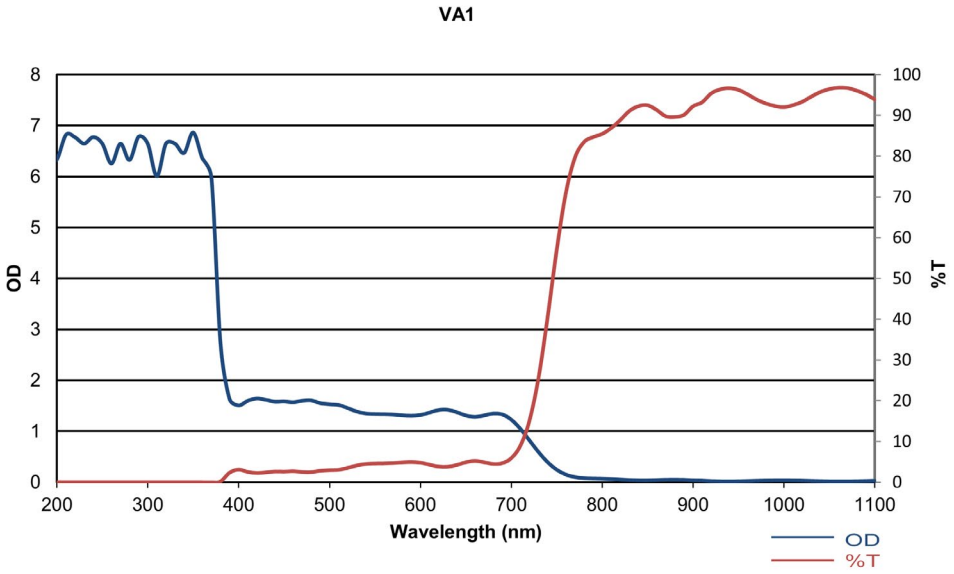
Wavelength (nm)	LB-Ratings
180 - 315	D LB7 + IR LB3
>315 - 370	DIR LB5
0.01 W 2*10E-6J 400 - 700	RB1 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 370	5+
400 - 700	1+

Wavelength Type: Visible

Luminous Transmittance: 4% Grey-Green



VA1

Figure 37. LSE-VA1-WRAP
Wraparound Frame

Figure 38. LSE-VA1-OVER
Fitover Frame

WAVELENGTHS:
VISIBLE

ZSY FILTER

LSE-ZSY-WRAP & LSE-ZSY-OVER

APPLICATIONS: Ultrafast, Medical, Alignment

EN207 Certified
Lens color: Red Filter material: Polymer

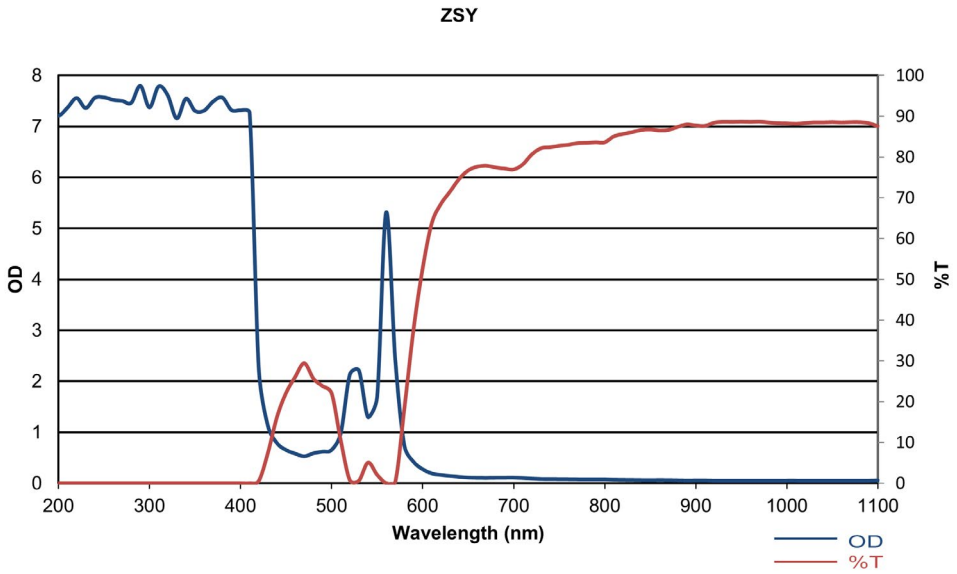
CE RATING

Wavelength (nm)	LB-Ratings
180 - 315	D LB7 + IR LB4
>315 - 390	DIRM LB5
0.1W 2*10E-5J 532	RB2
561	D LB5 + IR LB6 S

OPTICAL DENSITY

Wavelength (nm)	OD
190 - 400	7+
532	2+
561	5+

Wavelength Type: Visible
Luminous Transmittance: 15% Red



ZSY

Figure 39. LSE-ZSY-WRAP
Wraparound Frame

Figure 40. LSE-ZSY-OVER
Fitover Frame

FREQUENTLY ASKED QUESTIONS

QUESTIONS	SOLUTIONS
How do I clean my laser safety eyewear?	Use the following cleaning methods for WEI Laser Safety Eyewear: · Mild detergent/soap and hot water · Diluted isopropyl alcohol solutions (70-85% max) · Commercially available lens cleaning solutions · UV disinfection · Clean eyewear with clear water and neutral cleaning agents and dry gently with a soft cloth. Improper cleaning can damage the lens surface and/or compromise the integrity of the lens or frame. · Do not use caustic chemicals or acidic cleaning fluids · Do not insert into sterilization or disinfectant fluids · Do not clean with ultrasonic systems · Polycarbonate and glass lenses are mounted into nylon or polycarbonate frames. Filter absorption and protection properties are molded into the lenses and won't fade, scratch, bleach or wear off. However, discard and replace eyewear if surface scratches impair vision or if the eyewear is broken, cracked or otherwise cosmetically compromised.
Do these filters have an expiration date?	The official expiration date is 5 years, however, the protection provided by the filter is molded into the lens and does not decrease if the eyewear is well preserved, unscratched, and properly cared for. The protection does not degrade, scratch off or photobleach. Eyewear that show any damage to the filter or frame, or discoloration should be replaced. If you have any concerns, please contact us with your questions.
What impact standards do these safety glasses meet?	All eyewear in this datasheet meet the ANSI Z87.1 impact standard and the increased robustness per the CE EN207 specification.
How do I know what filter to select?	When given a selection of filters that fit the specified wavelengths and OD for your application, choose the one with the highest VLT. If you are unsure and need assistance, please contact our sales department for help in determining the most appropriate filter choice.
Can I see the laser beam with laser safety eyewear?	For laser safety eyewear with EN207 certification, the specified wavelength or wavelength ranges are absorbed or reflected, and the beam spot of a visible laser radiation is not visible. For laser safety eyewear with EN208 certification, the laser beam of the speficied wavelength or wavelength ranges is attenuated to a safe level while still allowing some visiblity for alignment. For full protection eyewear, if the beam is still visible, this would mean that the protection level of the eyewear is not high enough, or that secondary radiation (at a different wavelength) is generated. Always confirm the marking of the laser safety eyewear matches the requirements of the laser. The protection of carefully selected eyewear will remain stable when hit by the laser throughout a minimum period of 5 seconds 50 pulses under standardized conditions. Nevertheless, it is under no circumstances advisable to look into the beam directly.
How do I align my visible laser?	You should never put down your laser safety eyewear when working with lasers above class II. Use certified beam display devices to locate and help align beams. Alignment filters do not absorb or reflect the laser radiation completely. The radiation is often only reduced to values below 1mW for continuous wave lasers (see laser class 2). Do not exceed the power (R – protection level) given on the eyewear with the average power of the laser.
Can I purchase laser safety eyewear with a different color filter?	The color is determined by the requirements for particular wavelengths or ranges at specific optical densities and there may not be a choice of different colors for a given set of parameters. Often, though, there will be a selection of several options and the decision which filter to use should then take into consideration the VLT and color recognition.

CERTIFICATION AND WARRANTY

CERTIFICATION
Wavelength Electronics, Inc. (Wavelength) certifies that this product met its published specifications at the time of shipment.

WARRANTY
This Wavelength product is warranted against defects in materials and workmanship for a period of one (1) year from date of shipment for the filter and a period of five (5) years from the date of shipment for the frame. During the warranty period, Wavelength will, at its option, either repair or replace products which prove to be defective.

WARRANTY SERVICE
For warranty service or repair, this product must be returned to the factory. An RMA is required for products returned to Wavelength for warranty service. The Buyer shall prepay shipping charges to Wavelength and Wavelength shall pay shipping charges to return the product to the Buyer upon determination of defective materials or workmanship. However, the Buyer shall pay all shipping charges, duties, and taxes for products returned to Wavelength from another country.

LIMITATIONS OF WARRANTY
The warranty shall not apply to defects resulting from improper use or misuse of the product or operation outside published specifications. The warranty shall not apply to normal wear, including lens scratching or accidental breakage. No other warranty is expressed or implied. Wavelength specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

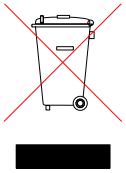
EXCLUSIVE REMEDIES
The remedies provided herein are the Buyer's sole and exclusive remedies. Wavelength shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

NOTICE
The information contained in this document is subject to change without notice. Wavelength will not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material. No part of this document may be translated to another language without the prior written consent of Wavelength.

DISCLAIMER
Filter characteristic data points are nominally represented here solely for informational purposes. We guarantee only those specifications, including Optical Densities, CE ratings and VLT, that are imprinted on the eye protectors and listed on filter data sheets. Incorrect data will lead to wrong protection levels. The responsibility and liability for injuries due to the use of unsuitable means of protection and improper use lies with the customer.

REVISION HISTORY
DOCUMENT NUMBER: LSE-00400

REV.	DATE	CHANGE
A	July 2024	Initial release



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