

Mineral Glass Laser Safety Windows

RENISHAW
RenAM 500Q



RenAM 5



Mineral glass laser safety windows are commonly used as observation windows in medium and high power laser applications, such as welding, cutting, drilling, and additive manufacturing, and – when designed accordingly – allow visual process observation without the need for laser safety eyewear.

In many cases, our mineral glass windows are made of a glass laminate composed of the laser safety filter itself and an additional layer of neutral glass. In the event of a direct laser hit or damage, this design prevents broken glass from falling out – similar to how a car windscreen reacts.

For quality reasons, the maximum possible dimension for a single piece is limited to 210 × 297 mm. However, for larger areas, lattice window structures can be manufactured according to customer requirements.

Mineral glass laser safety windows continue to provide higher levels of protection than their plastic counterparts in many cases and are particularly advantageous in NIR and IR applications as their excellent daylight transmission and low colouration mean that they offer exceptional colour recognition.

In order to meet the growing requirements in industry and research, laservision offers mineral glass windows with certification in the IR range up to 25 µm.

laservision
laser safety windows
made of mineral glass
These are available on our
website:

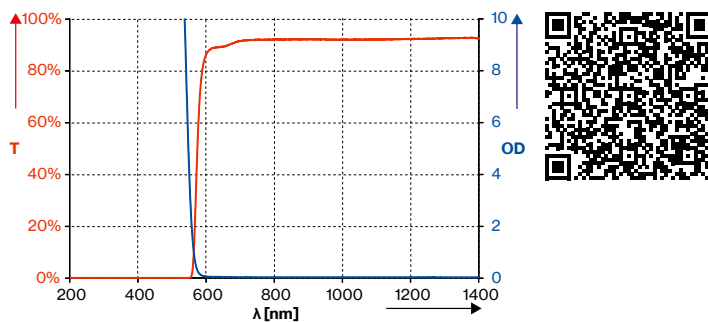


Window T1E02



- Filter for Nd:YAG lasers at 266, 355 or 532nm
- High protection levels
- Max. dimension: 297 × 210 mm

Transmission-/OD Curve T1E02**



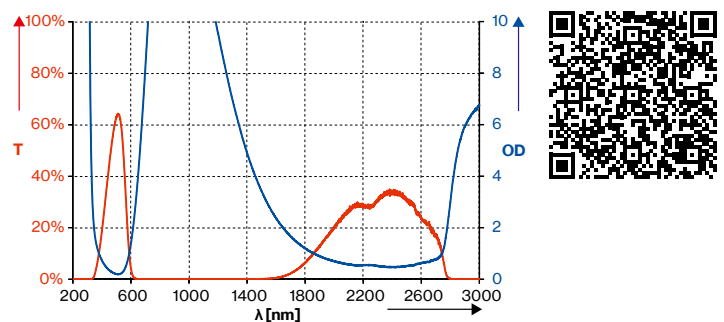
Window	T1E02			
	Full Protection			
Colour	Orange			
Filter Material	Mineral Glass			
Filtertechnology	Absorption Filter			
Certification	CE			
VLT (approx.)	40%			
Visual Brightness	Good			
Colour View	Limited			
Filter Thickness	approx. 5–6 mm*			
Protection according to DIN EN 60825-4:2011				
Ø 50mm				
5–6mm	200-532nm	203 kW/m²	T2	t _{max} =105s
Wavelength	[nm]	OD	Protection level {10 sec.}	
	180–315	10+	D LB10 + IR LB5 + M LB5Y	
	>315–532	8+	D LB7 + IR LB8 + M LB8Y	
Dimension	[mm]	Art. Number		
	200×100	000.T1E02:1001		
	297×210	000.T1E02:1002		

Window T1K01



- Broadband-filter for IR diodes, disc and fibre lasers
- High protection levels
- Max. dimension: 297 × 210 mm

Transmission-/OD Curve T1K01**



Window	T1K01			
	Full Protection			
Colour	Green/Blue			
Filter Material	Mineral Glass			
Filtertechnology	Absorption Filter			
Certification	CE			
VLT (approx.)	45%			
Visual Brightness	Good			
Colour View	Sufficient			
Filter Thickness	approx. 5 – 8mm*			
Protection according to DIN EN 60825-4:2011				
	750–1200nm	167 kW/m²v	T2	t _{max} =217s
	3950–25000nm	221 kW/m²	T2	t _{max} =105s
Wavelength	[nm]	OD	Protection level {5 sec.}	Protection level {10 sec.}
647–689	3+		DIRM LB3	DIRM LB3
690–749	6+		DIRM LB6	DIRM LB6
750–1200	8+		D LB7 + IR LB8 + M LB8Y	D LB7 + IR LB8 + M LB8Y
>1200–1320	6+		DIRM LB6	DIRM LB6
>1320–1400	3+		DIRM LB3	DIRM LB3
>1400–1520	3+		DIRM LB3	DIRM LB3
>1520–1550	2+		DIRM LB2	DIRM LB2
9000–11000	5+		DI LB4	DI LB3
Dimension	[mm]	Art. Number		
	200×100	000.T1K01:1001		
	297×210	000.T1K01:1002		

Mineral Glass

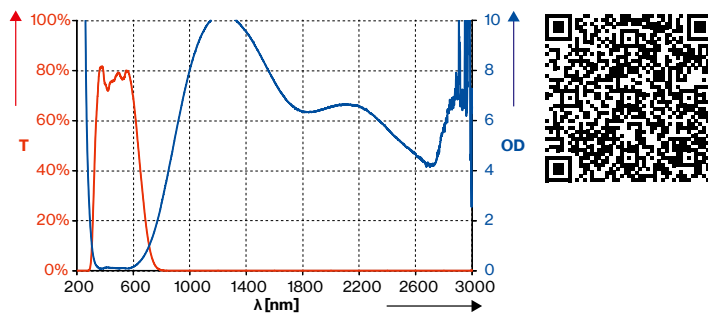
Laser Safety Windows

Window T1K02



- Standard filter for IR laser, disc and fibre lasers
- High VLT

Transmission-/OD Curve T1K02**



Window	T1K02
Full Protection	
Colour	Light Grey
Filter Material	Mineral Glass
Filter technology	Absorption Filter
Certification	CE
VLT (approx.)	70%
Visual Brightness	Very Good
Colour View	Excellent
Filter Thickness	approx. 5–6 mm*

Protection according to DIN EN 60825-4:2011				Ø 50 mm
	950–1399 nm	143 kW/m ²	T2	t _{max} =105 s
	3000–25000 nm	221 kW/m ²	T2	t _{max} =105 s

Wavelength	[nm]	OD	Protection level {10 sec.}
950–1000		5+	DIR LB5
>1000–1050		7+	D LB6 + IR LB7
>1050–1400		8+	D LB6 + IR LB8
>1400–2700		4+	D LB4 + IR LB3
>2700–3000		4+	DI LB4
5400		4+	DI LB4
10600		4+	DI LB4

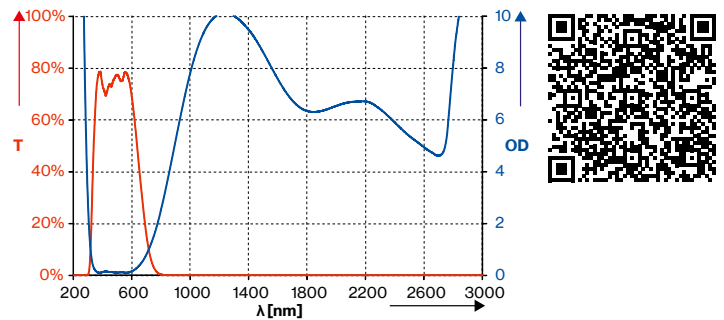
Dimension	[mm]	Art. Number
200×100		000.T1K02.1001

Window T1K03



- High power filter for IR laser, disc and fibre lasers
- High protection rating

Transmission-/OD Curve T1K03**



Window	T1K03
Full Protection	
Colour	Light Grey
Filter Material	Mineral Glass
Filter technology	Absorption Filter
Certification	CE
VLT (approx.)	66%
Visual Brightness	Very Good
Colour View	Excellent
Filter Thickness	approx. 5–8 mm*

Protection according to DIN EN 60825-4:2011				Ø 50 mm
	1000–2100 nm	265 kW/m ²	T2	t _{max} =105 s
	3000–25000 nm	284 kW/m ²	T2	t _{max} =105 s

Wavelength	[nm]	OD	Protection level {10 sec.}
900 – 1000		4+	DIRM LB4
>1000–1050		7+	DIRM LB7
>1050–1400		8+	D LB7 + IR LB8 + M LB8Y
>1400–2100		5+	DI LB5 + R LB3Y + M LB3
>2100–25000		4+	DI LB4 + R LB3Y + M LB4

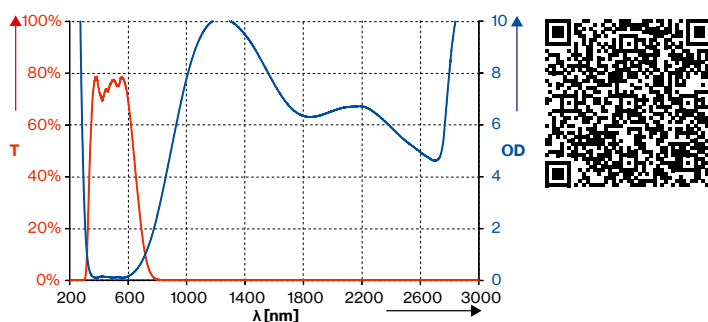
Dimension	[mm]	Art. Number
200×100		000.T1K03.1001
297×210		000.T1K03.1002

Window T2K03



- High power filter for IR laser, disc and fibre lasers
- High protection rating
- High daylight transmission (VLT)
- No neutral glass lamination

Transmission-/OD Curve T2K03**



Window	T2K03
Colour	Light Grey
Filter Material	Mineral Glass
Filter technology	Absorption Filter
Certification	CE
VLT (approx.)	66%
Visual Brightness	Very Good
Colour View	Excellent
Filter Thickness	approx. 5–6 mm*

Protection according to DIN EN 60825-4			
1000–2100 nm	61 kW/m ²	T3	t _{max} =10,5s

Wavelength	[nm]	OD
900 – 1000		4+
>1000–1050		7+
>1050–1400		8+
>1400–2100		4+
>2100–25000		4+
>3000–11500		5+

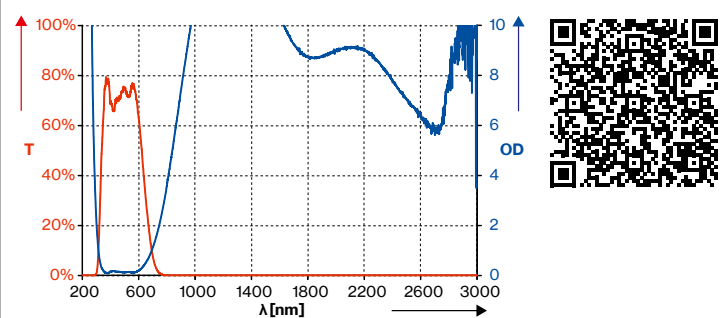
Dimension	[mm]	Art. Number
200×100		000.T2K03:1001
297×210		000.T2K03:1002

Window T1K06



- Filter for short pulse IR lasers
- M protection rating
- High daylight transmission (VLT)

Transmission-/OD Curve T1K06**



Window	T1K06
Colour	Light Grey
Filter Material	Mineral Glass
Filter technology	Absorption Filter
Certification	CE
VLT (approx.)	60%
Visual Brightness	Very Good
Colour View	Excellent
Filter Thickness	approx. 6–7 mm*

Protection according to DIN EN 60825-4:2011				Ø 50 mm
950 – 1399 nm	143 kW/m ²	T2	t _{max} =105s	
3000–25000 nm	221 kW/m ²	T2	t _{max} =105s	

Wavelength	[nm]	OD	Protection level {10 sec.}
730–<780		1+	DIRM LB1
780–<808		2+	DIRM LB2
808–840		3+	DIRM LB3
>840–870		4+	DIRM LB4
>870–885		5+	DIRM LB5
>885–900		6+	DIRM LB6
>900–950		7+	DIRM LB7
>950 – 1000		8+	D LB7 + IRM LB8
>1000 – 1400		9+	D LB7 + IR LB8 + M LB9
>1400 – 3500		5+	DI LB5 + RM LB4
>3500 – 25000		10+	DI LB5 + R LB3Y + M LB5

Dimension	[mm]	Art. Number
200×100		000.T1K06:1001
297×210		000.T1K06:1002

Mineral Glass

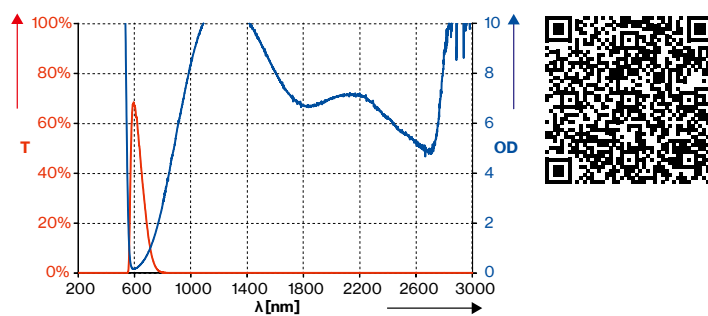
Laser Safety Windows

Window T1M01



- Broadband IR, UV and green filter
- M-ratings for ultrashort pulsed lasers (USP)
- Good daylight transmission (VLT)

Transmission-/OD Curve T1M01**



Window	T1M01
Colour	Orange
Filter Material	Mineral Glass
Filtertechnology	Absorption Filter
Certification	CE
VLT (approx.)	25%
Visual Brightness	Good
Colour View	Slightly Limited
Filter Thickness	approx. 8–13mm*

Protection according to DIN EN 60825-4:2011				Ø 50mm
200–532nm	203 kW/m ²	T2	t _{max} =105s	
890–1400nm	265 kW/m ²	T2	t _{max} =105s	
3000–25000nm	409 kW/m ²	T2	t _{max} =105s	

Wavelength	[nm]	OD	Protection level {10 sec.}
180 – 315		10+	D LB10 + IR LB5
>315–532		8+	D LB7 + IR LB8 + M LB8Y
808–<890		3+	DIRM LB3
890–<940		5+	DIRM LB5
940–<1000		6+	DIRM LB6
1000–<1025		7+	DIR LB7 + M LB7Y
1025–<1100		9+	D LB7 + I LB9 + R LB8 + M LB8Y
>1100–1400		8+	D LB7 + IR LB8 + M LB8Y
>1400–3000		4+	DI LB4
>3000–11500		5+	DI LB5

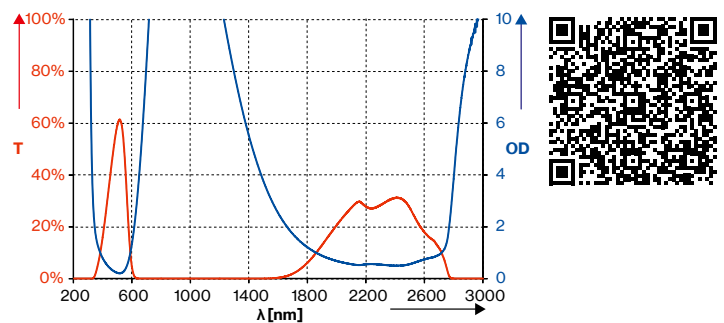
Dimension	[mm]	Art. Number
200 x 100		000.T1M01.1001
297 x 210		000.T1M01.1002

Window T1Q01



- Broadband filter for pump diodes, YAG- and IR-lasers
- M-protection rating
- Alignment filter for 633nm

Transmission-/OD Curve T1Q01**



Window	T1Q01
Colour	Green
Filter Material	Mineral Glass
Filtertechnology	Absorption Filter
Certification	CE
VLT (approx.)	35%
Visual Brightness	Sufficient
Colour View	Slightly Limited
Filter Thickness	approx. 7mm*

Protection according to DIN EN 60825-4:2011				Ø 50mm
690–1320nm	212 kW/m ²	T2	t _{max} =105s	
3000–25000nm	221 kW/m ²	T2	t _{max} =105s	

Wavelength	[nm]	OD	Protection level {5 sec.}	Protection level {10 sec.}
690 – 795		7+	DIRM LB7	D LB6 + IRM LB7
>795 – 1100		9+	DIR LB7 + M LB9	D LB6 + IR LB7 + M LB9Y
>1100 – 1200		8+	DIR LB7 + M LB8	D LB6 + IR LB7 + M LB8
>1200 – 1320		7+	DIRM LB7	D LB6 + IRM LB7
>1320 – 1400		3+	DIRM LB3	DIRM LB3
>1400 – 1550		3+	DIR LB3	DIR LB3
10600		4+	DI LB4	DI LB4
633		2–3	0,1W 2*10-5J RB2	

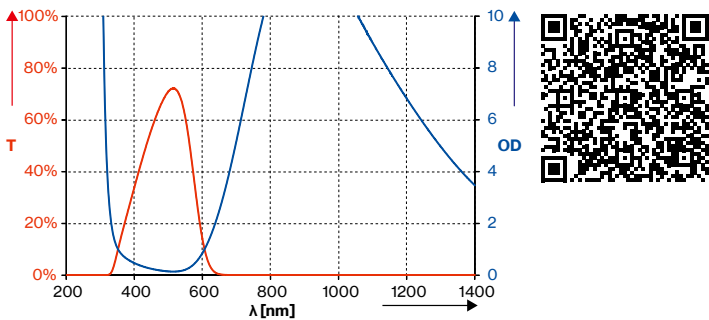
Dimension	[mm]	Art. Number
200 x 100		000.T1Q01.1001

Window T1Q03



- Filter for pump diodes, YAG, fibre and disc lasers
- M protection rating
- Alignment filter for 630-635 nm

Transmission-/OD Curve T1Q03**



Window	T1Q03		
	Full Protection		
Colour	Green		
Filter Material	Mineral Glass		
Filtertechnology	Absorption Filter		
Certification	CE		
VLT (approx.)	45%		
Visual Brightness	Sufficient		
Colour View	Slightly Limited		
Filter Thickness	approx. 4–5mm*		
Protection according to DIN EN 60825-4:2011			
	750–1290nm	174 kW/m²	T2
			t _{max} =105s
Wavelength	[nm]	OD	Protection level {5 sec.} {10 sec.}
	750 – 800	8+	D LB6 + IRM LB8
	>800 – 1064	9+	D LB6 + IR LB8 + M LB9
	>1064–1100	8+	D LB6 + IRM LB8
	>3000–25000	4+	DI LB4 + R LB3Y + M LB4Y
	630–635	1–2	0,01W2x10E–6J RB1
Dimension	[mm]	Art. Number	
	200×100	000.T1Q03.1001	

Laser Safety Training

The growing number of laser applications makes laser safety more and more important. Therefore laservision is offering a sophisticated, modular education and training concept for laser safety, which is centred on the Laser Safety Officer LSO course. These training courses are held in close cooperation with the uvex academy and include the Laser safety awareness course, an Advanced training, a Hands-on training and the Measurement course.

All courses are held in close cooperation with our partners i.e. the Bavarian Laser Centre BLZ at the uvex academy in Fuerth. On request and with a fair number of participants provided all courses can be held also at universities, institutes, or corporate clients.

