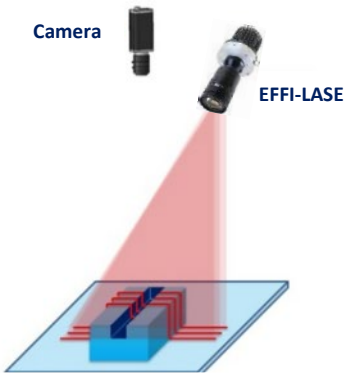
PASSIVE Version

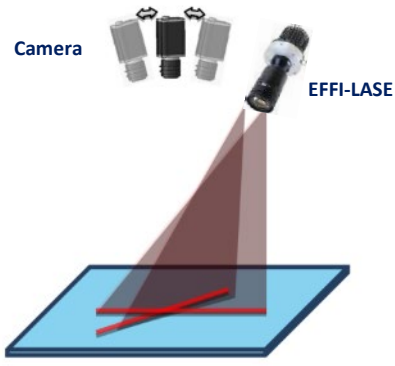
Very intense and uniform illuminated area
Full range of colors: from UV to IR, white
Long lifetime and few maintenances
Compatible with most objectives (C-Mount)
High depth of field for line version
No speckle

		PSV (Passive cooling)
Electronics	Connectors	M12, 5 Contacts (with LED driver)
	Power supply	24V DC
	Illumination mode	Continuous or strobe mode
	Power consumption	45 W to 90W (depending on the number of LEDs)
Optics	Wavelength	Various wavelengths (from UV to IR, white)
	Projected pattern	Various designs for alignment, 3D profiling and stereovision / Switchable
Mechanics	Weight	400 g
	Width x length	79.1 mm x 129.6 mm (without the objective)
	Objective adjustment	C-mount adaptor on the projector
	Fastener	8 x M5 holes on the sides of the device
	Material	Device body: Aluminum alloy
Environment	Working temperature	0°C to 40°C
	IP code	IP54 (PSV)

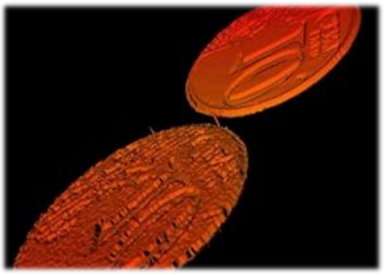
Applications



Stereovision and 3D profiling



Alignment applications



EFFI-LASE (up) vs. Laser (down):
No speckle = more accurate

Part Number

Reference:
Passive: EFFI-LASE-**PSV**-XXX-YYY-ZZZ

XXX: LED Version

LX1*(*recommended for Line pattern*)	MX1	MX2*(*strobe mode only*)
		

YYY: Wavelength (nm) / Color (*other wavelengths available on demand*)

● UV 385 – 395 – 405	● Blue 465	● Green 525	● Red 625	● IR 850	○ White 000 (T°= 5500 K ± 500 K)

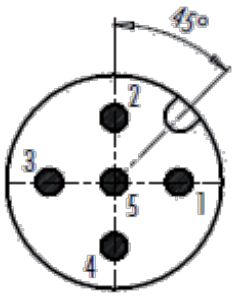
ZZZ: Type of Mask (custom masks are possible)

3D Profilometry (*line length: 13mm*)		**Stereovision and Alignment** *(A01/A02/A03)*	
L01	1 line: 50 µm	G01 Round Ø50 µm Surface (mm²) 10x10 *separated by* 50 µm	
L02	1 line: 20 µm	G02 Round Ø50 µm Surface (mm²) 13x13 *separated by* 50 µm	
L03	1 line: 10 µm	G03 Grid 40*40, lines 50 µm Surface (mm²) 10x10 *separated by* 50 µm	
L04	3 lines: 50 µm *separated by* 500 µm	G04 Grid 50*50, lines 50 µm Surface (mm²) 13x13 *separated by* 50 µm	
L05	3 lines: 50 µm *separated by* 200 µm	G05 Square 50*50 µm² Surface (mm²) 10x10 *separated by* 100 µm	
L06	5 lines: 50 µm *separated by* 750 µm	C02 Cloud of dots density 50% Surface (mm²) 12,8x9,6	
L07	100 lines: 45 µm *separated by* 67,5 µm	C03 Cloud of dots density 17% Surface (mm²) 12,8x9,6	
L08	22 lines: 50 µm	A01 Cross 50 µm Line length: 13mm	
L09	1 line: 5 µm	A02 Concentric circles	
L41	1 line 75 µm + 40 lines 45 µm	A03 Square 50*50 µm² Line length: 10mm	

Electronical considerations

Contact arrangement

The EFFI-LASE is supplied with a 24V constant voltage. The characteristics below are true for **PSV** version.

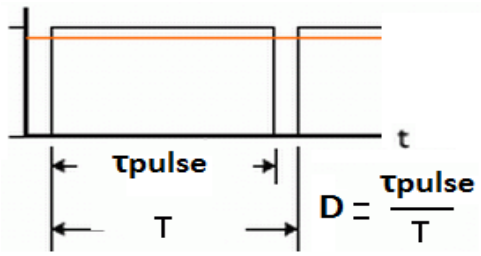
CONVENTION CABLE M12					
Pin number	**Cable color**	**Contact arrangement**	**Designation**	**Details**	**Max Power Consumption (with MX2 LED version)**
1	Brown	 M12 male connector	+24V	+24V	3.75A@24V (strobe) 1,25A@24V (continuous)
2	White		NPN	NPN [triggered on falling edge] - Max 24V (Light ON if V_{NPN} < 1.5 V / OFF if V_{NPN} > 3V)	12mA@3,5V 3mA@5V 0,5mA@10V 0,15mA@24V
3	Blue		GND	GND	/
4	Black		PNP	PNP [triggered on rising edge] - Max 24V (Light ON if V_{PNP} > 4.5 V / OFF if V_{PNP} < 3V)	12mA@24V 3mA@10V 0,5mA@5V 0,15mA@3,5V
5	Grey		AIC*	AIC (Analog Intensity control) * - Max 24V	0,1mA@0V 0,3mA@5V 1mA@10V 3mA@24V

**If the AIC is not connected, the light will light on at 100% as if V_{AIC}=24V. If you don't need to adjust light level do not connect/use this PIN.*

Strobe mode

The LED driver inside the product is set to automatically pulse the LED.
If you trigger light for a short pulse (< 100 µs), light is pulsed (LED are driven at 2A).
If your pulse is longer, light automatically decreases LED current to protect LED against failure.

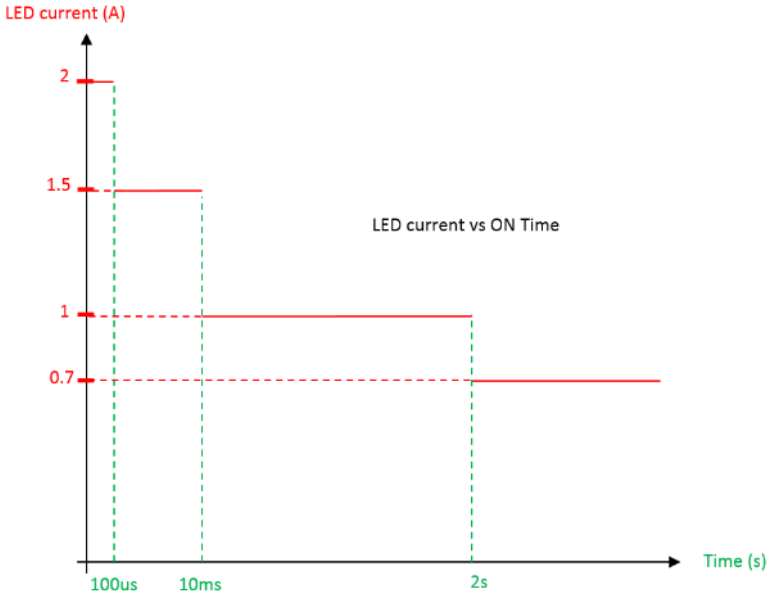
To protect LED, the product will enter in protection mode (Light is OFF for 2 second) if the duty cycle is superior to 0.3. Every 2 seconds, the product will check if duty cycle is correct to restart.



If D=Duty cycle (ON $_{TIME}$ / (ON $_{TIME}$ + OFF $_{TIME}$)) > 0.3 → Light shutdowns for 2 seconds

Continuous mode

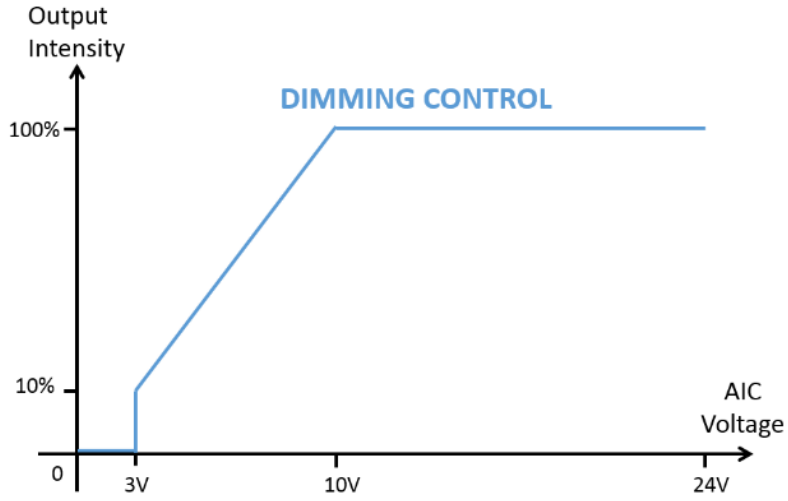
If you set trigger NPN continuously ON (or PNP), the light will run continuously with a 700 mA LED current.



Power consumption of the EFFI-Lase V2 PSV		
LED version	Power consumption – Continuous (0,7A)	Power consumption – Max (2A)
LX1 / MX1	15 W	45 W
MX2	30 W	90 W

Analog Intensity Control (AIC)

By adjusting the analog tension, light intensity can be controlled from 10% to 100%.
If the Input AIC is not connected, the EFFI-LASE will act as if AIC was set at 24V.



- 0 – 3V: LED OFF
- 3 – 10V: ≈10% to 100% light intensity
- 10 - 24V: LED ON 100%
- 100% if not connected

Temperature protection

The EFFI-LASE is protected against over warming.
If LED temperature exceeds 80°, the light is automatically switched off. The EFFI-LASE will restart itself as soon as temperature is below 70°C.

Optical considerations

Any C-mount objective (accessory) can be mounted on the EFFI-LASE. Objectives are not sold with EFFI-LASE.

To guarantee the quality of the projector, the pattern is directly mounted in the projector body. However, the pattern can be observed through the aperture of the projector. Avoid any sharp contact with the mask: this one is sensitive and can easily be damaged.

Objective selection

EFFILUX recommends using one of the following objectives with the EFFI-LASE-V2 :

1" Lenses :

	EFFO-KW-6-F1.8-1"-HR-CM	EFFO-KW-8-F1.4-1"-HR-CM	EFFO-RC-12.5-F1.8-1"-LR-CM	EFFO-KW-16-F1.4-1"-HR-CM	EFFO-VS-25-F1.4-1"-LR-CM	EFFO-KW-35-F1.4-1"-HR-CM	EFFO-RC-50-F1.4-1"-LR-CM	EFFO-KW-75-F1.8-1''-HR-CM
Distance focale (mm)	6	8	12.5	16	25	35	50	75
Ouverture du diaphragme	F1.8	F1.4	F1.8	F1.4	F1.4	F1.4	F1.4	F1.8
Angle de vue (HxV)	96.8°x79.4°	79.4°x63°	55.5°	44.3°x33.6°	16.1° x 19.0°	20.9°x15.8°	14.4°	9.7° x 7.3°
Monture de filtre	x	M55 P=0.75	M40.5 P=0.5	M35.5 P=0.5	M27 P=0.5	M35.5 P=0.5	M46 P=0.75	M46 P=0.75

2/3" Lenses :

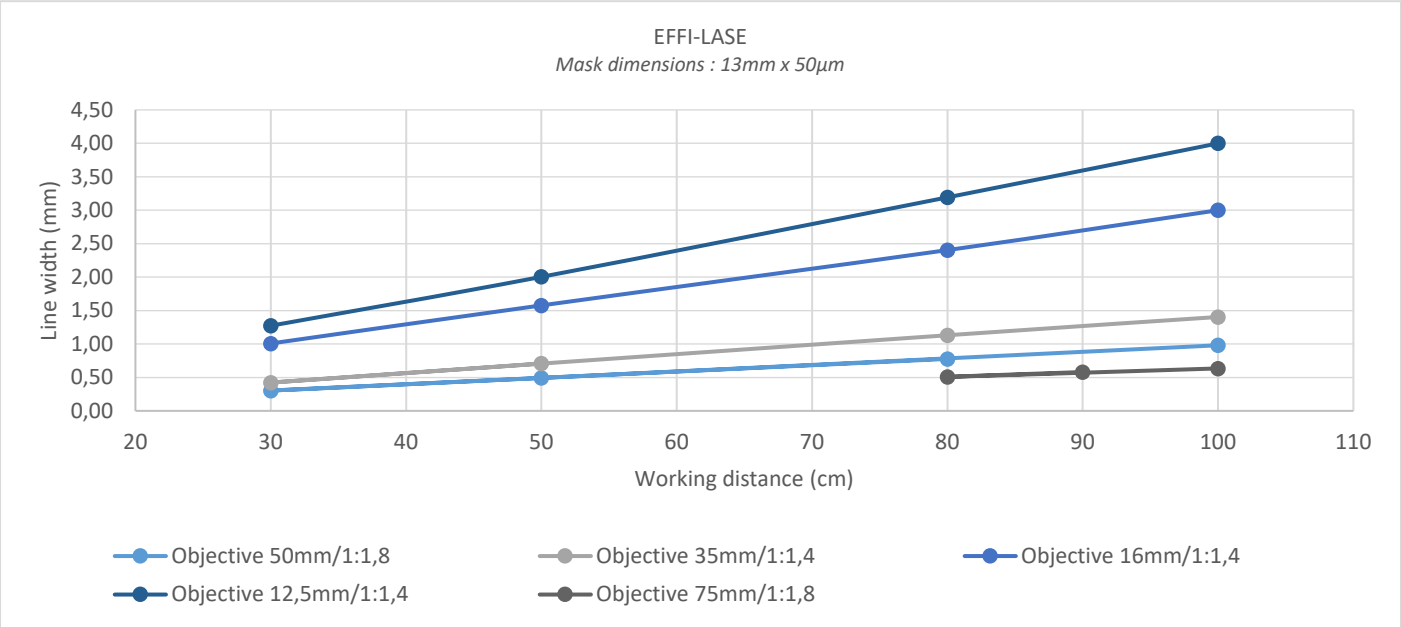
	EFFO-VS-8-F1.3-2/3"-LR-CM	EFFO-KW-12-F1.4-2/3''-HR-CM	EFFO-VS-16-F1.4-2/3"-LR-CM	EFFO-VS-25-F1.4-1"-LR-CM*	EFFO-VS-35-F1.8-2/3"-LR-CM	EFFO-VS-50-F1.8-2/3"-LR-CM	EFFO-KW-75-F2.5-2/3"-HR-CM
Distance focale (mm)	8	12	16	25	35	50	75
Ouverture du diaphragme	F1.3	F1.4	F1.4	F1.4	F1.8	F1.8	F2.5
Angle de vue (HxV)	49.0° x 57.2°	30.0° x 22.7°	24.6° x 28.9°	16.1° x 19.0°	11.7° x 13.8°	8.5° x 10.0°	6.7°x5.0°
Monture de filtre	M25.5 P=0.5	M25.5 P=0.5	M27 P=0.5	M27 P=0.5	M27 P=0.5	M30.5 P=0.5	M34 P=0.5

Depending on the working distance (WD) and the C-mount objective selected, different pattern sizes are obtained:

Objective	***Line width (mm)*** *Mask dimensions: 13mm x 50µm (LO1)*			
	WD = 30cm	*WD = 50cm*	*WD = 80cm*	*WD = 100cm*
f = 12.5 mm	1.27	2	3.19	4
f = 16 mm	1.01	1.58	2.40	3
f = 35 mm	0.42	0.71	1.13	1.40
f = 50 mm	0.30	0.49	0.78	0.98
f = 75 mm	n.a	n.a	0.51	0.63

*There could be a difference between measured size and indicated values.

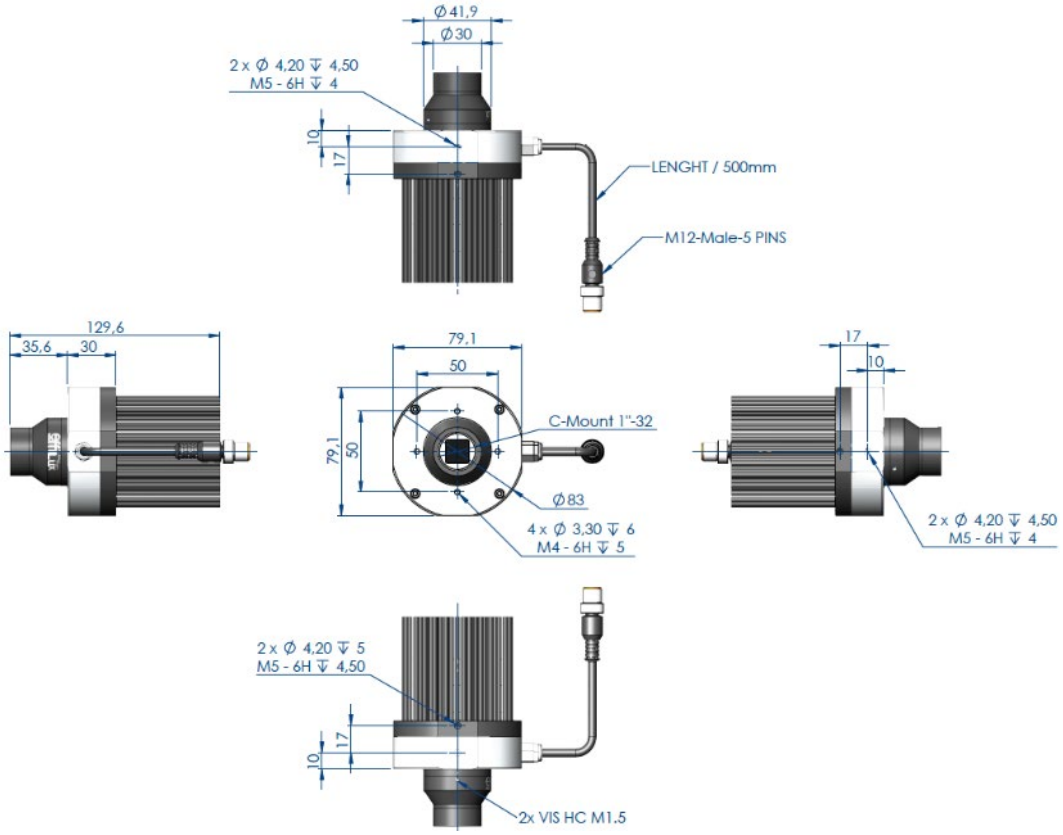
The relation between the line width and the working distance is linear. For a 50µm mask width, the following graphs are obtained**:**



Objective	***Pattern dimensions HxW (cm)*** *Dimensions of a 12.8x9.6mm cloud of dots pattern (CO2)*			
	WD = 30cm	*WD = 50cm*	*WD = 80cm*	*WD = 100cm*
f = 12.5 mm	32 x 23	51 x 37	82 x 59	102 x 73
f = 16 mm	25 x 19	41 x 31	66 x 49	82 x 61
f = 35 mm	11 x 8	18 x 14	29 x 22	36 x 27
f = 50 mm	n.a	12 x 9	20 x 15	25 X 19
f = 75 mm	n.a	n.a	13 x 10	16 x 12

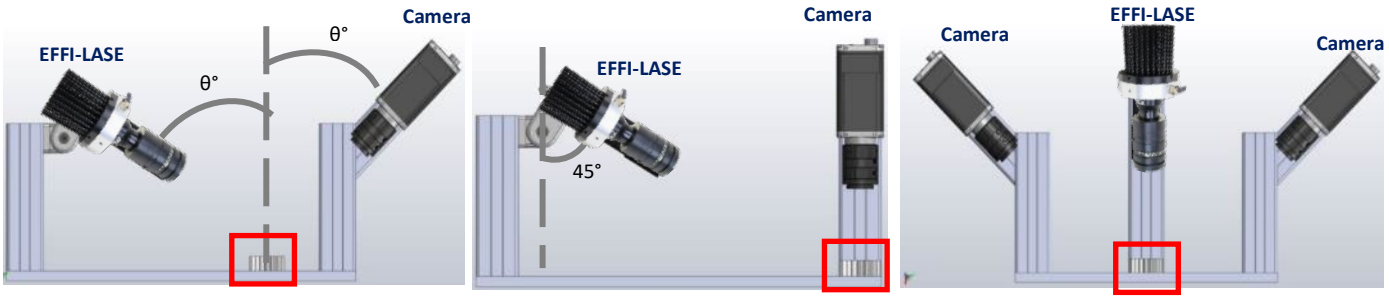
Mechanical considerations (Dimensions in mm)

PSV Version



Configurations

Three examples of recommended configurations:



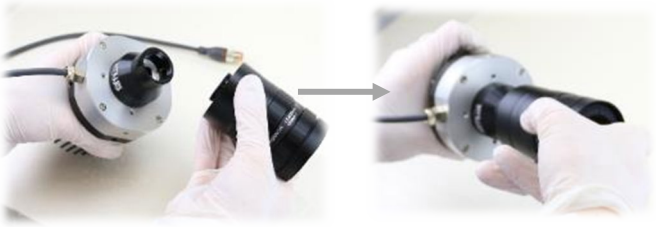
Configuration 1 *Configuration 2* *Configuration 3*

The selection between configuration 1 and configuration 2 depends on the object to observe: either the specular reflection needs to be captured (configuration 1) or reflections different from the specular reflections (configuration 2) are considered.

Use the fixings that you can see on the mechanical considerations to place and fix the EFFI-LASE correctly and efficiently.

Quick Start

1 Ready



2 Screw the objective

*The objective **is not provided** with the EFFI-LASE.

3 Plug the M12 connector*

*You can plug the M12 directly to your own power supply or to the EFFILUX power supply.

4 Turn ON and use the product

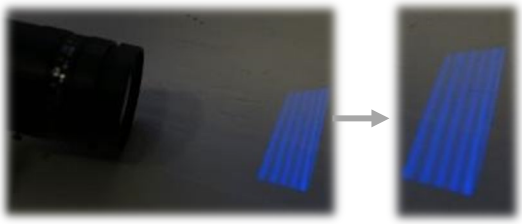
Verify your alignment between LED and mask

This part concerns you only if you got **A LINEAR LED VERSION** (LX1). To have an optimized depth of field, you need to align the mask with the LEDs. We recommend to use linear masks for the LX1 LED Version, the mask used is the L03 (one line) for the example. We apologize for the darkness of the pictures, we needed to show you the light form to help you to align correctly your mask.
N.B: ***Always checking the step 7*** *by adjusting the objective!*

Allen key:
Hex size (mm): 1.5

1 Ready (with Allen key*)

*The Allen key will allow you to unscrew the optical head to adjust it correctly.



The objective needs to be **defocused**. Remember, we are supposed to have one line. (mask

2 Wrong alignment

When defocused

Go to step 7 (mask aligned)

Go to step 4 (mask to align)

3 Checking light form

Use the Allen key for unscrewing the **2 screws**, hex size (mm): 1.5

4 Unscrew the optical head

Turn the optical head

One line is the right form (mask form) to have when it is **defocused**!

5 Obtain the right form

You are supposed to have a good alignment, so you can fix the optical head by screwing the **2 screws** (Hex size: 1,5 mm).

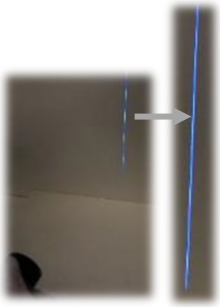
6 Screw the optical head

The light form is maintained whatever the objective focus.

But if the light form is changing you need to **go back to step 4**.

7 Checking alignment

Now you can adjust the focus for the clearness of the light form.



The EFFI-LASE is now ready to be used efficiently!

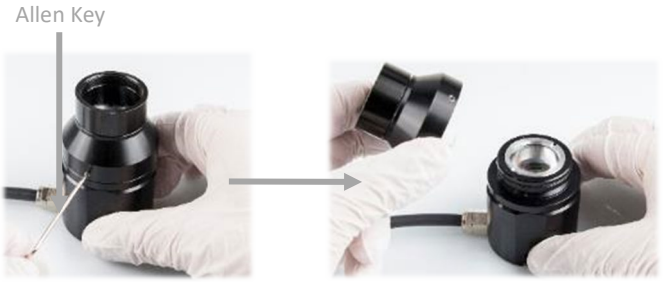
8 Good alignment

Change the mask

Before trying to change the mask, please **disconnect** the product and **unscrew** the C-mount objective. Then, you can follow the steps below. It is recommended to use **gloves**.

The three items are needed for the following steps.

1 Ready



2 Unscrew the optical head

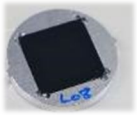
3 Unscrew the C-mount & ring

There is a cover in front of the mask that you have to remove from behind.

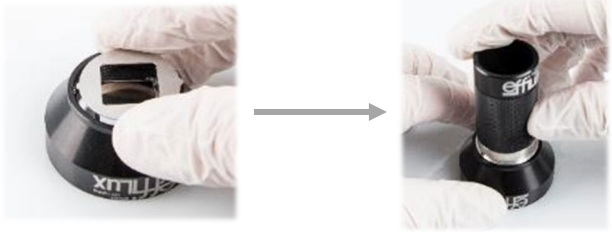
No need to unscrew.

4 Remove the mask carefully

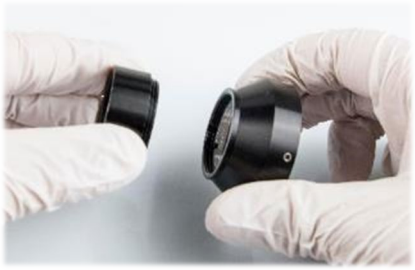
You must see the reference of the mask (L08, L03…) when you place it into the optical head.



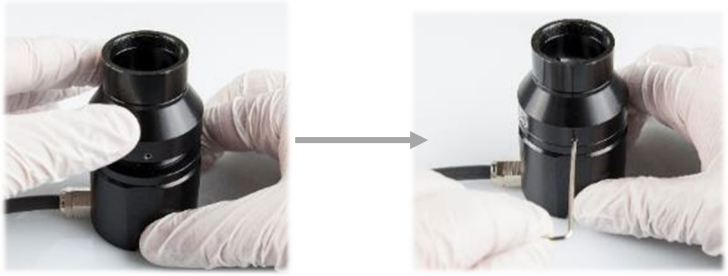
5 Place the new mask (L03)



6 Place the cover & Ring



7 Place and screw the C-mount



The EFFI-LASE is ready to be used with the new mask!
Please refer to the step alignment with the mask if needed.

8 Screw the optical head

Remember that the “Change the mask” part works with all the EFFI-LASE Version (PSV & CPT) even if the pictures are with a CPT.

N.B: If you did not to succeed the steps for one of the three parts. Please feel free to contact us.