

## Polarization

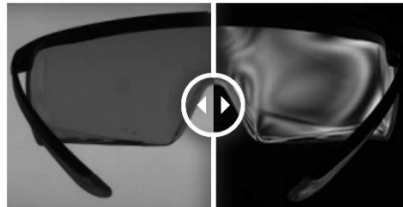
Polarization can be used in machine vision for direct illumination or backlight illumination.

In the first case, using the polarizer accessory, it is possible to **eliminate glare** from your workpiece making it easier to acquire a suitable image for the application. The camera can then analyse the part, without being disturbed by **glow effects**. The polarizer can be useful to perform quality control on many applications, for instance, to inspect parts packed in transparent plastic bags.



Without polarizer VS With polarizer

In the case of backlight applications, the polarizer is used to highlight **solder, hole, or thickness difference** in transparent materials.



Without polarizer VS With polarizer

## Camera filters: Polarizers

Reference	Description
Linear Polarizer - PR032	EFFO-FLR-PR032-MXX
Ultra High Contrast Linear Polarizer - PR120	EFFO-FLR-PR120-MXX
VIS/SWIR Wire Grid Linear Polarizer - PR1000	EFFO-FLR-PR1000-MXX
Circular Polarizer - PC052	EFFO-FLR-PC052-MXX

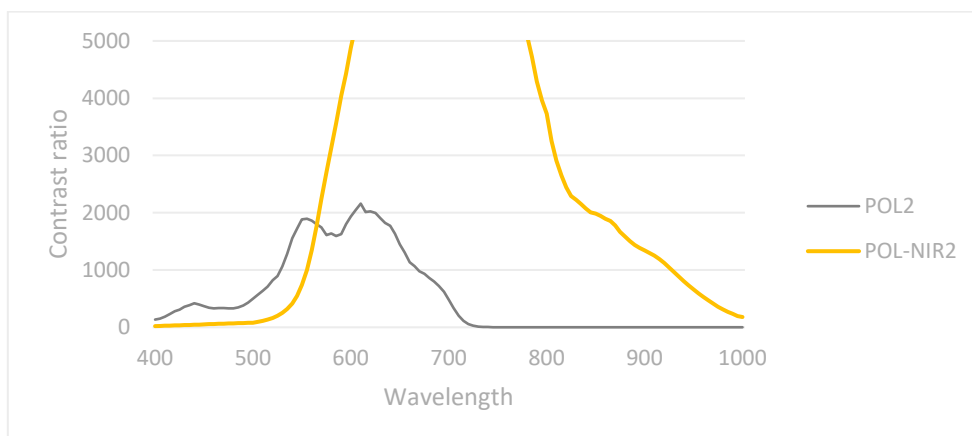
Available sizes: M13.25, M22.5, M25.4, M25.5, M27, M30.5, M34, M35.5, M37, M37.5, M39, M40.5, M43, M46, M48, M49, M52, M55, M58, M62, M67, M72, M77, M82, M86, M95, M105

## Effilux products: Available polarizers

Name	Reference	Description
<b>Standard</b>	EFFO-XXXX-POL2-...	Standard Polarizer (High Durability) 450nm-700nm / 40% < T < 45% - 0.75 mm
<b>Near Infrared</b>	EFFO-XXXX-POL-NIR2	Custom polarizer for Infrared lightings (transparent). 650nm-1065nm / T > 70% - 0.13mm

Please refer to the datasheet and the user manual of each product for guidance to install your accessory.  
Other products are available in polarized version upon request, please contact Effilux for more information.

Contrast Ratio of polarizers



The values of the contrast ratio have been measured with a crossed polarizer.


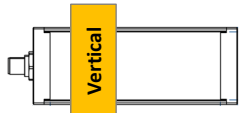
**EFFI-Flex ranges**

Typical configuration:

Put the polarizer under a transparent window, or on top of a diffusing film only.




**The use of a diffusive window can depolarize the light.**

For e.g., with a linescan configuration, put the polarizer on top of the linescan accessory.

<b>Orientation</b>	
Vertical polarization = 0° (passing direction)	
<p><b>Standard</b></p> 	<p><b>90°</b></p> 

<b>Compatibility &amp; Reference</b>			
Polarizer Type	Compatibility	Accessory's references	Product's references
Standard Polarizer (High Durability)	All sizes	EFFO-FLEX2-POL-XXXX XXXX: optical length	EFFI-FLEX2-XXX-YYY-WW-PP-POL
Standard Polarizer – 90° (High Durability)	Product's size max: 600mm	EFFO-FLEX2-POL-XXXX-90° XXXX: optical length	EFFI-FLEX2-XXX-YYY-WW-PP-POL-90°
Near Infrared Polarizer	Product's size max: 900mm	EFFO-FLEX-POL-XX-NIR2 XX: number of LED	EFFI-FLEX2-XXX-YYY-WW-PP-POL-NIR2

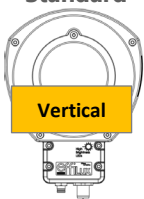
**How to install a polarizer in your EFFI-Flex:**

		
Open the EFFI-Flex and slide out the window	Slide in the polarizer and the transparent window together	Close the product

**EFFI-Ring**

Typical configuration:

Put the polarizer on top of the window (transparent, semi-diffusive or opaline). If IP65 rating is needed, use the glued accessory.

<p><b>Orientation</b></p> <p>Vertical polarization = 0° (passing direction)</p>
<p><b>Standard</b></p> 

Compatibility & Reference		
Polarizer Type	Accessory's references	Product's references
Standard Polarizer (High Durability)	EFFO-RING-POL2 <i>(EFFO-RING-POL2-TR: polarizer glued on TR window for IP65)</i>	EFFI-RING-XXX-WW-PP- <b>POL2</b> <i>(EFFI-RING-XXX-WW-PP-<b>POL2-IP</b> for IP65)</i>


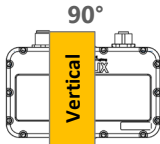
**How to install a polarizer in your EFFI-Ring:**

		
Open the EFFI-Ring	Place the polarizer on top of the suitable diffuser	Close the product

**EFFI-Smart**

Typical configuration:

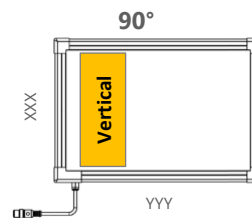
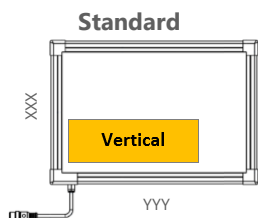
Put the polarizer under a transparent window. **The use of a diffusive window can depolarize the light.**

<p><b>Orientation</b></p> <p>Vertical polarization = 0° (passing direction)</p>	
<p><b>Standard</b></p> 	<p><b>90°</b></p> 

Compatibility & Reference			
Polarizer Type	Compatibility	Accessory's references	Product's references
Standard Polarizer	Standard Version: All sizes Not for IP69K version	EFFO-SMART-POL2-XXX XXX: number of LED	EFFI-SMART-XXX-YYY-WW-PP- <b>POL2</b>
Standard Polarizer – 90°	Standard Version: All sizes Not for IP69K version	EFFO-SMART-POL2-XX-90° XX: number of LED	EFFI-SMART-XXX-YYY-WW-PP- <b>POL2-90°</b>
Near Infrared Polarizer	Standard Version: All sizes Not for IP69K version	EFFO-SMART-POL2-XX-NIR-90° XX: number of LED	EFFI-SMART-XXX-YYY-WW-PP- <b>POL-NIR2</b>

**EFFI-BL & EFFI-FD**

**Orientation** (is based on product length and width)  
 Vertical polarization = 0° (passing direction)



**First solution: Add-On**

Accessory kit to attach the polarizer on top of the product thanks to a protective window, and brackets (2 brackets up to 300-300, 4 for larger products).

Polarized product's thickness (EFFI-BL or EFFI-FD + add-on polarizer kit): 45mm

The accessory kit must be ordered separately from the light to be installed on top of it.



How to install a polarizer kit on your EFFI-BL or EFFI-FD :

Unscrew the collar (for EFFI-FD only)	Put the polarizer on top of the opaline window.	Put the protection window on top of the polarizer.	Install the collar and the brackets to fix the window.

**Compatibility & References: Kit accessory**

Polarizer Type	Compatibility	Accessory's references
Standard Polarizer	Standard product's size max: 400-YYY Larger sizes available upon request (custom) Not for IP69K version	EFFO-BL-POL2-XXX-YYY-KIT EFFO-FD-POL2-XXX-YYY-KIT
Standard Polarizer – 90°	Standard product's size max: XXX-400 Larger sizes available upon request (custom) Not for IP69K version	EFFO-BL-POL2-XXX-YYY-90°-KIT EFFO-FD-POL2-XXX-YYY-90°-KIT

**Second solution: Built-In** (corresponds to a specific product reference)

Polarizer directly installed in the product, on top of the opaline window, during manufacturing.

Polarized product's thickness (EFFI-BL or EFFI-FD + built-in polarizer): 43mm

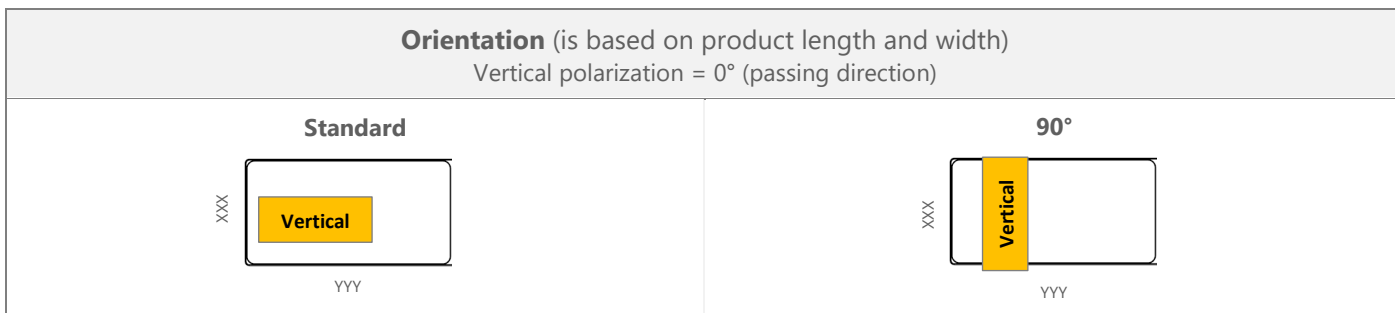
The complete product must be ordered, the polarizer cannot be installed by the customer afterwards.



**Compatibility & References: Built-in polarizer**

Polarizer Type	Compatibility	Product's references
Standard Polarizer	Standard product's size max: 400-YYY Upper sizes available upon request (custom) Not for IP69K version	EFFI-BL-XXX-YYY-ZZZ-POL2 EFFI-FD-XXX-YYY-ZZZ-POL2
Standard Polarizer – 90°	Standard product's size max: XXX-400 Upper sizes available upon request (custom) Not for IP69K version	EFFI-BL-XXX-YYY-ZZZ-POL2-90° EFFI-FD-XXX-YYY-ZZZ-POL2-90°

**EFFI-SBL (Custom)**



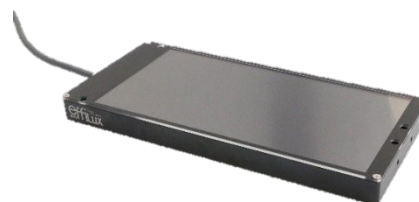
The standard EFFI-SBL enclosure does not allow to add a polarizer on top of it. A custom mechanics is necessary to have the polarizer integrated. **Please contact EFFILUX.**

**First solution: Built-in / Not fully IP**

The polarizer is added on top of the product with a transparent protective window and the whole setup is fastened with screws. The polarizer can be removed. The light is IP67 protected, but not the space between the diffuser and the protective window.

Polarized product's thickness (EFFI-SBL + polarizer + window): 18,5mm.

Part-number: EFFI-SBL-XXX-YYY-ZZZ-POL2-C



**Second solution: Built-in / Full-IP**

The EFFI-SBL is manufactured with the polarizer and the window integrated and glued inside the product. The polarizer cannot be removed. The light is fully IP67 protected.

Polarized product's thickness: 19mm.

Part-number: EFFI-SBL-XXX-YYY-ZZZ-POL2-IP-C

