

**Fast  
Efficient  
Innovative**



## High Quantum Efficiency Photocathode

**Specifically designed to improve quantum efficiency by up to 50%, the Hi-QE photocathode sets a new standard for dark count rates and spectral sensitivity.**

Photonis' innovation in photocathode technologies improves the traditional S20 or S25 photocathodes significantly, providing an unmatched combination of fast response time, low dark counts, and increased spectral sensitivity.

With Photonis' Hi-QE photocathode, quantum efficiency increases by up to 50% and the dark count rate is lowered by as much as 10X. The Hi-QE photocathode is available as an option in MCP-PMTs, image intensifier tubes, and hybrid photo diodes offered by Photonis.

When you use Photonis' Hi-QE photocathode in your detector, you will be the first to discover the next scientific breakthrough.



## Quantum Efficiency: Focusing the Spectral Range

Photonis offers the Hi-QE photocathode option in four versions: UV, blue, green and red. The improved spectral response is achieved by limiting the response range when compared to the broader range of a traditional S20 or S25 photocathode. (see Figure 1)

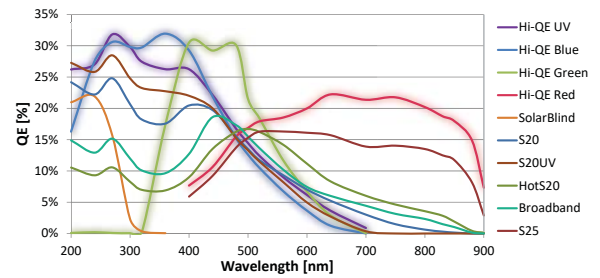
	QY at 200nm, %		QY at 270nm, %		QY at 400nm, %	
	Minimum	Typical	Minimum	Typical	Minimum	Typical
<b>Hi-QE UV</b>	22	25	28	32	22	25
<b>Hi-QE Blue</b>	12	16	27	30	27	30

Note: Hi-QE UV also available with sapphire cathode substrates for response to 155nm.

	Averaged QY [380-480nm], %		QY at 500nm, %	
	Minimum	Typical	Minimum	Typical
<b>Hi-QE Green</b>	26	30	18	22

## Quantum Efficiency Comparisons

Figure 1

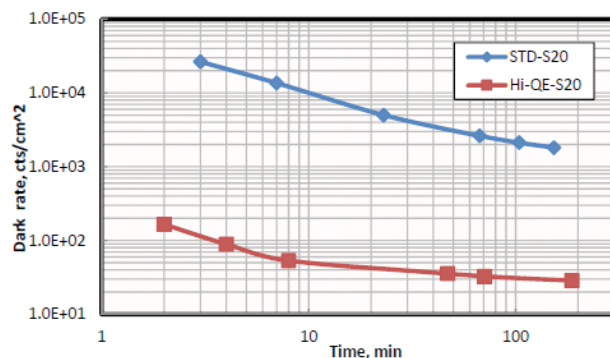


	Averaged QY [520-800nm], %	
	Minimum	Typical
<b>Hi-QE Red</b>	15	17

The Hi-QE Red photocathode provides greater quantum efficiency in the 400 to 900 nm spectral range.

## Dark Count Rate

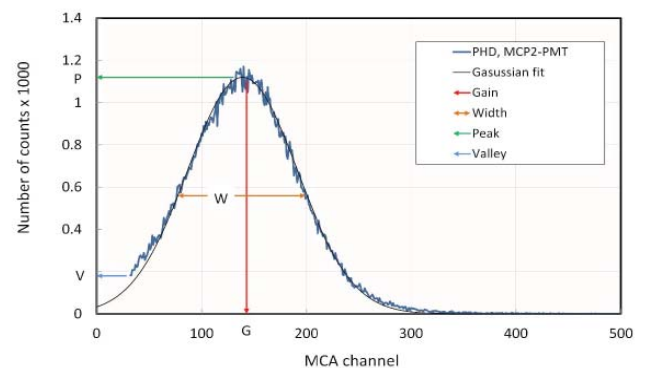
Figure 2



One key benefit to limiting the spectral response range of the photocathode is lower dark rates. As depicted in Figure 2, the standard S20 or S25 photocathode has a significantly higher dark count - typically 10X - than that of the Hi-QE equipped detectors.

## Pulse Height Distribution

Figure 3



Pulse height distribution measurements are indicators of the quality of the photon detector. When the Hi-QE photocathode is used in a dual MCP-PMT detector, it produces a near-symmetrical pulse which closely matches predictive model data, as shown in Figure 3.



The Photonis Hi-QE option is available to a wide range of custom-designed photonic detection solutions that would normally use a standard S20 or S25 photocathode, to improve spectral response and lower dark count rates.

Image Intensifiers | Hybrid Photo Diodes | MCP-PMTs | Imaging Photon Cameras

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