

ST-X Streak Tube

Image a number of channels onto an 18 mm long slit



The electron optical design of this tube was adapted from the RCA C 7435 by Ching Lai of Lawrence Livermore National Laboratories and was known as the ITT F 4157 tube.

More recently, built by Photek as the ST-X, this smaller tube allows a number of channels to be imaged onto an 18 mm long slit. A control grid allows the tube to be switched (gated) on/off with relatively low voltage.

The tube has three focus electrodes allowing the tube to be optimised for resolution, distortion and time response. The tube is an all-metal-ceramic construction which is robust for extreme environments, and the tube is usually delivered in a mu-metal magnetic shield.

Key Attributes

- > Timing resolution to 10 ps
- > 18 mm photocathode size
- > UV, solar blind, visible and NIR response
- > Can be supplied with a mu-metal shield for high magnetic field environments

Applications

- > Streak cameras
- > Fusion Research
- > Detonics and Ballistics
- > LiDAR Systems

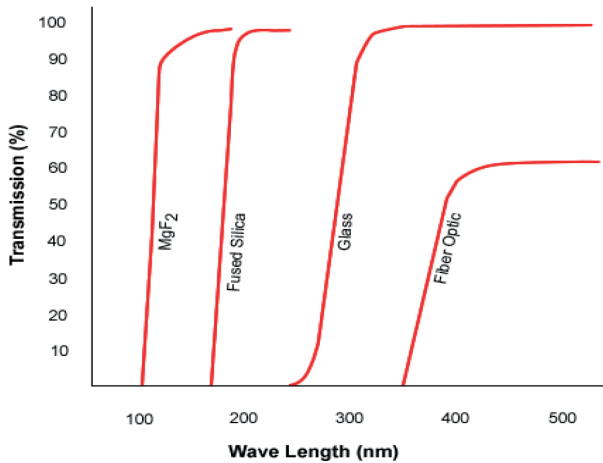
Product Overview

Equivalent to	Photonic P920
Cathode Size	18 x 3 mm
Useful Image Input	18 x 3 mm
Time Resolution (typical)	50 ps
Spatial Resolution (typical)	50 lp/mm
Magnification (spatial)	0.8 - 1.3
Magnification (temporal)	0.8 - 0.6
Deflection Sensitivity @ 15 kV	530 V/cm

Options Available

INPUT WINDOW

Photek streak tubes are available with a choice of input window materials. These include MgF₂, fused silica, glass and fibre optic, among others.



PHOSPHOR SCREENS

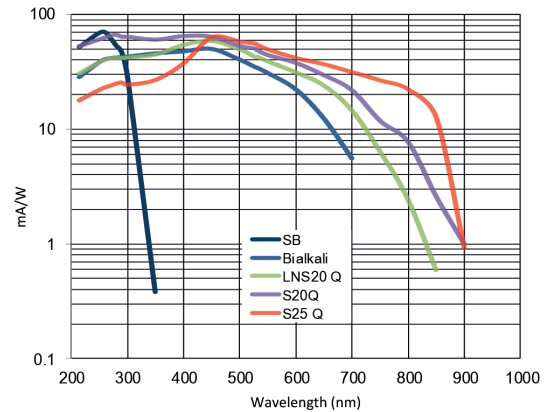
The Phosphor screen is 41 mm OD, and has an active diameter of 25 mm. The internal surface of the screen is concave to reduce distortion, and improve spatial resolution. Photek can offer two types of phosphor screen substrates; glass or fibre optic. Our standard phosphors include P20, P43, P46, P47, & FS depending on the brightness and decay time required. Other phosphors are available on request.

Type Wavelength (nm)	Anode Efficiency % *	Photons/ Electron @ 5kV	Decay Characteristic
P20 (540)	12	320	Fast initial decay with long decay at low level. 1ms to 1%
P43 (548)	8.7	240	1.2 ms/decade, true exponential
P46 (530)	1.8	55	300 ns
P47 (410)	3	64	80 ns
FS (513, 668, 768)	4.2	96	12 μs to 10%

* Optical Watts / Electrical Watt

SPECTRAL RESPONSE

Photek offer a full range of Gen II photocathodes, these include CsI, Solar Blind, Bialkali, Low Noise S20, S20 and S25.



Above is the broad spectral response that you would expect to achieve with Photek's range of Gen II photocathodes. Please note that input window material will affect overall sensitivity.

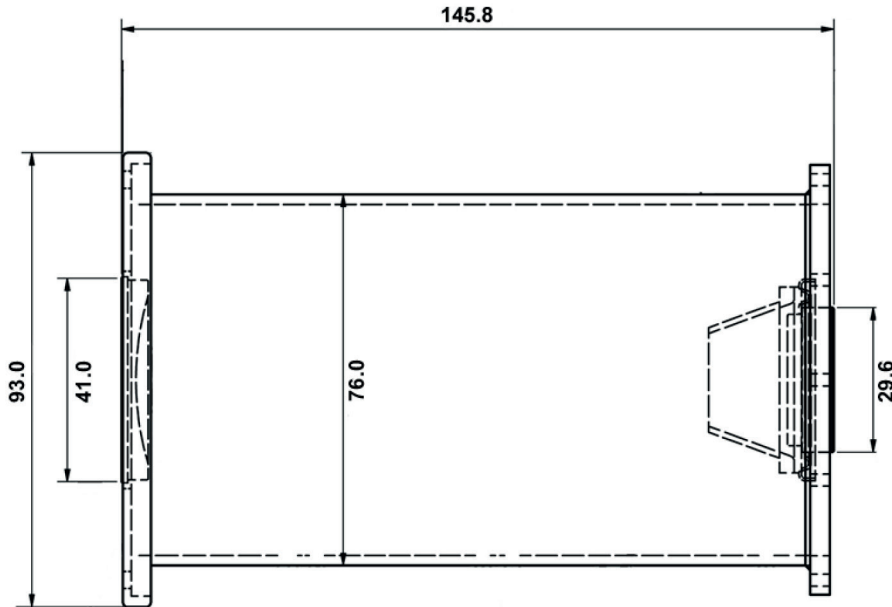
Deflection Sensitivity

The deflection sensitivity is proportional to overall voltage, but typically 500V/cm @ 15 kV. Exact deflection sensitivity is part of the test data provided with each tube.

Environmental

Operational Limits: -40°C to +45°C
Storage: -40°C to +60°C

Mechanical



Dimensions (mm) are indicative and may vary depending on the optics and housing required.

Optimisation and Operating Voltage

Below are examples of sets of voltages that can be optimised to suit particular needs. The suggested operating voltages by Photek are shown in 'Test mode' entry for high resolution, and in 'Fast mode' entry.

These voltages should only be used as a guide when operating the streak tube as fine tuning of these values is required specific to each tube.

Mode	Voltages (V)				Magnification				
	Cathode	Grid	Focus 1	Focus 2	Time	Spatial	Resolution Spatial Micron	Working Area (mm) 18x	Time Resolution (ps)
Test Mode	15,000	14,850	14,200	13,000	0.8	0.8	14	3.1	36
	15,000	14,700	13,000	13,700	0.68	0.73	14	3.1	17-18
	15,000	14,500	12,000	14,013	0.64	0.82	40	3.0	11-13
	15,000	14,000	11,000	14,270	0.6	1.0	75	0.4	5-10
Fast Mode	15,000	13,600	11,000	14,314	0.6	1.0	84	0.3	4-8

About Photek

Photek is a specialist manufacturer of vacuum based tubes and camera systems for photon detection.

Our product range includes; Camera Systems, Image Intensifiers, Photomultiplier Tubes, Streak Tubes plus a range of associated electronics.

We are experts in large area and ultra-high speed imaging and advanced photon counting camera systems.

Our continuing success is built upon continuous innovation and product development, and by harnessing and applying knowledge to find solutions for all of our customers' applications.

Photek is accredited to ISO 9001 and ISO 14001.



Contact Us

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