



Li-Foil Multiwire Proportional Counter (MWPC) Neutron Detector

Li-Foil MWPC Neutron Detector Technology

Li-Foil Multi-wire Proportional Counter (MWPC) Neutron Detectors provide an affordable large-area alternative to the ^3He -based and BF_3 detectors, maintaining a high thermal-neutron detection efficiency, at a comparable volume, mass, voltage, and power required. The Li-Foil MWPC can be integrated into existing electronics technology prepared originally for ^3He -based or BF_3 detectors. There is a strong demand for light-weight, large-area, and high efficiency neutron detectors to be integrated into systems as a direct replacement for more expensive or outdated equipment. Li-Foil offers a light-weight solution while maintaining high neutron detection sensitivity and ruggedness that is known of ^3He -based detectors.

Specifications

- γ -reject: $<1:10^{-8}$
- E_{thermal} : $40(\pm 1)\%$
- CTS/sec/nv: 79.5
- V_{input} : 2.7 – 4.5 V
- V_{output} : TTL or output driven
- Temp. Range: -20°C to 50°C
- Power: $\sim 200\text{mW}$ total
- Weight: $\sim 1.6\text{lbs}$
- Standard Size: $22.5'' \times 2.25'' \times 1.38''$

Technology Comparison

	Li Foil MWPC	BF_3	^3He
Pressure (atm)	0.71	0.52	1.5
Total Length (inch)	22.5	21.24	21.24
Active Length (inch)	18	18	18
Width/Diameter (inch)	2.25×1.38	2-inch cyl	2-inch cyl
cps/nv	79.5	~ 55	~ 85

Manufacturing

- The dry room facility at RDT allows for the commercial mass-production of the Li Foil MWPC.
- Capable of manufacturing batches of units with fast end to end throughput.
- RDT strives to maintain units in stock for fast delivery.
- Production is capable of scaling based on demand.
- Integrated electronics reduces overall profile
- Calibration is done in-house, so detectors come ready to use.

Electronics & Interfacing

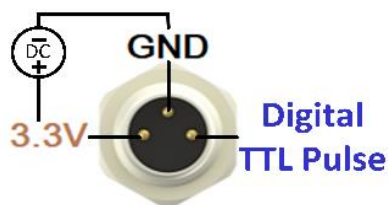
- Onboard readout electronics provided by RDT includes pulse processing components (e.g. preamp, amp, etc.) with TTL output or output driven signal to interface with customer's GUI.
- Customizable connection interface is available, e.g., USB, M8, SMA.
- **Microphonics rejection** allows for more accurate measurements by cutting unwanted noise from the signal via onboard software.



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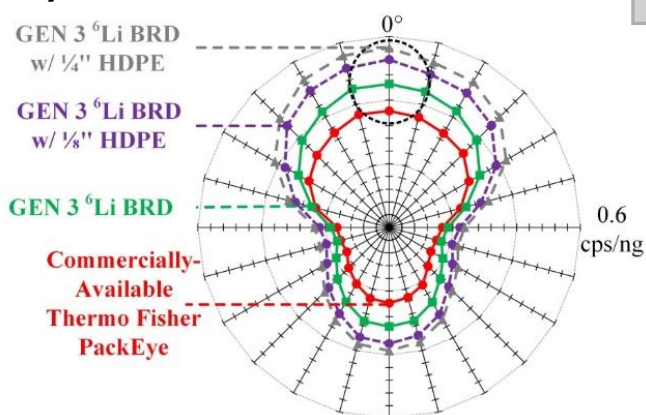


Interface Connector Options:

Readout electronics are outfitted with an M8 style waterproof connector (3.3V square pulse signal), USB-C (USB Communications Device Class), or other custom interface upon request.

Technology Note:

Backpack configuration response to Cf-252 using four (4) Li-Foil Devices in a panel array



Technology Note:

Li-Foil MWPC pulse height spectrum

