

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 detectors, maintaining a high thermal-neutron detection efficiency, at a comparable volume, mass, voltage, and power required. The Li-Foil MWPC are being integrated into existing electronics technology prepared originally for ^3He -based detectors. There is a strong demand for light-weight, large-area, and high efficiency neutron detectors to be integrated into systems as a direct ^3He replacement. Li-Foil offers a light-weight solution while maintaining high neutron detection sensitivity and ruggedness that is known of ^3He -based detectors. The Li-Foil MWPC technology has the flexibility to easily adjust available detection area to customer specifications with a 20% to 70% (40% standard) thermal-neutron detection efficiency.

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: -40°C to 85°C
- Power: $\sim 400\text{mW}$ total
- Weight: $\sim 1.6\text{lbs}$
- Standard Size: 19.5" x 2.2" x 1.4"

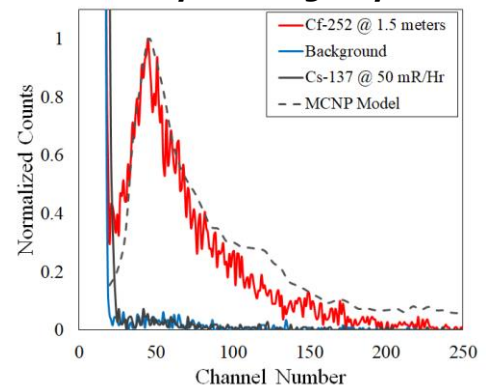
Cost Comparison

	Li Foil MWPC	BF_3	^3He
Pressure (atm)	1.7	0.52	1.5
Length (inch)	19.2	21.24	21.24
Active Length (inch)	18	18	18
Width/Diameter (inch)	2.2 x 1.4	2-inch cyl	2-inch cyl
COTS Pricing	100%	$\sim 60\%$	$\sim 270\%$
cps/nv	79.5	~ 55	~ 85

Electronics & Interfacing

- Optional 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 - i.e. USB, M8, SMA, etc.
- **Microphonics rejection** optional integrated in the electronics firmware.

Li-Foil MWPC pulse height spectrum

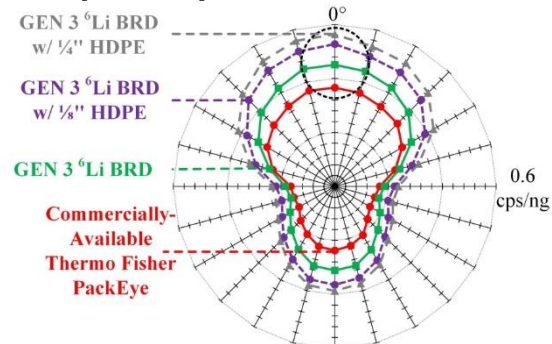


Manufacturing

- The dry room facility at RDT allows for the commercial production of the Li Foil MWPC.
- Capable of manufacturing batches of units with fast end to end throughput.
- We strive to maintain units in stock for fast delivery.
- Production is capable of scaling based on demand.



Backpack response to Cf-252



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