

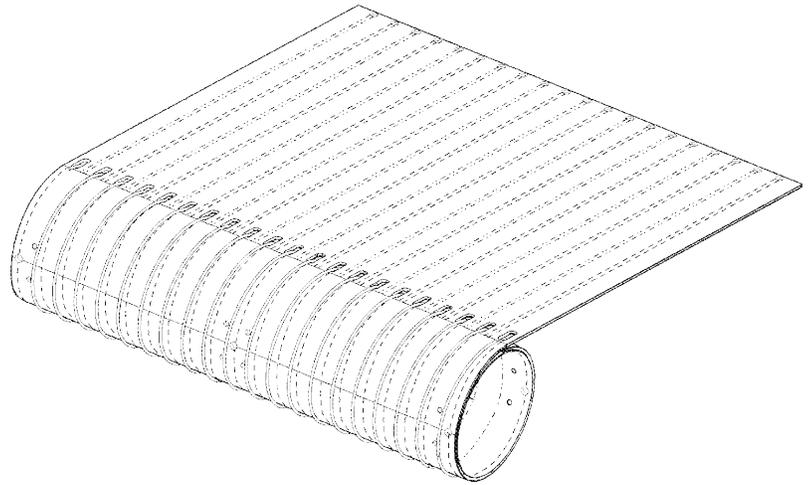
SELF-SHIELDING FLEX-CIRCUIT DRIFT TUBE

US Pat. No.: 9,324,550

Technology Readiness Level: 4

Basic technological components are integrated to establish that the pieces will work together

Ion-mobility spectrometry (IMS) is commonly used for security and military purposes in the detection of explosives and drugs. Commercially available IMS devices utilize stacked electrode tubes which are ill suited for portable field use. Components of these stacked electrode tubes are difficult and time consuming to produce, are prone to breaking, and require thicker walls for mechanical stability and noise reduction. Sandia National Laboratories has developed an alternative that is compact, lightweight, low power, and durable enough for field use applications.



Sandia's ion mobility drift tube is fabricated utilizing industry standard flex circuit technologies in which every other drift electrode is located on a different layer of the flex circuit and partially overlaps adjacent electrodes on other layers. The resulting tube is self-shielding which protects the interior of the tube from unwanted electro-magnetic noise. Its low thermal mass allows for quicker warm-up times and bake-out cycles, ensuring the device is ready as soon as it is needed. The self-supporting structure eliminates the need for any external support, keeping the device compact and lightweight. The near monolithic design minimizes gas leaks, discontinuities that trap analytes and effect performance. Our design also allows for easy integration of flex heaters for temperature control.

Sandia's drift tube improves noise immunity, size, weight, and power requirements of currently available hand-held ion mobility systems.

TECHNICAL BENEFITS

- Reduced weight, size, and power requirements for portable use
- Built-in noise immunity
- Near monolithic construction
- Ease of manufacturing
- Lower costs
- Lower thermal mass

INDUSTRIES & APPLICATIONS

- Defense & law enforcement
- Industrial
- Laboratory analytical applications