FirstDefender

Handheld Raman for Law Enforcement Applications

FirstDefender® is deployed worldwide for rapid, accurate identification of unknown chemicals. Designed to meet the needs of first responders, FirstDefender is a lightweight, rugged instrument that increases responder safety and delivers precise results in seconds.

FirstDefender has passed extensive testing for shock, drop, submersion, vibration, chemical resistance and operation in extreme temperatures. It is certified to MIL-STD 810F standard for ruggedness—amongst the most stringent requirements worldwide.

FirstDefender offers the superior performance, portability, accuracy and durability required by today's law enforcement personnel.

KEY BENEFITS INCLUDE:

- **Fast, accurate identification.** Using Raman spectroscopy, quickly identifies unknown solid and liquid chemicals in the field, including aqueous and other solutions.

- **Vast substance library.** Identifies explosives, toxic industrial chemicals (TICs), toxic industrial materials (TIMs), chemical warfare agents (CWAs), narcotics, precursors, white powders and more.

- **Lightweight, ergonomic design.** Weighs less than four pounds (1.8 kg) and is designed for use in bulky protective gear.

- **Built for field use.** Certified to MIL-STD 810F standards for ruggedness. Ready to use in less than one minute from a cold start and offers 5 hours of battery life for continuous use.

- **Point-and-Shoot™ identification.** Operates directly through glass or translucent plastic containers, minimizing contamination and avoiding exposure to potentially harmful substances. An integrated vial holder offers an alternative sampling method.

- **Automatic mixture analysis.** Sophisticated chemometric algorithms automatically determine presence of mixed chemicals.

- **Easy to use and maintain.** Intuitive menu-driven user interface requires minimal training. No scheduled maintenance or calibration required.

- **Non-destructive testing.** Optical technique maintains sample integrity.

AhuraScientific

Ahura Scientific, Inc.   46 Jonspin Road   Wilmington, MA, 01887, USA
tel: +1.978.642.1132   www.ahurascientific.com   sales@ahurascientific.com

```
Session008 : Scan005
Mixture                              98%
    Ammonium Nitrate                 51%
    Sugar                            47%



The measured data cannot be adequately described by a single
library item, but a mixture of the items shown accounts for 98%
of the data.  Values shown are the amount of molecular signal
that can be described by each item.
                                  1/18/2008 1:48 AM
```

Advanced mixture analysis algorithms enable accurate identification of solid/liquid combinations and aqueous, organic solvent and other solutions.

Complementary Technology

FirstDefender is actively deployed by first responders, military organizations and national law enforcement agencies worldwide. Building on this proven technology, Ahura Scientific, Inc. has introduced TruDefender™ FT and TruDefender FTG, complementary instruments for identification of unknown solids, liquids and headspace gases. FirstDefender and TruDefender FT are available together in Ahura Scientific's Chemical Technology Kit (CTK), combining two powerful chemical identification technologies— Raman and FTIR spectroscopy— into a single kit for the first time.

Specifications

Raman Spectral Range	250 cm^{-1} to 2875 cm^{-1}
Spectral Resolution	7 to 10.5 cm^{-1} (FWHM) across range
Laser (excitation wavelength)	785 nm +/- 0.5 nm, 2 cm^{-1} linewidth, stability <0.1 cm^{-1}
Laser Output Power	300 mW or lower (adjustable)
Collection Optics	NA = 0.33; 18 mm working distance; 0.2 mm to 2.5 mm spot size
Exposure	Manual, Automatic modes (100 ms minimum)
Battery	Rechargeable 7.4 V Internal Lithium Ion Battery; >5 hours at 25 °C
External Power Supply	Wall plug transformer 100-240 V AC 50/60 Hz
Weight	<4 lbs (<1.8 kg)
Size	12″ x 6″ x 3″ (30 cm x 15 cm x 7.6 cm)
Operating Temperature	-20 °C to +40 °C

Note: Product details current as of printing. All information subject to change. 24August2009