

# Customs and border protection on the front line

## By land, by sea, by air.

Customs and Border Protection (CBP) organizations are charged with protecting public safety by serving as guardians of a nation's borders. They are on the front lines, balancing the interdiction of suspicious shipments with keeping commerce moving and are expected to facilitate legitimate trade while stemming the overwhelming, constant flow of suspect shipments.

Despite their constant vigilance, the world's ports of entry and borders can serve as gateways for illegal narcotics, new synthetic drugs, explosives, precursors, counterfeit pharmaceuticals, unknown chemicals and radiation threats.

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Handheld safety identification instruments can help agents and officers accurately analyze products at the port of entry, holding up only those shipments that potentially pose the greatest risk. Results are immediate for fast, informed decisions.

It is estimated that a quarter of a billion people used drugs. Of these, around 29.5 million people - or 0.6 per cent of the global adult population - were engaged in problematic use and suffered from drug use disorders, including dependence.<sup>1</sup>



The rugged, compact Thermo Scientific™ Gemini™ analyzer meets the demanding requirements.

### Using portable optical analysis to identify the suspects

Thermo Scientific instruments are rugged, designed for rapid and precise identification and screening at the point of need. In many cases, a user can easily conduct an analysis by simply holding a chemical or narcotic of interest in a sealed containers against the instrument nosecone. Just like finger prints are matched in a database of criminals, Thermo Scientific instruments can match chemicals and sources to a database of known materials. Whether the need is for radiation detection and identification, narcotics identification, explosives or precursor identification, or inspection for spurious/falsely labeled/falsified/counterfeit (SFFC) pharmaceuticals, these instruments provide accurate results in seconds.

### What you need, when you need it, where you need it

With a mission to safeguard the public by safeguarding the products and raw materials that enter through ports of entry and borders, Customs and Border Protection personnel can achieve success through international collaboration, targeted operations, and the deployment of innovative technology.

## Narcotics identification

According to the World Customs Organization in 2017, 1,256,256 kilograms of illicit narcotics were seized by customs officials in 105 countries.<sup>2</sup> In addition to dealing with more well-known drugs such as cocaine, heroin, and MDMA (ecstasy), Customs personnel now also have to face the rapidly growing challenge of synthetic drugs. Synthetic cathinones — also called “bath salts” or “plant food” — and synthetic cannabinoids — often called “spice” — are broad categories of designer drugs that are pushing the capabilities of law enforcement worldwide. With the emergence of extremely potent drugs like fentanyl and carfentanil, taking precautions to ensure officer and agent safety is more critical than ever. In the United States, the rise of the fentanyl is of alarming concern. Customs and Border Security seizures of fentanyl have increased from only two pounds in FY13 to approximately 1,485 pounds in FY17.<sup>3</sup>

New alternatives appear on the market faster than countries can make a certain drug type or derivative illegal thereby circumventing the new laws. With drug targets evolving so rapidly, those agencies chartered to police such activities must keep pace by deploying the latest testing methods.

In some locations, if Customs officials suspect a package may contain drugs, it can be sent to a lab for analysis, which could take hours—even days. The result is that commerce is slowed and legal shipments can be delayed. A new field-deployed technology helps to eliminate this problem.

## Narcotics: our solution

For rapid identification of suspected narcotics in the field, among the ships, at the airports, at the borders, the Thermo Scientific™ TruNarc™ analyzer offers a handheld Raman system that can scan through transparent/translucent containers, plastics bags, and bottles for most samples.

A single test for multiple controlled substances provides enforcement officials with clear, definitive results for presumptive identification. Lightweight and easy to use, the TruNarc analyzer delivers fast and accurate narcotics analysis anywhere it's needed.



Field-based presumptive narcotics, precursor and cutting agent testing with a Trunarc.

This breakthrough instrument easily identifies narcotics, stimulants, depressants, hallucinogens and analgesics using lab-proven Raman spectroscopy. It can analyze key drugs of abuse as well as common cutting agents, precursors, and emerging threats such as fentanyl, cathinones and bulk cannabinoids—ensuring that Customs officials are always ahead of the curve.



[See a video on our TruNarc Analyzer](#)

## Explosives & Unknown Chemicals

Improvised explosive devices (IEDs) are gaining traction due, in part, to the relative ease of production and widespread availability of raw materials. Because they are not fueled by traditional explosive materials like TNT, but are made in crude chemical labs using industrial chemicals like nitric acid, ammonium nitrate, diesel fuel and sugar, they avoid detection by traditional explosive detection technologies and trained canines.

In fact, they are considered one of the most prevalently used explosive device employed by criminals worldwide, and terrorist training manuals have been uncovered that detail how to easily assemble IEDs with a basic knowledge of chemistry.<sup>5</sup>

The European Union recently noted that “homemade explosives” have been used in the vast majority of terrorist attacks in the EU, including those in 2015, Brussels in 2016, as well as Manchester and Parsons Green in 2017. Attacks with homemade explosives have also been responsible for the vast majority of victims of such attacks in the last decades.<sup>6</sup>

## Chemical identification: our solution

Increase protection against homemade, improvised chemical agents and threats using more sophisticated chemical identification instruments. Our analyzers enable government agencies to quickly identify potential CBRNE hazards. The Thermo Scientific Gemini Analyzer is the only CBRNE / HME / IED support software to have earned a U.S. Department of Homeland Security certification for approved anti-terrorism technology. Our handheld chemical identification instruments also help CBP officers identify shipments that may contain hazardous substances. These highly accurate instruments are deployed globally by military and civilian responders for field-based assessment of a broad range of unknown chemicals. This unique set of tools helps equip Customs and Border Protection personnel in the fight against the IED threat.



## Choosing the right chemical ID product



		Gemini	FirstDefender RMX	FirstDefender RM	TruDefender FTXi	TruDefender FTX
Technology	Raman	●	●	●		
	FTIR	●			●	●
	Flex Probe	●	●			
	Point-and-shoot. No sample preparation	●	●	●		
	Ideal for fluorescent or dark samples FTIR	●			●	●
	Scan delay	●	●	●		
	Cellular wireless				●	
	Robot integration		●			

## Radiation threats

There are no shortcuts to preparing for the most dangerous scenarios that impact public health and safety.

Radiation is an often overlooked threat, yet unsecured radioactive sources can lead to catastrophic scenarios for law enforcement and emergency response teams, and can have devastating, long-term implications for a community, city or entire region.

Preventing nuclear terrorism is a national security priority for the United States. As part of the effort, Governments seek to prevent adversaries from unauthorized development, possession, importation, storage, transport, or use of nuclear or other radioactive materials. The Canadian Nuclear Safety Commission maintains a list of reports on lost or stolen sealed sources and radiation devices, many of which are stolen.<sup>4</sup> In the wrong hands, these devices could be used to create a dirty bomb.



See a map of potential radiation threats in the United States.

## Radiation: our solution

Radiation protection goes wherever you go with our compact, portable radiation detection and identification instruments. Our radiation detectors and monitoring instruments feature patented Natural Background Rejection (NBR) technology to detect, locate, and identify radioactive nuclides such as nuclear weapons, dirty bombs, and orphaned or purposely masked sources. We also offer a wide range of alpha and beta probes well suited for a range of applications.

There are 5 key steps to ensure you are prepared.

- 1 – Recognize the importance of preparation.
- 2 – Develop a coordinated, smart program
- 3 – Determine funding sources for approach
- 4 – Identify instrumentation to meet your needs
- 5 – Train agents and implement plan

To read more about these 5 steps, please visit



## Safe and fair imports

Globally Thermo Scientific™ TruScan™ RM Handheld Raman Analyzer is being widely used by Government Agencies to ensure medicines are not being falsified or are sub-standard due to poor storage conditions.

Custom organizations are also utilizing this instrument to verify different types of medications that are in passengers' luggage. They verify each medicine is in fact what the traveler claims the medication is. This ensures that medicines which should only be used with a doctor's prescription don't find their way into the consumer supply chain.



microPHAZIR™ RX NIR Analyzer

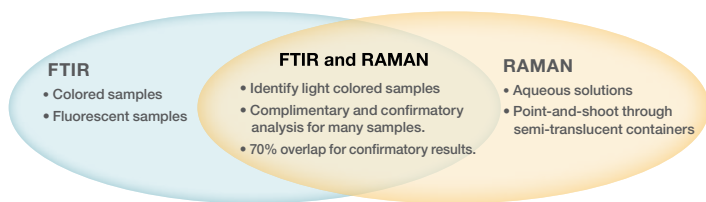


TruScan™ GP Raman Analyzer



TruScan™ RM Handheld Raman Analyzer

## Technology overview



Raman and Fourier Transform Infrared (FTIR) spectroscopy are lab-proven, trusted analysis techniques that provide highly accurate analysis results:

• **Raman:** As a laser-based technique, Raman spectroscopy uses a single laser to interrogate a sample, measuring the light that is scattered by the sample of interest to develop the chemical fingerprint. Raman is uniquely able to scan through transparent or translucent containers, eliminating direct contact with the substance and providing significant tactical advantage.



Visit our Raman Academy



• **FTIR:** Complementary to Raman, FTIR is an absorption technique. A broad-spectrum light is used to interrogate the sample, and the light that is absorbed provides the chemical fingerprint. FTIR is well suited for fluorescent or dark-colored substances which can be problematic for a Raman spectrometer.



Visit our FTIR Academy



## Meeting the challenge of customs and border protection

Customs organizations worldwide face a daunting challenge—detect and deter dangerous and hazardous substances while facilitating commerce and safe travel. From radiation detection to narcotics and explosives identification to anti-counterfeit inspection, the ultimate goal is to protect the public by ensuring the integrity of materials that reach our shores and borders. Thermo Scientific safety and security field instruments were specifically designed and engineered to help meet this challenge.

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Find out more at [thermofisher.com/threatdetection](http://thermofisher.com/threatdetection)