

Safer narcotics identification

A guide for communities and agencies

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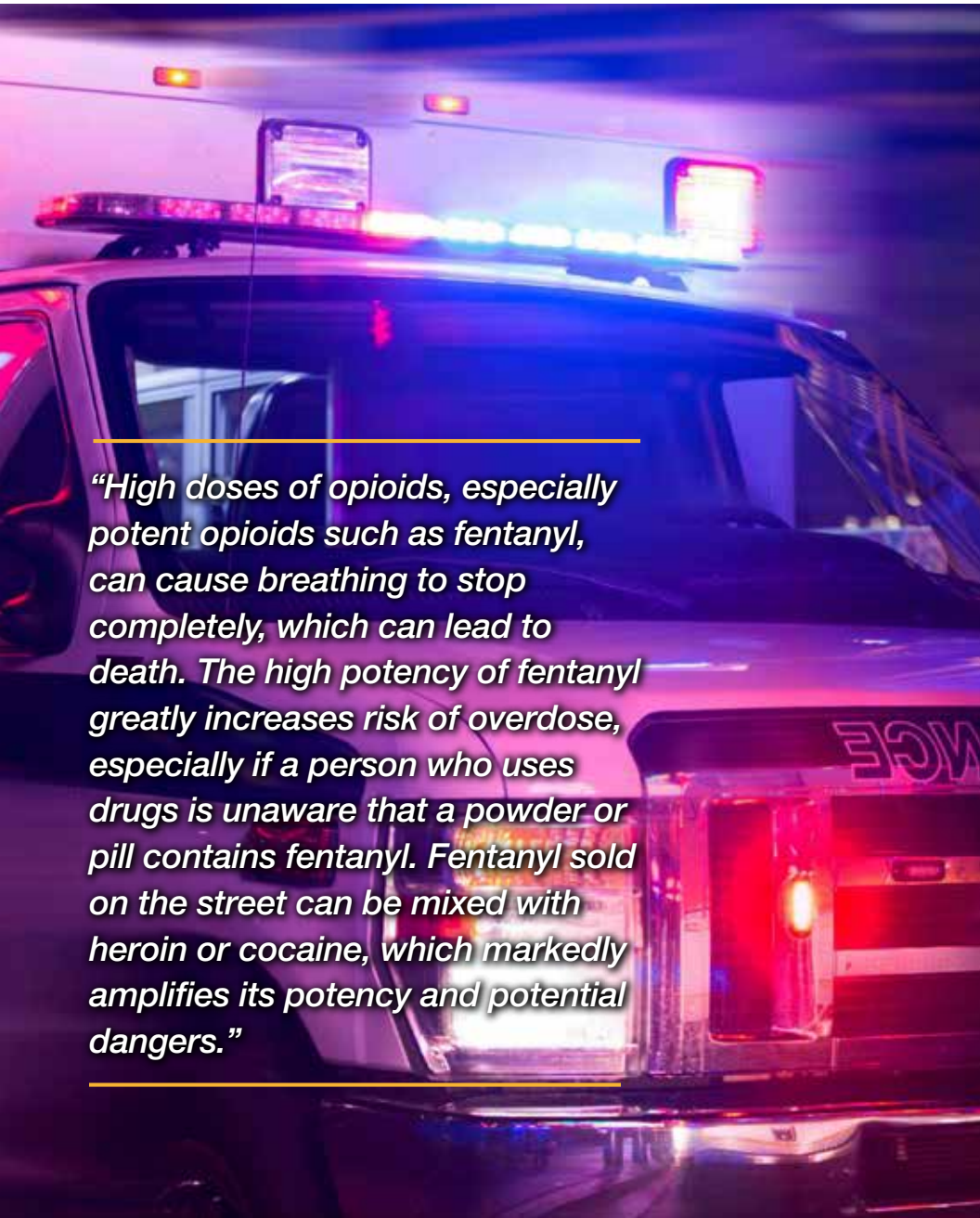
Overview

The growing drug crisis

The global drug problem is increasing, with production and trafficking of fentanyl, methamphetamines, cocaine, MDMA (ecstasy), heroin, and cathinones (bath salts) impacting communities worldwide and stressing already constrained investigative resources. Law enforcement personnel need to utilize the latest technology to quickly identify suspected illegal drugs in the field and get clear, definitive results while keeping themselves safe.



Protecting the public



“High doses of opioids, especially potent opioids such as fentanyl, can cause breathing to stop completely, which can lead to death. The high potency of fentanyl greatly increases risk of overdose, especially if a person who uses drugs is unaware that a powder or pill contains fentanyl. Fentanyl sold on the street can be mixed with heroin or cocaine, which markedly amplifies its potency and potential dangers.”

The ongoing fight against illegal drugs continues. New, hard-to-detect low concentration lab-made narcotics are emerging. Agencies must be extremely vigilant to protect the public against these dangerous circumstances. Efficient narcotics identification methods are crucial for moving cases through the judiciary to resolution and also identifying those in need of substance abuse support.

[National Institute on Drug Abuse \(NIDA\)](#), describes fentanyl as a powerful synthetic opioid analgesic that is similar to morphine but is 50 to 100 times more potent.

Source:

www.drugabuse.gov/publications/drugfacts/fentanyl

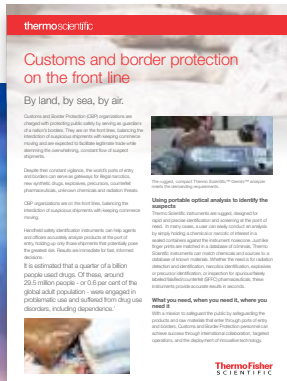
Protecting the officer

Police officers and their canine partners can become sickened if exposed to fentanyl. Unknown substances spill and become airborne. Packages open and spread contaminants—puffs of unidentified material release. Investigating canines become exposed, carrying the deadly drug on their fur and back to fellow officers.

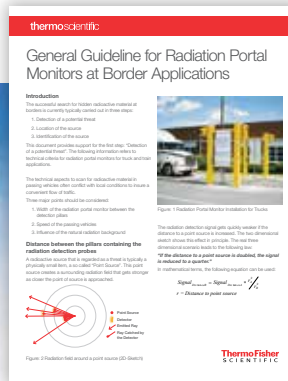


Protecting the border

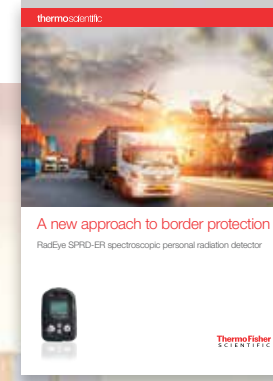
Despite constant vigilance, the world's ports of entry and borders can serve as gateways for illegal narcotics, synthetic drugs, precursors, counterfeit pharmaceuticals, radioactive materials and unknown chemicals. Customs officials must balance the interdiction of suspicious shipments with keeping commerce moving. Defending the public by safeguarding the products that enter through ports of entry and national boundaries, customs and border protection personnel achieve success through international collaboration, targeted operations, and the deployment of innovative technology.



Read [“Customs and border protection on the front line”](#)



Read [“General guideline for radiation portal monitors at border applications”](#)



Read [“A new approach to border protection - SPRD-ER”](#)

Analyzing the worldwide problem

According to the latest World Customs Organization Illicit Trade Report, 1.25 million of illicit narcotics were seized by customs officials in 105 countries. Here are just a few of the stories...



How SERS Can Aid Law Officers in Australia with Identification of Low Concentration MDMA



Europe Sees Increasing Fentanyl Drug Activities



Taiwan Coast Guard Identifies \$30 Million in Drugs



Turkey Intercepts Bonsai, Bananas, and Cocaine



Portable Analyzer Helps Identify Shabu in Philippine Drug Bust



Blue Barrels of Acetone Leads to Drug Arrest in The Netherlands



Would You Spend a Half Million Dollars to Protect your Officers and Community from Drugs?



Technology 

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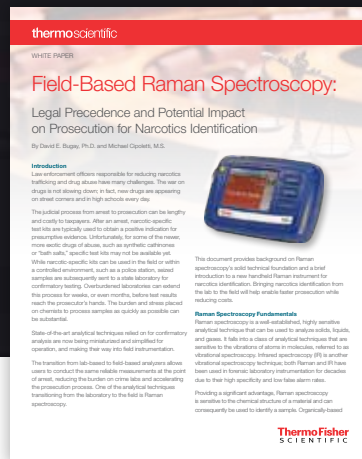
thermofisher.com/NarcoticsID

Raman spectroscopy

Legal precedence and potential impact on prosecution for narcotics identification

Raman spectroscopy is a well-established forensic laboratory technique. Further, it is also accepted by the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG) for the analysis of controlled substances. Forensic labs tasked with providing confirmatory narcotic testing results will also frequently use gas chromatography/mass spectrometry (GC/MS), which some consider the gold standard in analytical instrumentation.

Raman spectroscopy has a proven track record as an analytical technique. TruNarc is widely accepted as a presumptive test for use with search warrants, probable cause, preliminary hearings and felony arraignment. If a case goes to trial, confirmatory testing from the lab is required.



[Download white paper >](#)

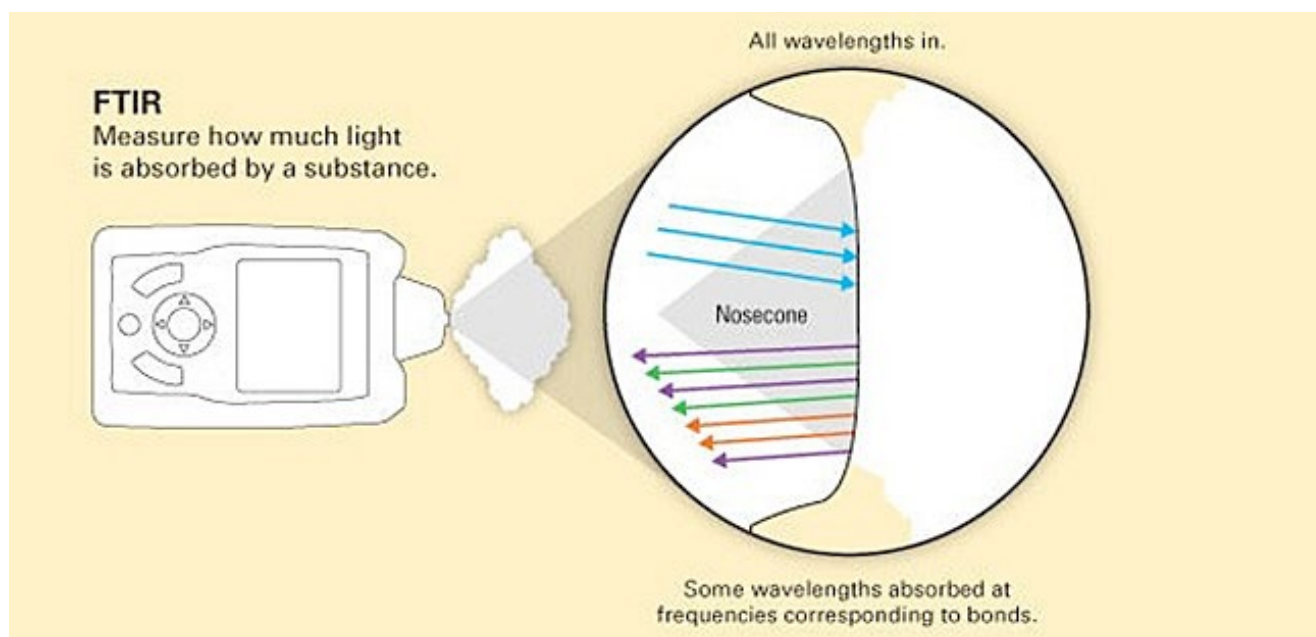
[Learn more about Raman Spectroscopy >](#)

FTIR spectroscopy

FTIR stands for Fourier Transform InfraRed, the preferred method of infrared (IR) spectroscopy. When an IR laser fires at a sample, the substance absorbs portions of the beam. What light isn't absorbed passes through the material and is collected by the detector. Fourier Transformations convert the detector output to interpretable spectra. Analysis of the spectral patterns enables chemical identification. The usefulness of infrared spectroscopy arises when attempting to identify fluorescent chemicals which overwhelm other spectroscopic techniques.

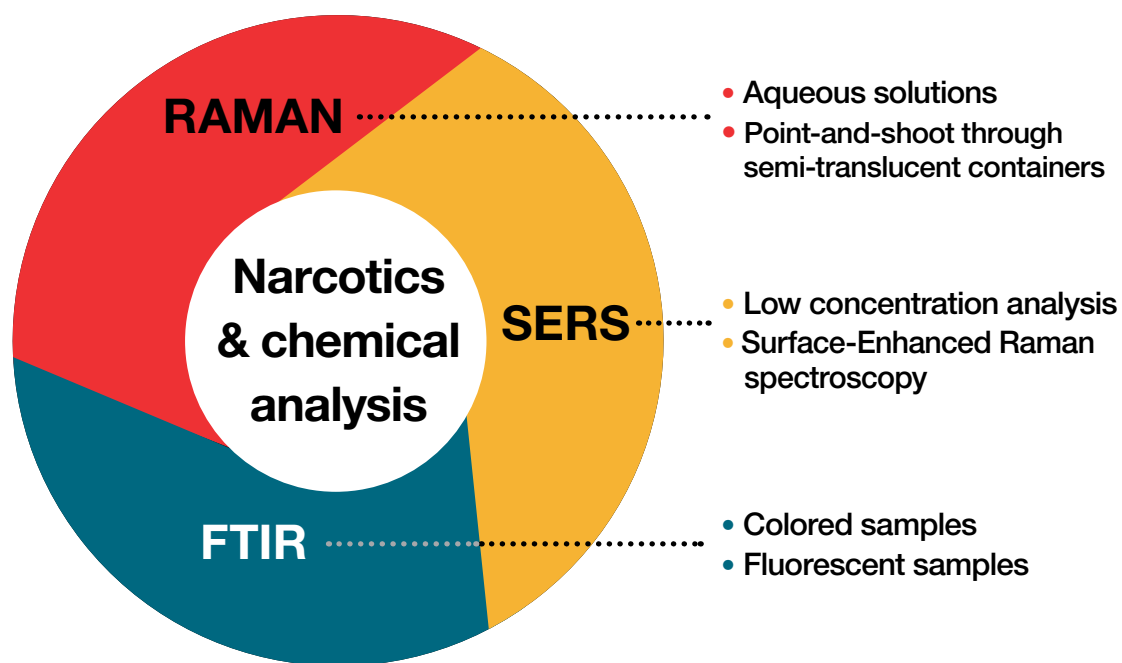


[Learn more about FTIR technology in our FTIR Spectroscopy Academy >](#)



Raman and FTIR spectroscopy

Complementary technologies for chemical identification



[Raman and FTIR Technical Note >](#)





Equipment



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Identifying the unknown

The latest technology includes handheld instruments that can identify unknown substances on the spot – whether it's at a traffic stop, a meth lab, or a port of entry — and can quickly adapt to new designer drugs and emerging variations as they gain traction in the market.



Narcotics identification products

Thermo Scientific TruNarc handheld narcotics analyzer



Efficient, economical and safe.

- No direct contact with most substances ensures officer safety
- Regular library updates to keep up with emerging drug threats
- Delivers clear, real-time results for presumptive evidence
- Tamper proof records with date-and-time stamps expedite prosecution

[Learn more >](#)

Thermo Scientific 1064Defender handheld Raman analyzer



Definitive answers. Maximum flexibility.

- Point and shoot scanning ensures officer safety
- Customizable interface offers user flexibility and ensures you get it right every time
- Solid chain of custody with no guessing needed
- Regular library updates that can be user defined to meet agency specific needs

[Learn more >](#)

Thermo Scientific Gemini analyzer with LowDoseID



The industry standard offering integrated Raman and FTIR for chemical and explosive ID.

- Intuitive interface requires minimal training
- Rugged design for survivability
- Raman and FTIR technologies: complementary and confirmatory prosecution

[Learn more >](#)

Choosing the right narcotics identification product



TruNarc



1064Defender



Gemini with LowDoseID

Safe narcotics identification	✓	✓	✓
Clear actionable results	✓	✓	✓
Tamper proof records	✓	✓	✓
Raman technology	✓	✓	✓
Non destructive solution	✓	✓	✓
Accuracy you can trust	✓	✓	✓
Areas with high heroin use	Utilizing SERS	✓	✓
Ideal for low concentration chemicals (less than 10 weight%)	✓		✓
Explosives and Hazmat libraries		✓	✓
General characterization of chemicals		✓	✓
Complementary and confirmatory results in one handheld instrument			✓

SERS is Surface-Enhanced Raman Spectroscopy

Putting products into action: Case studies & resources

thermoFISHER

Case Study

Gemini Stars in Philippine Drug Bust

Every month of every year, tons of illegal drugs move through a large part of Southeast Asia, known as the Golden Triangle. They are moved in part by the notorious Chinese-run Golden Triangle syndicates and other smuggling operations, destined for consumers with such insoucious names as Wooti Lulu Empire Corp.

The Golden Triangle is the area where the borders of Thailand, Laos, and Myanmar meet at the confluence of the Ruak and Mekong rivers. The "Golden Triangle" has been one of the largest opium-producing areas of the world since the 1930s. Most of the world's heroin came from the Golden Triangle until the early 21st century when Afghanistan became the world's largest producer.

"Shabu" - Old Enemy with a New Name

Now, a new drug known as "shabu," which is really nothing more than methamphetamine with a new slang name, is increasingly trafficked through the region, including the adjacent Philippines. The Philippine Drug Enforcement Agency (PDEA) is working hard to stem the flow of shabu, but it's difficult. Shabu is easy to conceal and can be micro-encapsulated in small packages, disguised and mislabeled as innocent substances, transported in barrels among other products or in small vessels from port to port. Now, the PDEA has a new ally in their efforts, the handheld Thermo Scientific™ Gemini™ analyzer. The Gemini analyzer is a handheld integrated Raman and FTIR instrument, capable of identifying more than 15,000 individual substances in an average of 30 seconds or less. It weighs both Raman and FTIR technology to address a broader range of samples than either technique alone. Fast, safe, and accurate, it identifies unknown solids and liquids, from narcotics to explosives and chemical warfare agents to industrial chemicals and precursors using a comprehensive onboard library. Often, the Gemini analyzer is used in conjunction with the Thermo Scientific TruNarc handheld narcotics analyzer, a smaller unit that is typically carried in the field by law enforcement agents, while Gemini is used at the nearby field office to deliver a more comprehensive analysis of substances identified as suspicious.

With a properly equipped lab can make a definitive analysis of an unknown substance, typical lab equipment does not lend itself to use by law enforcement personnel in the field because it is either too heavy, cumbersome, difficult to operate, or too expensive to distribute widely.

"When officials opened the container, declared as containing plastic resin, they found 276 packs of shabu worth a total of P1.8 billion."

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Gemini Stars in Philippine Drug Bust

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Case Study

Stemming the flow of narcotics in Turkey with Gemini handheld analyzers

How do you stop the flow of narcotics funneling through Turkey's busiest airport? Istanbul Ataturk International Airport is a portal for approximately 16 million passengers annually. But it also is a port of entry for a substantial narcotics trade from around all over the world, with massive amounts of drugs hidden in luggage, in commercial shipments of produce, and more.

The key to putting a dent in this traffic is active interdiction, on-the-spot, real-time detection of the airport with quick and reliable, credible results that will stand up in court. This is now achievable with the portable, quick-response Thermo Scientific™ Gemini™ Handheld Analyzer. The Gemini Analyzer helps identify a broad range of narcotics, unknown chemicals, and explosives in the field quickly, safely, and confidently using FTIR and Raman spectroscopy in a single instrument. It has been used on many occasions to detect and identify narcotics that individuals or organizations were attempting to smuggle into or through Turkey. The Gemini Analyzer is the first and only integrated Raman and FTIR handheld instrument in the world, providing complementary and corroboratory testing in a single, field-portable device.

BLG Chemical Technologies

In Turkey efforts to bring and seize together with the most advanced technology to meet customer needs and the constantly evolving threats that the public faces. As such, BLG, Thermo Fisher Scientific's new distributor, has sold a number of Gemini Analyzers to Customs Enforcement officials who manage Ataturk Airport. A significant number of international flights from regions that are known for the manufacture of narcotics pass through Ataturk Airport. Effective narcotics detection and interdiction is often achieved by a unique team effort involving skilled enforcement officials, trained drug-sniffing dogs, and the Gemini Analyzer. Here are a few examples:

Borel

In one instance, more than 260kg of material that was packaged as glass cleaning and repair material arrived on a plane from China. Drug-sniffing dogs at the airport signaled that the product might possibly contain narcotics. Utilizing the Gemini Analyzer, agents were quickly able to determine - within minutes - that the product was actually the chemical used to manufacture Borel, a synthetic compound. The raw material seized could have been used to create 260 tons of Borel and, if released, the Borel would have been distributed to potentially millions of people.

Cocaine

A passenger traveling from Colombia was stopped by customs enforcement officers when they suspected he might be carrying narcotics. The customs officers noticed that the passenger's luggage appeared to have been modified and didn't look right. The suspect had hidden several fat

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Stemming the flow of narcotics in Turkey with Gemini handheld analyzers

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TruNarc helps Police bust one of Europe's biggest "meth labs"

If you came upon a clandestine "meth lab", an illegal operation producing hundreds of pounds of deadly synthetic drugs, would you know it?

From afar, it might look like nothing more than a quiet old farm in the rolling hills of German countryside. That's what last of autumn a major drug "boon" from the Netherlands was being before he was caught by German police and was locked up in prison for 10 years and heavily fined for running one of the largest methamphetamine labs ever found in Germany. A known producer of synthetic drugs in the Netherlands, set up a clandestine meth production facility on a farm in Germany, just across the border.

According to German police, the "boon" set up the operation and oversaw the drug synthesis. The Thermo Scientific™ TruNarc™ Handheld Narcotics Analyzer was utilized to identify chemicals found in his lab. The TruNarc Analyzer quickly identifies a wide range of illegal drugs including narcotics, synthetic drugs including methamphetamine, cutting agents, and precursor materials. Analysis is performed in a single test, portable, hand-held, on the spot, in 30 seconds or less per sample. TruNarc is used worldwide by narcotics detectives, customs agents, and law enforcement personnel for faster analysis of suspected illegal drugs. TruNarc provides non-destructive, non-contact sampling (lower threat to preserve evidence and is capable of identifying up to 250 prohibited substances. TruNarc is able to scan for more than 450 suspected controlled substances in a single, definitive test. The capability delivers a critical advantage especially in today's dangerous world of synthetic drugs of widely varying strength and toxicity.

TruNarc helped put the "boon" behind bars when a large police force, following a lengthy investigation, raided the operation in a comprehensive sting.

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TruNarc helps Police bust one of Europe's biggest "meth labs"

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Testing for over 250 narcotics, including fentanyl in a single test

Charles County Sheriff's Office

When officers discovered narcotics on the scene, identifying them was a time-consuming and dry process. Officers would often handle the drugs as they attempted to determine what the drug was. A small quantity of fentanyl coming in contact with an officer can result in an overdose or death.

- The sheriff's office received a grant to purchase a Thermo Scientific™ TruNarc™ analyzer
- One scan of the sample can test it against all of the narcotics in the TruNarc library
- Samples can be tested without removing them from the plastic bag, drastically reducing risk of exposure to officers
- By quickly identifying the presence of fentanyl mixed with heroin officers are able to ensure officer safety when handling the substance
- If a suspect has overdosed, by quickly determining what the drug involved is, officers can get the best treatment and result for the individual
- The TruNarc results can be used to press charges against the suspect immediately instead of waiting months for lab results to come back

"The safety of our officers is one of our top priorities, and the TruNarc allow us to safely identify controlled dangerous substances quickly and accurately without having to wait on lab results. The community will benefit because we will be able to charge suspects sooner and more precisely."

- Charles County Sheriff's Office

Find out more at thermofisher.com/trunarc

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Testing for over 250 narcotics, including fentanyl in a single test

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Testimonials

Retired DEA agents encourage law enforcement to use handheld narcotics analyzers

"I wish we had handheld narcotics analyzers back in the 80s because there was a lot of dope out there and we did not know what it was."

— Retired DEA Agent Javier Pena, one of the agents who helped take down notorious Colombian drug lord and narcoterrorist, Pablo Escobar, and whose story inspired the hit Netflix™ Series NARCOS™

[Learn more >](#)



Testimonial from retired DEA Agent Ernie Batista



Testimonial from retired DEA Agent Stephen Murphy



Testimonial from retired DEA Agent Javier Pena



[Watch the videos >](#)

TruNarc Handheld Narcotics Analyzer

With the TruNarc handheld narcotics analyzer, the accuracy and reliability of a narcotics and drug test lab are available anywhere you go. With this handheld drug detector, narcotics, stimulants, depressants, hallucinogens and analgesics are easily identified using lab-proven Raman spectroscopy.

- Even little known substances can be identified almost instantly in the field
- The need for Law Enforcement Officers to handle potentially lethal narcotics is greatly reduced
- Valuable lab time is freed up for higher priority cases
- Reduced demand for lab testing delivers significant cost savings



[Download brochure >](#)



[View specifications >](#)

10 reasons TruNarc strengthens law enforcement

The latest technology includes handheld instruments that can identify unknown substances on the spot — whether it's at a traffic stop, a meth lab, or a port of entry — and can quickly adapt to new designer drugs and emerging variations as they gain traction in the market.



1

Point and shoot simplicity

A handheld Raman analyzer can ID hundreds of narcotics, precursors or cutting agents in seconds — right at the scene. With high specificity, the analyzer is non-destructive, non-contact and easy to use.



2

Court-admissible results

Handheld Raman analysis is allowed in early court proceedings. Law enforcement gains probable cause and the ability to charge suspects while rapidly moving cases through the system.



3

Faster turnaround

With backlogs at the crime lab, the time between arrest and early court proceedings can reach one year. With admission of handheld Raman analysis, cases can be prepared for court in a matter of weeks.



4

Complete police reports

A handheld analyzer automatically generates a tamper-proof report, with test location, time, result and operator, for inclusion in the investigative file delivered to the prosecuting attorney's office.



5

Reduced backlogs at the crime lab

In jurisdictions that permit handheld Raman analysis, crime labs may enjoy more efficient operation because each field test becomes a screening test, preventing backlogs.



6

Lower costs

Given the cost per sample at the crime lab, drug testing can run tens of thousands of dollars per month. By deploying a handheld Raman analyzer, law enforcement can realize substantial savings over the life of the instrument.



7

Early warning sign

Handheld Raman analysis helps discover novel synthetic compounds. When these new substances are understood at the lab level, the information is quickly passed back to the analyzer for positive field ID.



8

Fast library updates

As new drug threats emerge, new substances can be added to an analyzer's "fingerprint" library quickly. These updates are made available frequently and are typically free of charge.



9

Beyond wet chemistry kits

Wet chemistry kits require multiple steps with user interpretation. Some drugs require multiple chem kits to make the correct call. Handheld Raman provides a more accurate and reliable test, and is a total solution.



10

Officer safety

Many drugs on the street today can be lethal if officers are exposed to even trace amounts. The TruNarc allows officers to test samples without having to make contact with them.

[Download here >](#)

1064Defender Handheld Raman Analyzer

The Thermo Scientific 1064Defender Raman analyzer provides you with a flexible tool to meet your agency's chemical identification needs. By offering user configurable scan profiles and libraries, the 1064Defender Raman analyzer tailors itself to an officer's needs providing definitive results for confident and efficient decision making.

- Touchless point and shoot scanning
- Clear and intuitive interface
- Comprehensive and expandable library
- Dependable chain of custody reporting

1064 nm



Optical engine cuts through fluorescence

Wi-Fi



Share and report what you see in the field with headquarters

Wi-Fi



Manipulate instrument settings from the comfort of your laptop



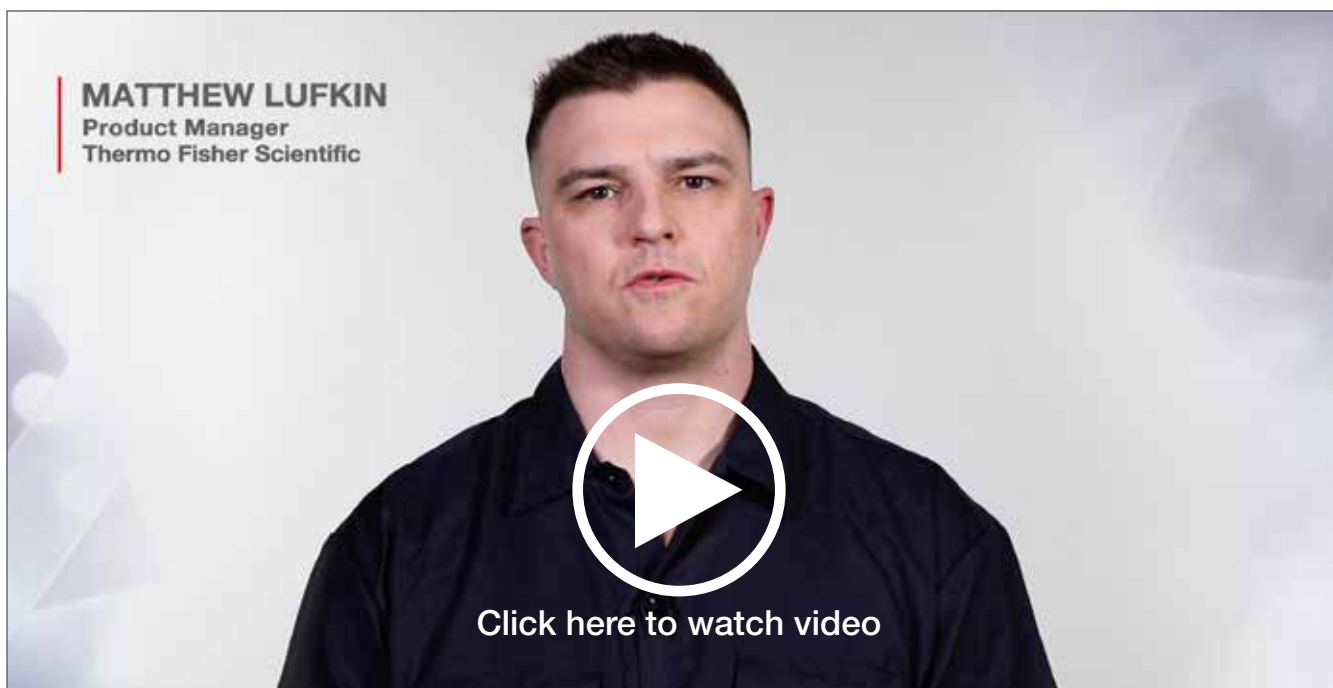
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[View specifications >](#)



7 Benefits of the Thermo Scientific 1064Defender Raman Analyzer

Discover 7 Key Benefits of the 1064Defender for Narcotics Identification from product expert Matthew Lufkin, and which ways our technology can assist with meeting the requirements of agencies around the world.



10 Reasons 1064Defender strengthens communities and agencies

A lab-proven technology providing the flexibility to meet your agency's narcotics and chemical identification needs. The Thermo Scientific 1064Defender tailors itself while providing definitive results for confident and efficient decision making.



1 Touchless, point and shoot

Our Raman analyzer can effectively ID many substances, with enhanced identification of heroin and other fluorescence materials while safely protecting against unwanted exposure.



2 Accurate results

Our dual algorithm capability backed by our p-value algorithm ensures definitive results for a presumptive test that can be trusted through circumstances such as court proceedings and threat identification.



3 Faster turnaround

Get accurate data from the field to where it needs to go, through exporting by means of WebUI, file share or to a USB drive.



4 Definitive answers

Our handheld analyzer automatically generates reports, with GPS location, time, result(s), operator, digital image, along with user added meta data.



5 Reduced backlogs

Users may enjoy more efficient operations because of field tests now becoming screening tests, preventing potential backlogs.



6 Lower costs

Given the cost per sample, chemical analysis can be extremely costly. By deploying a handheld Raman analyzer, users can realize substantial savings over the life of the instrument.



7 Early warning sign

Handheld Raman analysis helps discover novel synthetic compounds. When these new substances are identified at the lab level from Reachback support, the information is quickly passed back to the analyzer for positive field ID.



8 Fast library updates

With a customizable interface, the user and the instrument are always in sync. This device is future-proof against the changing threat environment for law enforcement and the community.



9 Beyond wet chemistry kits

Wet chemistry kits require multiple steps with user interpretation. Some drugs require multiple chem kits to make the correct call. Handheld Raman provides a more accurate and reliable test, and is a total solution.



10 User safety

Many chemicals today can be lethal if individuals are exposed to even trace amounts. The 1064Defender allows users to test samples without having to make contact with them.

The Thermo Scientific Gemini analyzer with LowDoseID™ for detection of low concentration illicit drugs

The manufacture, distribution, and use of illicit drugs is a continuing and growing problem worldwide. The ability to detect and identify these types of substances in the field plays an important part in fighting this problem. One instrument that has been highly successful in detection and identification of illicit drugs is the Thermo Scientific Gemini Analyzer. The Gemini analyzer is the world's only handheld instrument that incorporates both Fourier Transform InfraRed (FTIR) and Raman spectroscopies in one unit. These two spectroscopies are complementary techniques and enhance the ability of a user to identify unknown substances in the field.



The Thermo Scientific Gemini Analyzer with LowDoseID for detection of low concentration illicit drugs

[< Download the white paper](#)

Identify unknown, fluorescence, and low concentration chemicals with one instrument





Available grants for narcotics identification products

Get FREE assistance

- Grant research customized to your department's needs
- Unlimited free consulting from senior grant consultants
- Free grant application help and review services
- Free online grant writing training



Funds are available and we have a wide range of narcotics and chemical identification products to meet your needs

[Learn more about grants >](#)





About Thermo Fisher Scientific

Thermo Fisher Scientific is the world leader in serving science. Our mission is to enable our customers to make the world cleaner, healthier and safer. We help our customers accelerate life sciences research, solve complex analytical challenges, improve patient diagnostics, deliver medicines to market and increase laboratory productivity.

Through our premier brands – Thermo Scientific, Applied Biosystems, Invitrogen, Fisher Scientific and Unity Lab Services – we offer an unmatched combination of innovative technologies, purchasing convenience and comprehensive services.

Request more information

Follow us - Identifying Threats



Find out more at thermofisher.com/NarcoticsID

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