

# Detection of Hazardous Narcotics and New Psychoactive Substances (NPS) with Agilent Resolve— a Handheld SORS System



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## Abstract

The Agilent Resolve Raman handheld through-barrier identification system uses Agilent proprietary spatially offset Raman spectroscopy (SORS) technology to identify hazardous materials, explosives, and narcotics concealed behind single and multiple barriers. These barriers can include colored and opaque plastics, glass, paper, card, wrapping, and fabrics.

The combination of SORS, high data quality, reduced fluorescence interference, and a library continuously updated with new psychoactive substances (NPSs) makes the Resolve system a powerful tool in the detection and identification of controlled substances.

## Introduction

The rise in the prevalence of fentanyl and new psychoactive substances (NPSs) presents a major challenge to law enforcement professionals. Variants of fentanyl are reportedly 10–1,000 times more potent than heroin, with fatal doses comparable to a few grains of sugar. Similarly, several types of NPS have active doses measured in micrograms. There are several worldwide reports that describe accidental exposure of officers to either fentanyl or NPSs, with serious medical consequences. Both material types present a high risk in their pure form (as it is smuggled or transported). Due to their high potency, the risk remains after these substances are cut down into the multitude of street forms and products, often mixed with conventional narcotics. This means that there is a risk of dangerous accidental exposure in situations where full personal protective equipment (PPE) is not always worn nor practicable.

## Experimental

The Agilent Resolve system allows operators to examine a maximum range of packages or containers for indications of fentanyl or NPSs before disturbing, opening, or taking a sample. This practice reduces the risk of exposure, and enables more efficient decision making and processes (Figure 1).



**Figure 1.** The Agilent Resolve system has the unique capability to scan through multiple opaque layers of packaging without any prior knowledge of the sample. This example consists of pills contained within opaque plastic and mailer bag.

## Results and Discussion

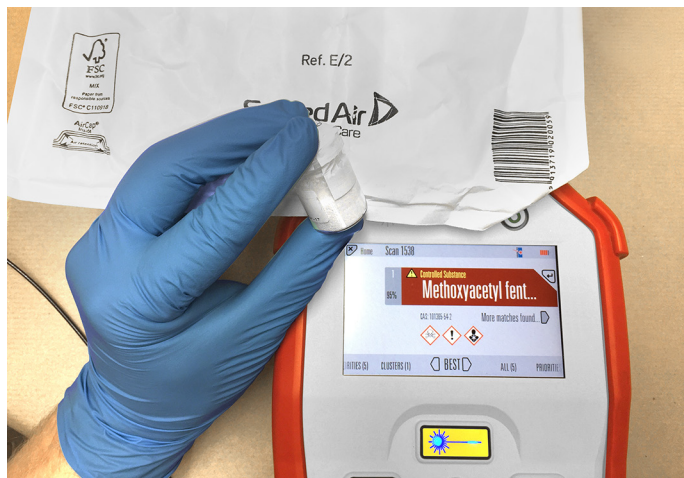
The ability of Resolve to identify hazardous narcotics and NPS concealed behind barriers has been tested at expert laboratories in the UK, USA and China. Figures 2 and 3 show two variants of fentanyl concealed behind barriers typical of international postage.

### Materials tested include

- Fentanyl, carfentanil, and derivatives
- New psychoactive substances
- Amphetamines
- Cocaine
- Heroin
- Controlled precursors

### Barriers tested include

- Post packs
- Padded mailers
- Brown paper wrapping
- Card
- Opaque polyethylene
- Opaque polypropylene
- Opaque PVC containers
- Rubber/nitrile rubber



**Figure 2.** Scan of a seized sample of methoxyacetyl-fentanyl through white paper, brown paper, bubble wrap, and glass.



**Figure 3.** Scan of fentanyl through multiple plastic layers.

## Conclusions

Resolve has several capabilities and features that are highly desirable for law enforcement and customs officers dealing with the threat of hazardous narcotics and NPS.

### Advantages of the Agilent Resolve system

- **Improved safety:** True through-barrier measurements (not just transparent barriers) reduce the risk of exposure to operators—crucial with increasingly potent opioids and NPSs.
- **Class-leading library:** More than 300 narcotics, NPSs, and controlled substances in the library along with 200+ cutting agents.
- **Traceable standards:** The narcotics library is updated regularly from world-leading institutions and sources in Europe, Asia, and the Americas to cover emerging threats. Updates are typically provided several times per year, or in direct response to new threat types.
- **High data quality:** Due to efficient optics, even in through-barrier mode, the Resolve system provides greater confidence, and aids remote Reachback analysis.
- **Evidence is preserved:** Nondestructive analysis preserves evidence, and the chain-of-custody is protected.
- **Fast scans:** Scans typically take approximately 1 minute through barriers.
- **Scan more samples:** Due to the reduced fluorescence interference of the Resolve system's 830 nm laser, a wider range of samples can be scanned compared to conventional Raman.
- **Unique optical design:** The Resolve system can scan most pills without the need for grinding.
- **Easy to use:** Library items can be tagged as a Priority when searching for specific materials. Priority matches display in red, all other matches display in green.
- **Controlled substances:** A flashing warning tag indicates the presence of a controlled substance.

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This information is subject to change without notice.