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Rigaku Analytical Devices

APPLICATION NOTE

HOUSEHOLD HAZARDOUS MATERIAL IDENTIFICATION USING HANDHELD 1064nm RAMAN

- Analyze through containers
- Identify a wider range of substances
- Determine threat severity in seconds

Common materials found in homes and businesses have the potential of creating hazardous waste if not disposed of properly, espeically when their containers break or leak (see Table 1). First responders have the need to identify these potentially hazardous materials immediately in order to correctly mitigate the potential threat to others.

Cleaning Products	Nitrobenzene Degreasers
Automotive Products	Gasoline and diesel Oil and fluids
Lawn and Garden Products	Pesticides Fertilizers
Pesticides	Methoxychlor Chlordecone
Workshop/Painting Supplies	Halogenated hydrocarbons Alcohols
Flammable Products	Gasoline Starter fluids
Miscellaneous	Mystery products from decades past Formaldehyde DDT

Table 1. The US Environmental Protection Agency (USEPA) has grouped their list of hundreds of potential chemicals into these categories

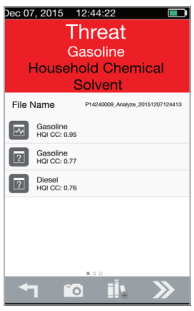
ACTIONABLE IDENTIFICATION

Raman technology provides responders with a molecular fingerprint of substances and material identification. Raman spectroscopy is a nondestructive, non-contact method and can be used to analyze through glass, plastic bags and bottles, providing protection from potentially hazardous exposure.

Progeny™ ResQ™ is a handheld Raman analyzer that utilizes a unique 1064nm excitation laser. The 1064nm advantage allows responders to detect the most comprehensive list of substances using a library of over 12,000 compounds – including cleaning, automotive, pesticide, or precursor materials as well as analyze colored substances or through colored containers (see Figures 1-4 as examples of potentially hazardous household chemicals).

CONCLUSION

Accurate identification of unknown household chemicals can assist first responders to quickly and safely mitigate dangerous situations and also facilitate the correct disposal process for the hazard. Progeny ResQ's unique 1064nm laser technology facilitates the identification of hazardous chemicals which are often found in residential environments. Using an onboard library containing over 12,000 chemicals for reference, virtually any unknown chemical can be identified within seconds using safe, non-contact sampling.



Figures 1 and 2. Analysis of gasoline through colored glass using Progeny ResQ.

Figures 3 and 4. Analysis of ammonium nitrate through plastic container using Progeny ResQ.

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