Application Brief

Aviation Security

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Screening Water and Soft Drink Bottles Using the Agilent Insight Series Alarm Resolution Systems

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Water bottle false alarm rate of 0%

Water and soft drink bottles are common items carried by passengers traveling through airports. Any regulation changes that increase the 100 mL limit on liquids to larger volumes (up to 2 L) in cabin baggage would likely increase the frequency at which bottles are screened at airport security screening checkpoints. Therefore, a low false alarm rate when screening bottles is important for all liquid screening devices used in airport security, including the Agilent Insight Series alarm resolution systems.

The Agilent Insight300M and Agilent InsightBLS are alarm resolution systems used to screen liquids with high specificity and a very low false alarm rate using spatially offset Raman spectroscopy. This application brief presents the results of using these instruments to screen water and soft drink bottles in a large variety of containers, including common re-usable containers. Screened volumes ranged from 10 mL to as large as 5 L to test the Insight Series' resilience to regulatory changes.

Bottle testing method

In the study, a total of 122 unique glass and plastic bottles of water and soft drinks were screened. These bottles varied in color and shape and contained either tap water, bottled drinking water, or soft drinks purchased from a shop. The bottles were screened on four instruments in varying positions, giving a total of over 3,000 scans. None of these scans returned an alarm, therefore giving a false alarm rate of 0% for all container types, as shown in Table 1.

Table 1. Table of false alarm rates for several types of glass and plastic water bottles. The percentage of overall containers screened for each type is indicated in brackets. The volume screened ranged from 10 mL to 5 L bottles.

Container Type	Alarm Rate (%)
Clear (54.8%)	0
Dark Colored (14.5%)	0
Light Colored (6.3%)	0
Painted Glass (1.6%)	0
Opaque Plastics (1.1%)	0
Through-Label (21.7%)	0

Figure 1. The selection of water and soft drink bottles screened in this study.

Conclusion

The total false alarm rate of water and soft drink bottles was 0% for over 3,000 scans. This success, irrespective of volume, shows that the Agilent Insight300M and Agilent InsightBLS are future-proof against potential regulatory changes regarding the 100 mL limit. Moreover, the absence of a false alarm on these common necessities provides a fast, safe, and smooth transition through security for all involved.

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