



**WINNER**

## **2000 R&D 100 Awards Winner**

### **ANDE—Advanced Nondestructive Evaluation System**

#### **Features**

ANDE is a detector system that uses ultrasonic interferometry and resonance to identify the contents of sealed containers, either through direct contact or from a distance of up to 15 feet. ANDE consists of a sound projector, a laser vibrometer, and an electronics package containing a computer, database, and transducer system. Other features include the following:

- identifies contents of sealed containers in less than 30 seconds,
- measures physical properties of contents,
- operates in hazardous environments,
- adapts for characterization of single-drop samples,
- operates over a broad frequency range with high resolution,
- can be used with sensitive materials such as high explosives, and
- allows continuous monitoring.

#### **Applications**

ANDE's primary application is in the area of national security. It can also be used for law enforcement and environmental monitoring and is easily adapted for industrial and medical applications:

- identifies all common chemical warfare agents in munitions and storage containers;
- identifies hazardous chemicals in unlabeled containers;
- identifies illicit materials stored inside legal materials;
- accurately determines liquid levels, even in thick-walled tanks;
- monitors water quality inside tanks and pipes;
- detects wall corrosion inside sealed containers;
- determines physical properties of chemicals (e.g., process control in chemical industry);
- detects contamination and spoilage of foods inside bottles and cans;
- can monitor downhole fluid (oil, brine, etc.) for the petroleum industry; and
- tests single-drop pathological and biological samples.

#### **Benefits**

Almost everyone can benefit from this technology. ANDE can save lives and property by safely identifying real threats, such as chemical warfare agents and other highly toxic chemicals before people and the environment are jeopardized. It can prevent public concern by quickly exposing false threats before they attract attention. ANDE can also improve the quality of life through its medical applications and benefit industry through its numerous commercial applications.