

ANDE™ : Novel Acoustic NDE Technique

Description

This proprietary technology addresses the problem of rapid and precise detection of hidden cracks and corrosion. ANDE™ merges commercially available technology with a proprietary software analysis tool in order to accurately image hidden metallic defects such as cracks, kissing bonds, and corrosion. This is particularly useful for maintenance evaluations on marine vessels, aircraft and potentially, terrestrial structures, such as bridges. ANDE™ is suitable for metals, including aluminum and steel, as well as composite structures. Inspections can be made to check for cracks before they become critical in size. For large areas that need to be systematically inspected, using a non-destructive, large field-of-view technique will efficiently perform the examinations.

Potential Applications

- Marine depot and field repairs
- Aircraft depot and field repairs
- Terrestrial structures, such as bridges
- **Space Micro has a partner company that can enable spatial awareness for large jobs using GPS type location, which enables accurate defect mapping over large surfaces, such as aircraft and ships.**

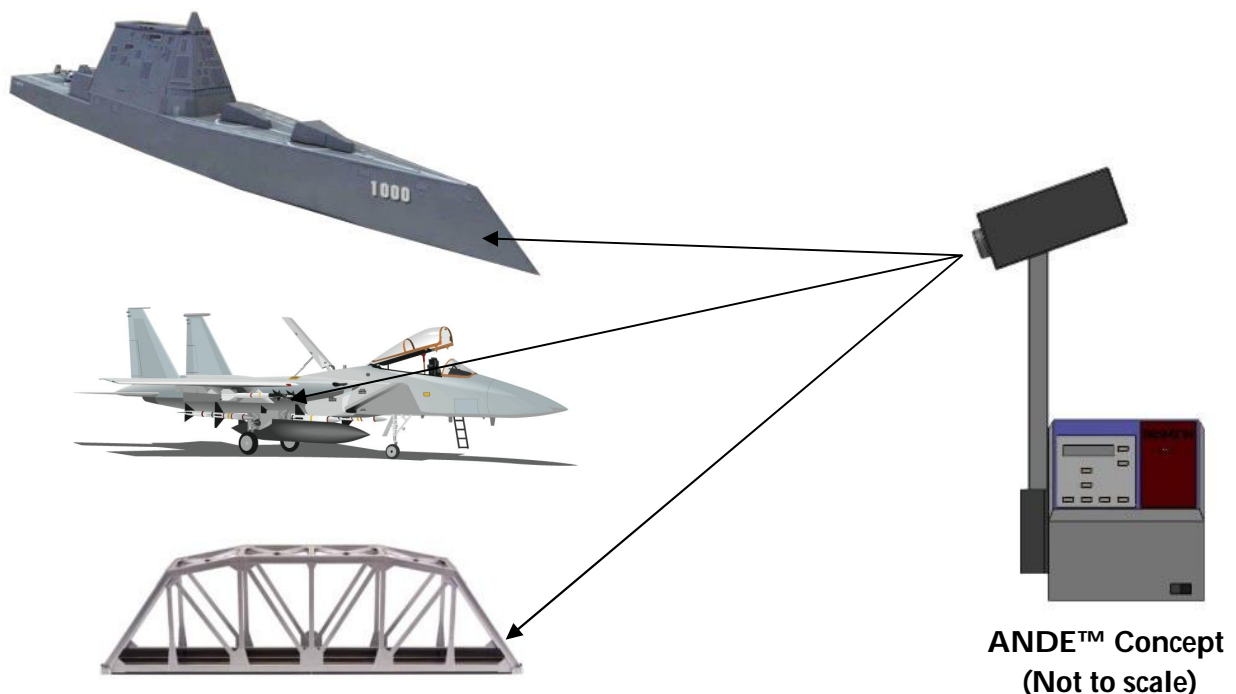


Figure 1: Potential applications for ANDE™ include ship hulls, aircraft wings, and bridges

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Operation

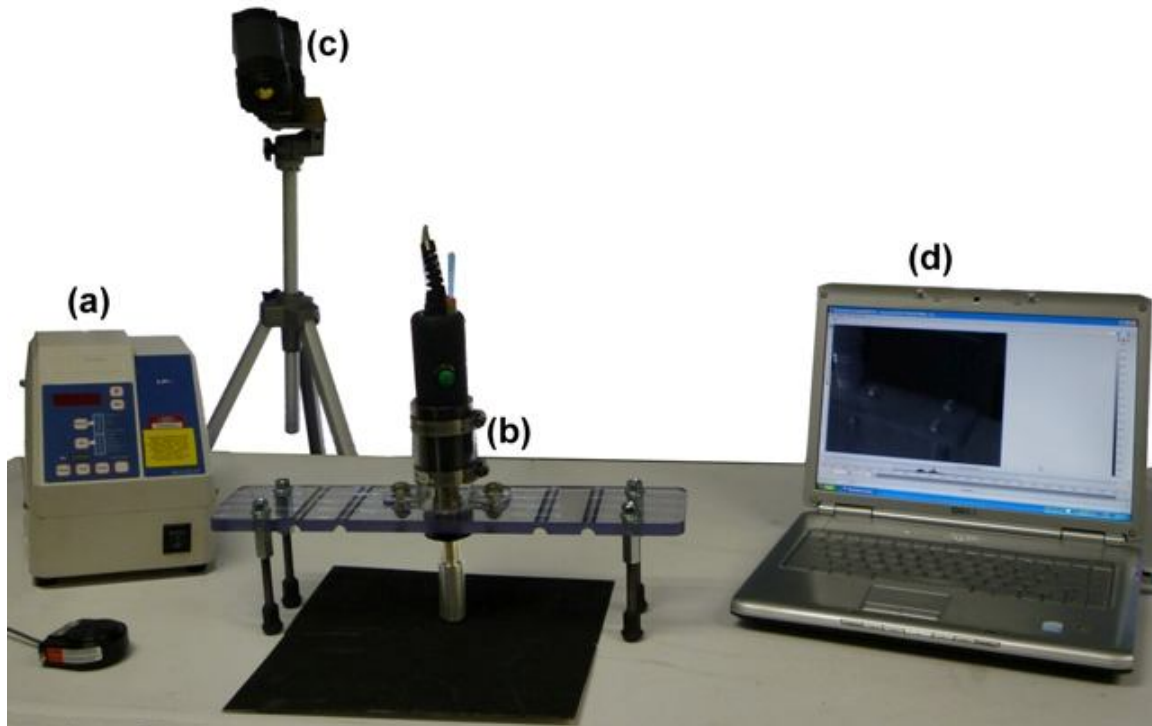


Figure 2: Laboratory demonstration of ANDE™ system technology

(a) Input Short Pulse
of Ultrasonic Power

(b) Vibration in
Cracks Converts
Sound to Heat

(c) Thermal Signature
Detected by IR
Camera

(d) Images fed to
computer or other
electronics



Figure 3: Photo of thermal image of a crack obtained in 2-3 seconds (light areas)

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Features and Benefits

- Portable
- Easy to position and operate
- Scalable and fast
- Rapid detection – seconds/sq. ft
- Detects closed cracks, kissing bonds, and corrosion
- Economical: < \$35K

Technique	Detection Speed	Closed Crack Detection	Detection Depth Limit	Detection Resolution
ANDE™	2-3 seconds	Yes	~1"	High
Thermal Pulse	minutes	Limited	<0.25"	Low
Lock-in Thermography	minutes	Limited	<0.25"	High
C-scan Ultrasonics	many minutes	Possible	~1"	High
Phased Array Ultrasonics	many minutes	Possible	~1"	High

Table 1: Comparison of key features for various tested NDE techniques

For additional information and specifications, please contact Space Micro Inc.

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