

# Nondestructive Characterization of Critical Components

**JENTEK Sensors, Inc.**  
Waltham, MA



## INNOVATION

Conformable Meandering Winding Magnetometer (MWM™) eddy current sensors and high resolution MWM-Array imaging systems provide characterization of coating systems, process quality assessment (e.g., shot peening) and imaging of surface and subsurface geometric features (e.g., cooling holes, air foil thickness), as well as detection of surface breaking and subsurface cracks.

## ACCOMPLISHMENTS

- ◆ Metallic coating thickness measurement using multiple frequency MWM (an advanced eddy current sensor) and grid methods (an intelligent data analysis algorithm that uses databases of precomputed sensor responses to provide absolute material property measurements, without requiring coating thickness standards for calibration).
- ◆ Conformable sensors for complex turbine blade/disk surfaces (e.g. leading edges, tight radii, disk slots, holes).
- ◆ Contact and non-contact wide-area scanning for C-Scan imaging.
- ◆ Ferrous and nonferrous alloys.
- ◆ Ceramic porosity (e.g., aging) measurement with capacitive IDED sensors and sensor arrays (dielectrometers).

## COMMERCIALIZATION

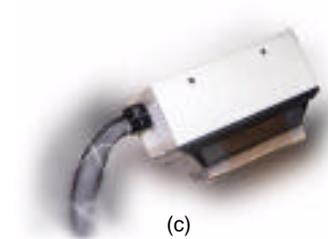
- ◆ Spin-off Achievement Award winner at 1997 Technology 2007.
- ◆ 14th Fastest growing Technology Company in New England according to a Deloitte & Touche 1999 Survey.
- ◆ Numerous JENTEK GridStation System sales for coating applications closed prior to Phase II completion, with growing sales continuing, including sales to NASA GRC, Air Force, Army, Navy, and major OEMs.
- ◆ Significant non-SBIR R&D funding from several government and private sector sources, including a recent \$25 million IDIQ contract from the Navy.
- ◆ New OEM approved method for cold work quality assessment on C-130 and P-3 propellers currently in use by the Air Force and Navy.



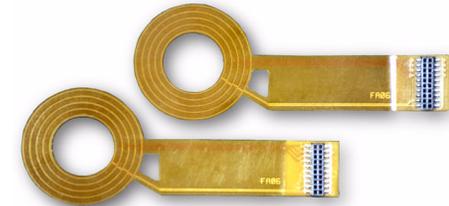
(a)



(b)



(c)



(d)

(a) MWM for engine disk slot inspection; (b) conformable MWM for cold work quality control inspection, (c) 37-Channel probe with conformable MWM-Array for wide-area high-resolution imaging, and (d) surface mountable MWM-Rosettes for detection of cracks around fasteners for in-service aircraft inspections at difficult-to-access locations and for fatigue testing.

## COMMERCIALIZATION (cont.)

- ◆ New product line introduced in 2000, including new high resolution MWM-Arrays for imaging/detection of surface and subsurface damage (cracks, creep, corrosion, etc.), manufacturing quality control, and imaging of geometric features.
- ◆ New rapid solution turnaround service provides customers with rapid solutions (software and hardware) for both standard and customized applications of JENTEK technology.

### Points of Contact:

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## GOVERNMENT/SCIENCE APPLICATIONS

- ◆ Currently in third year of an FAA Program to detect cracks in engine disk slots using conformable high-resolution eddy current arrays, including rapid high throughput scanning with relatively low cost systems.
- ◆ Ongoing Air Force program to detect cracks in fretting region within slots of F-110 engine disks; successful demonstration of capability completed.
- ◆ Recently awarded Phase II SBIR with the Air Force, WPAFB, for detection and characterization of buried hard alpha inclusions and in titanium castings and surface mapping of alpha case.
- ◆ Ongoing Phase II SBIR with the Air Force, WR-ALC, for fatigue monitoring using permanently mounted eddy current sensors, including linear MWM-Arrays and MWM-Rosettes.
- ◆ Service Life Assessment Program subcontract to Lockheed-Martin for the Navy P-3 fatigue testing program with permanently mounted on-line MWM-Arrays for crack initiation/growth monitoring; eighteen sensor kits delivered for mounting in difficult-to-access locations for continuous monitoring during an up-coming full-scale fatigue test.
- ◆ Air Force program for C130 propeller cold work quality assessment at WR-ALC; three systems delivered. Upgrades being delivered in an ongoing contract including coating characterization module, shot peen quality assessment module, crack detection support tools, and software environment upgrades.
- ◆ Navy program for P-3 propeller cold work quality assessment; three production systems delivered.
- ◆ System delivered to the Army CCAD for shot peen quality assessment.