FOR IMMEDIATE RELEASE

TEST DEVICES INC. ACHIEVES FIRST-EVER DYNAMIC THERMAL MECHANICAL FATIGUE (TMF) TEST USING ITS ADVANCED SPIN™ ROTATIONAL TESTING PLATFORM

Hudson, MA, January 26, 2009 – Test Devices Inc. (TDI), a dynamic materials testing company that provides state-of-the-art materials testing services and products, announced that it has achieved the first-ever thermal mechanical fatigue (TMF) dynamic test, which was conducted on a turbine engine bladed high compressor component. The test is the first of its kind in the industry, and was performed using TDI’s exclusive Advanced Spin™ rotational testing platform.

TDI’s pioneering Advanced Spin thermal mechanical fatigue testing is able to conduct complex tests that simultaneously measure the combination of thermal and mechanical stresses on a component in a cyclic fashion. The testing more accurately simulates low cycle fatigue (LCF) conditions by combining thermal gradients – that is, the cooler-to-hotter temperature differences in the component from its bore to its live rim – with rotational speed, or mechanical load, on the component being tested. Current LCF testing methods use isothermal conditions, which do not account for the severe stresses experienced during rim-to-bore thermal gradient conditions.

Using Advanced Spin TMF testing, the actual performance of components under real-world conditions, such as high compressor bladed assemblies, can be replicated and analyzed with extremely high accuracy.

Robert L. Murner, president of Test Devices Inc. explained the benefits of the company’s breakthrough in TMF dynamic testing: “Because the Advanced Spin platform measures both thermal gradients and mechanical stresses simultaneously under realistic operational conditions, the data generated by our Advanced Spin testing provides a far more accurate picture of component and engine performance than previous methods have been able to deliver.”
The chart above is an example of the information that can be obtained from a thermal mechanical fatigue test. The graph shows that as the speed increases, the rim and bore temperatures increase correspondingly. However, the rim and bore temperatures do not reach their highest point until the speed is held at approximately 12,000 rpm. The large gap between the rim and bore temperature accurately illustrates normal engine operation, in that the rim area would be hotter than the bore since it is in the gas path.

In addition to thermal mechanical fatigue testing, TDI’s Advanced Spin rig offers many additional capabilities, such as measurement and verification of the dimensional elastic/plastic growth of a part at operational speeds; full field strain measurement; and thermal gradient measurement. For all testing, complete, detailed certification and test documentation is provided.

TDI’s Advanced Spin thermal mechanical fatigue testing capability is currently available at its newly expanded Hudson, MA facility.
About Test Devices, Inc.
Test Devices, Inc. (TDI) is a leading dynamic materials testing company that provides state-of-the-art services and products for the aerospace, energy, and other industries. TDI’s Dynamic Spin™, Advanced Spin™, and Standard Spin testing services replicate the most demanding real-world operational conditions with extremely high precision, and provide comprehensive, accurate test data. TDI’s testing competencies include: axial/radial thermal gradient; data-intensive Low Cycle Fatigue (LCF); blade dynamic/static stress (Goodman) and damper validation; crack initiation/growth studies; High Cycle Fatigue (HCF) to failure; HCF/LCF interaction; and elastic/plastic radial growth at speed.

TDI has more than 30 years’ experience in implementing cost-effective, on-time testing programs that range from extremely specialized applications to high volume production proof spins. In addition to its in-house services, TDI manufactures a wide range of spin testing rigs and equipment. The company moved into a new, expanded facility in 2008 in order to better serve its customers. For more information, contact Test Devices Inc. at 978-562-4969 or visit www.testdevices.com.

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