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A new ultrasonic fatigue testing device for biaxial bending in the gigacycle regime

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**A new ultrasonic fatigue testing device for biaxial bending in the gigacycle regime****C. Brugger<sup>1,\*</sup>, T. Palin-Luc<sup>1</sup>, P. Osmond<sup>2</sup> and M. Blanc<sup>2</sup>**

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**ABSTRACT.** *A new fatigue testing device has been developed to test specimens under biaxial loading at 20 kHz. The specimen is a flat smooth disc. It is placed on a torus frame and cyclically loaded in compression at the center of its upper face. Consequently disc bending generates a biaxial proportional stress state at the center of the specimen lower face. Any positive loading ratio can be applied. This device has been tested and is well functioning on specimens made of a cast aluminum alloy used to produce cylinder heads. Preliminary results in VHCF regime are compared with literature results obtained under similar stress state but in HCF regime and at 20 Hz only.*

**Keywords:** very high cycle fatigue; biaxial stress; cast metal; aluminum alloy; experimental technique.

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