

TOP precisio

Lockheed Martin establishes a modern force transducer calibration center

Doc Ardrey, Ardrey Inc., USA

To be sure that their force transducers, despite being economical are still accurate, most aerospace centers take extensive measurements in their own factories. Reliable force transducers are at the heart of structural testing for aerospace components and are indispensable for their integrity, performance and safety.

Lockheed Martin ...

... has established a new measurement center in the John C. Stennis Space Center, MI, USA and set up its force measurement division to the very highest standards.

"Force transducers are testing devices for the integrity of aircraft cells, and here we are testing the testing devices"

Brian King, measurement engineer at the Lockheed-Martin Integrated Metrology Center (LMIMC) in Stennis, USA

The laboratory received its accreditation from the American Association for Laboratory Accreditation.

USA debut for high-precision transfer force transducers

Among the most important instruments in the new measurement center are the TOP transfer force transducers and the DMP40 precision amplifier from HBM. The TOP transfer force transducers are already in use in the national metrological institutes of Europe and are 10-times more accurate than the previous best force transducers according to ISO 376 Class 00. They were developed for applications at the top of the calibration pyramid, for comparisons between national calibration laboratories.

The laboratory accepts and calibrates force transducers from more than 100 Lockheed-Martin facilities worldwide and also provides this service for other companies.

Force transducers with nominal loads up to 250 t are calibrated

The LMIMC uses two Morehouse force presses to perform the calibrations. The two presses and all the reference transducers from HBM are designed both for tensile force and compressive force testing. The relevant analog measurement signals arrive at HBM's DMP40 precision amplifier, which outputs the measured values at an accuracy of 0.0005% and a resolution of 2,000,000 digits.

Some of the force transducers to be calibrated fit in the palm of your hand, others weigh almost 230 kg. The nominal loads are between a few grams and several tons.

Increasing throughput while retaining the same high level of accuracy

It is quick and easy to switch between test piece capacities, as the measuring amplifier can be programmed for eight load ranges and has the HBM catman®Express measurement software available.

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From top to bottom:

Fig. 1:
HBM TOP transfer force transducers

Fig. 2 and 3:
A load cell calibration structure in the new
Lockheed-Martin Integrated Metrology Center

Fig. 4:
Force transducer calibration
with the DMP40 amplifier



"Because the amplifier can be programmed, we have already saved a great deal of time"

Brian King

**High-precision measurement package,
more accurate inspection**

Although HBM's TOP force transducers are new to the American market, they have been in use for many years as reference standards in national metrological institutes in Europe and for international force comparison measurements. Their repeatability is ten times more precise than is required under ISO 376, making their accuracy better than Class 00. The expected long-term stability, with a variation of less than 0.002% per year is also outstanding.

The DMP40 is used worldwide in national metrological institutes as the test standard. ■



...with hbm