

Press Release

IABG Acoustics Laboratory

The IABG acoustics laboratory, which commenced operations at the beginning of 2001 in Ottobrunn near Munich, offers all the technical and spatial prerequisites for the qualification of large space structures, their components and also typical aeronautical objects with respect to acoustic loading from 130 dB to 156 dB OASPL. Small components can be tested with acoustic pressure of up to 170 dB OASPL. Thus, in particular, the enormous acoustic loads occurring during the launch of space vehicles can be realistically simulated. Investigations into acoustic fatigue and acoustic stability in accordance with MIL-STD as well as basic investigations into sound propagation, absorption and shielding similarly belong to the self-evident performance spectrum of the laboratory.

The new test unit has been structurally fully integrated into the facilities in the ESA-coordinated Space Test Centre in existence since 1972. Thereby it is ensured that a complete series of qualification tests can be conducted in **one** test centre and under **one** roof, without having to leave the Class 100.000 clean conditions. A separate control and measurement room, an own preparation hall with an area of 125 m² and a measurement room for customers are further parts of the infrastructure of the new acoustics laboratory.

The heart of the acoustics laboratory is a an acoustic chamber with a volume of 1378 m³ and dimensions measuring H x B x L = 15,2 m x 10,6 m x 8,6 m. During the tests, several acoustic generators with an acoustic capacity of up to 90 kW ensure that test objects can be exposed to a diffuse sound field of up to 156 dB OASPL. The acoustic generators are supplied for this by three compressors with an air volume of 6 kg/s at a pressure of about 2 bar. The control of the acoustic generators is undertaken by two separate independent systems and permits the genera-

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tion of the required sound spectra in the range of 30 Hz to 10 kHz. The control and metrological facilities offer, in addition to 24 microphone channels, 256 measurement channels for recording the vibration responses and the metrological data processing is state-of-the-art.

In addition to the acoustic chamber, a high energy acoustic channel with a cross-section of 0.8 m x 1.2 m has been installed in which progressive sound fields of up to 170 dB OASPL can be generated practically continuously over longer periods and which is suitable for acoustic stability investigations on extremely stressed parts and components.

Similarly the laboratory is suitable for the performance of thermo-acoustic tests. Thus, in a specially fitted high-energy acoustic channel with a flame heater, sound fields can be generated with an acoustic pressure of up to 160 dB OASPL can be combined with simultaneously impacting thermal loads on the test specimen of 1 300 kJ /m²s. This realistically simulates the environmental conditions for re-entry into the Earth's atmosphere. The maximum possible surface temperature amounts to 1 000 °C.