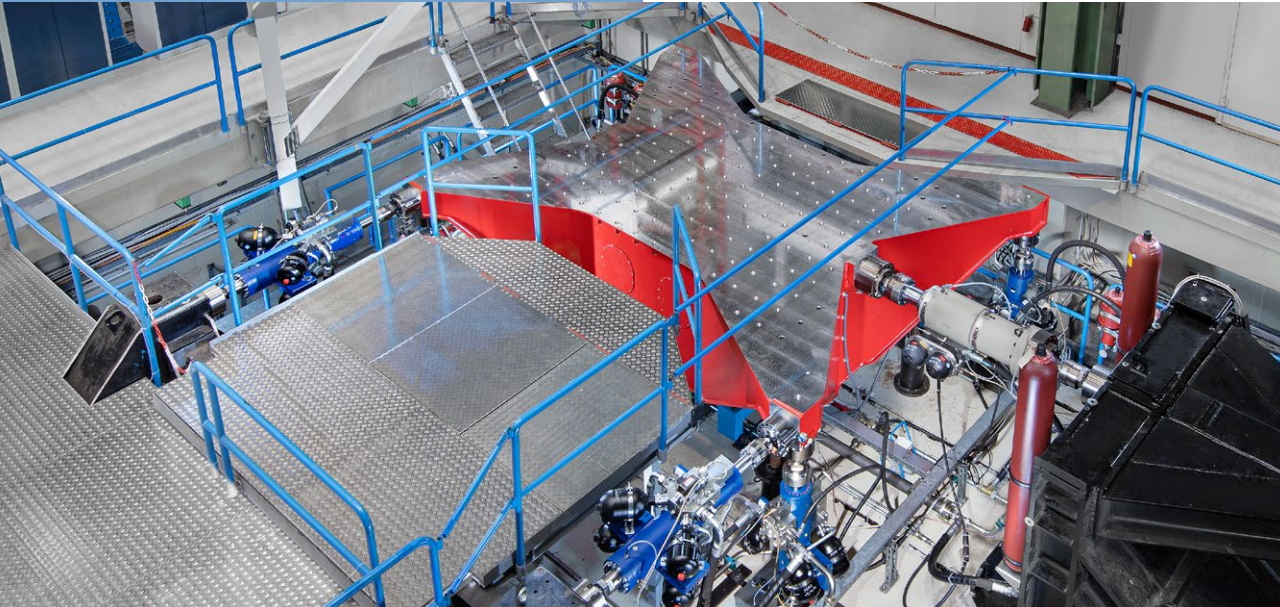


Versatile. Flexible. Efficient.



Multi-axis vibration testing and earthquake simulation

IABG Fatigue Strength Laboratory
(IBL)

Prepared for all events

How reliable is your product in cases of earthquakes? Vibration tests reveal it. For many years, product manufacturers and plant operators have had the experimental proof for the qualification of components carried out on the HyMAS (Heavy Multi-Axial Shaker) multi-axis (6 DOF) vibration test bench. To ensure effectively technical failures, more than 1,000 individual tests were conducted for:

- (Nuclear) Power plant and medical technology (seismic, sine sweep)
- Energy, aviation, rail technology (random tests, sine beats)
- Automotive (load time history tests)

In the field of vibration testing and earthquake simulation, IABG is accredited according to DIN EN ISO 17025. We actively participated in the IEEE 693 as well as IEC/IEEE 60980-344 standard for seismic qualification.

Our experts will advise and provide you with a customized engineering solution. Our aggregated services:

- Qualification campaigns
- Uniaxial-electrodynamic vibration tests
- Analysis and simulation
- Strength tests
- Climatic tests/environmental simulations
- Material and damage analyses

IABG is the only company in Europe listed by the OSHPD and is thus authorised to perform certification processes.



* OSHPD

California's Office of Statewide Health Planning and Development (OSHPD) is the leader in collecting data and disseminating information about California's healthcare infrastructure. OSHPD promotes an equitably distributed healthcare workforce, and publishes valuable information about healthcare outcomes. OSHPD also monitors the construction, renovation, and seismic safety of hospitals and skilled nursing facilities and provides loan insurance to assist the capital needs of California's not-for-profit healthcare facilities.

The technical solution

Normally, vibration loads occur geographical independent. Since the test specimens have to be tested according to their special mounting and location, the experimental vibration investigation is carried out with simultaneous multi-axial excitation.

Our shake-table enables the movement in all six degrees of freedom by means of its four vertical and three horizontal hydraulic actuators. Within its performance and configuration limits, the test stand can be operated with the following test signals:

| Designation | Standards (examples out of the accreditation) |
|----------------------------|---|
| Sine and sine sweep | IEC 60068-2-6, IEEE 693 |
| Time-history and sine-beat | IEC 60068-2-57, IEC/IEEE 60980-344 |
| Random | IEC 60068-2-64, IEC 61373 |

Random and transient acceleration profiles are generated out of different requirements, such as required response spectra or power spectra density. Real-time earthquake profiles (e.g. El Centro, San Fernando, Landers, VERTEQII) are stored in the signal library of the process computer.

In order to meet the high standard requirements in terms of multi-axis testing, IABG generates and iterates the time-histories according state of the art.



Accreditation certification
DIN EN ISO/IEC 17025 for
Fatigue Strength Laboratory

[→ PDF download](#)



The accreditation is only valid for the scope of accreditation listed in the annex to the certificate D-PL-12001-02-00.



especially in extreme situations

Energy

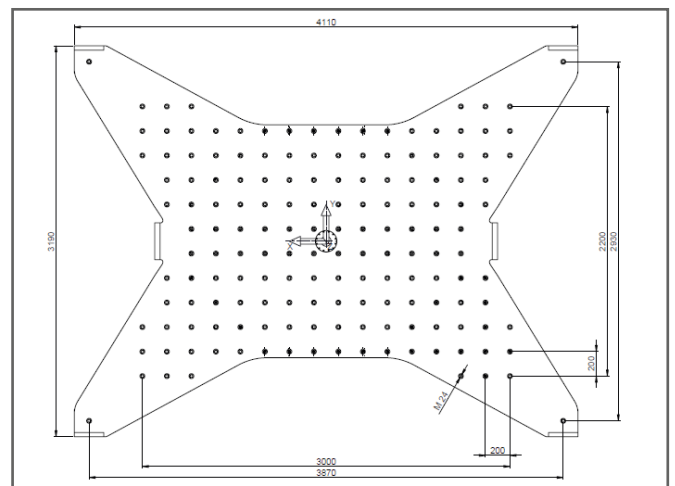
- Simulation of synthetic multiaxial real-time earthquake histories
- Reproduction of transient events (wind gust loads, aeroplane crashes on buildings, separation of building components due to blast-offs)

Automotive: Multiaxial vibration tests on car and commercial vehicle components

Transport: Vibration and shock tests on electronic equipment, equipment on rail vehicles

Aeronautics: Windmilling tests (Fan Blade Out, Sustained Engine Imbalance)

Wind: Vibration, shock and random tests



Performance characteristics of HyMAS test bench

| | | | |
|--------------------------|---|-----------|------------------|
| Bed dimensions | | 4.1 x 3.2 | m |
| Clamping area | | 2.5 x 2.2 | m |
| Test bed weight | | ≈ 4,900 | kg |
| Maximum test item weight | | ≤ 14,000 | kg |
| Frequency range | | 0.1 - 120 | Hz |
| Eigenfrequency of base | | 0.7/1.2 | Hz |
| Number of cylinders | | | |
| horizontal | x | 1 | - |
| horizontal | y | 2 | - |
| vertical | z | 4 | - |
| Cylinder output power | | | |
| | x | 250 | kN |
| | y | 160 | kN |
| | z | 160 | kN |
| Maximum amplitude | | | |
| | x | ± 125 | mm |
| | y | ± 125 | mm |
| | z | ± 75 | mm |
| Maximum velocity | | | |
| | x | 0.60 | m/s |
| | y | 0.60 | m/s |
| | z | 0.60 | m/s |
| Maximum acceleration | | | |
| | x | 50 | m/s ² |
| | y | 50 | m/s ² |
| | z | 80 | m/s ² |
| Power supply | | 850 | l/min |
| Oil pressure | | 280 | bar |





AUTOMOTIVE



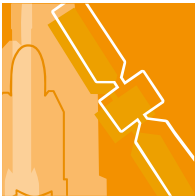
INFOCOM



MOBILITY, ENERGY & ENVIRONMENT



AERONAUTICS



SPACE



DEFENCE & SECURITY

IABG. The Future.

IABG offers integrated, ground-breaking solutions in the sectors Automotive • InfoCom • Mobility, Energy & Environment • Aeronautics • Space • Defence & Security. We provide independent and competent consulting. We implement with future viability and target orientation. We operate reliably and sustainably. Our success is based on an understanding of market trends and requirements, on our staff's technological excellence and a fair relationship with our customers and business partners.

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