

Calibration Laboratory D-K-15183-01-00 entitled to issue DAkKS and ISO certificates

The DAkKS calibration laboratory with SPEKTRA is accredited for measurand acceleration and acoustical quantities in conformity with international standard DIN EN ISO/IEC 17025. With calibration systems for primary- and secondary calibration the laboratory is able to carry out calibrations with best possible measuring uncertainty.

**Feature of the accredited DAkKS calibration laboratory:
Vibration calibration with a measuring uncertainty
from 0.15 % at primary and from 0.5 % at secondary level.**

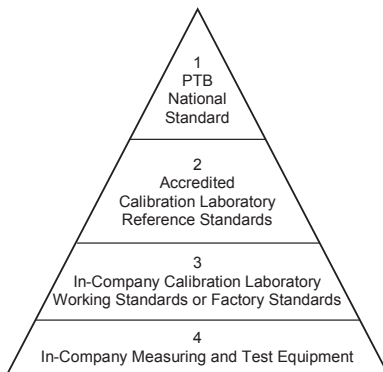
Devices to calibrate are sensors, measuring equipment and calibrators from the fields vibration and acoustics i.e.:

- Vibration sensors (also optical) and measuring microphones
- Vibration meters, laser vibrometers and sound level meters
- Vibration and acoustic calibrators
- Signal conditioners for charge and voltage

As result of the calibration DAkKS or factory calibration certificates will be issued. Calibration certificates of accredited laboratories will be accepted internationally within the framework of ISO 9000 and the MRA (Mutual Recognition Arrangement).



Accreditation certificate of SPEKTRA DAkKS calibration lab D-K-15183-01-00



Hierarchy of metrological infrastructure in industrial measurement



View of a calibration stand in the SPEKTRA DAkKS laboratory

Calibration of

- Geophones from 0.2 Hz (also very low frequ. from 0.1 Hz)
- Human vibration meters
- Crash sensors with shock excitation
- Dynamic force sensors
- Impact hammers

Sound pressure calibration of

- Microphones and
- Sound level meters

Performance spectrum sound pressure calibration – pressure chamber and free field

Physical Quantity	Object of Calibration	Measuring Conditions		Calibration Result
		Frequency	Sound Pressure Level	
Sound Pressure Level (Pressure Chamber)	1/4", 1/2", 1"- Measuring microphones, Pistonphones, Acoustic calibrators	250 Hz 1,000 Hz 31.5 Hz ... 2 kHz	124 dB 94 dB / 114 dB 84 dB ... 114 dB	Pressure non load or factory transfer value of measuring microphones; Display differences of sound level meters; Sound pressure level, frequency and distortion factor of acoustical calibrators and pistonphones
Sound Pressure Level (Free Field)	All types of measuring microphones, Sound level meters, Sound level measuring chains	125 Hz ... 20 kHz	74 dB ... 94 dB	Free-field non load or factory transfer value of measuring microphones; Display differences of sound level meters

DAkKS Calibration

Traceable to the Physikalisch-Technische Bundesanstalt (PTB) and to NIST via MRA

Object of Calibration	Calibration Method	Physical Quantity	Measurement Range	Calibration Result
Vibration sensors charge, ICP [®] , voltage, capacitive and piezo-resistive types for quantities acceleration, velocity or dis- placement	Secondary calibration with Sine excitation acc. to ISO 16063-21	Vibration • Acceleration • Velocity • Displacement	0,1 Hz ... 20 kHz 0,01 m/s ² ... 500 m/s ² horizontal or vertical	• Transfer coefficient (modulus) • Angle of phase shift
Vibrationmeter for machines, or impact on human bodies, vibration calibrators, belt tension measuring device, optical vibrationmeter	Secondary calibration with Sine excitation acc. to ISO 16063-21 Human vibration calibration acc. to ISO 8041	Vibration • Acceleration • Velocity • Displacement	0,1 Hz ... 20 kHz 0,01 m/s ² ... 500 m/s ² horizontal or vertical	• Transfer coefficient (modulus) • Angle of phase shift • Deviation of displayed value
Reference sensors (primary calibration using laser vibrometers)	Primary calibration with Sine excitation acc. to ISO 16063-11	Vibration • Acceleration • Velocity • Displacement	0,1 Hz ... 20 kHz 0,01 m/s ² ... 10 m/s ² horizontal or vertical	• Transfer coefficient (modulus) • Angle of phase shift
Geophones, seismometers with / without vibration sensor	Secondary calibration with Sine excitation acc. to ISO 16063-21	Vibration • Acceleration • Velocity • Displacement	0,2 Hz ... 80 Hz 0,01 m/s ² ... 30 m/s ² horizontal up to 5 kg vertical up to 3 kg	• Transfer coefficient (modulus) • Angle of phase shift • Deviation of displayed value
Signal conditioner, measurement amplifier for charge, ICP [®] , voltage, capacitive or piezo-resistive types of sensors	Secondary calibration with Sine excitation	• Charge • Voltage	0,2 Hz ... 50 kHz 0,1 pC ... 10,000 pC 1 mV ... 30 V	• Transfer coefficient (modulus) • Angle of phase shift • Deviation of displayed value
Shock accelerometers charge, ICP [®] , voltage, capacitive or piezo-resistive types	Secondary calibration with shock excitation acc. to ISO 16063-22	Shock acceleration	0,2 km/s ² ... 2 km/s ² 1 ms ... 10 ms	Transfer coefficient (modulus)
High-g-shock accelerometers charge, ICP [®] , capacitive or piezo-resistive types	Primary or secondary calibration with shock excitation	Shock • Acceleration • Velocity	0,2 km/s ² ... 100 km/s ² 4 ms ... 30 μs	Transfer coefficient (modulus)
Impact hammer	Secondary calibration with shock excitation	Force	10 N ... 500 N	• Transfer coefficient (modulus)
Laser vibrometer with velocity, displacement or acceleration output as well as Reference laser vibrometer	Primary calibration with Sine excitation acc. to ISO 16063-41	Vibration • Acceleration • Velocity • Displacement	0,1 Hz ... 20 kHz 0,01 m/s ² ... 250 m/s ²	• Transfer coefficient (modulus) • Angle of phase shift • Deviation of displayed value

Factory Calibrations

Object of Calibration	Calibration Method	Physical Quantity	Measurement Range	Calibration Result
Static accelerometers	Calibration in the earth gravity field	Static acceleration	Calibration at 9.81113 m/s ²	Transfer coefficient (modulus)
Inclinometer	Calibration by tilting in the earth gravity field	Static acceleration	0 ° ... 360 ° 0,01 ° angular resolution	Transfer coefficient (modulus)
Temperature Calibration	Secondary calibration at various temperatures	Acceleration	-40 ° ... 120 °	Transfer coefficient (modulus)

All data are subject to change without notice

January 2013