HBK
HOTTINGER BRÜEL & KJÆR

PRECISION. PERFORMANCE. CLARITY.

Measurement Solutions for the Audio Industry

With a proud heritage rooted in the legacy of Brüel & Kjær, Hottinger Brüel & Kjær (HBK) continues to lead in sound and vibration measurement. For over 80 years, we've set the standard in acoustic excellence – helping industries worldwide deliver high-performing, perceptually superior products.

Combining decades of technical expertise with real-world insight, HBK offers a complete suite of solutions across the audio measurement chain. From design and requirement setting to production testing and after-sales support, we help engineers validate, refine, and optimise performance at every stage.

Whether you're developing consumer electronics, enhancing vehicle infotainment, or advancing medical devices, HBK provides the tools and insights to ensure acoustic integrity, compliance, and customer satisfaction.

Comprehensive support at every stage of your product journey

HBK DELIVERS TAILORED SOLUTIONS THAT SUPPORT YOUR PRODUCT'S ENTIRE LIFE CYCLE – FROM CONCEPT AND DEVELOPMENT TO PRODUCTION, COMPLIANCE, AND AFTER-SALES – ENSURING QUALITY, PERFORMANCE, AND CUSTOMER SATISFACTION AT EVERY STAGE.

Benchmark testing

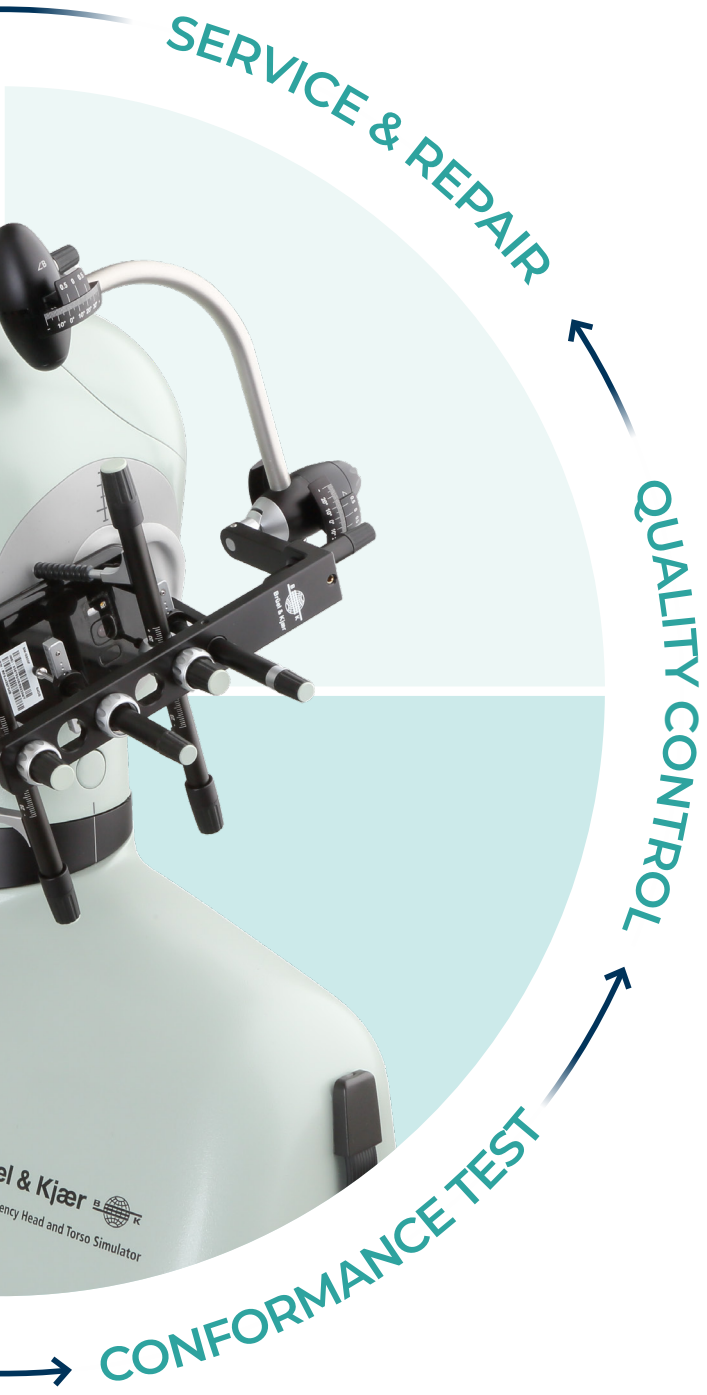
Benchmark testing is essential for evaluating key product parameters, comparing both manufacturer and competitor offerings. It also aids in selecting components based on specific performance characteristics. HBK analyzer platforms feature a flexible, open architecture that supports both traditional objective measurements and subjective evaluations. With powerful and versatile data management capabilities, they make benchmarking straightforward and efficient.

Requirement setting

To align with customer preferences and to define product differentiators, requirements are established across a broad range of parameters. Each feature is carefully characterised and quantified to ensure measurability. Subjective evaluation methods can be employed to predict end-user preferences. HBK's versatile sound and vibration test systems support this work with a wide array of advanced objective analysis tools. Sophisticated graphical presentation techniques further enable precise and effective characterisation of new products.

Design optimisation

In today's competitive environment, time-to-market is as crucial as product performance. The design optimisation phase plays a key role, as it defines the fundamental quality and cost of the product. This is also when manufacturing test methods and procedures are established. With our flexible suite of acoustic and vibration tools, potential issues can be identified early, enabling timely product improvements. In addition, our comprehensive analysis and documentation capabilities ensure the optimal design of testing processes during manufacturing.



After-sales service

In today's market, after-sales service is essential for maintaining long-term customer relationships. Effective service and repair not only extend product life but also build trust and confidence. Reliable performance documentation is key to supporting this relationship. HBK's electroacoustic test systems are designed to verify and document product performance with precision. Integrated reporting tools facilitate the quick generation of standardised reports, while the intuitive Microsoft® Windows®-based interface minimises staff training requirements and costs.

Quality control

The goal of quality control is to guarantee product quality while maximising production yield and uptime. Achieving this requires precise testing and calibration procedures, which enable selective testing and significantly reduces false rejects. Production-line conditions are continuously monitored using real-time statistical analysis of collected data. With HBK's advanced solutions for both on-line and off-line quality control, you can confidently meet product specifications and optimise throughput across your production line.

Conformance testing

Conformance testing ensures that new equipment meets relevant industry standards as non-compliance can prevent a product from entering the market. HBK offers a comprehensive range of electroacoustic test systems designed to deliver reliable, and comparable results, supporting standardised testing, calibration, and documentation procedures. A broad selection of standardised couplers provides a consistent and well-controlled acoustic interface.

Precision acoustic solutions for everyday and critical technologies

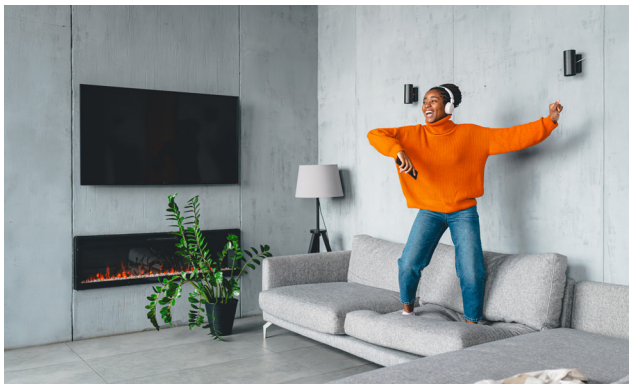
FROM CONSUMER ELECTRONICS TO CRITICAL COMMUNICATION SYSTEMS, ACOUSTIC PERFORMANCE IS KEY TO QUALITY AND SAFETY. HBK PROVIDES PRECISE, REAL-WORLD MEASUREMENT SOLUTIONS TO HELP MANUFACTURERS MEET THE HIGHEST STANDARDS FOR SOUND CLARITY, PERFORMANCE, AND COMPLIANCE.

Smartphones: balancing design and acoustic precision

Modern smartphone design is a delicate trade-off between appearance, cost, weight and acoustic performance. Using inappropriate materials or enclosures that are too thin can lead to uncontrolled resonances and poor acoustic characteristics. Selecting the right transducers to complement the mechanical design is equally important. HBK brings over 80 years of expertise in vibration and acoustic testing to help you manage these challenges. From ensuring compliance with current standards to contributing to the development of future ones, we provide proven methods and tailored solutions to optimise your acoustic design.

Entertainment systems: enhancing the listening experience

In modern loudspeaker design, there is a high emphasis on sound quality, ensuring that customer preferences are always met. From loudspeakers and surround sound systems to TVs, headphones, microphones, and game consoles, acoustic performance plays a critical role in user experience. Whether testing the acoustic and vibration performance of the smallest micro-speaker in a doll or the most powerful surround sound system in a movie theatre, HBK has the solution.



Infotainment systems: precision-tuned for in-vehicle audio performance

In modern vehicles, activities such as listening to music, engaging in conversations with passengers, or communicating remotely via the in-car system all rely heavily on the performance of the infotainment system. Optimising this system is a complex task that requires precise tuning. HBK provides advanced instrumentation to support infotainment system manufacturers in achieving optimal sound quality and communication performance.

Wearable devices: speech clarity on the move

The increasing use of wearables – such as smartwatches for on-the-go communication and body-worn audio badges used by warehouse personnel, first responders, and others who need hands-free operation – demands reliable speech quality under challenging conditions. HBK offers measurement solutions that deliver both fundamental electroacoustic parameters and advanced speech analysis, helping manufacturers ensure clear and consistent communication.

Hearing aids: accurate testing for innovation

Today's hearing aids are more sophisticated than ever, leading to a dramatic increase in the demand for more tests in shorter timeframes. We offer a comprehensive range of measurement instrumentation for both standardised and customised in-house testing of all types of hearing aids available on the market today.

Headphone and headsets: meeting demands for high-fidelity and compliance

Today's high performance headsets and headphones are expected to provide exceptional audio quality, while enabling communication in various challenging noise environments. Features like High Resolution Audio and Active Noise Cancellation have become essential. Additionally, these devices must meet mandatory safety requirements and international performance specifications. HBK provides solutions for the necessary electroacoustic measurements to ensure these standards are met.

XR glasses: enhancing realism

Whether for virtual reality, augmented reality, or extended reality applications, delivering an immersive audiovisual experience is critical. In scenarios involving human or artificial speech, synchronisation between visual and auditory content must be ensured and documented through measurements during design and implementation. HBK provides electroacoustic solutions to determine the relevant and fundamental acoustical performance parameters for these glasses.

Public address and alarm systems: ensuring clear, distortion-free sound

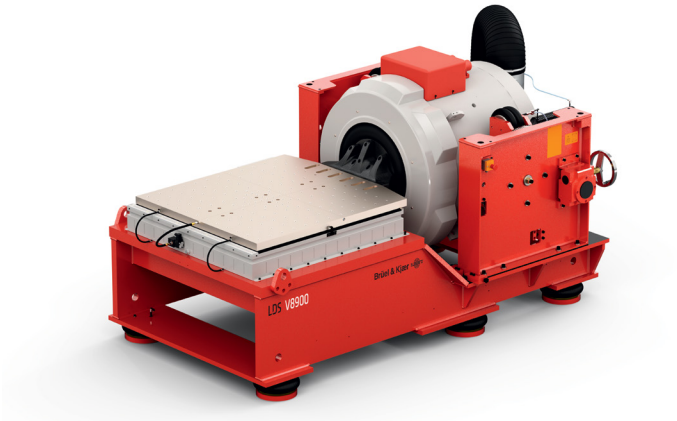
Public address and alarm systems are vital for safety and communication in public spaces. Clarity and low distortion are essential for effective alerts. HBK offers comprehensive acoustic measurement solutions – covering sound power, sound pressure, directivity, loudness levels, speech intelligibility, and more – ensuring compliance with global standards and optimal performance in critical applications like fire alerts and emergency sirens.

Applications, solutions and products

AT HBK, WE DELIVER ADVANCED SOLUTIONS THAT HELP ENGINEERS OPTIMISE ACOUSTIC AND VIBRATION PERFORMANCE. FROM TESTING AND EVALUATION TO MATERIAL CHARACTERISATION AND MONITORING, OUR PRODUCTS AND SOLUTIONS PROVIDE PRECISE, RELIABLE MEASUREMENTS TO SUPPORT MODERN PRODUCT DEVELOPMENT.

Vibration testing

In both research and development as well as production, a wide range of vibration testing strategies is used to assess the reliability and quality of products and components. Reliability testing involves subjecting the unit under test to simulated environmental conditions. Common methods include accelerated life testing, accelerated stress testing, life cycle testing, and squeak and rattle. A portfolio of vibration exciters – in small, medium and large sizes – are available from HBK along with associated controllers.



The range of shakers will support packaged testing of small products such as earbuds as well as larger products such as televisions to be exposed to transport simulation testing, which are designed to simulate a product's journey from when it is boxed at the factory until it reaches the customer. The primary purpose is to ensure that the packaging will sufficiently protect the product and that the packaging itself can withstand the stress of transportation.

Sound quality evaluation

Consumers often perceive the sound of a product as a key indicator of its overall quality. Achieving desirable sound quality requires tools that can identify the specific characteristics of sound that align with consumer expectations. Jury evaluation tools allow both engineers and consumers to listen to and assess these sounds, enabling the definition of clear, objective, and achievable sound quality targets in engineering terms. An HBK suite of sound quality software provides a full suite of metrics – all seamlessly integrated into the BK Connect® multi-channel data acquisition environment.

By using combinations of various objective sound quality metrics to describe the outcomes of subjective evaluations, complex psychoacoustic phenomena can reliably be quantified in a repeatable way that gives clear engineering directions. Metrics such as stationary loudness, loudness percentiles, loudness level, time-varying loudness, binaural loudness, sharpness, fluctuation strength, roughness, articulation index, tone-to-noise ratio, prominence ratio and tonality form the basis for an objective characterisation.

Acoustic material characterisation

With the growing focus on noise control and the importance of sound quality in product design, acoustic material testing has become increasingly relevant to engineers, designers, and manufacturers across various industries. This process determines the acoustic characteristics of materials, including absorption, reflection, impedance, admittance, and transmission loss.

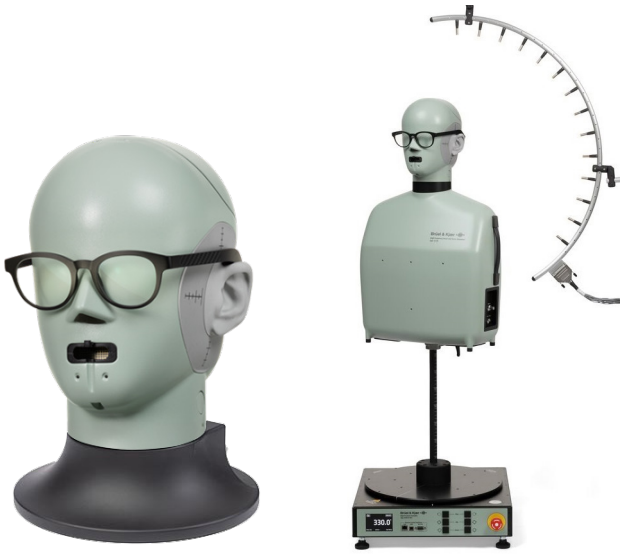
Testing is guided by international standards that define precise acoustic conditions and require specialised instrumentation to ensure accurate and repeatable results. Our acoustic material testing systems perform measurements according to international standards and calculate transmission loss based on transfer matrix representation. Simulation software can then help to predict the impact of specific noise control materials at an early stage in product development, once the acoustic characteristics of the materials are accurately known.

Ground vibration monitoring

The semiconductor manufacturing process is highly sensitive to vibration and requires specially designed facilities to manage heating, cooling, humidity, and vibration isolation. As semiconductor sizes decrease, the effects of vibration become increasingly critical. To address this, many semiconductor fabrication machines are now placed on active vibration isolation platforms or have built-in vibration isolation. HBK's complete solution for monitoring ground vibration levels, includes seismic accelerometers, LAN-XI data acquisition modules and Tescia® software – all integrated to accurately measure key parameters such as acceleration, velocity, and displacement.

Acoustic leakage profiling

Whether aiming to ensure privacy during conversations on smart devices or to optimise sound distribution in wearable technology like audio-enabled glasses, visualising the sound radiation pattern is key to understanding and improving acoustic performance. HBK offers a variety of microphone arrays, ranging from spherical to arc arrays, designed for measuring devices mounted on a Head and Torso Simulator (HATS) placed on a turntable, providing a full 3D sound perspective.



Acoustic noise detection

The ultimate sound experience of audio products can be compromised by acoustic noise from electronic components, especially in devices placed close to or inside the ear canal. To measure these unwanted but audible noises during manufacturing, HBK offers low-noise microphones and conditioning amplifiers.

Call to action

Reach out for a personalised consultation with our acoustics experts. We'll take the time to understand your unique challenges and provide tailored solutions to meet your needs. Visit www.hbkworld.com, email us, or call your local sales office for more information.

We provide exceptional validation tools that deliver actionable insights, enabling you to create solutions for a cleaner, healthier, and more productive world.

CONTACT US

ACCELERATE YOUR PRODUCT INNOVATION

HBK provides integrated solutions and domain expertise across the test and measurement product life cycle, bridging the gap between the physical world of sensors, testing and measurement and the digital world of simulation, modelling software and analysis.

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