

Sunroof NVH testing

m+p international's NVH solutions simulate real-world conditions in controlled laboratory environments and on the road

m+p international

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➤ Vehicles have to cope with a variety of road surfaces during their lifetime. In addition, the engine and driveline generate high levels of potentially damaging vibration. Therefore, noise and vibration tests are essential during design and product development to ensure the reliability, structural integrity and acoustic characteristics of not only the vehicle, but also its components. These tests involve the measurement and simulation of the extreme conditions that a product might encounter during its lifetime. This enables the manufacturer to gain confidence in the product's performance.

ACS (Advanced Comfort Systems) Group, based in France, is a global automotive component supplier with sites in Europe, Asia and the USA. The company manufactures sunshades, sliding windows and sunroofs. These components undergo comprehensive noise and vibration tests in the laboratory, on test tracks and on roads.

At its production and R&D site in Bressuire, France, ACS uses m+p international systems for environmental testing as well as noise and vibration analysis. The facility is equipped with a 10kN electrodynamic shaker, which is controlled by m+p VibControl software and an m+p VibPilot front-end. Vibration tests include

sinusoidal (fixed or swept) and random. The Advanced VibUtil module is used to automatically sequence several tests and to exchange status with a climatic chamber.

ACS also carries out vibration and durability tests on its automotive components using road load data, which is derived from real-world measurements. m+p's simulation software enables raw data in almost any format to be imported, viewed and edited to create a suitable drive file for the vibration test system. The m+p VibControl software provides unlimited time data replication with real time, closed-loop control. The road load simulation option for m+p VibControl works equally well with electrodynamic and hydraulic shakers to suit the frequency range of interest. When testing has been completed, m+p VibControl also provides flexible and comprehensive reporting tools. Test result data can be presented in a variety of pre-determined or customized formats, and include company logos where required; the data can also be forwarded to recipients using the ActiveX output.

For in-vehicle recordings and noise and vibration analysis, ACS uses m+p international's dynamic signal analyzer. The m+p SO Analyzer is a fully integrated solution for dynamic signal measurement, analysis and advanced reporting of all noise and vibration, acoustics and



ACS (ADVANCED COMFORT SYSTEMS)

ABOVE: Vibration test in a climatic chamber

BELOW: m+p VibPilot front-end for environmental testing and noise and vibration analysis



general dynamic signal applications. Comprehensive time and frequency analysis is available with both online and offline data processing. It offers a wide range of applications to satisfy all NVH needs including structural testing, modal analysis, rotational dynamics and acoustic analysis.

Acoustic testing conducted by ACS also includes sound quality analysis. This is essential for product refinement and diagnostics where sound quality metrics can be used to rank and evaluate different product designs. The sound quality metrics are based on Zwicker loudness according to ISO-532 and DIN-45631 and can be viewed as 2D, 3D or as color maps (spectrograms) for further detailed assessment. ◀