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Shape your product sound with Simcenter Testlab sound quality engineering

Solution brief

Siemens Digital Industries Software

One of the trends in product design and development is the increasing number of design variants that are offered to consumers. This trend puts pressure on the noise, vibration and harshness (NVH) engineers in many development and validation teams, who have to deliver test results faster and in a more efficient way. Regardless of their level of expertise, engineers need tools that help them achieve better results faster, while enabling them to maintain the same level of quality and confidence in their analyses and methods. The NVH and sound quality engineering capabilities of Simcenter Testlab™ software are designed to meet these requirements.

Increase productivity with operational NVH testing

Most acoustic or NVH engineers analyze data daily so their analysis tools must enhance efficiency. Benchmarking competitive products or verifying design variants against targets must be performed quickly, and they must have confidence in the results. The next-generation Simcenter Testlab platform, Simcenter Testlab Neo, offers easy-to-use data acquisition, clear and intuitive processing, automatic data visualization, interactive replay with filtering and state-of-the-art NVH and sound quality metrics to support daily engineering tasks. Simcenter SCADAS™ XS hardware brings a new dimension to NVH and sound quality testing. This portable measurement system fully supports high-quality binaural recording and stereo audio replay. It is an excellent data acquisition solution for sound quality analysis. Next to that, the Simcenter Testlab Scope app delivered with the SCADAS XS will allow you to document your measurements with video recordings. With Simcenter

Challenges

- Troubleshoot sound-quality issues
- Benchmark product against competition
- Increase productivity in NVH testing
- Properly evaluate the customer's perception of your product's sound

Solutions

- A 12+ channel personal data acquisition system for high-quality binaural recordings
- Calibrated and equalized audio replay with interactive, real-time filtering
- An intuitive, efficient sound quality analysis tool that delivers more insight
- Listening tests with jurors to clearly identify subjective preferences

Solution focus

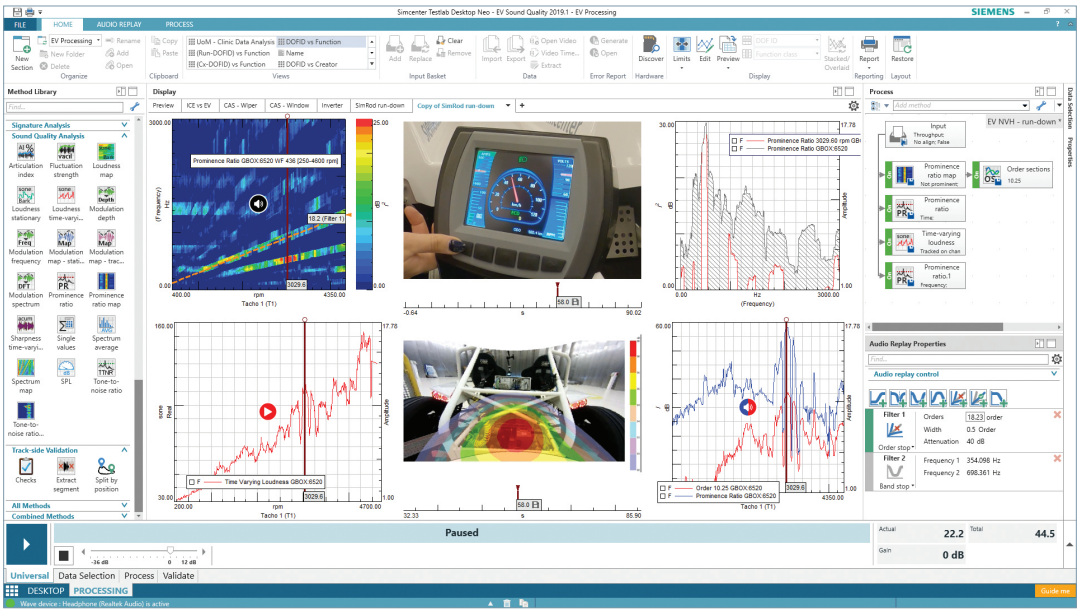
Results

- Achieve greater productivity and accelerate decision-making
- Understand the preferences and expectations of your customers
- Deliver great-sounding products to market faster

Testlab Neo, NVH engineers can calculate spectral maps, order sections and articulation index values, and compare them against targets in seconds. The Simcenter Testlab sound quality engineering solution follows your engineering workflow. It lets you validate measured data with high-quality audio replay functionality. It also streamlines the analysis of measurements by using process designer, a graphical, flow-based processing functionality that provides a clear and immediate overview of your data analysis workflow. Predefined processing flows are available to help you run accurate sound quality, NVH, vibration and durability analyses in parallel.

Get more insight while troubleshooting sound quality issues

Sound quality analysis goes beyond operational assessment. It is not uncommon that a noise issue occurs unexpectedly during the product development cycle. The cause could be anything; from a small design modification to a new material or component used during manufacturing. The Simcenter Testlab sound quality engineering solution delivers the full processing functionalities needed to quickly troubleshoot noise issues and easily share findings with colleagues and suppliers. Engineers can start by correlating the problematic sound with a frequency range, a particular tone or



an order. Using the interactive filtering during audio replay, they can precisely identify the origin of the problem. The advantages of process designer functionality go beyond implementation of recommended procedures or process automation. Both occasional and expert users can easily build processes that apply analyses differently; for example, depending on the measured channels or sensor type. The process designer allows you to automate simple and complex processes, but also to interactively design a process flow tailored to any test setup. The library of sound quality analysis tools includes a selection of metrics that apply the psychoacoustic theory to support the objective evaluation of sound perception. These metrics can help predict the consumer's annoyance based on the loudness and prominence ratio or evaluate the sharpness of flow-related noise sources as well as describe the sound characteristics with a time domain modulation analysis. Knowledge of the described methods is embedded in the software: Default parameters are set in order to always obtain high-quality results.

Calibrated and equalized audio replay with real-time filtering

Faithful audio reproduction is the basis of any sound quality evaluation. Simcenter Testlab Advanced Audio Replay gives you the possibility to easily calibrate any audio device, includes ASIO drivers support and frequency responses of most popular headphone models. Real-time audio filters can be used to interactively troubleshoot sound quality issues, conduct what-if scenarios and identify the critical frequency content.

Accelerate decisions with better sound evaluation

The Simcenter Testlab Jury Testing functionality complements the Simcenter Testlab sound quality engineering solution and offers a structured approach to subjective sound evaluation based on listening tests. Obtaining feedback from a panel of jurors allows you to break down sounds into descriptive features, such as expensive, sporty or comforting, and determine how these descriptors correlate with objective metrics that can be easily measured. With jury testing, sound quality engineering and the compact Simcenter SCADAS hardware, Simcenter provides an all-round sound quality solution, from data acquisition and operational assessment to the objective and subjective analysis of sounds. The exhaustive solutions meet the needs of all those involved in acoustic engineering, from simple assessment to advanced analysis. It is made to help every engineer design the optimal sound.

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