

# New Challenges for NVH: Acoustic Optimization for the Volkswagen ID. Family

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## Keynote-Speech

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## Outline

- The all new Volkswagen ID. Family
- BEV - Enhancing challenges for NVH
- Acoustic optimization using numerical methods
- Future perspectives

## Abstract

One Idea. Many models. From city cars and SUVs to 7-seaters, one central idea runs throughout them all. Although it sounds complicated, the Volkswagen modular electric drive matrix combines the vision of space, flexibility, comfort and dynamics and brings them together to create the ID. Family.

Due to the inherent quiet nature of electric motors, special challenges rise in the area of electric vehicle NVH optimization. In the past, combustion engine noise often masked annoying acoustic phenomena such as wind noise, HVAC acoustics and general vehicle structure-born noise.

Current NVH challenges include external wind noise reduction from side mirrors, A-pillars, etc. Furthermore, air conditioning ventilation noise and structure-born noise are addressed on a new level. In addition to riding comfort, harshness and rolling noise, the aeroacoustic optimization will be addressed in more detail.

In order to insure the highest level of product quality and comfort, simulation methods have become an integral part of the vehicle development process. At Volkswagen, special effort has been invested in researching and generating new aeroacoustic simulation methods to evaluate virtual prototypes. These new methods also contribute to lower development costs and a shorter time to market of new vehicle types like the Volkswagen ID. Family.

This presentation will give a special focus on the vehicle side mirror which is prone to generate broadband noise and radiate resonant frequencies which directly affect driver and passenger comfort. New aeroacoustic methods such as numerical beamforming for external noise source identification and whistle noise prediction will be presented in detail.