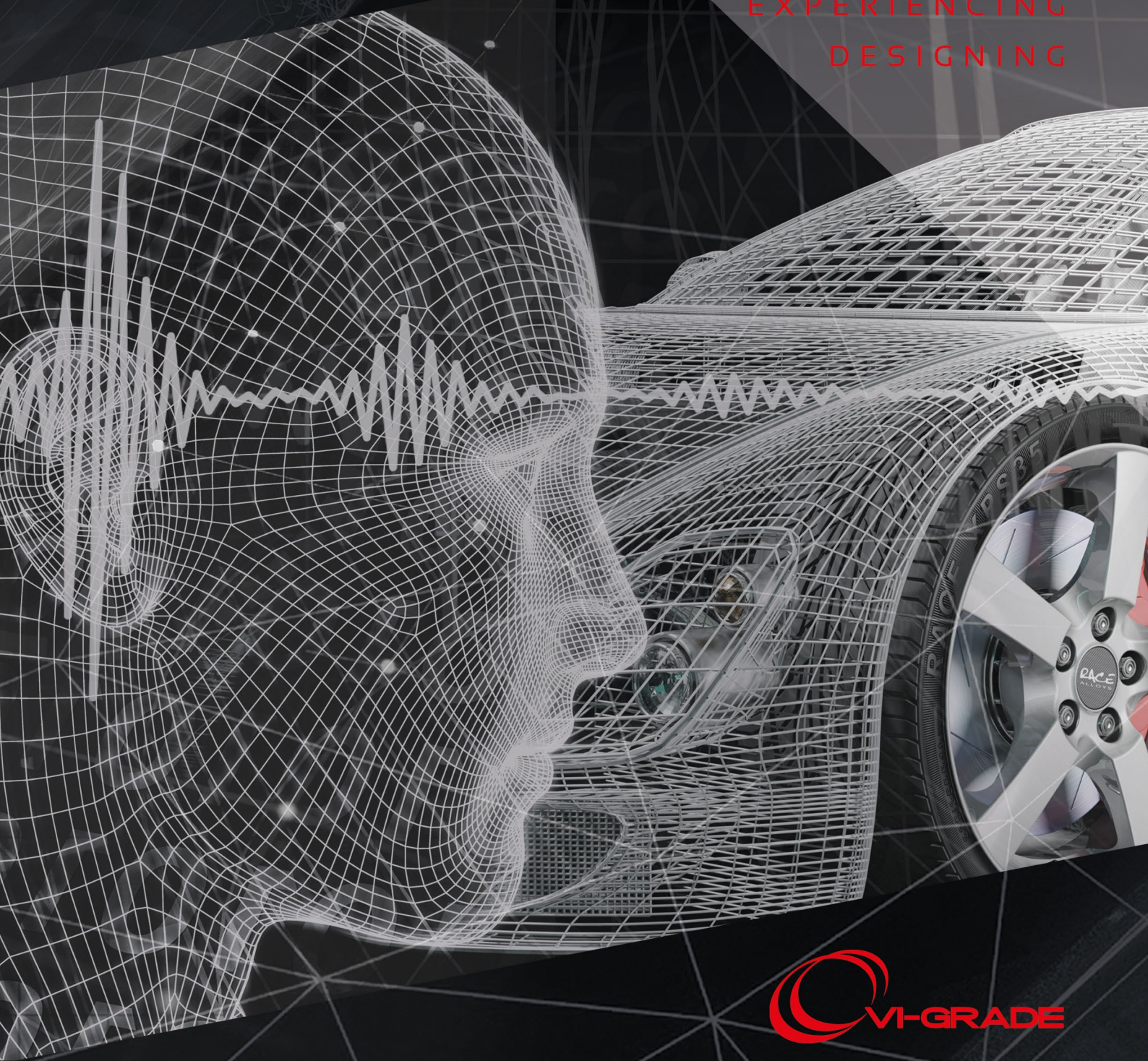


# Automotive Sound Experience

REAL-TIME ACOUSTICS

RECORDING  
EXPERIENCING  
DESIGNING



# Challenges

RECORDING  
EXPERIENCING  
DESIGNING

## FEEL THE CAR IN EVERY SENSE

Car manufacturers are constantly facing new challenges: nowadays when people buy a car, they expect all aspects of the driving experience to be pleasant and safe. Hearing naturally also contributes to that. Your childhood memories must include the sound of the family car. And when you learned to drive, didn't that vibrating, magical noise lift your spirits? **Sound is a fundamental indicator**; it aids the driver's perception to have total control over the car and makes passengers feel comfortable.

For this reason, during the development process, also engineers and designers have to work in an acoustic environment that exactly replicates the real one. Our simulators meet this requirement by **perfectly reproducing the sound information** from engine, road and environmental conditions surrounding the vehicle. One significant challenge these days is that many engine types, such as electric, are revolutionizing the classic contest between a powerful or a quieter engine.



### NEED TO BALANCE CONFLICTING TARGETS

The dual challenge of making vehicles sound powerful or quieter poses a very difficult task to sound engineers searching for the correct trade-off between conflicting targets.



### NEED TO MANAGE EXTERNAL FACTORS

External factors like varying road and weather conditions need also to be managed, to ensure that the occupants can enjoy driving or relaxing in a quiet and comfortable space.



### NEED FOR VERSATILITY

Alternatively, a performance vehicle may reward the driver with a distinctive and unique sound when driven hard, but perhaps more quiet when driven more slowly.

**Looking for  
the best driving  
experience ever**



# Solution

RECORDING  
EXPERIENCING  
DESIGNING

## DESIGNING THE PERFECT SOUND

VI-grade identifies and records **acoustic sources**, simulates the **acoustic interior environment**, synchronizes recorded sounds with a Driver-in-the-Loop system to generate a **Real-Time acoustic model for the driving simulator**.

This provides the acoustic engineers with the possibility to tune different sound sources in real working conditions.



Photo courtesy of Brüel & Kjær



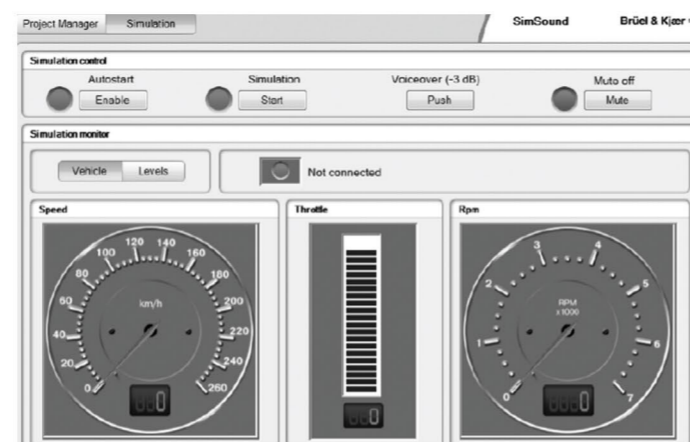
A complete acoustic recording of your vehicle



Accurate data processing and model generation



Sound playback and modularization on the Driving Simulator



### GOALS

Enjoy a fully immersive acoustic experience on the driving simulator:

- On any kind of road
- In any weather condition
- In total safety
- As often as necessary

# Benefits

RECORDING  
EXPERIENCING  
DESIGNING

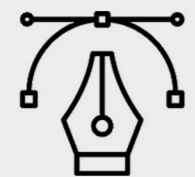
## VI-grade SOUNDS GOOD

VI-grade driving simulators enable designers and engineers to experience the sound of the vehicle they are developing without having to build a prototype. This is very important for making cars that meet market demands and cut the next finish lines. Sports car pilots, car manufacturers, component manufacturers, can all benefit from using this solution on VI-grade simulators.



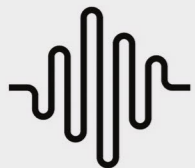
### IMMERSIVE REAL-TIME DRIVING EXPERIENCE

- Can be used in all VI-grade driving simulators
- Same hearing experience for the driver as in a real vehicle
- Enhance the simulator driving experience for complete immersion



### PERFECT FROM BASS TO TREBLE

- Test acoustics perception and performance with a Driver-in-the-Loop
- Evaluate Acoustic Design impacts on users and vehicle development



### FIND THE BEST VIBRATIONS

- Add VI-grade Shakers to cover the full Noise & Comfort NVH spectrum



**Automotive Sound Experience helps customers bridge the gap between testing and simulation by adding real sounds on a driving simulator for an improved and more immersive driving experience.**



**Are you ready to evolve  
with Automotive Sound Experience?**

**“ Volvo Car Corporation is using SimSound from BKS in combination with the VI-grade DiMI50 dynamic driving simulator for Vehicle Dynamics and ADAS assessments from early concept phase and throughout the development process. SimSound helps to create an immersive environment around the driver - ultimately helping the driver to perform as if he/she was driving a physical car - ensuring that we can perform high quality Driver-in-the-Loop testing. ”**

Carl Sandberg, Manager Vehicle Dynamics CAE, Volvo Car Corporation

RECORDING

EXPERIENCING

DESIGNING



# BRIDGING THE GAP

BETWEEN TESTING AND SIMULATION



Learn more at [vi-grade.com/automotive\\_sound\\_experience](http://vi-grade.com/automotive_sound_experience)