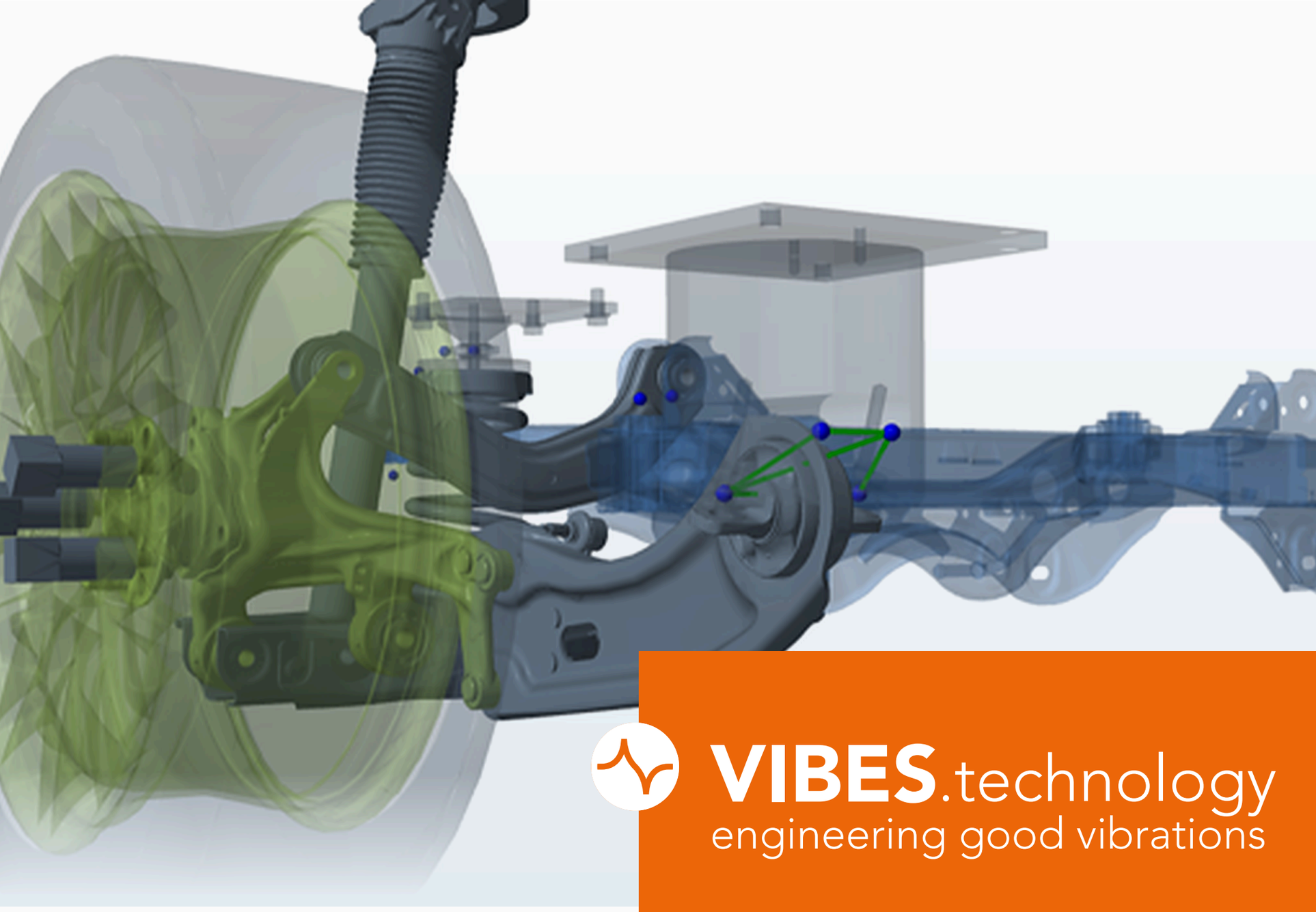


VIBES.technology
engineering good vibrations

TRANSFER PATH ANALYSIS

An age-old paradigm, done right to provide meaningful insights for engineers

EVALUATE NOISE FROM **SOURCE TO RECEIVER**

Transfer Path Analysis (TPA) allows for evaluating noise from various sources as it propagates to the receiver through different transfer paths. By utilizing Component TPA, you can independently analyze and isolate noise and vibration issues of individual components, enabling early design optimization and the reuse of data across different configurations. Furthermore, looking at complex power alongside (blocked) forces and transfer functions provides a detailed view of how vibrations propagate and dissipate.

“With VIBES, a classic TPA campaign takes one to two weeks instead of the four to six weeks typical of other tools.”

- VIBES customer, **NVH manager at an Italian OEM** -

COMMON CHALLENGES

How to find which source and path cause a noise problem?

A good Transfer Path Analysis approaches the noise problem from many angles. VIBES makes it possible to look at many of them all at once: blocked forces of the source, partial contributions & complex power in the assembly and auralizations for human interpretation.

How to get reliable TPA results without weeks of manual work?

TPA is often seen as a tedious and error-prone process. The unique approach of VIBES takes away the common pitfalls. Manual steps (such as matrix regularization, choosing the right interfaces) are replaced by our patented X-DoF algorithm. Quality indicators check every step from sensor placement to validation, giving valuable insights in days, not months.

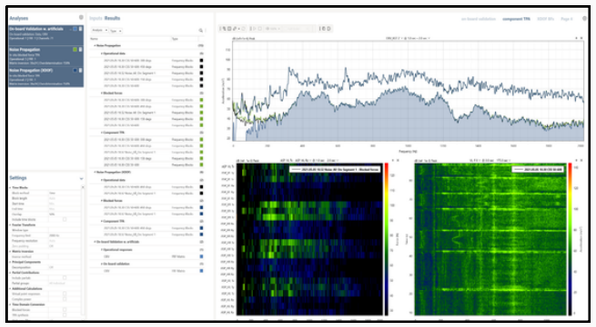
How to get one clear interpretation from large amounts of TPA data?

TPA results are traditionally interpreted in separate, custom scripts, so different engineers can read the same data differently. VIBES has best-in-market data organization, so you can navigate between hundreds of channels without losing overview. Result dashboards can be shared live with colleagues and OEMs/suppliers.

How to reuse test results beyond the one assembly that was measured?

Classic TPA forces apply only to the assembly that was measured, so every change needs a new test campaign. Component TPA uses receiver-independent blocked forces, so one characterization can be reused across receiver variants, platforms, and source databases.

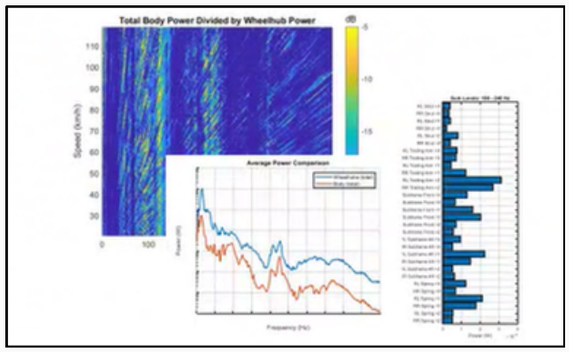
THE WORKFLOWS



COMPONENT TPA

Component TPA describes an active source by its blocked forces: interface forces that belong to the source alone, independent of the structure it's mounted to. Combined with the FRFs or noise transfer functions of any receiver, they predict noise and vibration in assemblies that don't physically exist yet.

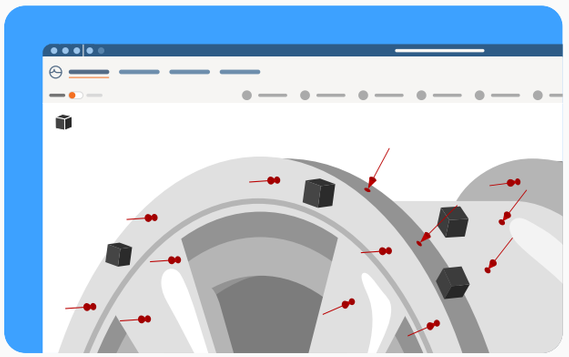
The forces are estimated in situ with VIBES patented X-DoF algorithm, so no rigid test bench is needed, and one characterization can be reused across receiver variants and platforms. As blocked forces describe only the component, OEMs and suppliers can set and verify component-level NVH targets on an objective basis.



COMPLEX POWER

Forces, partial contributions, and transfer functions each show part of how vibration travels through a system. Complex power adds the energy view: per frequency, it shows where power is transmitted, absorbed, and dissipated, which paths carry the most energy, and where isolation or damping will be effective. Drill-down views such as bar diagrams break the power flow down by path.

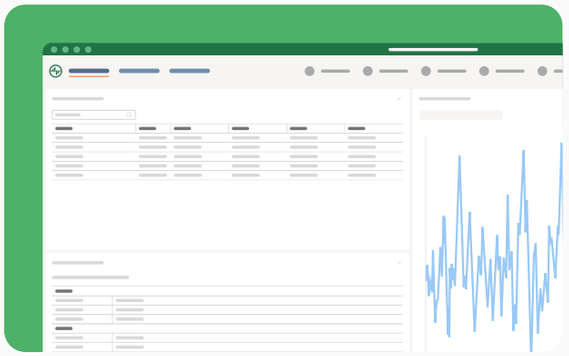
INSIDE THE SOLUTIONS



DIRAC

MEASURE

DIRAC is VIBES user-friendly FRF testing software with Virtual Point Transformation technology. It enables engineers to measure FRFs of components and full-vehicles and to use the resulting models in many different configurations or for Blocked Force calculations.



SOURCE

CHARACTERIZE

SOURCE is a dedicated software application for Blocked Force source characterization and component TPA. It generates high-quality and traceable calculations, an intuitive workflow and multi-leveled quality checks.



EXCITED ABOUT **TRANSFER PATH ANALYSIS?** GET IN TOUCH FOR A **DEMO**

VIBES.technology

+31 (0) 85 822 5049
info@vibestechnology.com
www.vibestechnology.com

VIBES.technology - Delft office (H.Q.)
Burgwal 8a
2611 GJ Delft, The Netherlands

VIBES.technology - Munich office
Loewengrube 12
80333 Muenchen, Germany