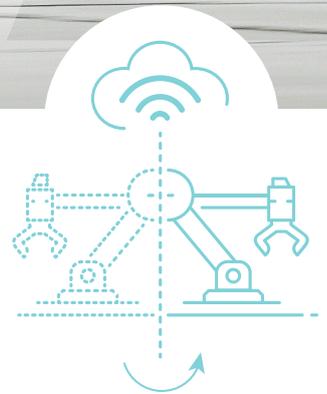




DESIGN & OPTIMISATION

NOISE REDUCTION THROUGH LIGHTWEIGHT VIBRO-ACOUSTIC METAMATERIALS

Flanders Make has developed a patented metamaterials' technology combining excellent noise and vibration behaviour with a low weight and compact volume. With this technology, we assist companies in achieving excellent NVH-performance.



We assist companies that are in search of quieter products by:

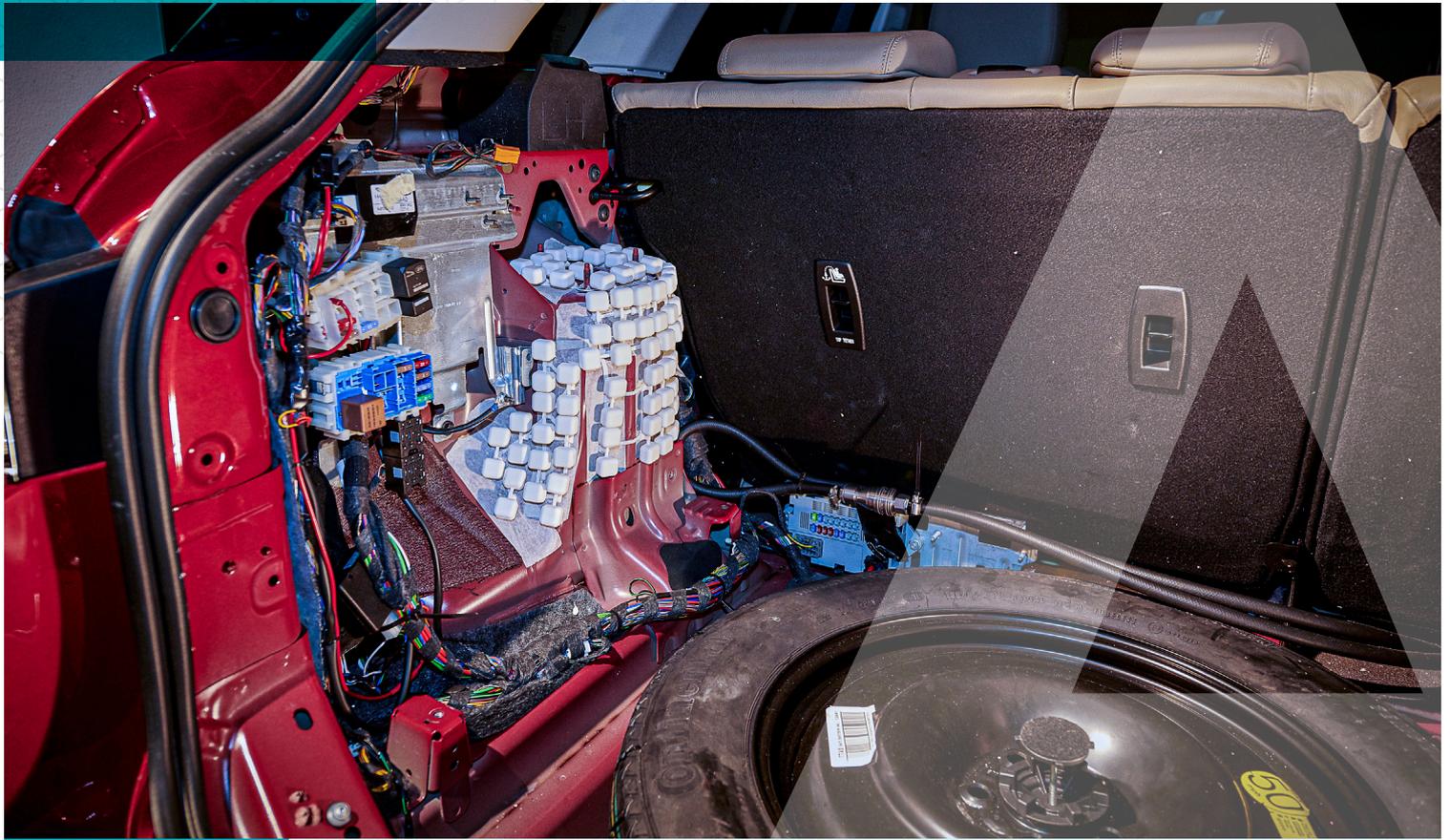
- analysing the current noise and vibration status;
- evaluating the potential of a metamaterials solution, based on the relevant transmission paths and the frequency spectra of the NVH-signals;
- designing and validating a prototype of the identified solution.

Our patented metamaterials technology offers a solution not only to OEMs in the machinery, equipment, transportation or construction industry, but also to companies specialised in retrofitting machinery - for example ductwork for AC.

**A metamaterial (from the Greek word meta, meaning "beyond" and the Latin word materia, meaning "matter" or "material") is any material engineered to have a property that is not found in naturally occurring materials. They are made from assemblies of multiple elements fashioned from composite materials such as metals and plastics. The materials are usually arranged in repeating patterns, at scales that are smaller than the wavelengths of the phenomena they influence.*

We use various unique software and hardware tools in this process:

- A wide range of sensors and exciters to perform vibro-acoustic evaluations
- In-house developed software tool to optimise the design/geometry of the resonators so as to create the stopband at the aimed at frequency



SUCCESS STORY

Lightweight vibro-acoustic insulation in a Range Rover Evoque

PROBLEM

As product designers are looking for lighter materials to increase performance or reduce energy consumption, conventional (heavy) noise and vibration solutions do not suffice anymore.

SOLUTION

In a Range Rover Evoque, we installed insulation using lightweight vibro-acoustic materials on the inside of the trunk and above the wheel and shock absorber.

CUSTOMER VALUE

The use of metamaterials strongly reduces noise and/or vibration levels in machines or motion equipment. This vibro-acoustic insulation has proven to be equally efficient in vibration reduction as traditional insulation but weighs 50% less.