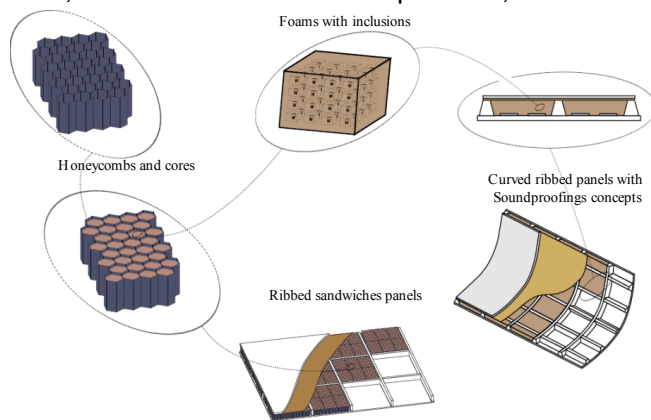


H2020-MSCA-ITN-EJD

EU Project 675441 – VIPER

VIPER Project (2016-2020)

VIPER is a European Joint Doctorate network focused on research in **Vibroacoustic of PERiodic** media. Structural periodic design is a powerful strategy for lightweight structures achievements while remaining a convenient solution for manufacturing aspects. One of the research targets is the inclusion of vibroacoustic design rules at early stage of products development through the use of periodic media which exhibit proper dynamic filtering effects. In order to understand how periodic concepts can improve the broadband vibroacoustic signatures and performances, the VIPER project will develop and validate tools for the design of global vibroacoustic treatments based on periodic patterns allowing passive control of structural and acoustical paths in layered concepts. Dealing with large scale periodic structural-acoustic concepts involves a multi-scale aspect that needs specific numerical tools. A two scale strategy will be pursued to handle periodicity effects: the meso-scale, related to the cell or the span size, and the macro-scale related to the final structure size. Bridging the cell



scale behavior and the vibroacoustic indicators is a challenging issue which will dramatically improve the macro structural design. As the cell topology and constitutive materials are important data, VIPER will consider the combination of different materials and structural arrangements, in which viscoelastic, poroelastic, auxetic materials will play a major role.

Finally, this project will also address the lack of perfect periodicity which can be considered both in view of robustness and design analysis of proposed periodicity based concepts. VIPER has a multi-disciplinary character, coupling expertise from material science, vibration and acoustics as well as applied mathematics.

It can offer different applications in transports (aeronautics and space, automobile), energy and civil engineering sectors, where vibroacoustic integrity and comfort can be crucial points.

The VIPER project offers Joint Doctoral Degrees between EU academic partners:

- École Centrale de Lyon – FR
- University of Bristol – UK
- Katholieke Universiteit Leuven – BE
- Université de Franche-Comté – FR
- Università degli Studi di Napoli "Federico II" – IT.

The research work will be realized in collaboration with two non-EU academic partners involved in the network: Université de Sherbrooke – CA and Georgia Tech – USA.

Five EU industrial partners are also involved in the project:

- AIRBUS-Defence and Space (ASTRIUM)
- Siemens Industry Software NV
- Vibratec
- Lamiflex
- iChrome.