Autoneum's Thermal Management Expertise
CO_2 Reduction thanks to Engine Encapsulation

In order to support customers in the design phase and development of existing as well as new vehicle models, Autoneum uses a broad spectrum of latest testing equipment and internally developed simulation tools. This allows to comply with future emission regulation standards, such as new worldwide harmonized light vehicles test procedures (WLTP) and real driving emission verification (RDE).
In addition, it facilitates the calculation and subsequent enhancement of thermal performance for engine bay parts.

Thanks to these efforts, Autoneum makes a decisive contribution towards heat storage solutions with improved insulation properties in the engine bay. Main target of heat storage in the powertrain is to reduce CO_2 emissions during driving cycle and engine restart due to higher oil and coolant starting temperatures.

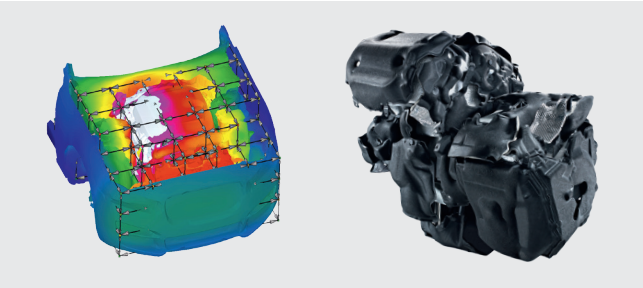
With Theta-FiberCell, Autoneum offers a key technology for innovative engine bay parts like engine encapsulations, engine top covers or hoodliners. Autoneum provides full engineering services for the predevelopment and development stage for thermal safety, heat storage as well as acoustic validation at vehicle level.

Eco-Innovation*
The EU Commission allows car manufacturers to take into account CO_2 savings from innovative technologies which are not covered in the standard fuel consumption measurement procedure. Heat retention in the engine to reduce CO_2 emissions is one of the technologies recognized by the EU Commission. The exact measurement procedure to derive the CO_2 savings, taking into account cool down, hot start benefit and parking time distribution, thanks to engine encapsulation is defined by the EU Commission. Autoneum has done several customer projects to analyze the CO_2 saving potential of different vehicles.

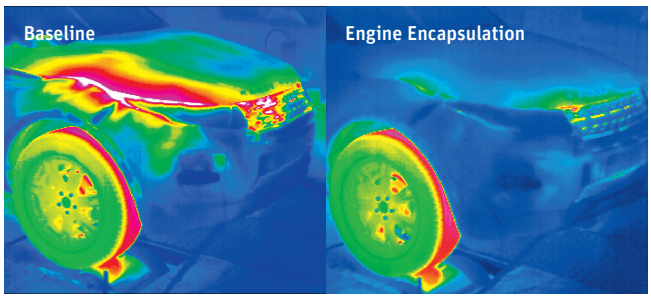
Average CO_2 savings of 0.8 - 1.1% after a cool down period of 0...24h were measured according to this regulation*

*Regulation (EC) No. 443/2009 (technical guidelines version: October 2015).

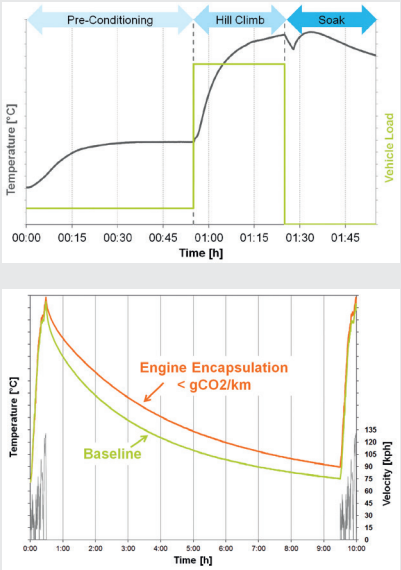
Example:
Engine encapsulation pre-development workflow



Concept selection and material choice



Prototyping and vehicle testing



Thermal safety and emission analysis

Autoneum's solutions for thermal management

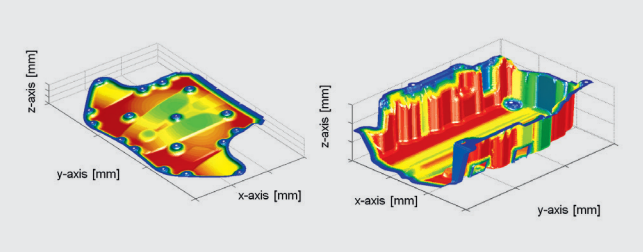
Autoneum has a full range of tools based on its long-standing expertise in thermal management to provide customers with cost-effective solutions and reduced development time.

Thanks to scalable simulation tools, it supports the definition of solutions during the concept phase as well as during development loops.

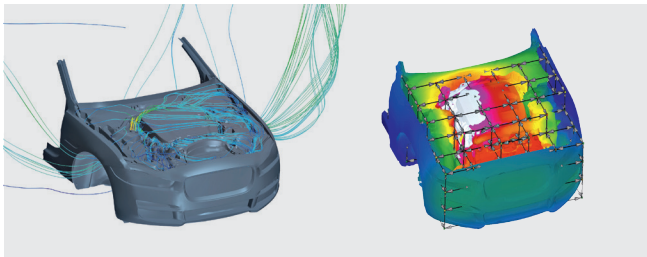
Part simulation for thermal and acoustic performance:

VisualTherm is an Autoneum simulation software which predicts the thermal insulation performance of engine bay parts.

VisualSISAB is an Autoneum simulation software which predicts the acoustic absorption and insulation performance of engine bay parts.

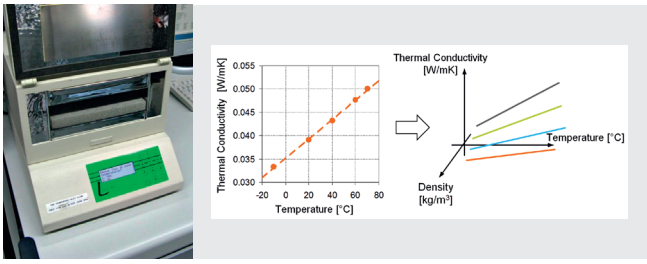


Engine cooldown methodology is based on a smart and accelerated combination of Star-CCM+ and TAITherm. Autoneum can virtually evaluate in shorter time the cooldown duration and efficiency of engine encapsulations. This allows the exploration of more variants during the concept phase.



Vehicle testing facilities offer the possibility to perform OEM's thermal safety cycles and 24 hours cooldown measurements for engine encapsulation efficiency assessment, either in Autoneum's climatic test bench or in external test facilities.

Material measurement equipment enable the creation of temperature- and density-dependent thermal property databases.



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