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INTERIOR INSULATION FOR ELECTRIC VEHICLES TO INCREASE EFFICIENCY

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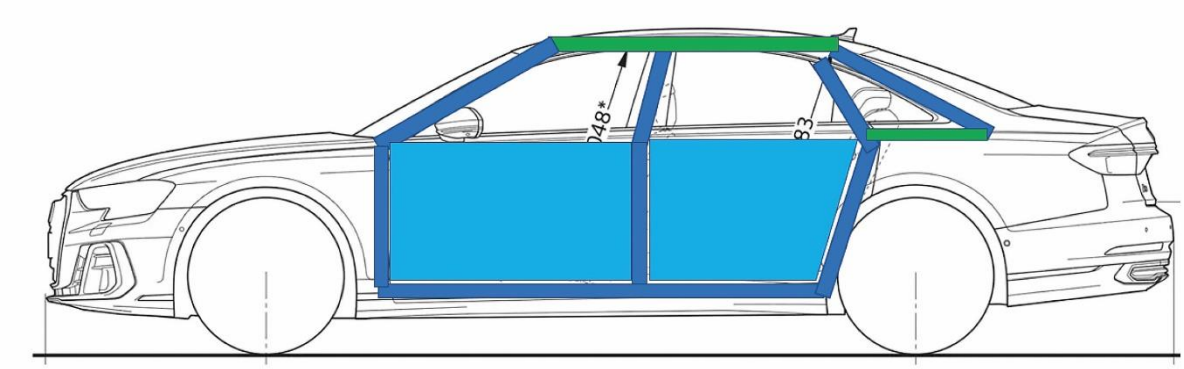
Today's state of the art
According to the current state of the art, vehicles are only partially thermally insulated. This results in relatively rapid and strong heating in the blazing sun at the height of summer, while in winter at sub-zero temperatures, the temperature inside the vehicle corresponds relatively quickly to the outside temperature.

Disadvantage

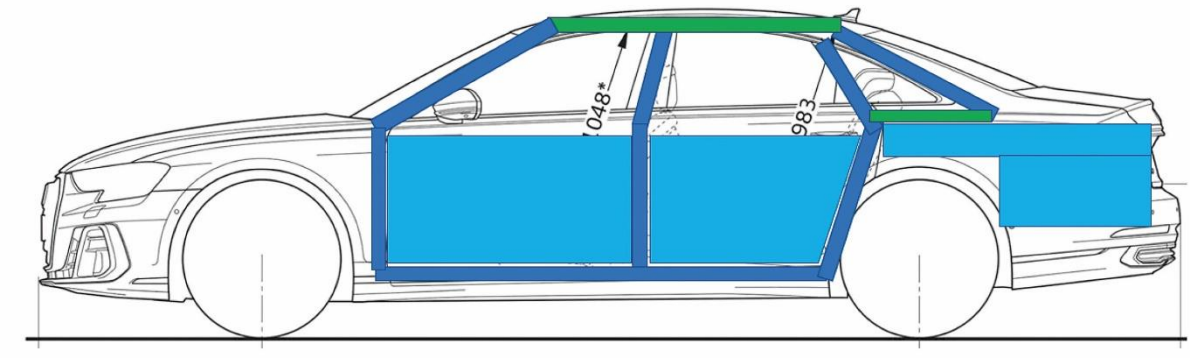
- With electric vehicles, active air conditioning of overheated or undercooled interiors is very energy-intensive, which can limit the range enormously.
- Also energy-intensive is the constant maintenance of comfort temperatures with poor thermal insulation.

New idea
The new idea involves targeted thermal insulation of the vehicle interior. This includes:

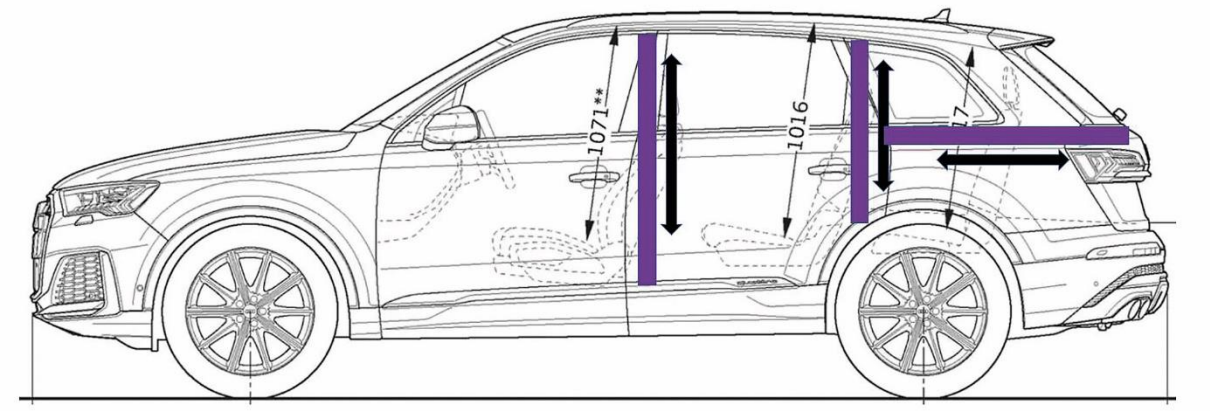
- Roof lining
- Insulating glazing
- Interior door trim
- Carpeting/floor mats
- A-/B-/C-pillar trim
- Various other trim parts in contact with the bodywork
- Seats, cockpit trim, steering wheel etc.



Design example 1: Insulation of the passenger compartment



Design example 2: Insulation of passenger compartment and luggage compartment (for transported goods)



Example of embodiment 3: Introduction of thermal and spatial segmentation of the vehicle interior

Thermally low conductive segment partitions can thermally segment a passenger compartment/trunk. For example, if a driver is often alone in the vehicle on his way to work, he could thermally segment the front row of seats and would thus consume less energy for the thermal management of this segment (and have a greater range).

The insulating materials can be incorporated into trim parts, for example, in the form of:

- Coatings
- Insulation layers on top (e.g. glued, joined)
- Incorporation of insulating materials into the cladding part/carpet/foot mat
    - Example: Incorporation of mineral wool into rubber floor mats
- Weaving heat-insulating fibres into fibre fabric coverings/carpets
- Incorporation of gases (e.g. air) into cladding/insulating materials (e.g. polystyrene)
    - Gas porosity, double wall, air gap, vacuum layers etc.

Advantage

- Active air conditioning of overheated or undercooled interiors are less energy-intensive compared to the current state of the art, which can extend the range enormously.
- Constant maintenance of comfort temperatures, which is also energy-intensive, is more efficient with improved thermal insulation.