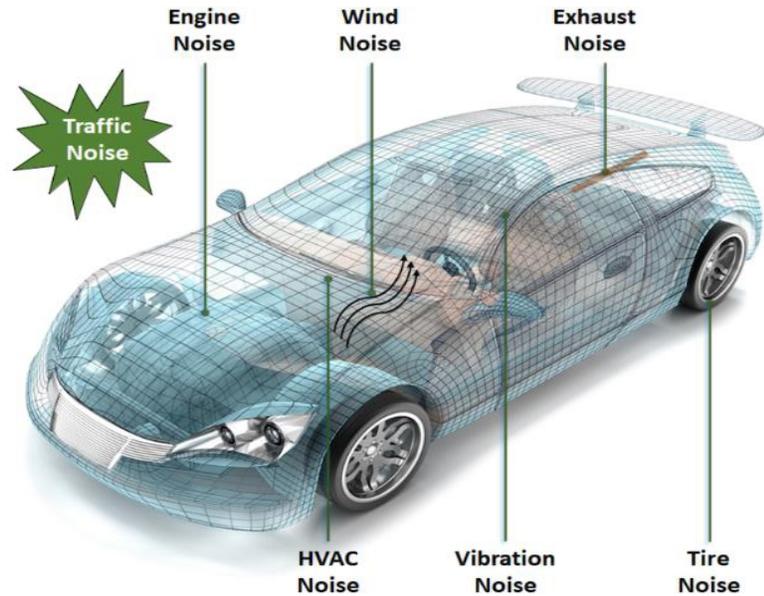




# NVH-T Material

THINSULATE PRESENTATION

## \*Internal combustion engine vehicles typical sources of noise



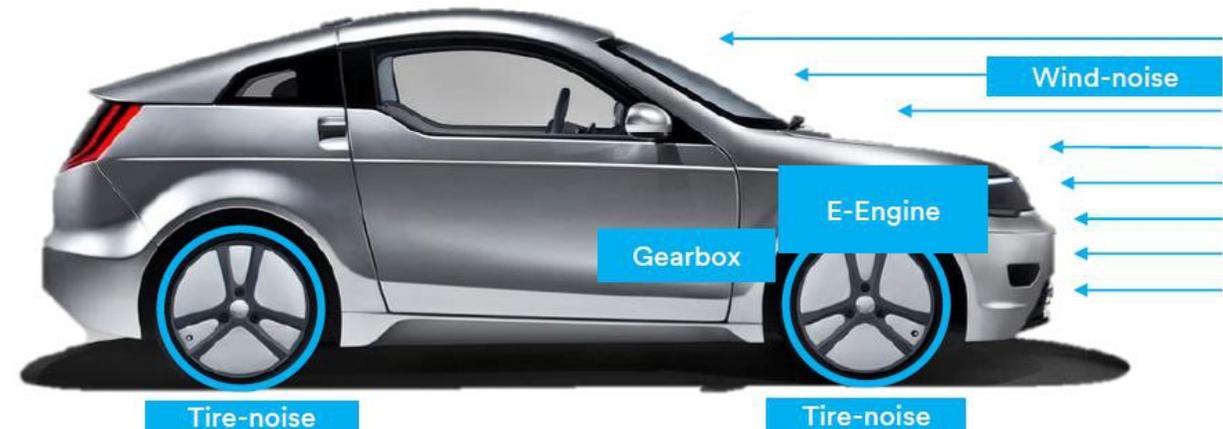
### NVH Sources

- Road noise
- Wind noise
- Engine noise
- Buzz / Squeak / Rattle
- Component Noise

## \*Electrical vehicles typical sources of noise

### Sound sources in vehicles with electric engines:

- No main sound source, but several sources like tire-noise, wind-noise, actuators for climate control, steering boosters, ...
- **Light weight structures** do not insulate noises from exterior very well
- Electric engine noises will **not mask** other noises anymore
- Additional noises are not related to the speed of the engine anymore



\*NVH-T → Noise Vibration Harshness and Thermal

# 3M™ Thinsulate™ Acoustic Insulation

40 Products

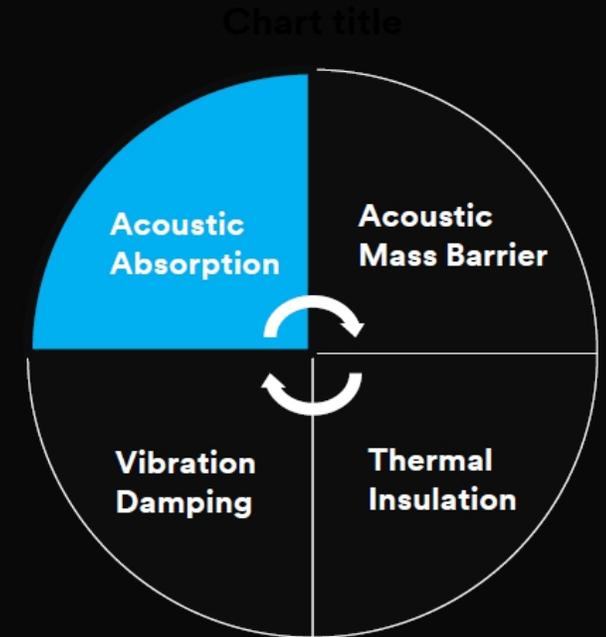
globally

*Thickness: 8mm – 40mm*

*Weight: 107 – 650 (g/m<sup>2</sup>)*

*Scrims: Single/Double, White/Black*

*Thermal Resistance: 120° C-150° C*



# Thinsulate™ Properties

- Fiber Length
- Compressibility
- Hydrophobicity & Drying Behavior
- Thermal Properties
- Edge Sealing Options
- Attachment Options

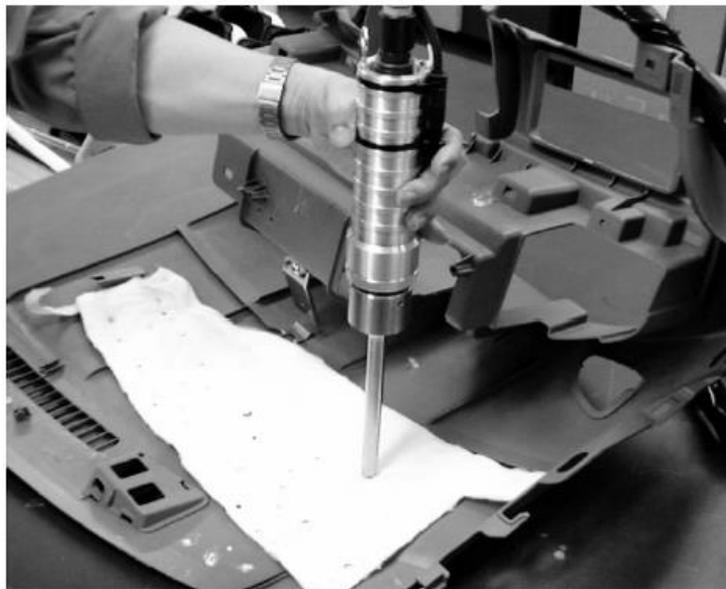


## 3M™ Thinsulate™ Acoustic Insulation – Die Cut Options

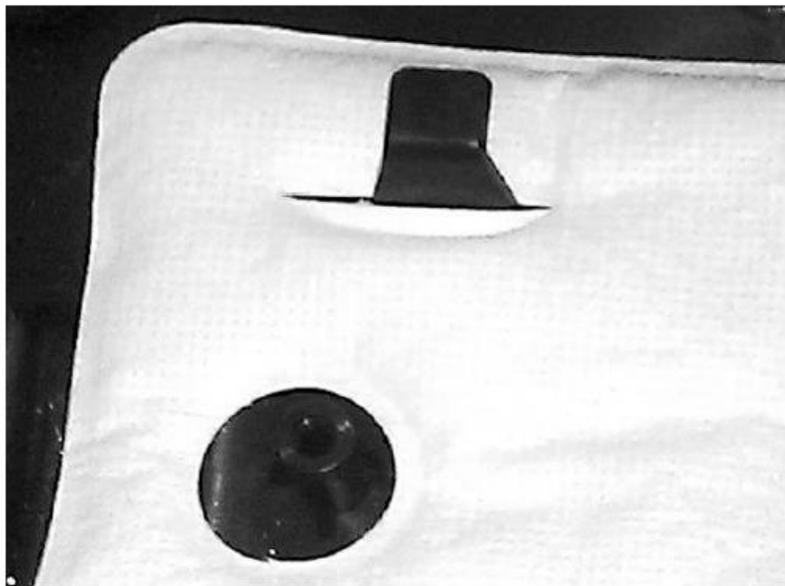
- Plain Cut – cold weld, easy to open
- Hot Trimmed – slightly sealed e.g., for self-adhesive parts
- Sealed Edge – fully sealed edges, robust sealing
- Stich Sealing – for cut-out reinforcement



# 3M™ Thinsulate™ - Easy to apply



Ultrasonic Welding



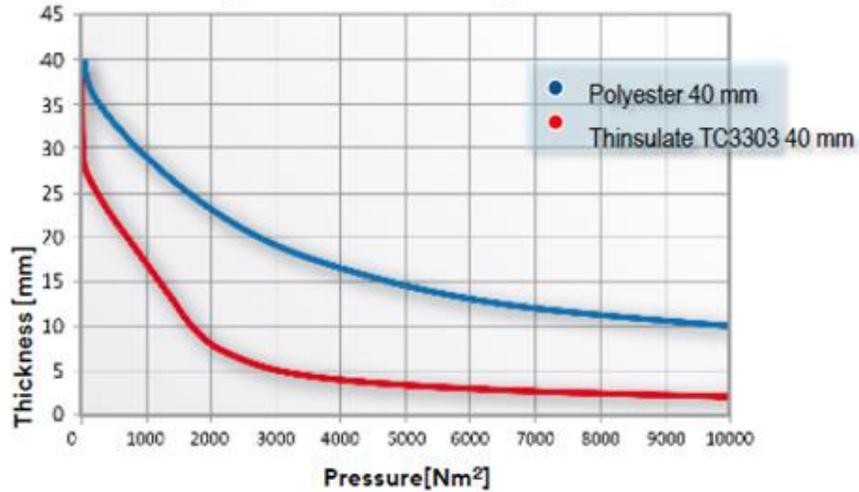
Mechanical Attachment



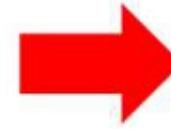
Self-adhesive Parts or  
hot-melt adhesive

# Thinsulate Advantages – practical optimization examples

## Compressibility



Competitor part



optimization



Example

- Part reduction from 5 to 2
- Surface area reduction 13%
- Weight saving: 16g (50%)
  - Cost down

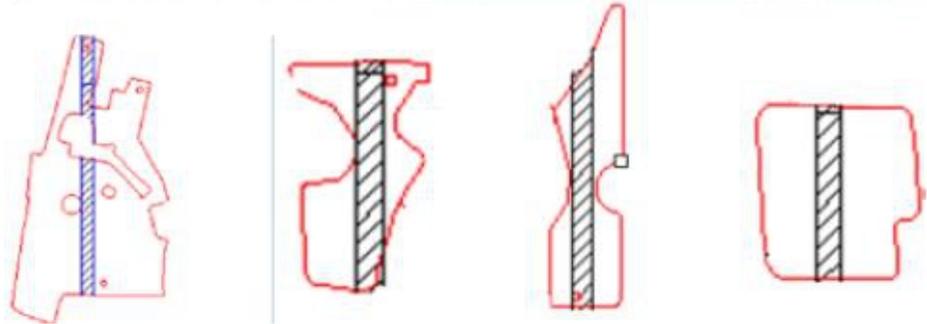
Easy to  
compress

No issue with  
external parts

Shape  
simplification

Reference/nb  
of part  
optimization

4 NVH patches with adhesive & US welding.



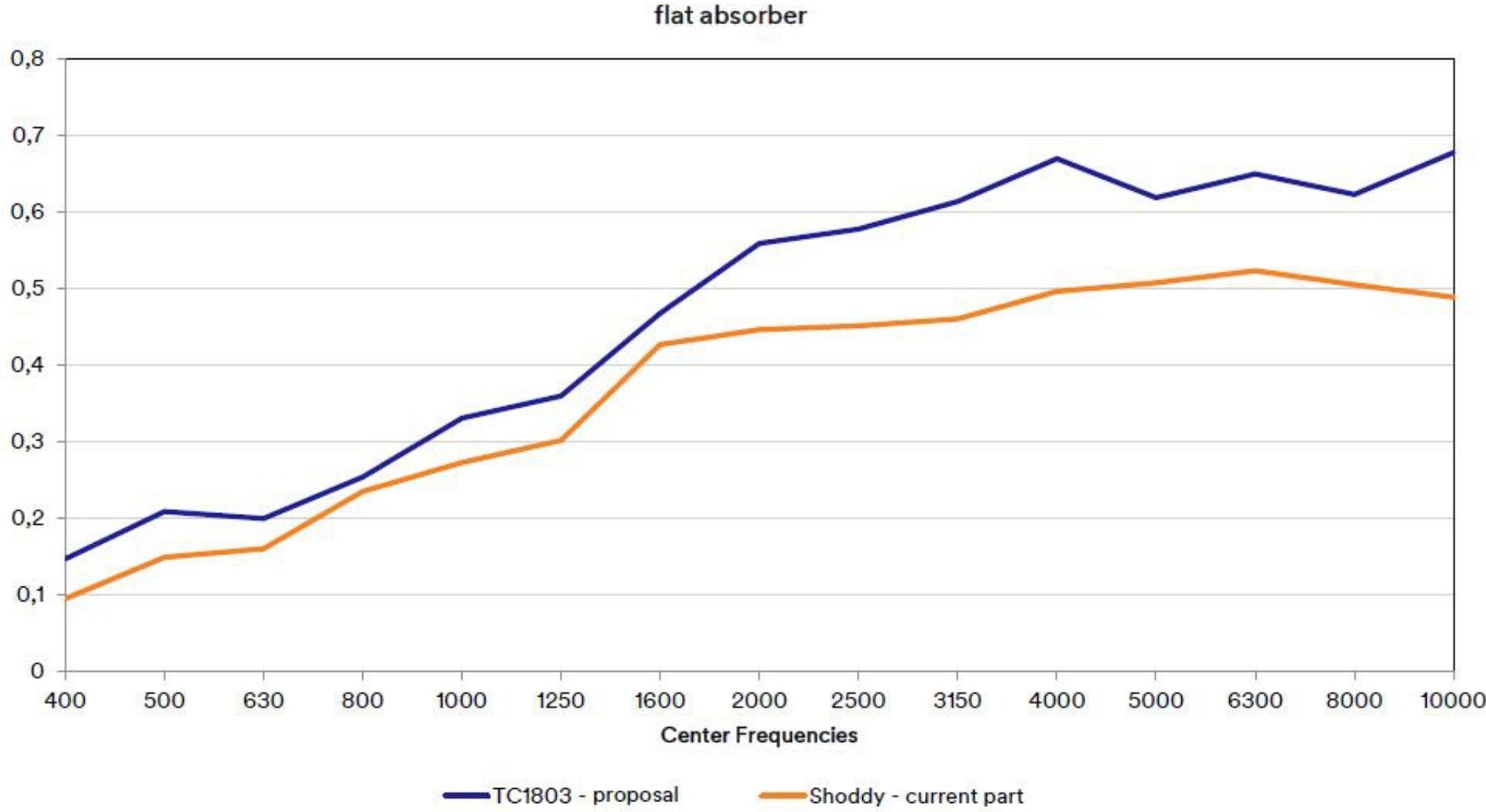
1 single part with adhesive and US welding



TC1803 : first design, 2 parts used  
(Total area : 633m<sup>2</sup>)



Shoddy : 12 parts used  
(Total area : 0,431m<sup>2</sup>)





# THANK YOU!

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