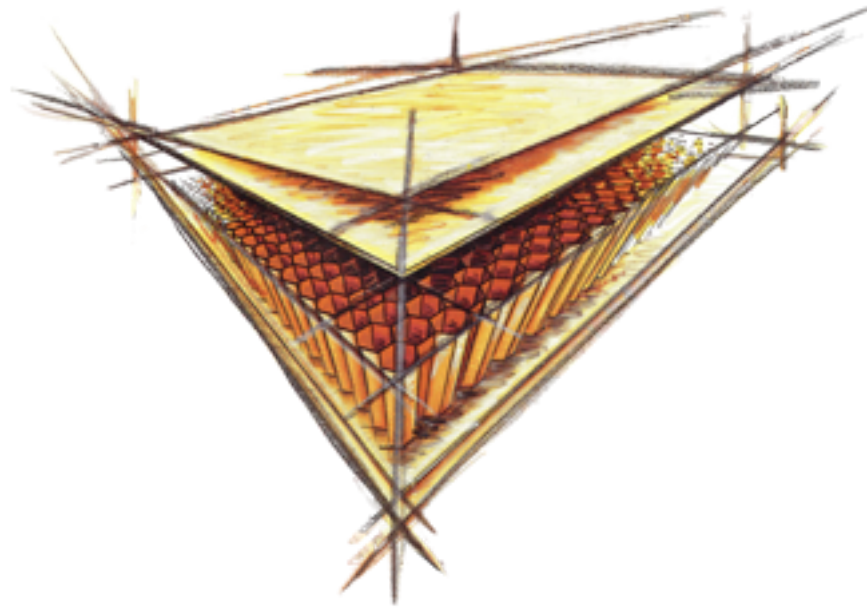


## Lightweight solutions for railway coaches



EURO-COMPOSITES<sup>™</sup> S.A. , Gunnar Ziwes, RWI, November 2011

## Technology break down from aviation to railway



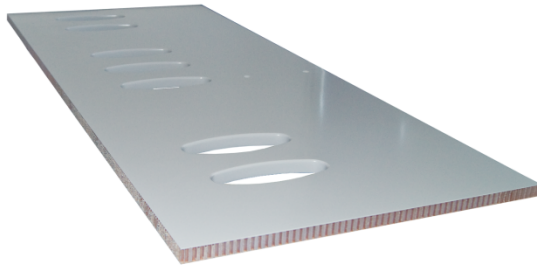
Aviation design with industrial material, proven technology with lower material costs



Reduction of life cycle costs

## Applications

### Interiors



 EC  
© EURO-COMPOSITES S.A.



### Flooring



 EC  
© EURO-COMPOSITES S.A.

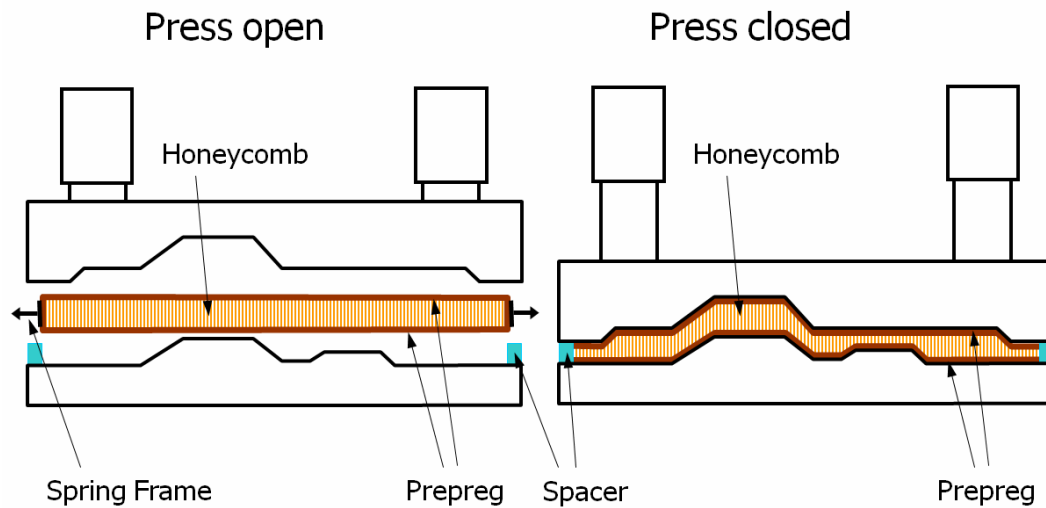
### Galley / Furniture



 EC  
© EURO-COMPOSITES S.A.



## Lightweight honeycomb panels in Crushed-Core-Process for window panels



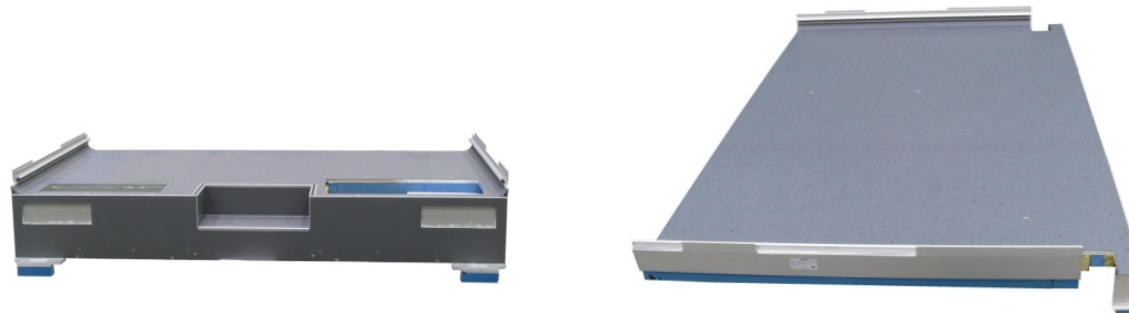
## Interiors

weight comparison between different materials

Material	Process	Density	Thickness	Weight of part	Relative Weight
		g/cm <sup>3</sup>	mm	kg	Index
Steel	Stamped	7,8	0,8	3,7	100
Aluminum	Stamped	2,7	1,1	1,8	50
SMC FS (Fire Safe)	Pressed	1,9	2,2	2,8	75
SMC	Pressed	1,9	1,8	2,3	62
Prepreg Solid Laminate	Vacuum-bag	1,9	1,6	2,0	54
Prepreg Sandwich Laminate *	Pressed or Vacuum-bag	0,6	1,8	0,7	20

\* Core 130kg/m<sup>3</sup>, 3 times thickness of laminate

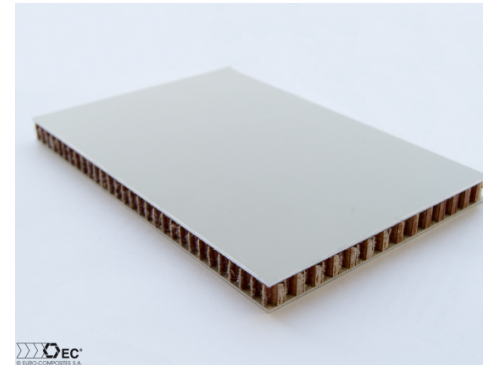
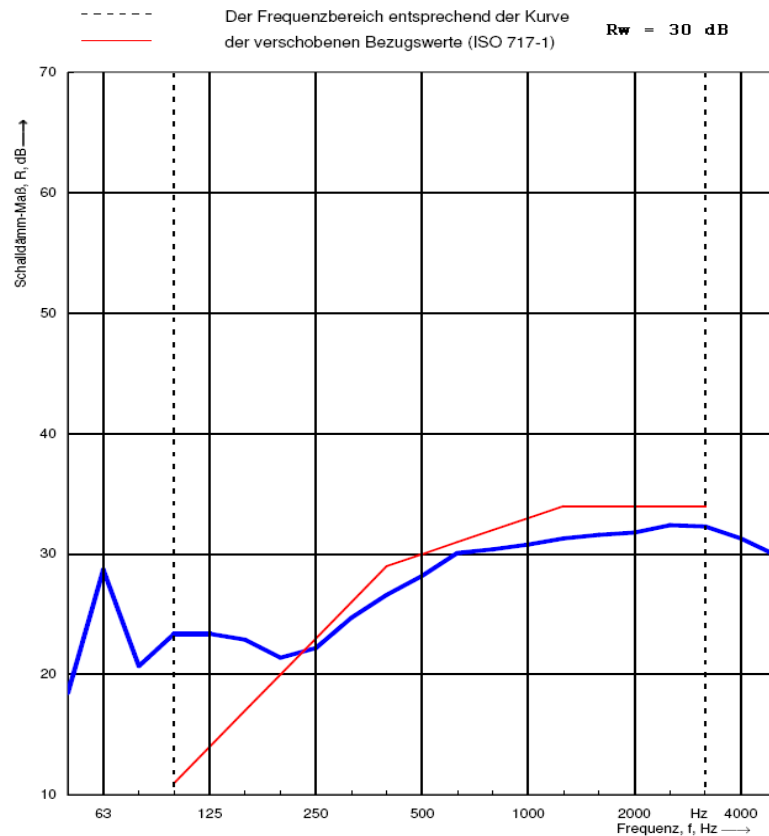
## Flooring



### **Advantages versus a wooden floor with the same features are:**

- Reduction of assembly time by 75 %
- 25 % less weight (better energy efficiency → “green floor”)
- Longer life cycle, does not rot
  - > from a total cost-over-lifetime perspective, this system is even cheaper than a comparable wooden floor
- Floor covering can be easily exchanged without damaging the panels
- A heating system can be applied below to the panels
- Maintenance-free

# Flooring



Flooring panel with 1,5 / 1,0 mm aluminum skins and Nomex core ECA-I 4.8-96, panel weight of 8,8 kg / m<sup>2</sup>,  $R_w = 30 \text{ dB}$  (ISO 717-1)



## Galley Furniture





Advantages vs. conventional design are:

- Aluminium furniture is about 30 % lighter than stainless steel furniture
- Modular design
- Quick installation
- Flexibility in color and surface design





Thank you!

Thank you for your attention.

You are welcome to visit our booth stand 9320!

EURO-COMPOSITES<sup>™</sup> S.A.

