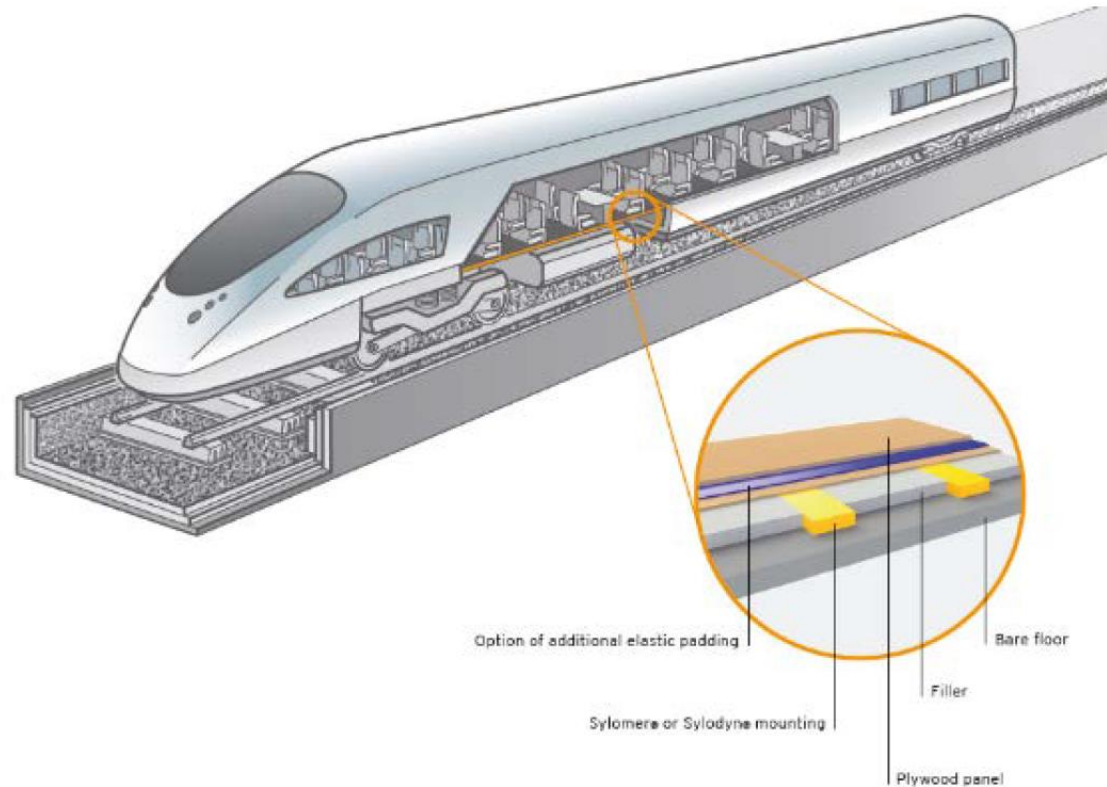


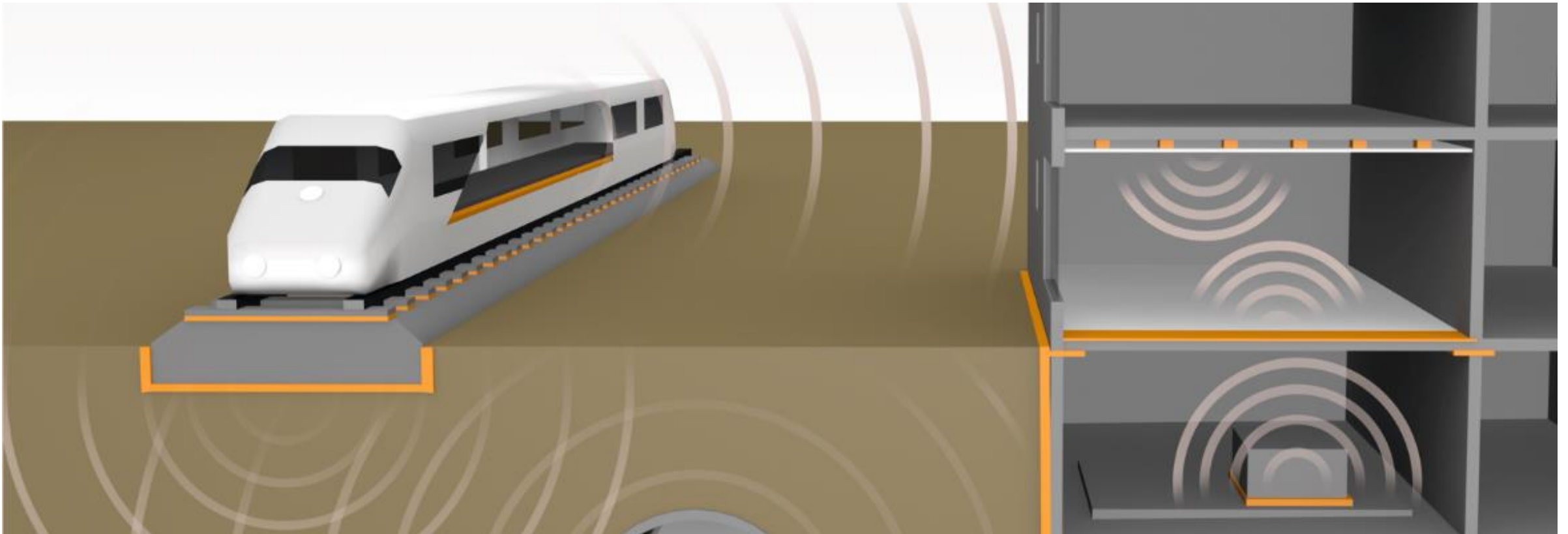
# Elastic Floor Bearings with Polyurethane Materials in Rolling Stock



## *A Technology Transfer from Rail Cars to Marine Vessels*

# Why Elastic Floor Bearings?

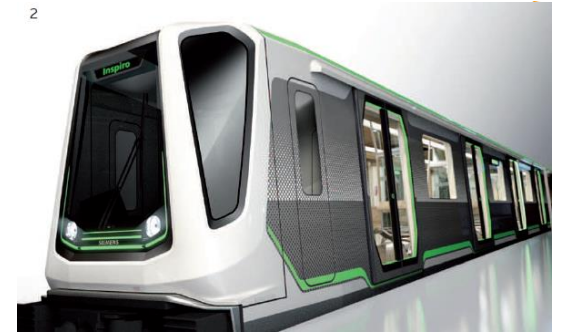
- Vibrations lead to considerable secondary Air-Borne Noise inside Rail Cars
- Floating Floor Concepts for Rail Cars to decouple the Floor of the Rail Car Chassis



# Benefits of Elastic Floor Bearings with Polyurethane

material advantage	benefit
Vibration Isolation	<ul style="list-style-type: none"><li>• Reduction of Secondary Air-Borne Noise</li><li>• Higher Passenger Comfort</li><li>• Decreased Life-Cycle-Cost</li></ul>
Porous Elastomer Material	<ul style="list-style-type: none"><li>• Lower Weight</li><li>• Decreased Energy Consumption</li></ul>
High Durability	<ul style="list-style-type: none"><li>• No Loss of material properties</li><li>• No Maintenance</li></ul>
Low Creeping	<ul style="list-style-type: none"><li>• Longer Service Intervals</li></ul>
High Efficiency	<ul style="list-style-type: none"><li>• Reduction of Floor Height</li></ul>
Easy Installation	<ul style="list-style-type: none"><li>• Easy Cutting and Bonding</li></ul>
Flame Retardant	<ul style="list-style-type: none"><li>• Complying with Fire Safety Norms</li></ul>

# References Rolling Stock



## Reference projects

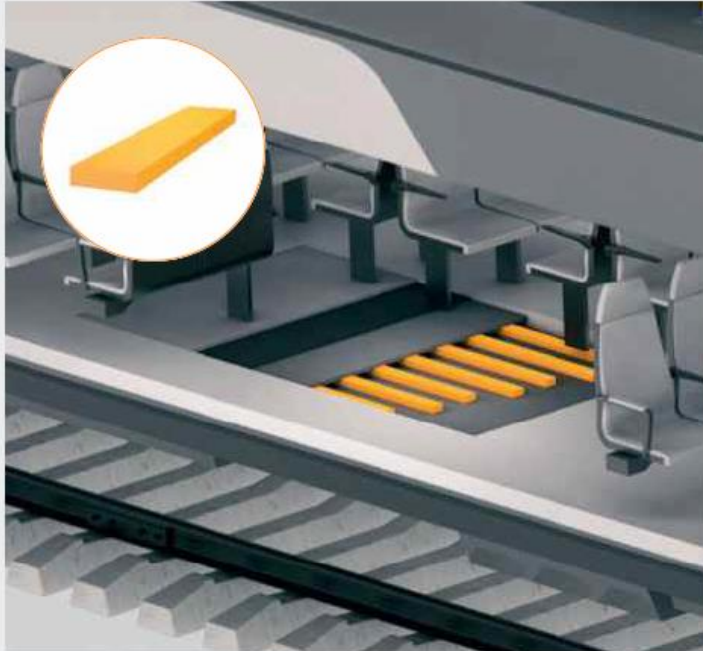
MANUFACTURER	TRAIN TYPE	REGION	APPLICATION
Siemens	Desiro RUS	Russia	Intercity
Alstom	Coradia	Germany	Commuter services
Siemens	Desiro	Europe	Commuter services
Siemens	Inspiro	Russia/Poland	Underground
Bombardier	Itino	Germany	Commuter services
Alstom	Coradia X61	Scandinavia	Commuter services
Alstom/Bombardier	ET 430	Germany	Commuter services
Bombardier	Zefiro 380	China	Intercity/High Speed
CAF	RENFE - Type HT 65000	Turkey	Intercity/High Speed
BEML/Rotem		India	Underground
Siemens	ULF	Austria	Tram



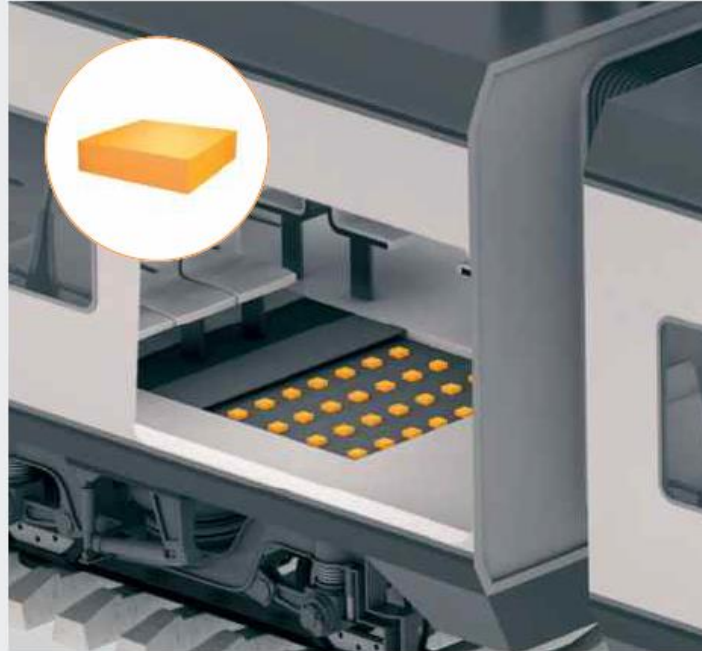
Pictures: 1 Harald Eisenberger,  
2 Siemens, 3 Alstom  
Transport TOMA - C.Sasso,  
4 Bombardier



# Elastic Floor Bearings with Sylomer® in Rail Cars



Strip bearing



Point bearing



Sylomer® decoupling in underground carriage

# Selection of Sylomer® Strip Bearings

## Material grade selection

Properties	Sylomer ® FR 3220	Unit
Static range of use	0,210	N/mm <sup>2</sup>
Number of bearings	1,667	
Length	1000	mm
Width	50	mm
Thickness	13,0	mm

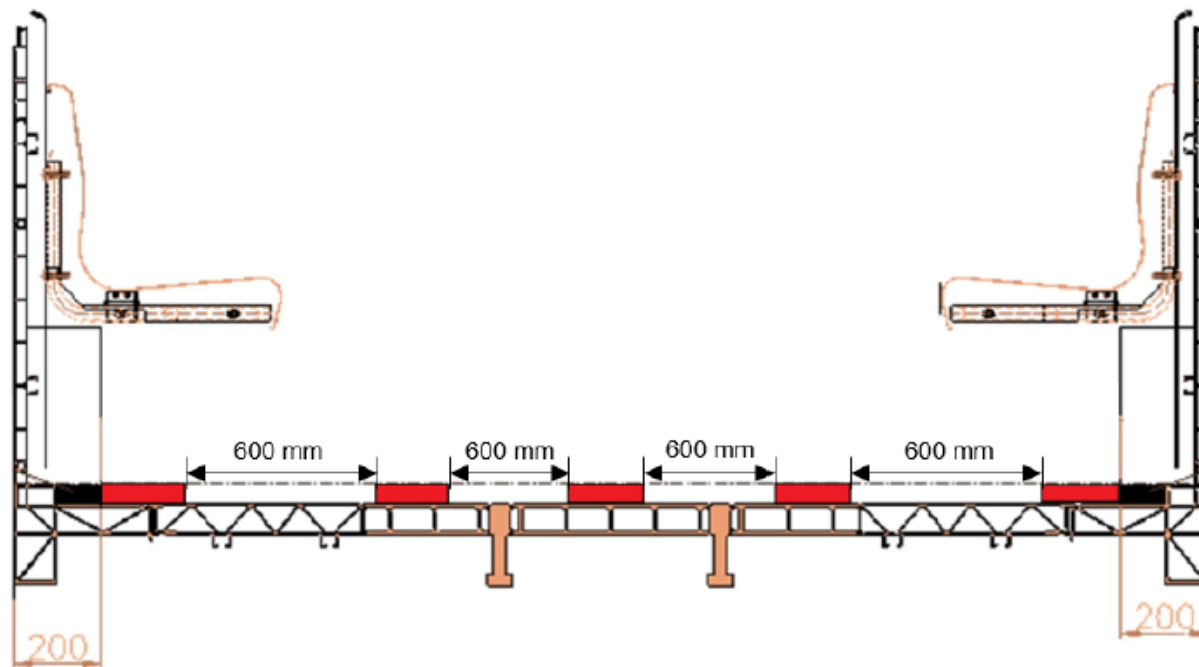


Fig: Cross-section along length of car

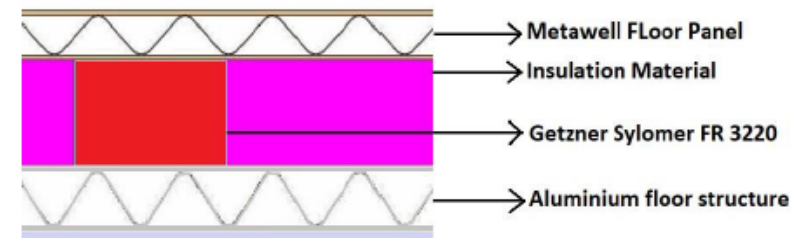
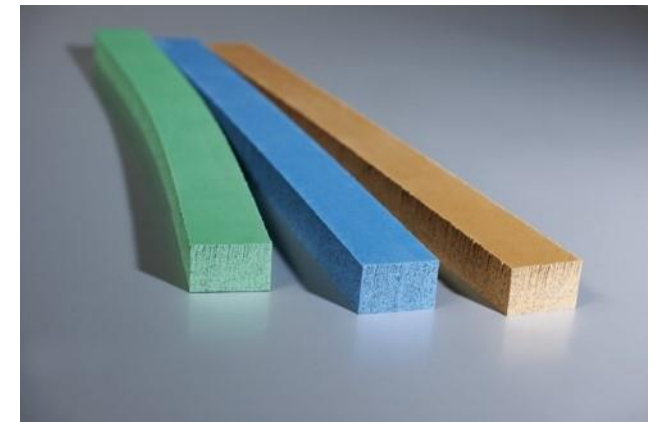
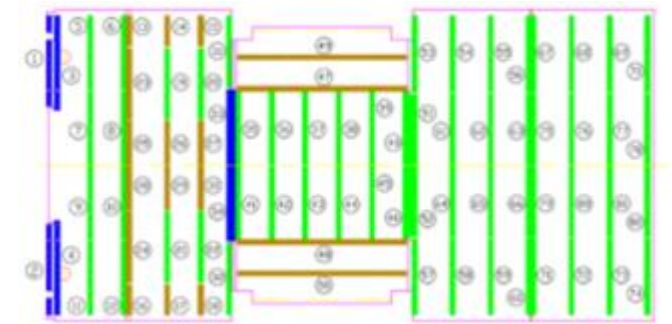
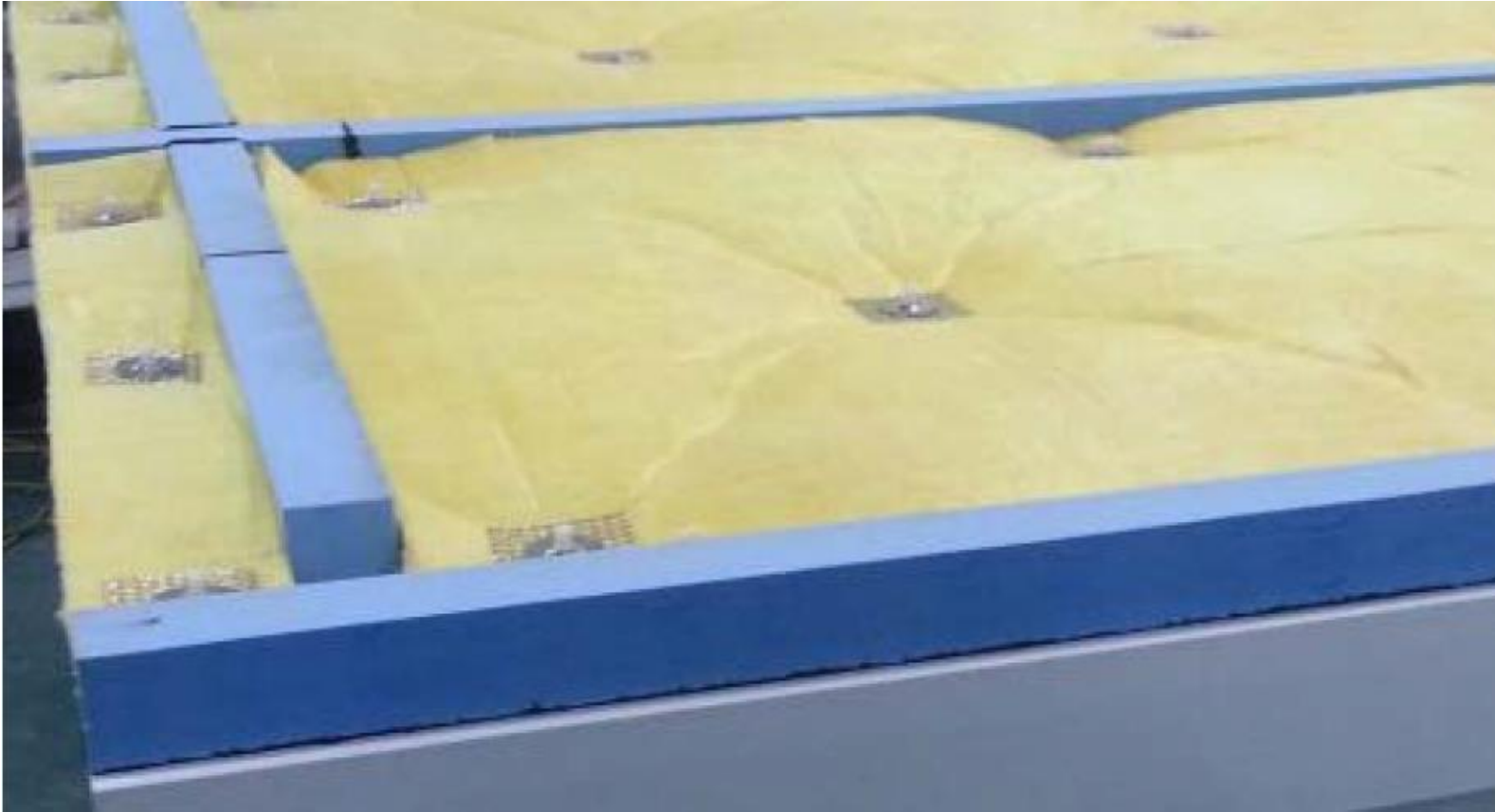


Fig: Cross-section along length of car

# Installation Of Sylomer® Strip Bearings

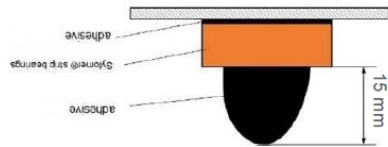


# Floor Height Levelling Proposals for Rail Cars

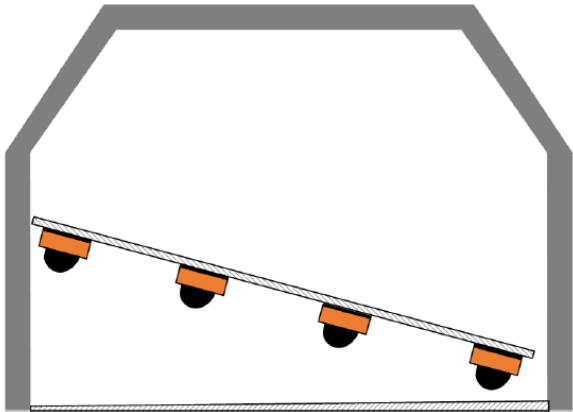
## Height levelling- proposal No. 1

pre – mounted floor panel + strips directly mounted on floor panel

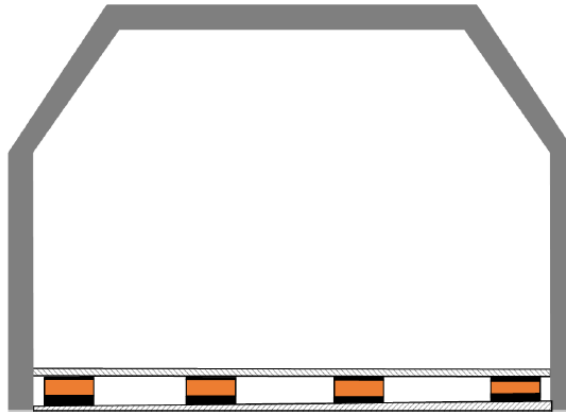
Step 1



Step 2



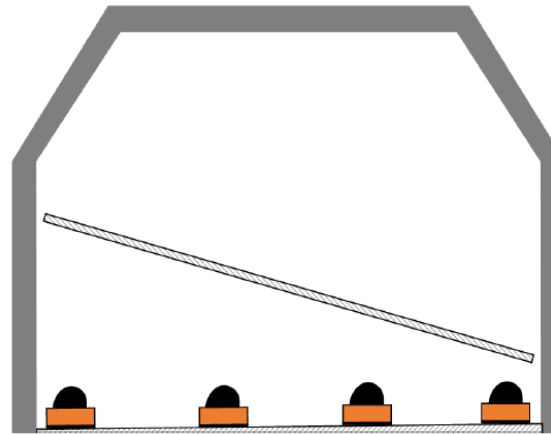
Step 3



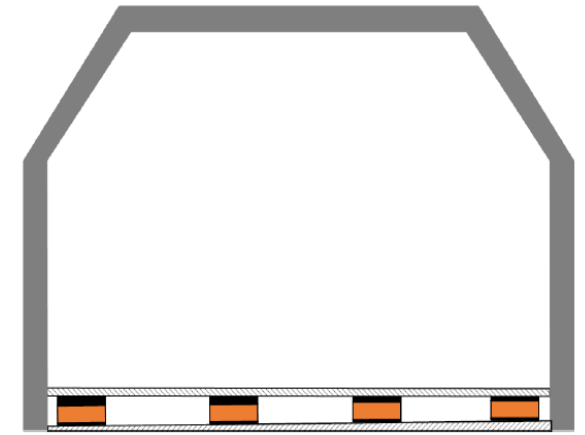
## Height levelling- proposal No. 2

bottom up installation – Sylomer directly between underfloor and floor panel

Step 1



Step 2





# Sylomer® Aluminium Vibration Damper

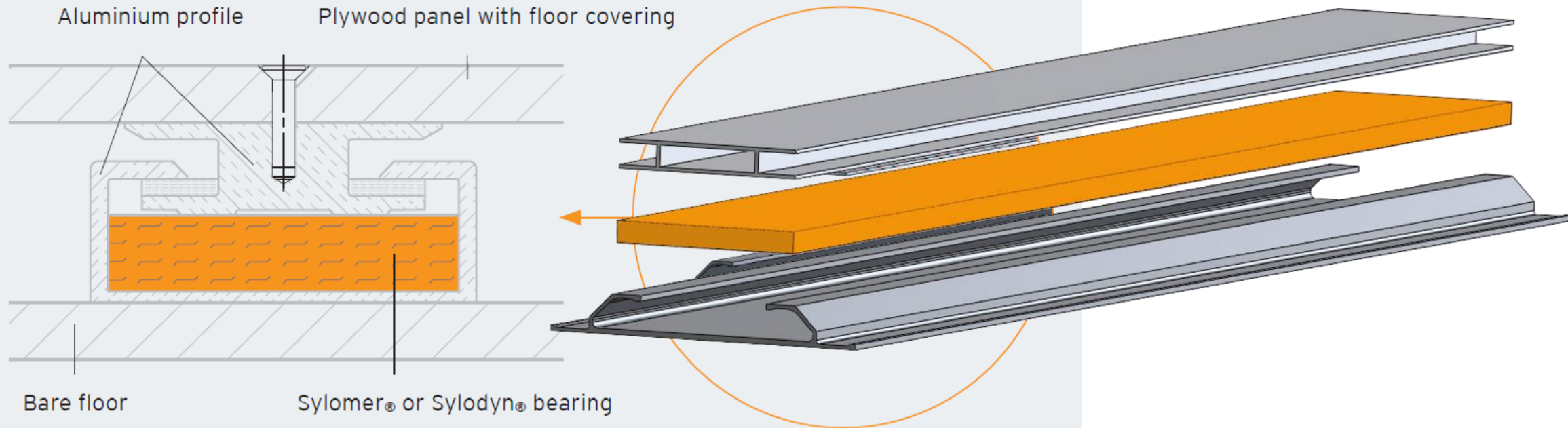


Exceptionally light vibration protection made from high-tech polyurethane Sylomer® combined with aluminium

Products developed with Hydro, the leading manufacturer of aluminium profiles

# Sylomer® Aluminium Vibration Damper

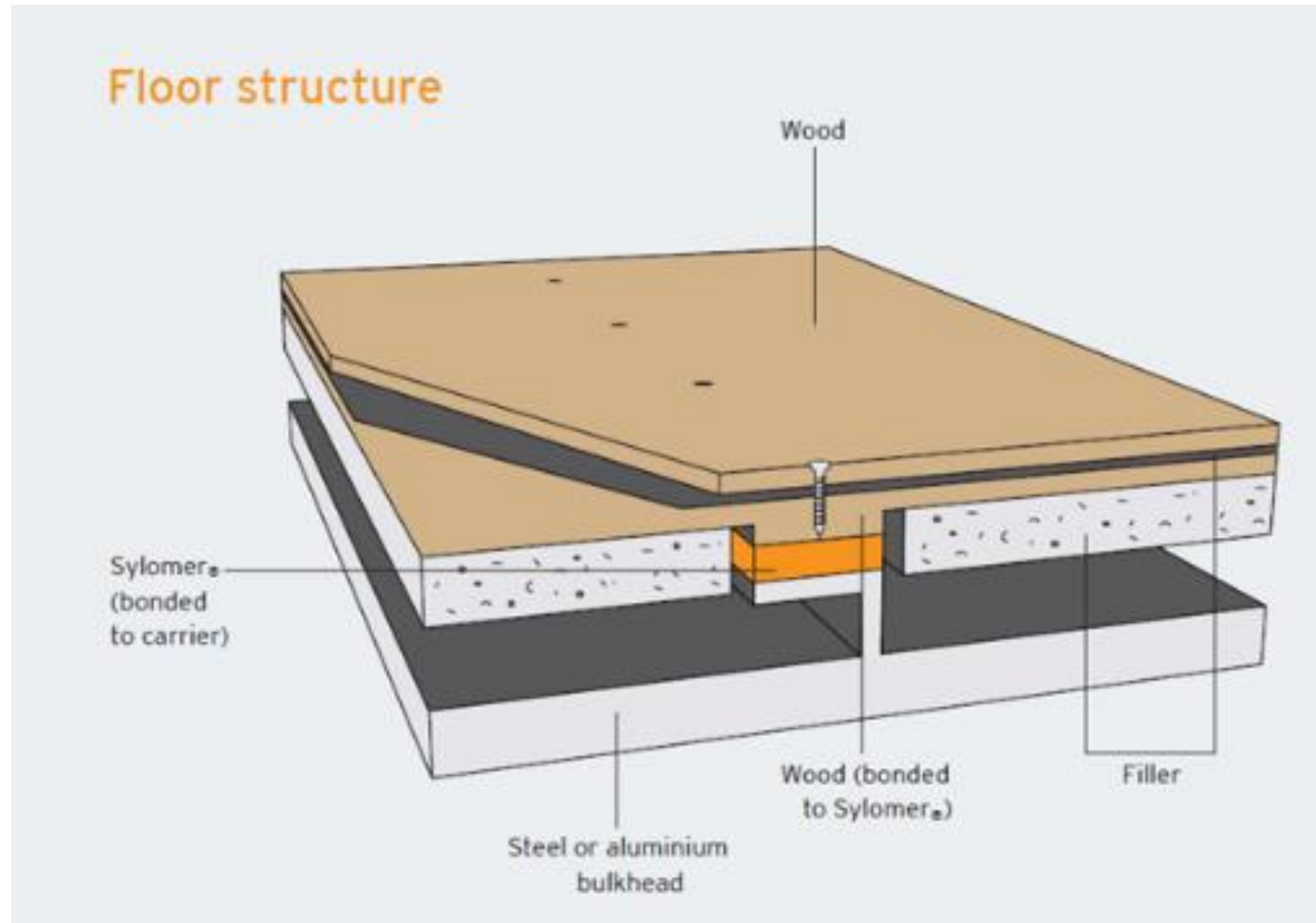
## Compression-traction element mounting



# Sylomer® Aluminium Vibration Damper



# Elastic Floor Bearings with Sylomer® in Marine Flooring





# Reference Marine Flooring: MY Excellence





## Reference Marine Flooring: MY Excellence





# Reference Marine Flooring: Red Sapphire



## Reference Marine Flooring: Red Sapphire





# Concept Ideas for Marine Flooring in Passenger Ships



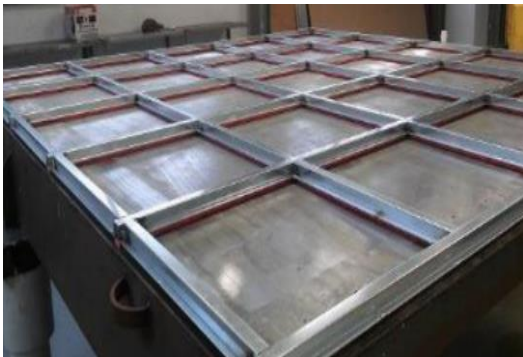
Metal profiles equipped with Sylomer®-strips



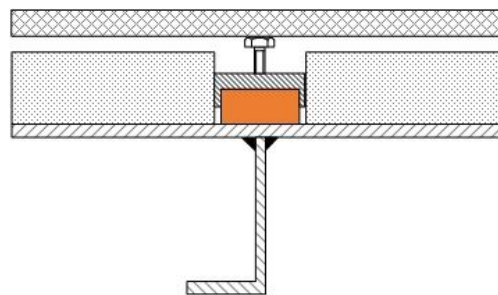
Spindle positioning



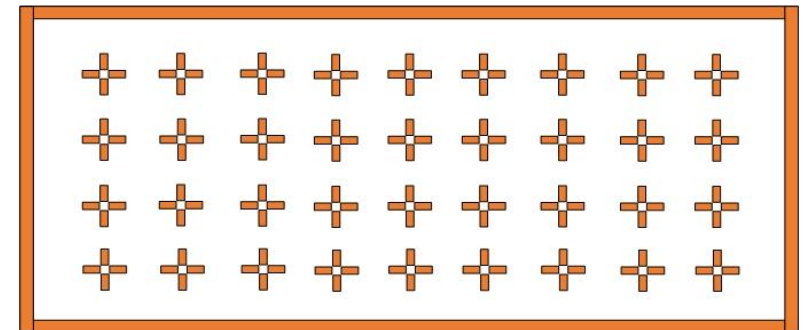
Honeycomb structure floor panel



Supports for floor panel



Cavities filled with mineral wool for thermal isolation



# Concept Ideas for Marine Flooring in Passenger Ships

	Standard mock up (mineral wool + concrete slab)	Mock up with Sylomer® FR strips
Height of mock up	60mm	65mm
Installation speed	Quick installation	Might seem slower but can be optimized by pre mounting the system
Waiting- /curing time	Curing time of the concrete layers	No concrete, no curing time, ready to proceed
Height levelling	via adjustment of height of concrete layer	Easy and quick adjustment via spindle positionning
Mass of the mock up	36kg/m <sup>2</sup>	16-18kg/m <sup>2</sup>
Effectivity (vibration isolation)	good	good
Long term performance	Effectivity decreases	Proven long term performance (no creeping)



**We are Austrians. We come from the mountains. We need your support!**

