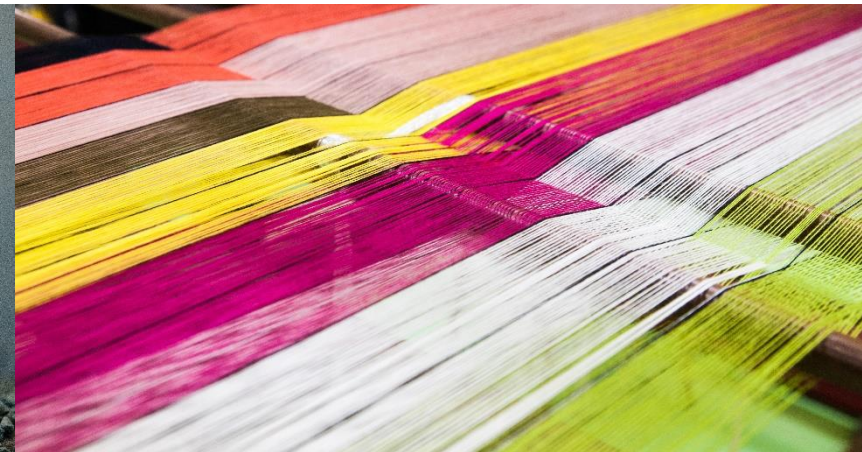


# Op zoek naar biobased coatings voor composieten

*Willem Böttger*



*Centre of Expertise  
Biobased Economy*



**avans**  
hogeschool



# *Composites are a growth market because of advantages ...*



**Light**  
**Low maintenance**  
**Double curved forming**  
**Function Integration**



# Façade elements Enexis



# Composites make light & large possible



DSC\_7298.jpg



DSC\_7340.jpg



DSC\_7281.jpg



DSC\_7299.jpg



DSC\_7297.jpg



DSC\_7250.jpg



DSC\_7305.jpg



DSC\_7310.jpg



DSC\_7292.jpg



DSC\_7255.jpg



DSC\_7318.jpg



DSC\_7325.jpg



# ... but do have a disadvantage



2008



Future



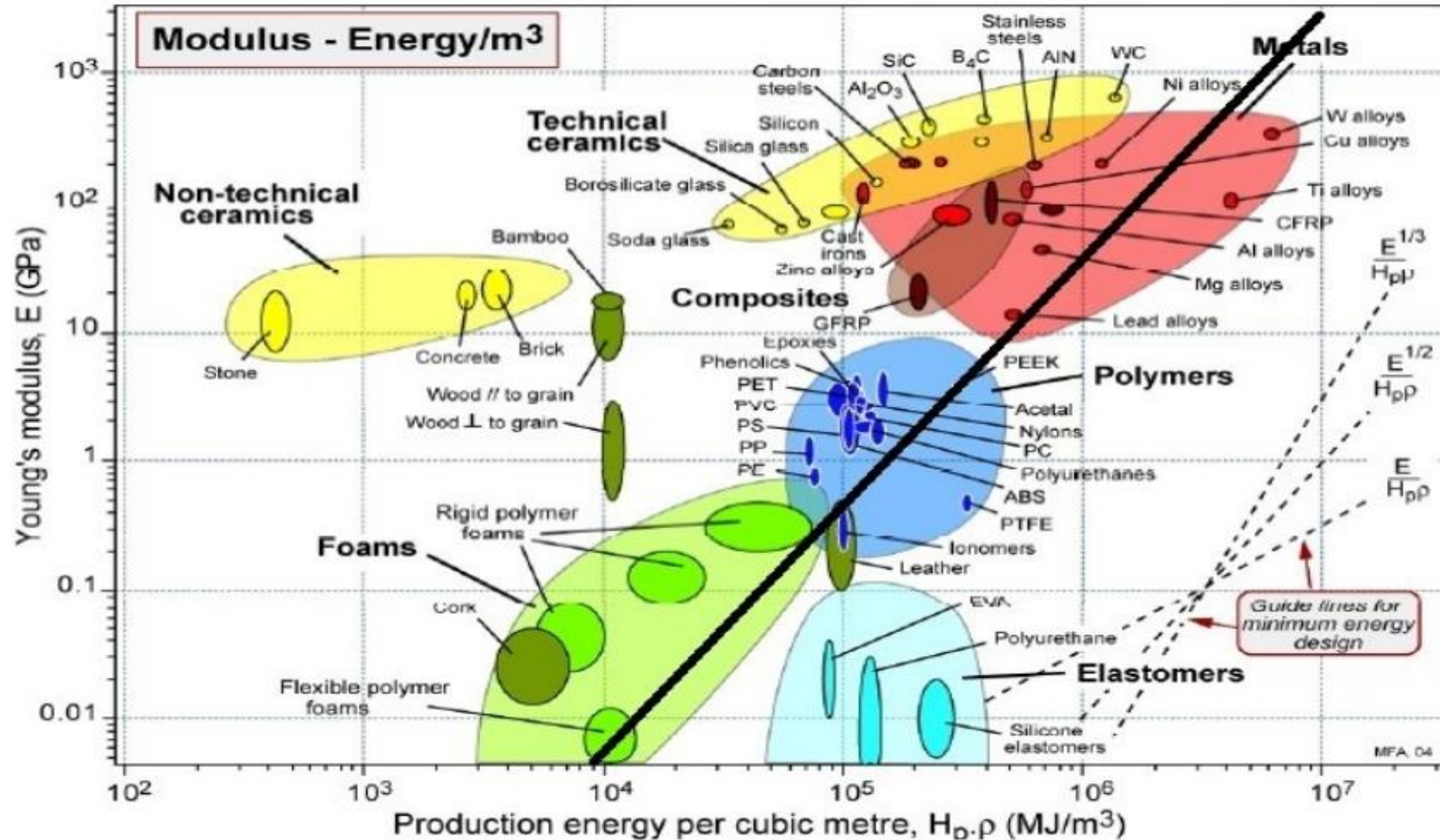
# Biocomposite value chain



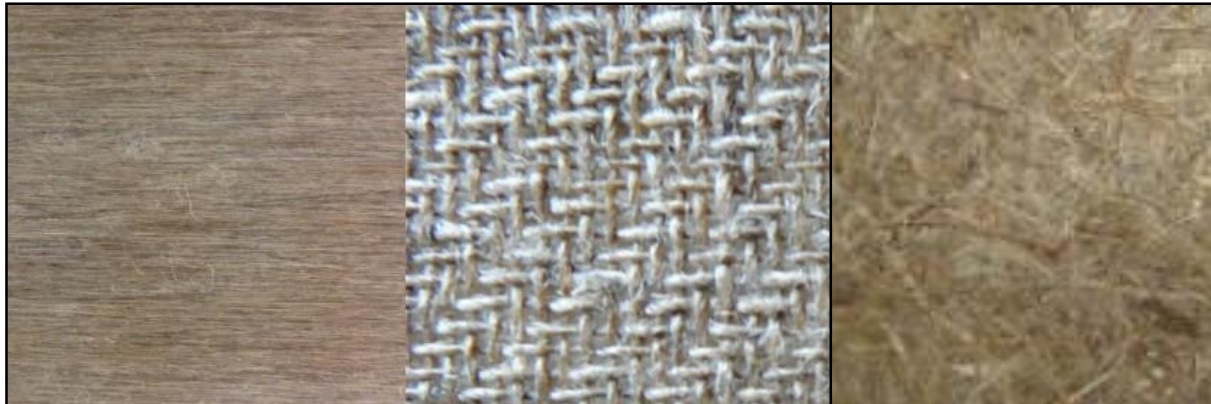
## Biocomposites



# Ashby Materials Chart



# Biocomposites



**UD Woven non woven FLAX/HEMP FIBERS**



**KURK**



**PLA foam**



**RESINS BASED ON SUGARS**



**... LINSEED OIL ...**



**... SOYA BEAN OIL ...**

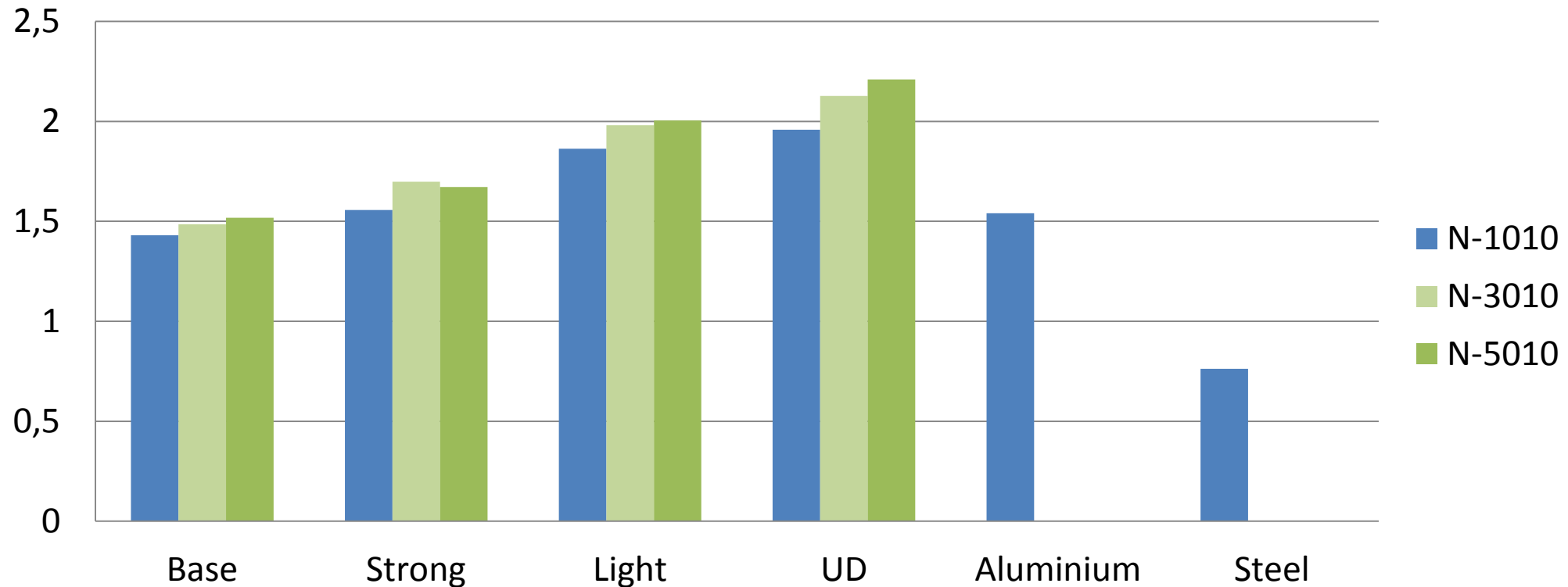


**... FURANES ...**

# Bio composites next to environmental do have more advantages: Acoustics, Radiance permeability, Aesthetics, Safety and Performance

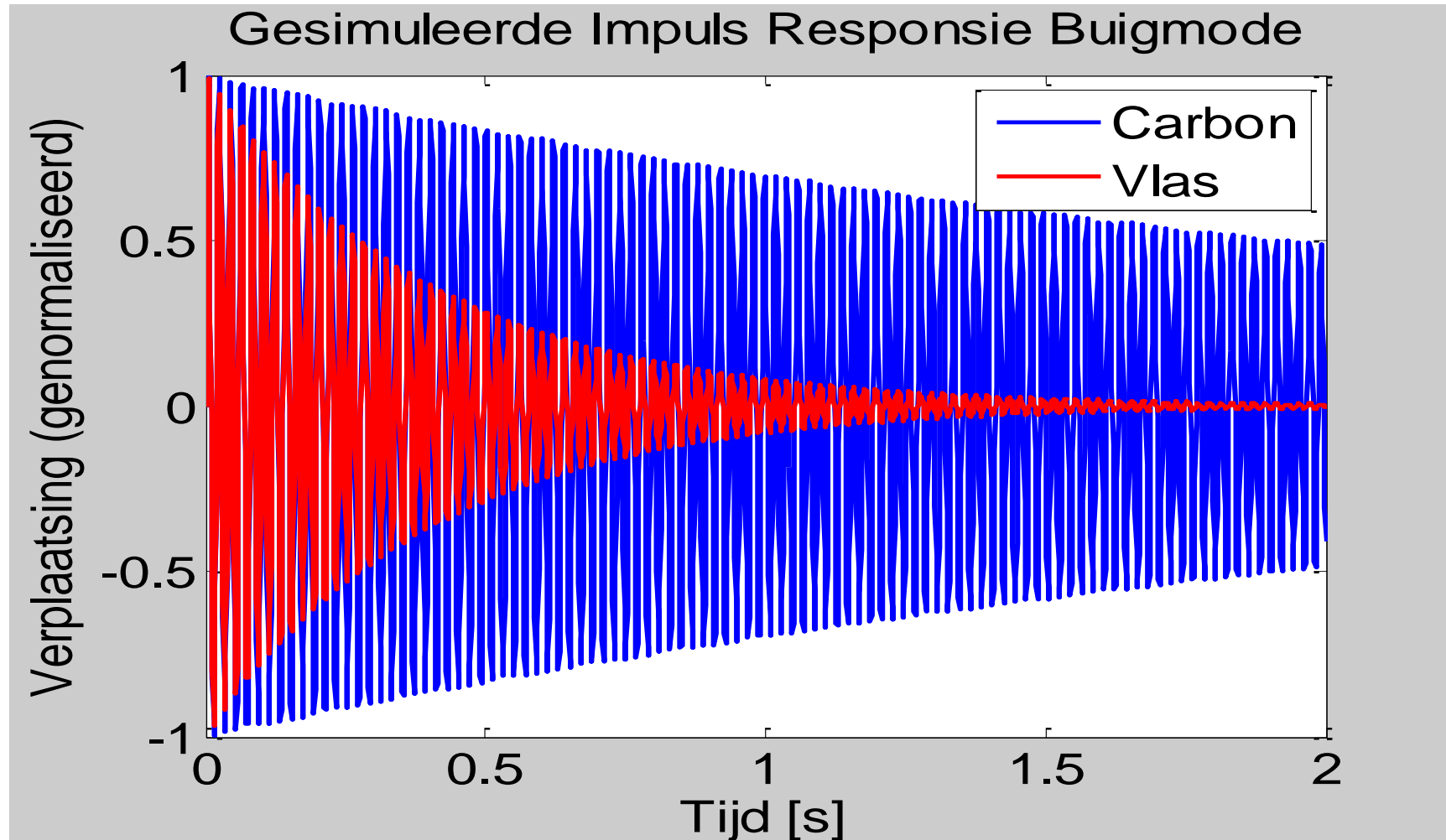


**Sp. Plate Stiffness as measured by NPSP ( $E 1/3/\rho$ )**

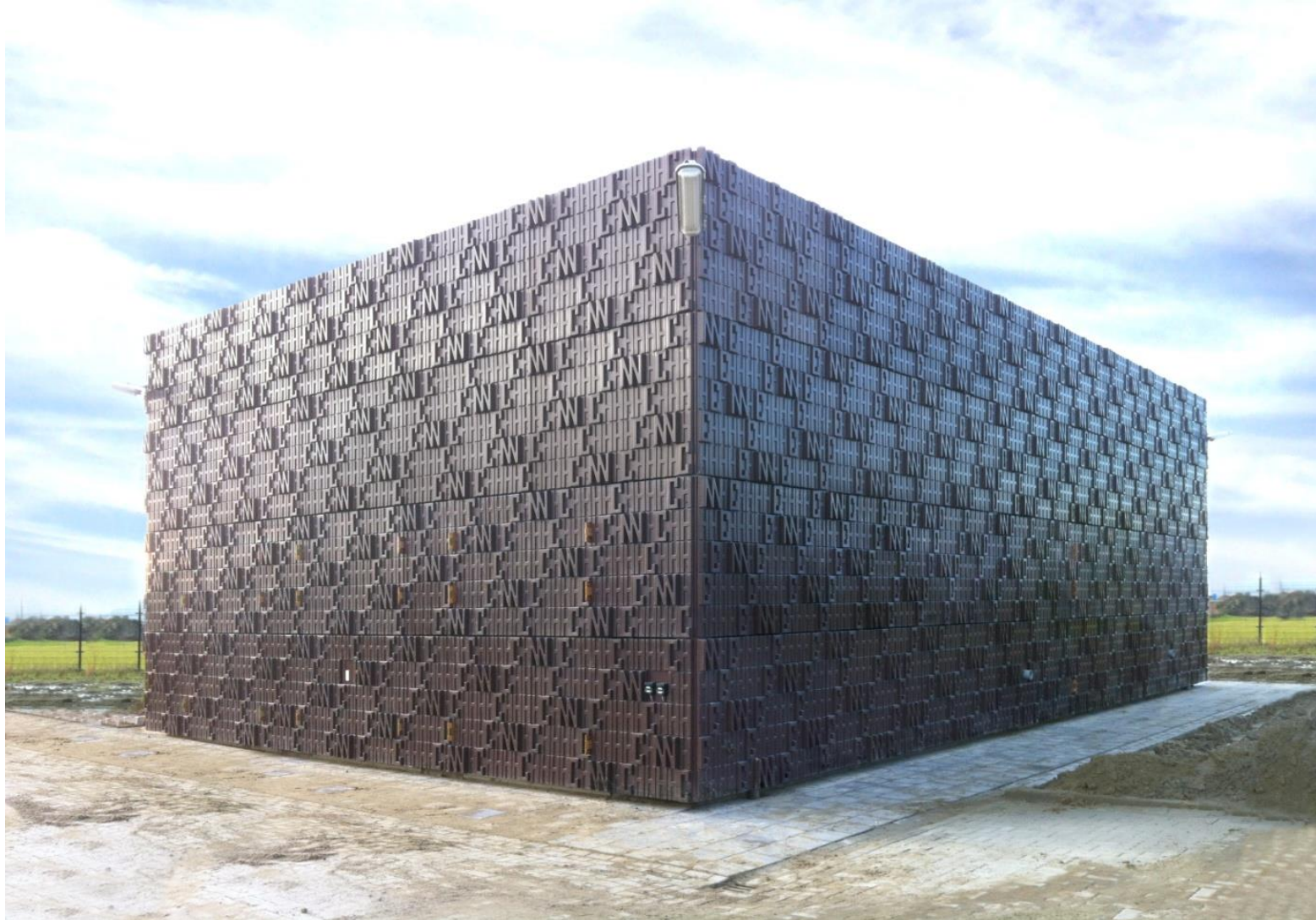


# Vibration damping much better

- Experiment<sup>1</sup>: UD flax vs UD carbon panels,  $[0^\circ]_9$ , epoxy, equal geometry



# Bio based Façade elements



# Maarten van Severen chair



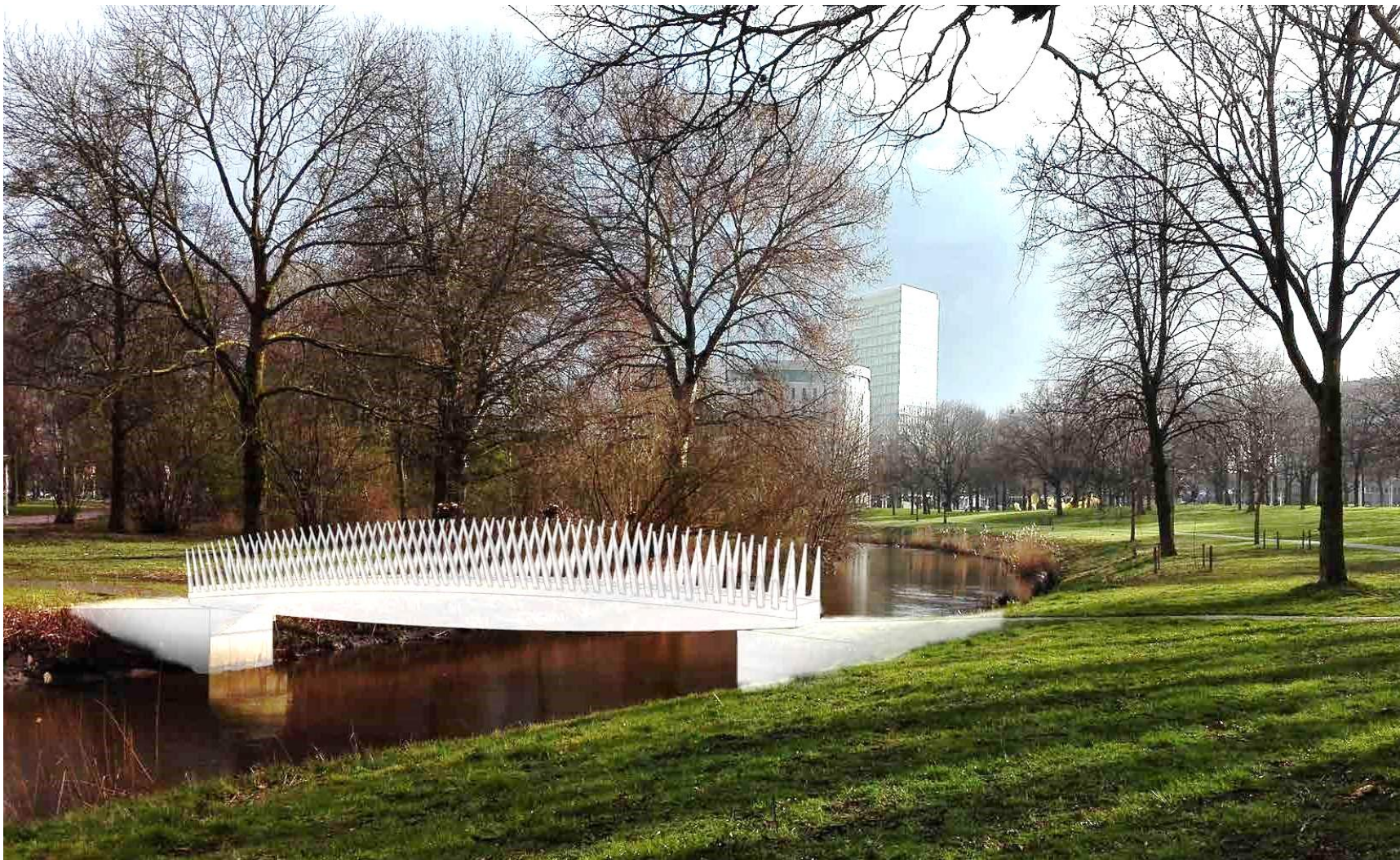
# Renovation of flat unit, cover of air-air heat exchanger for heat pump



# *Flax and hemp based monocoque scooter frame replacement of steel*



# Biocomposite Bridge – realisation coming weeks



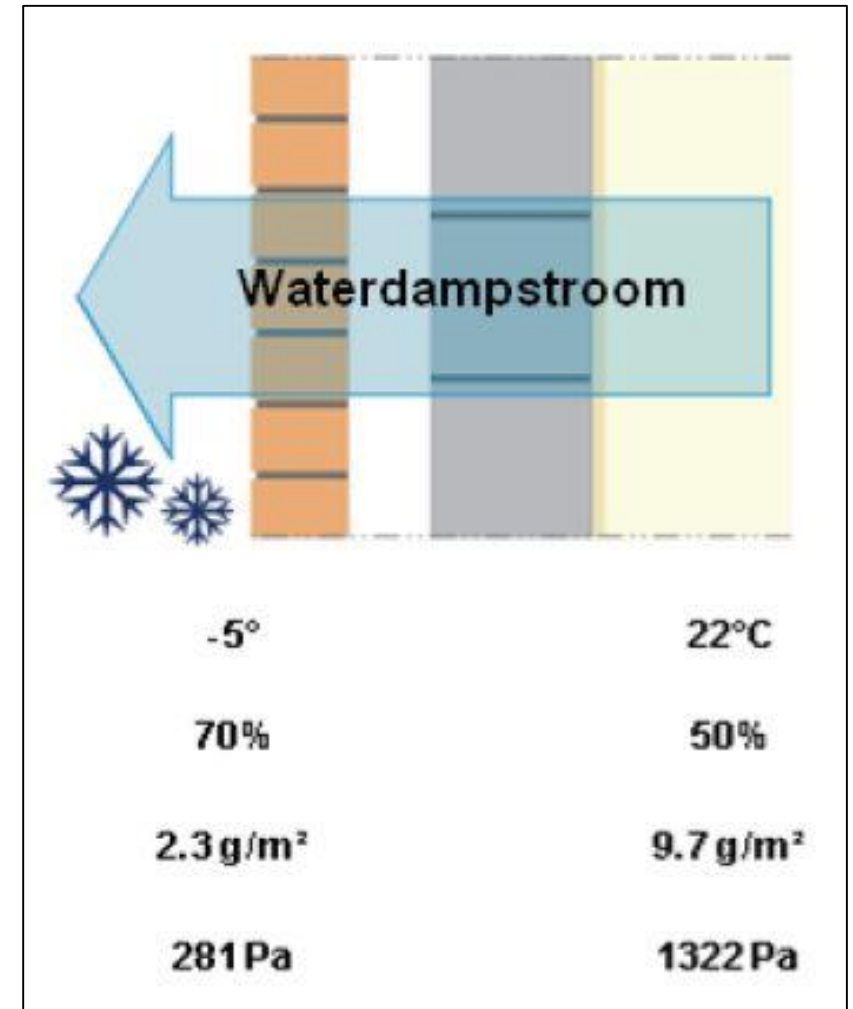
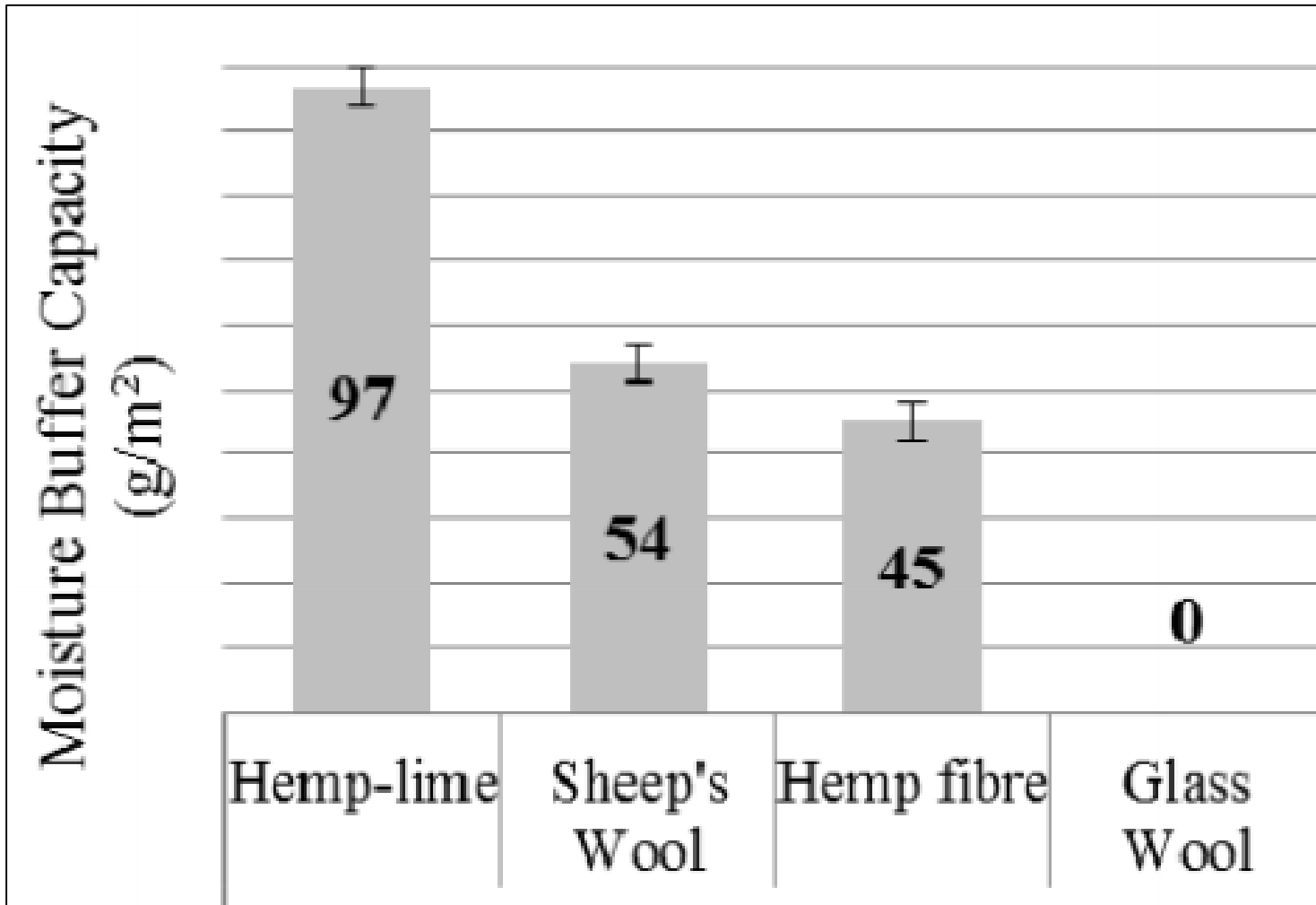


## *Coating belangrijk:*

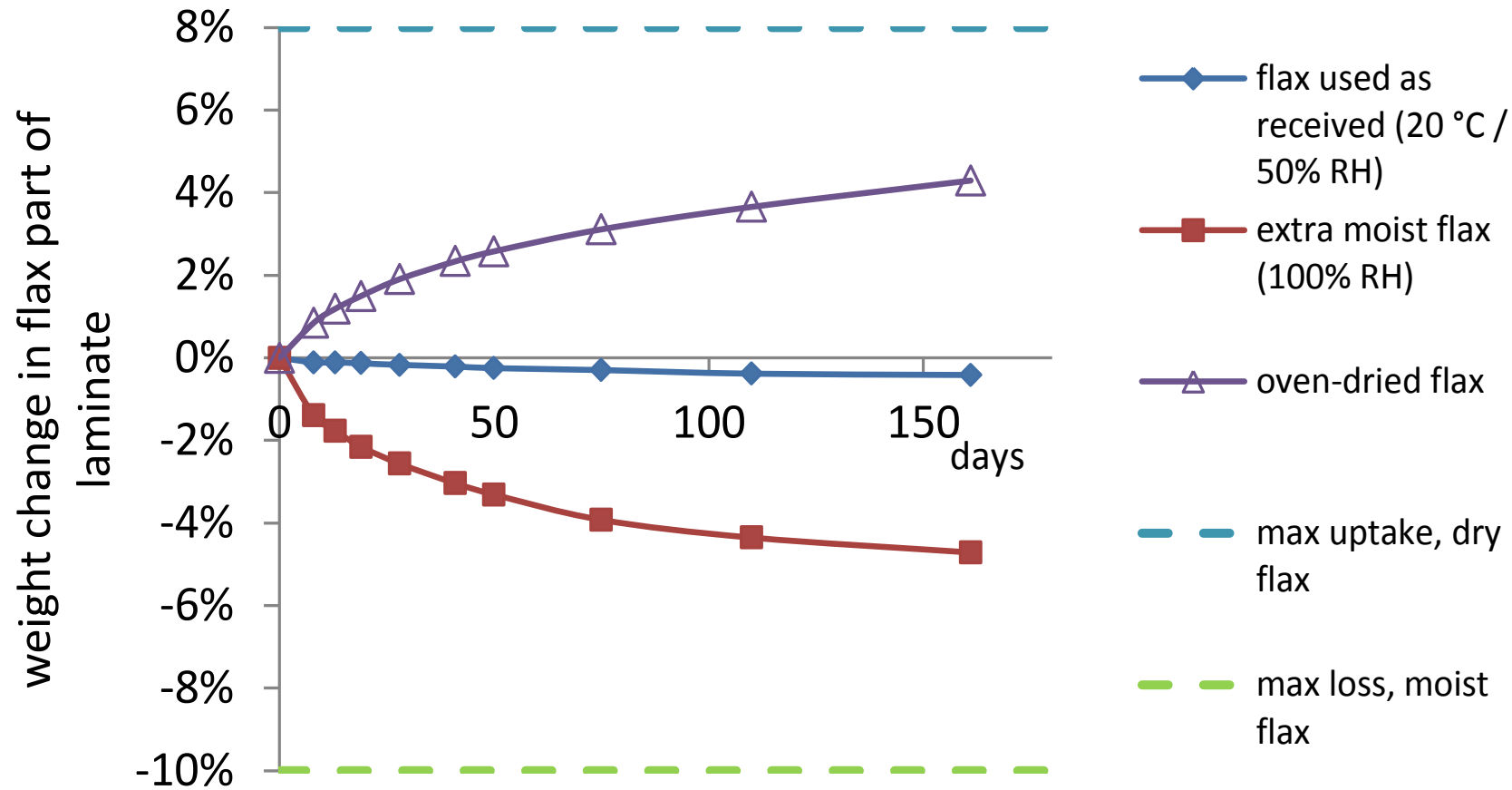
- Vocht, maar dampopen
- UV/kleur
- Krassen
- Brand
- Bacteriën en schimmels te verminderen

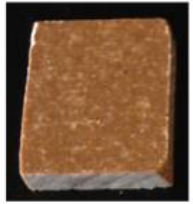
En

- biobased

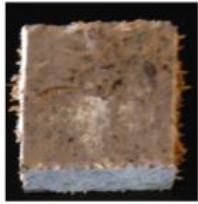


# Water uptake of composites





Resysta



Coir composite



Cork



Bamboo composite



Marmoleum



Touch Duet



Corklinoleum



Ecopanel



Hemp composite



Bamboo



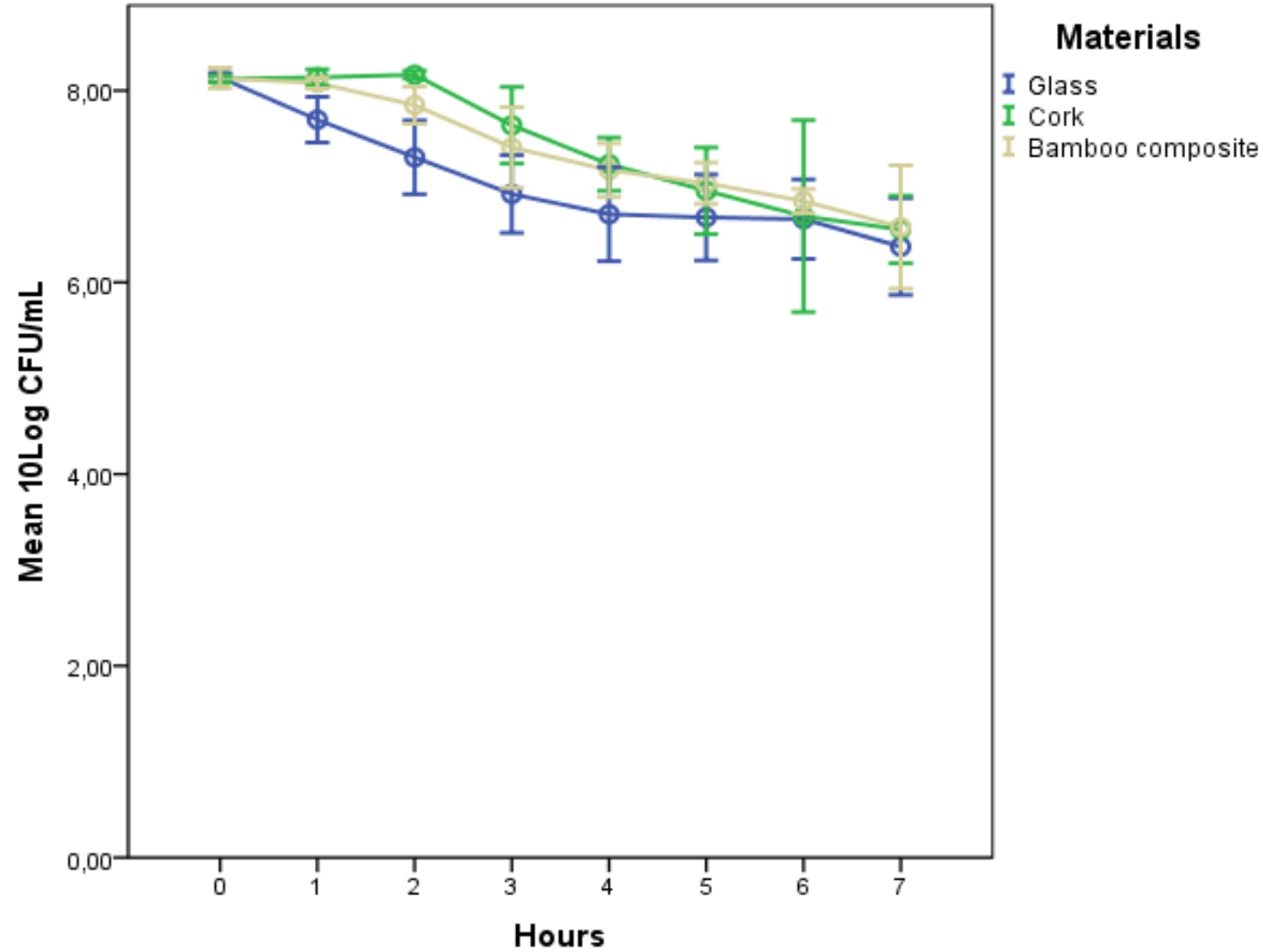
Flax composite

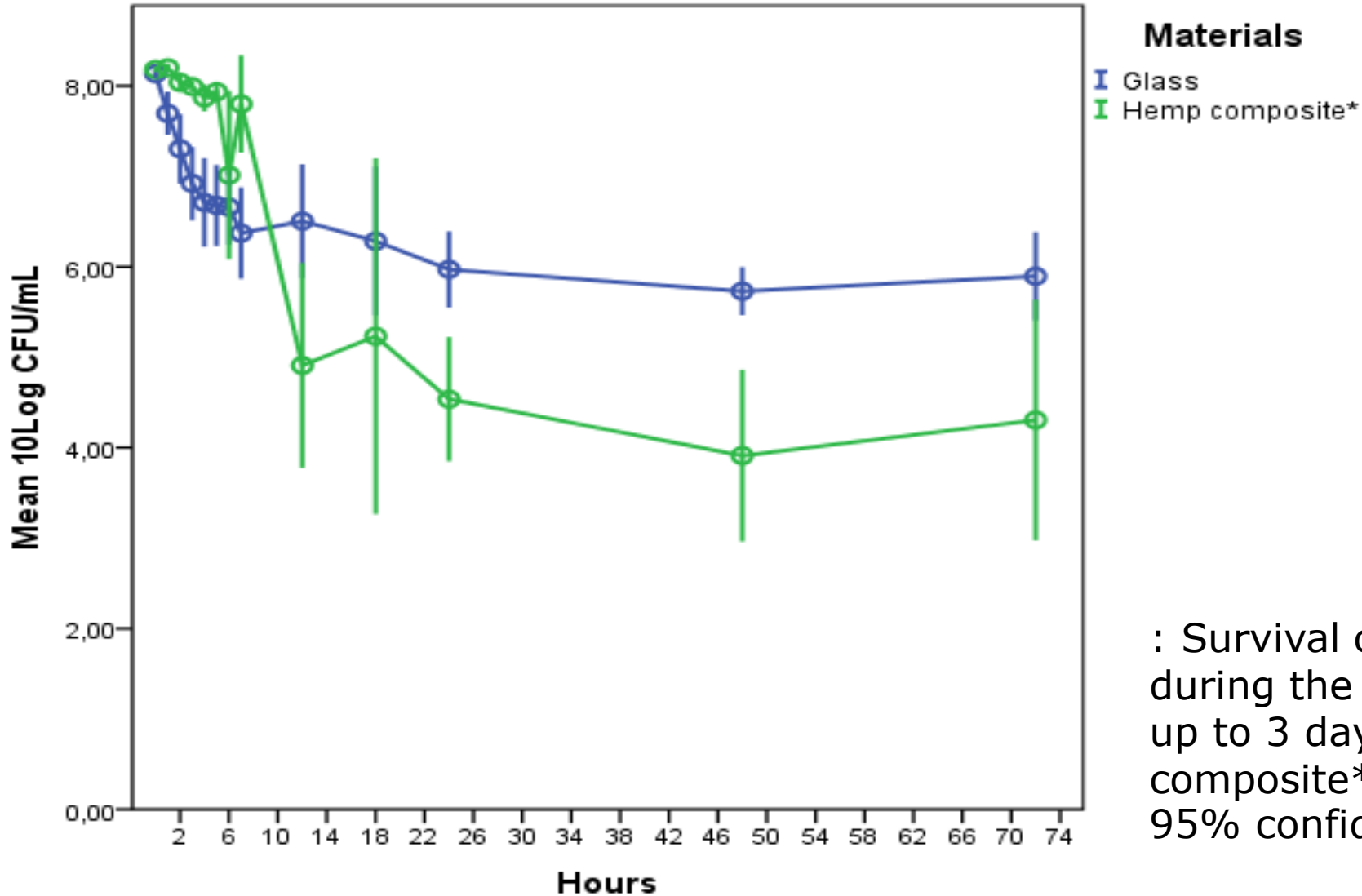


Hemp composite



Reed composite





: Survival curve of E. coli ST131 hourly during the first day up to 7 hours and daily up to 3 days on glass and hemp composite\*. Error bars are proposing the 95% confidence intervals.

