

# Circular sandwich panels

Mechanical properties & application

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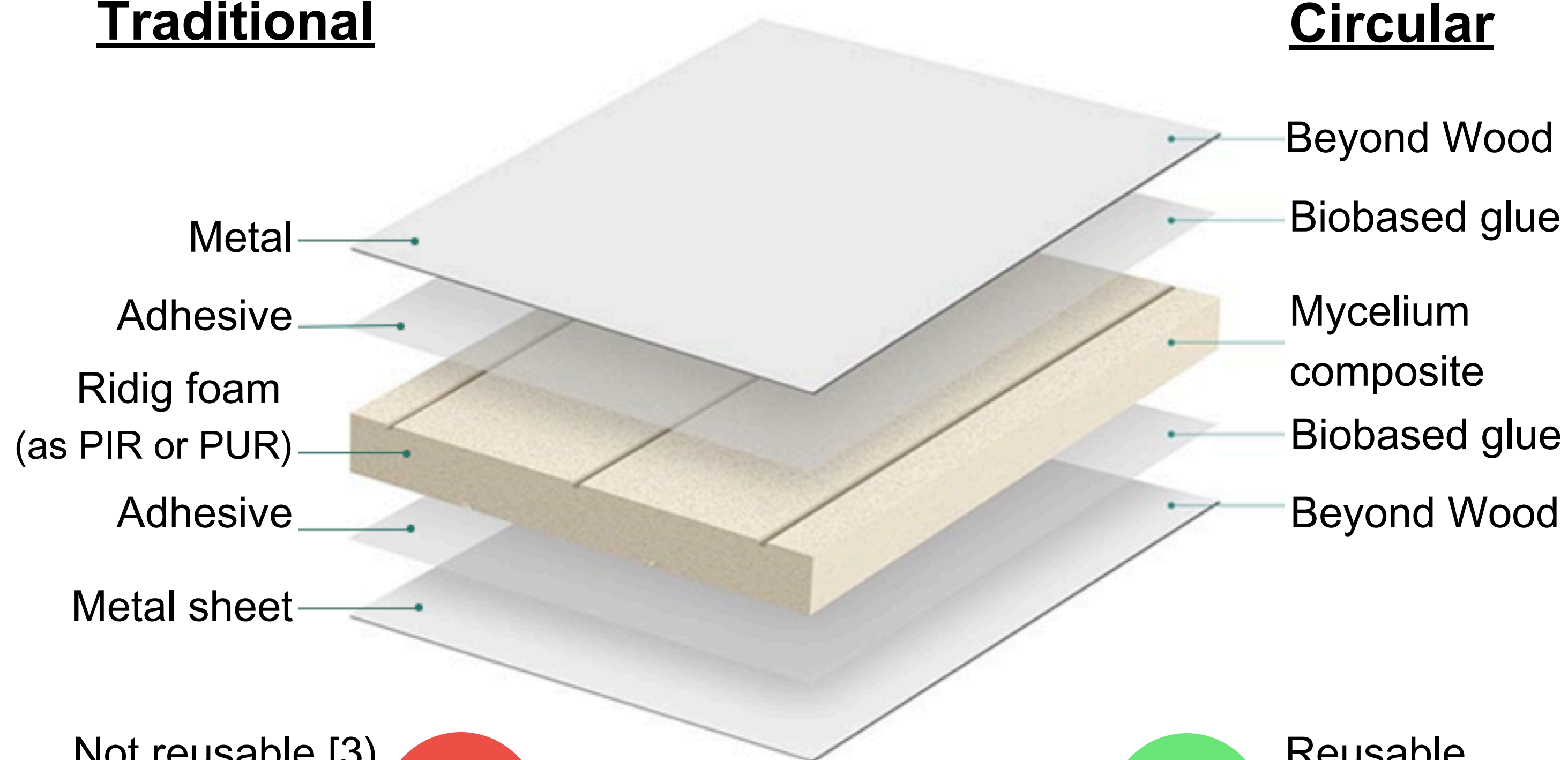
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## Introduction

The building industry significantly impacts the environment through energy use, carbon emissions, resource consumption, and waste production [1]. Most traditional building materials are not designed according to circular economy [2].

This research investigates the mechanical properties of circular sandwich panels and their application in the built environment.

### Traditional



Not reusable [3]  
Limited recyclability  
High emission



TOPOLO New Materials, 2024



Reusable  
Recyclable  
Low emission

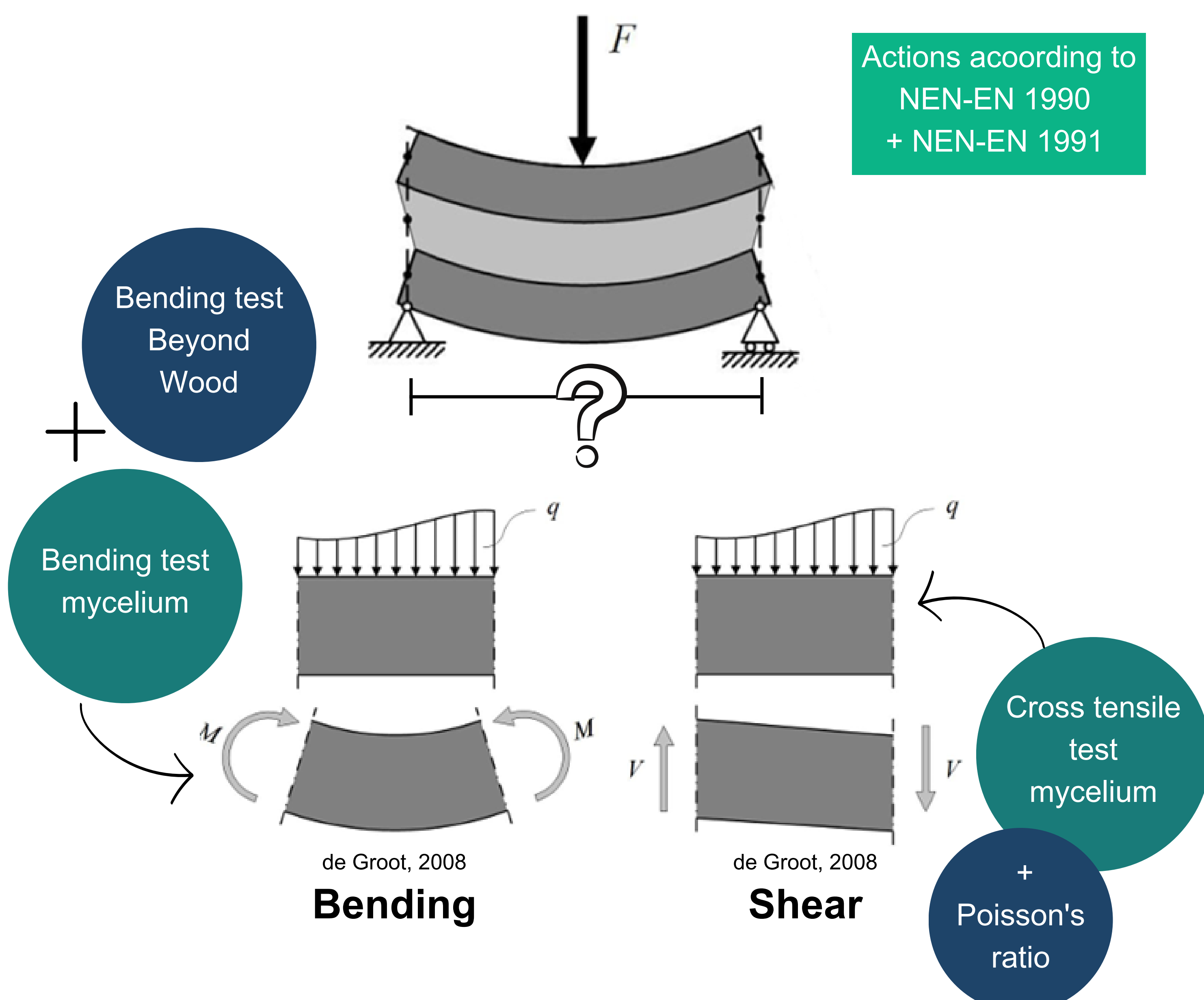
### Research question

How can circular sandwich panels be applied in the building industry based on their mechanical properties?

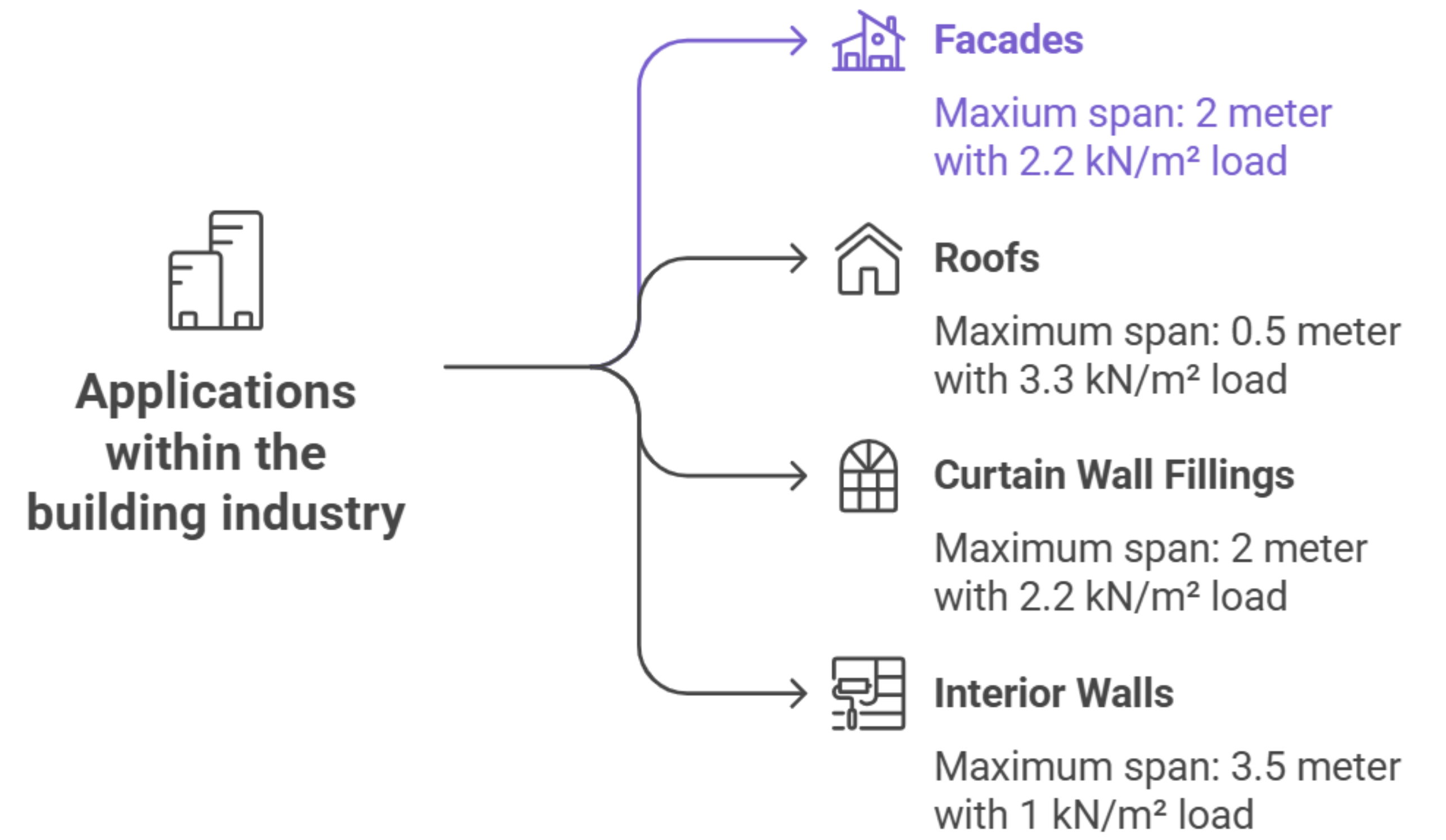
## Methodology

To determine the usability of the panels, the maximum span length of the circular panels is calculated. The strength and stiffness of both materials, as well as the applied load on the panels, play a crucial role in this assessment.

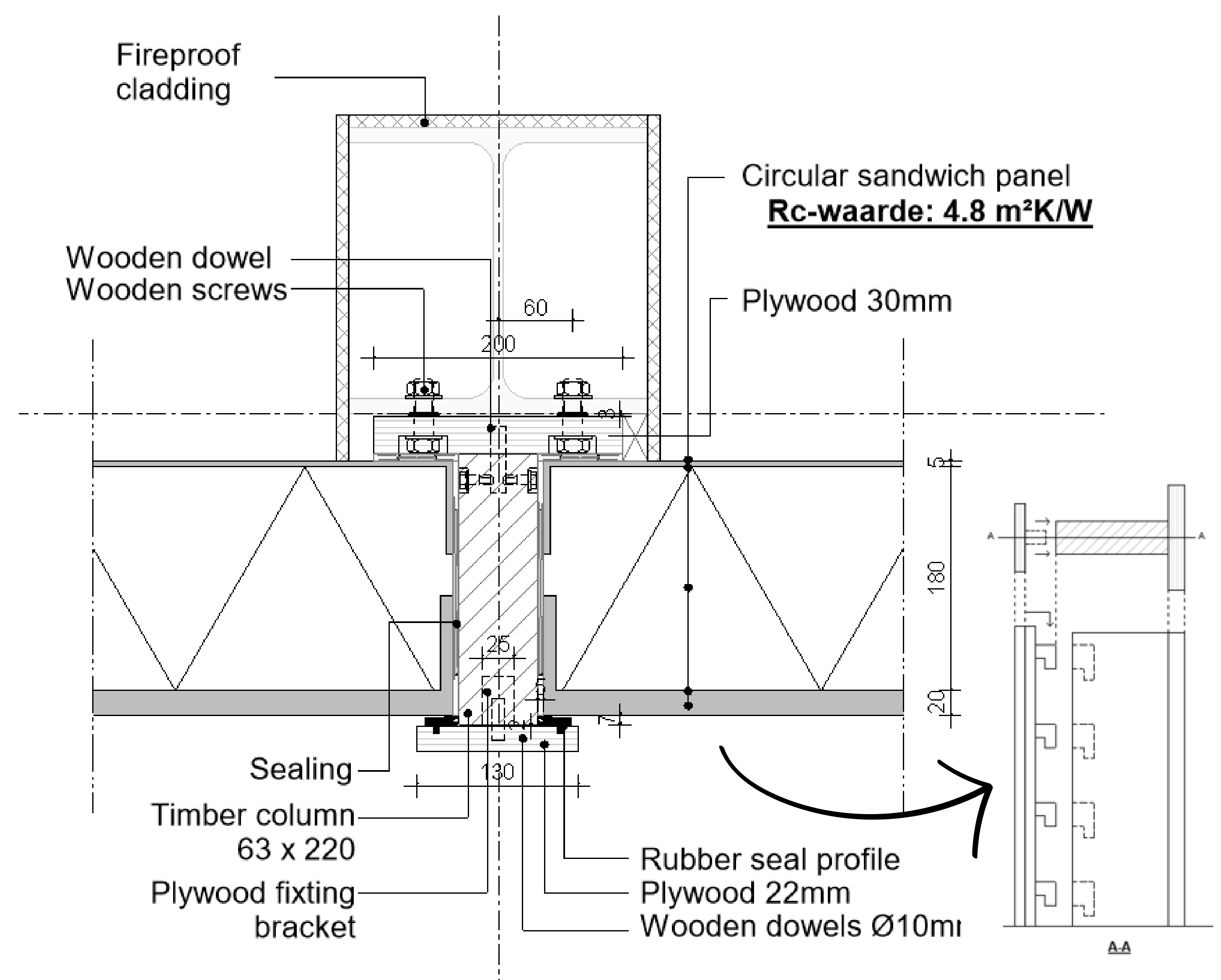
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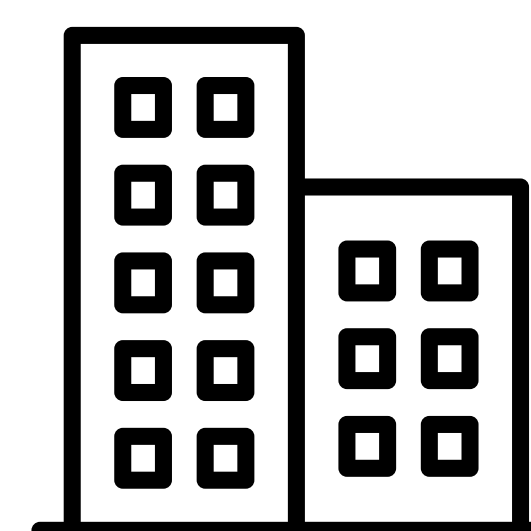
## Results



## Design application



## Conclusions & recommendations



Suitable for indoor applications or for curtain walls. Outdoor applications are not efficient enough **yet**.

For outdoor application, it is recommended to increase the strength of the materials and to focus more on improving the shear modulus of mycelium.

## References

- [1] J. R. Janson, U., Richter, J. L., Milios, L., & Johansson, D. (2023). Towards a Circular Building Industry. In Springer eBooks (pp. 1787–1810). [https://doi.org/10.1007/978-3-031-04560-8\\_148](https://doi.org/10.1007/978-3-031-04560-8_148)
- [2] Kanters, J. (2020). Circular Building Design: An Analysis of Barriers and Drivers for a Circular Building Sector. Buildings, 10(4), 77. <https://doi.org/10.3390/buildings10040077>
- [3] Kuhnhenne, M., Pyschny, D., & Janczyk, K. (2021). Reuse of steel sandwich panels. In CRC Press eBooks (pp. 268–273). <https://doi.org/10.1201/9780429343292-31>