

Development of a construction panel made from crushed wood scrim

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The Scrimber technology is used to create high-performance materials from low-quality wood. A novel single-layer board was developed using an industrially viable process. The developed panel shows promising results for a scaleable, resource-efficient usecases.

Introduction

The Scrimber-Technology offers a resource efficient way to produce materials with high mechanical properties from low quality wood assortments. In this thesis, a single layer board is developed and manufactured from scattered Scrimber-Strands, taking into account the industrial feasibility. Such a board does not yet exist and there is no detailed information on an industrially viable manufacturing process. Therefore, in this thesis, a single layer oriented board is developed and tested, which can later be applied in the core layers of cross-laminated timber. The board is produced in a self developed laboratory process with regards to an industrial scale up. The laboratory process includes glue application in a glue drum, unidirectional mat forming in a forming mould and pressing in a hot press. It has been possible to develop an industry-oriented laboratory process with homogeneous Scrimber-Strand orientation and very homogeneous density distribution.

Results

Panels produced using this process achieve a flexural strengths of approximately 62 N/mm^2 , E-modulus of $17'000 \text{ N/mm}^2$, which exceeds the target values of 16 N/mm^2 and $8'000 \text{ N/mm}^2$. The target value for thickness swelling has not yet been achieved and achiev-

ing the shear modulus of solid wood with Scrimber panels does not seem possible.

Conclusion

Scrimber can be a solution for the resource efficient use of wood in the construction sector and this work provides a reproducible method of production on a laboratory scale that can be scaled up industrially. Evaluation of the tests shows that this Scrimber process is quite competitive compared to other scrimber processes and can be used as a basis for further development.



Johannes Crux



Scrimber strand (Picture Source: BEKB)



Scrimber board (Picture Source: BEKB)