

Interreg



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Wood Added Value Enabler

Grande Région | Großregion

Développement d'un outil d'aide à la décision multi-critères sur le potentiel en
construction des essences –

Vorstellung einer multikriteriellen Entscheidungshilfe für das
Konstruktionspotenzial von Holzarten

Tom Mortelmans



LIÈGE université
Forest is life
TERRA

Development of a multi-criteria decision support tool for evaluating the construction potential of tree species

Developped by Arthur Duyck, Tom Mortelmans, Thierry Descamps and Tom De Mil

Objectives : Choose a wood species for a construction product. This species must be as relevant as possible according to several criteria (performance, environmental, etc.)

Analytical tool : Multi-Criteria Decision Making (MCDM) Tool



Steps summary

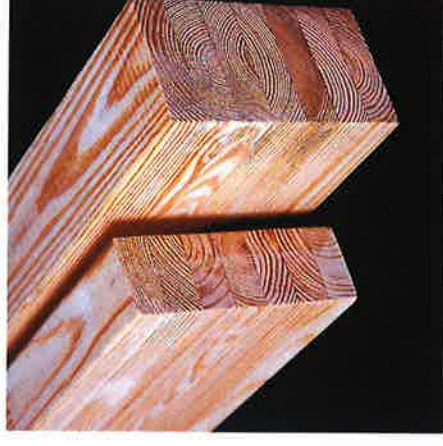
1 – Choice of a product of interest

Massive wood, CLT and Glulam to begin with

2 –Determination of primary criteria

Performance, Environmental relevance and Economical relevance

3 – Determination of secondary criteria



Steps summary

3 – Determination of secondary criteria

C1 - Performance :

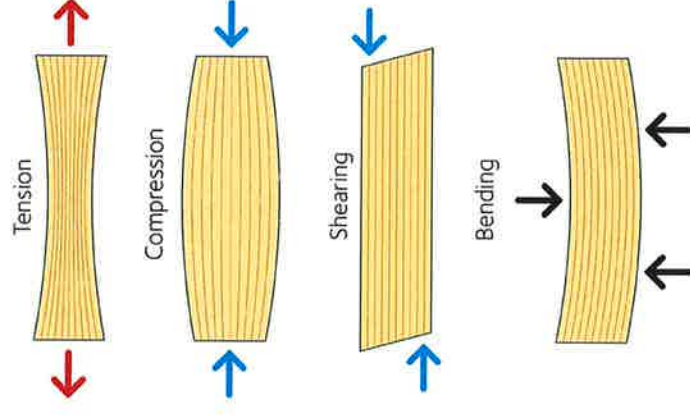
- Resistance (comp., traction, bending, shear) – [MPa]
- Young modulus– [MPa]
- Wood volumetric mass – [kg/m³]
- ...

C2 – Environmental relevance

- Climate change resistance – [Qualitative]
- Biodiversity impact – [Qualitative]
- Health hazard – [Qualitative]
- ...

C3 – Economical relevance

- Disponibility of the ressource – [m³ standing]
- Produced volume – [m³/ha/year]
- Buying price of the wood – [€/m³]
- ...



4 – Determination of the criteria weight

-> AHP method (Analytic Hierarchy Process)

	C1	C2	C3
C1	1	3	7
C2	1/3	1	5
C3	1/7	1/5	1

Points	Conversion scale
1	Equal importance
3	Moderate importance
5	Strong importance
7	Very strong importance
9	Extreme importance

5 – Performance matrix

-> TOPSIS : Technique for Order Preference by Similarity to Ideal Solution

Tool summary

