PerformWOOD

Performance standards for wood in construction - delivering customer service life needs

www.performwood.eu

Performance standards – recent CEN activities and project PerformWOOD

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cost

SEVENTH FRAMEWORK PROGRAMME

Supported by

How long?

Material resistance

Increase the resistance of the material

Moisture risk

Minimise the risk of moisture being present in the product

Service life

New approach

- Statistical analysis of test outcomes
- Enable all technologies
- Enable design for durability
- Create a user friendly interface in the language of design, service, location, environment

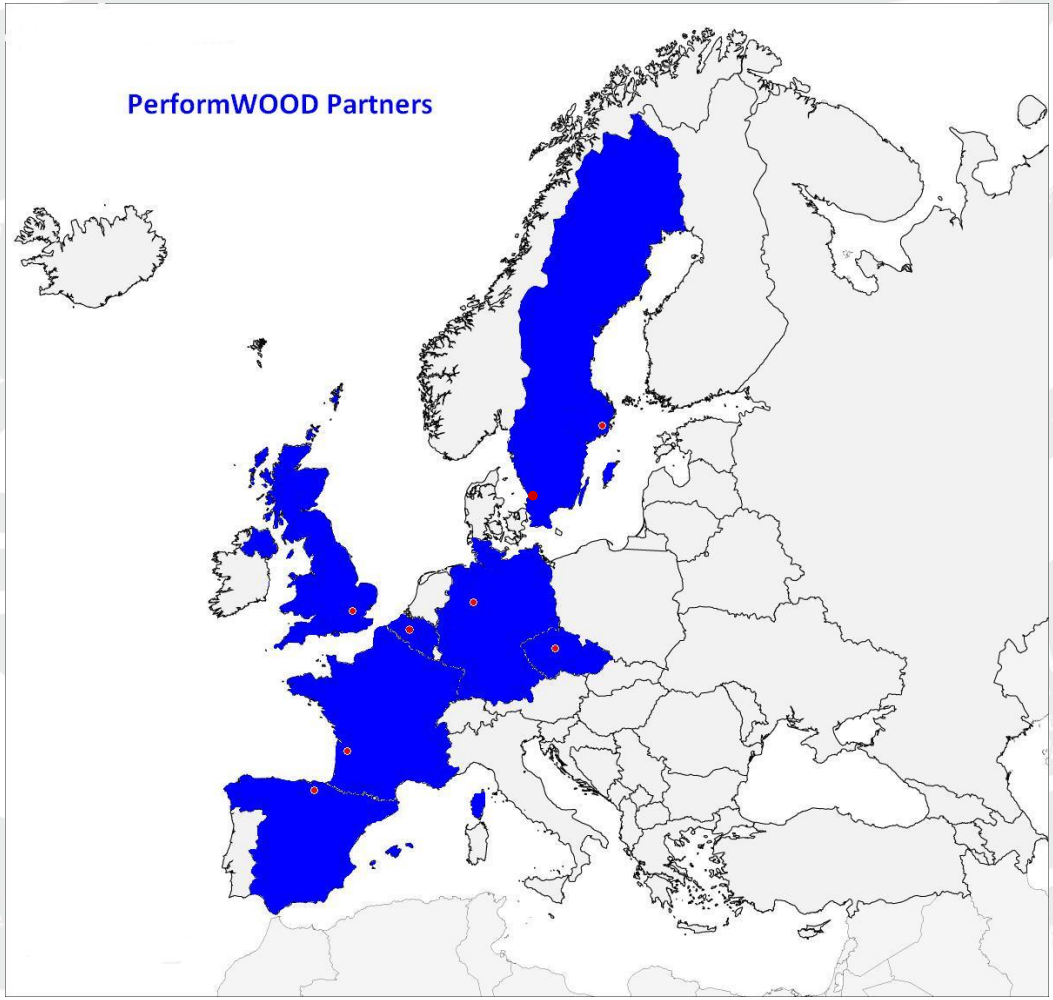
Motivation

- Construction Product Regulations
  - Reliable components
  - Six essential requirements fulfilled for a ‘reasonable service life’
- Warranty providers
  - Housing standards, mortgage lenders, risk management
- End users
  - I need to know how long! Service Life Planning
- LCA and Environmental Product Declarations
  - Critical in-use phase for products

CEN/TC38 WG28 Performance Classification

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

- Radical look across TC38
- How can we improve to meet user expectations?
- How can we update?
- How do we support wood specification and enable product innovation?



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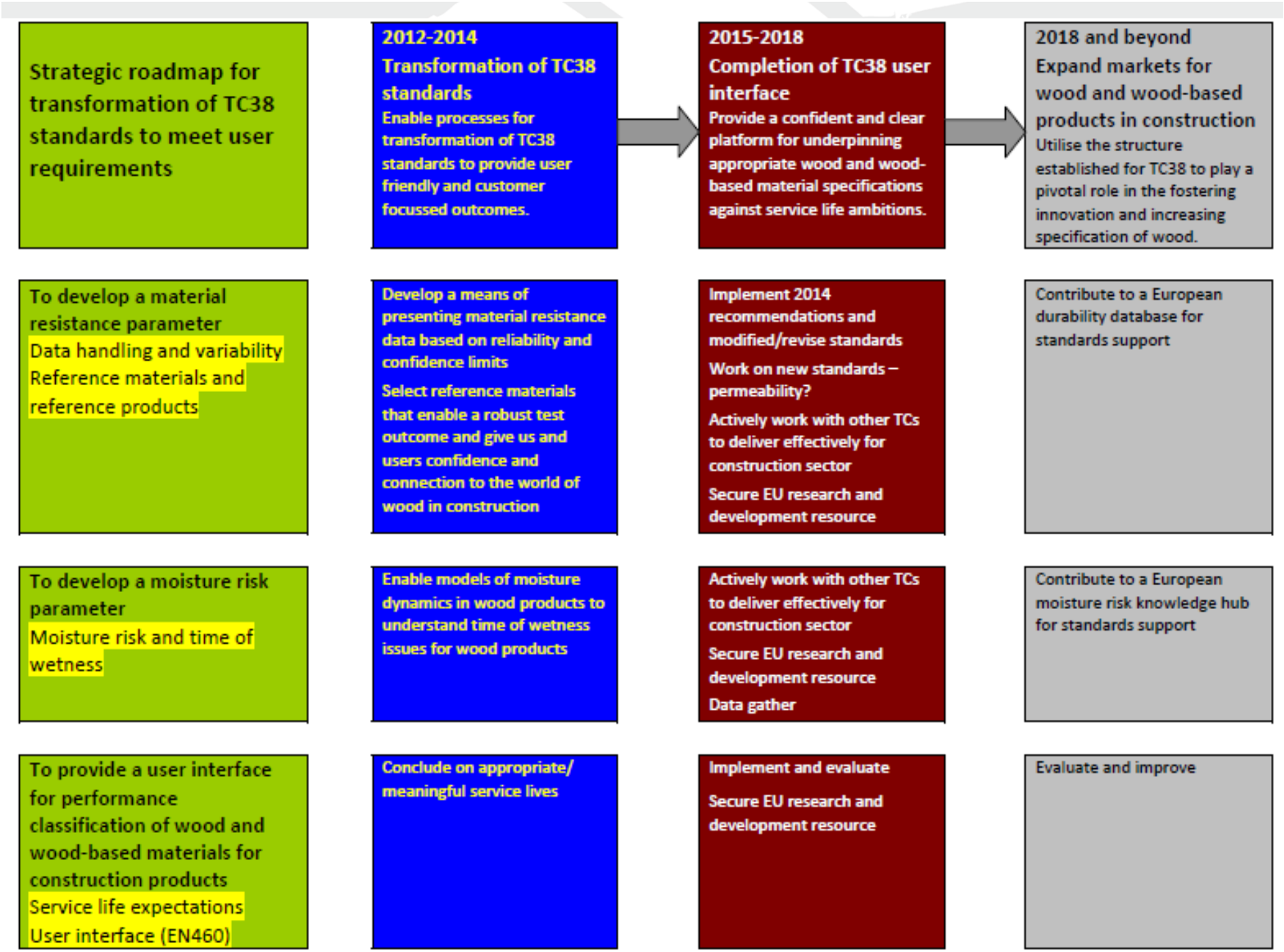
Project PerformWOOD

- WP1 Strategic roadmap
- WP2 Data handling and analysis
- WP3 Reference materials
- WP4 Moisture risk in wooden components
- WP5 Service life expectations
- WP6 Draft standard


Strategic roadmap for transformation of TC38 standards to meet user requirements
2012-2014
Transformation of TC38 standards
Enable processes for transformation of TC38 standards to provide user friendly and customer focussed outcomes.
2015-2018
Completion of TC38 user interface
Provide a confident and clear platform for underpinning appropriate wood and wood-based material specifications against service life ambitions.
2018 and beyond
Expand markets for wood and wood-based products in construction
Utilise the structure established for TC38 to play a pivotal role in the fostering innovation and increasing specification of wood.
To develop a material resistance parameter
Data handling and variability
Reference materials and reference products
Develop a means of presenting material resistance data based on reliability and confidence limits
Select reference materials that enable a robust test outcome and give us and users confidence and connection to the world of wood in construction
Implement 2014 recommendations and modified/revise standards
Work on new standards – permeability?
Actively work with other TCs to deliver effectively for construction sector
Secure EU research and development resource
Contribute to a European durability database for standards support
To develop a moisture risk parameter
Moisture risk and time of wetness
Enable models of moisture dynamics in wood products to understand time of wetness issues for wood products
Actively work with other TCs to deliver effectively for construction sector
Secure EU research and development resource
Data gather
Contribute to a European moisture risk knowledge hub for standards support
To provide a user interface for performance classification of wood and wood-based materials for construction products
Service life expectations
User interface (EN460)
Conclude on appropriate/ meaningful service lives
Implement and evaluate
Secure EU research and development resource
Evaluate and improve

Material resistance

- Inherent durability and Wettability
- Data handling and variability
- Present MR in based on reliability and confidence limits
- Improvements to standards

Reference materials

- Reference Service Life
  - Codes and standards, Whole life costing
- Reference test materials
- Commercial or market reference products
  - Existing products that meet market expectation
  - National examples

Moisture risk

- Gather experience of moisture risk models and data
- Translate into moisture risk rules and use class products
- Prediction of moisture content development in wood based on climate data, size, moisture uptake properties and detail design

Survey - Moisture Risk and Wood Durability Testing

This survey aims on gathering information about the significance of moisture induced risk in wood durability testing. Hereby the focus is on degradation by fungi and bacteria.

In the following you will be asked to provide information about your practice in durability testing.

This questionnaire is therefore structured according to laborytory tests, field tests, monitoring of structures and finally development of models and service life prediction.

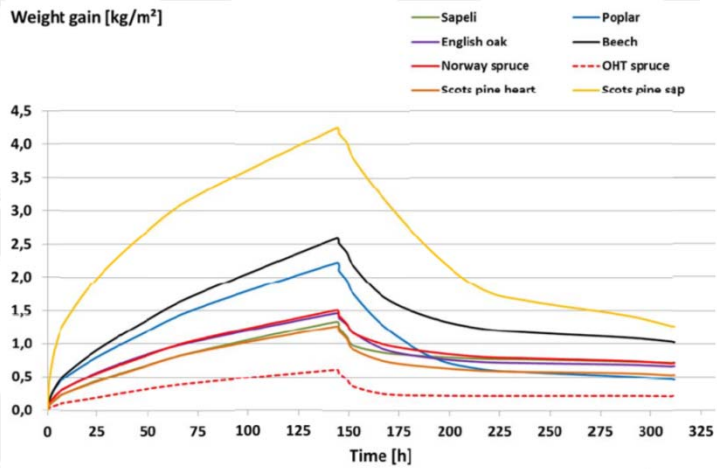
According to your answers the questionnaire will be adapted to your activities in wood durability research.
The time for processing the questionnaire is approx. 20 min.

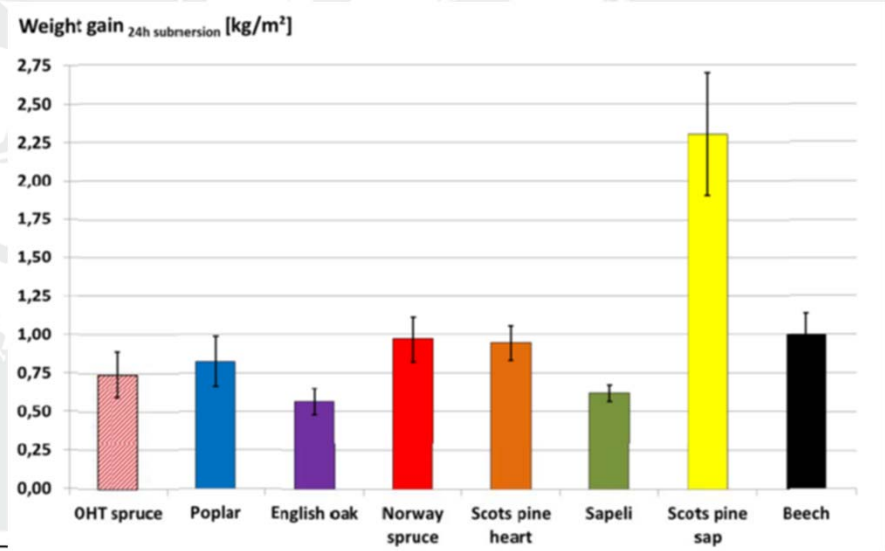
All data will be handled confidentially (Name and Organization will not be named).

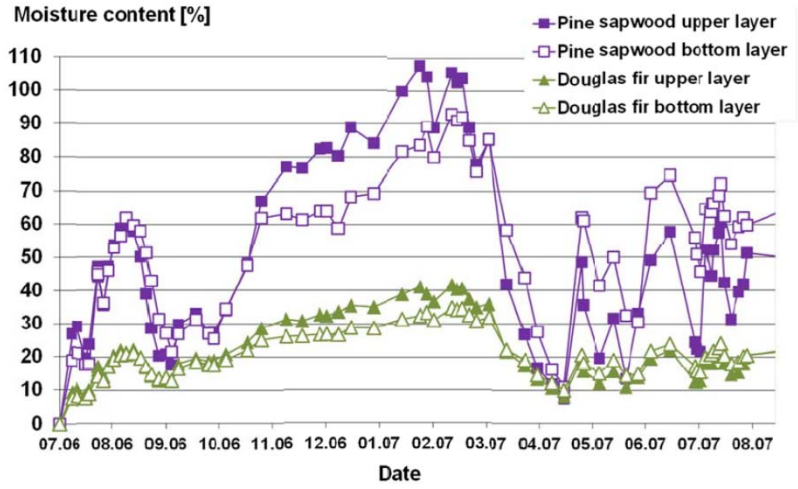
Your contribuition is highly appreciated!

Moisture risk

- New moisture relation data
- Moving towards predictions







User expectations

- Compile and analyse user expectations for service life
  - Public perceptions and experiences (guarantees)
  - Professionals experience
- Compare expectations and reality
  - Historical database of buildings
- Improvements to standards
  - Presentation and terminology

FP7 Coordination and supporting action "Support for standardisation needs" Grant agreement no: 319132

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European users expectations for wood product service life

Deliverable D5.2

23 December 2013

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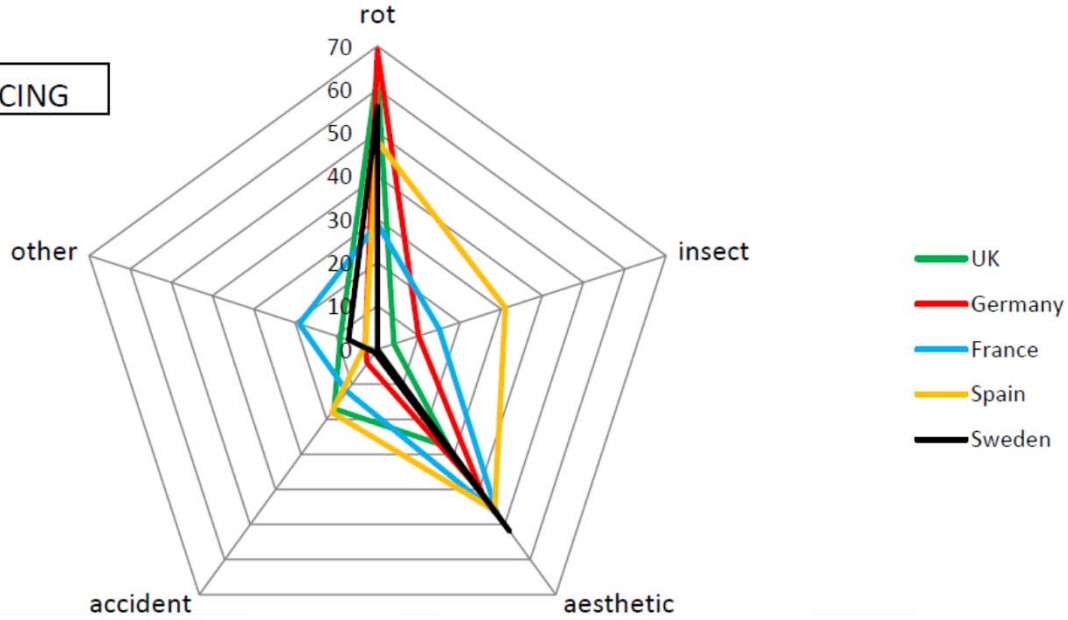
FENCING



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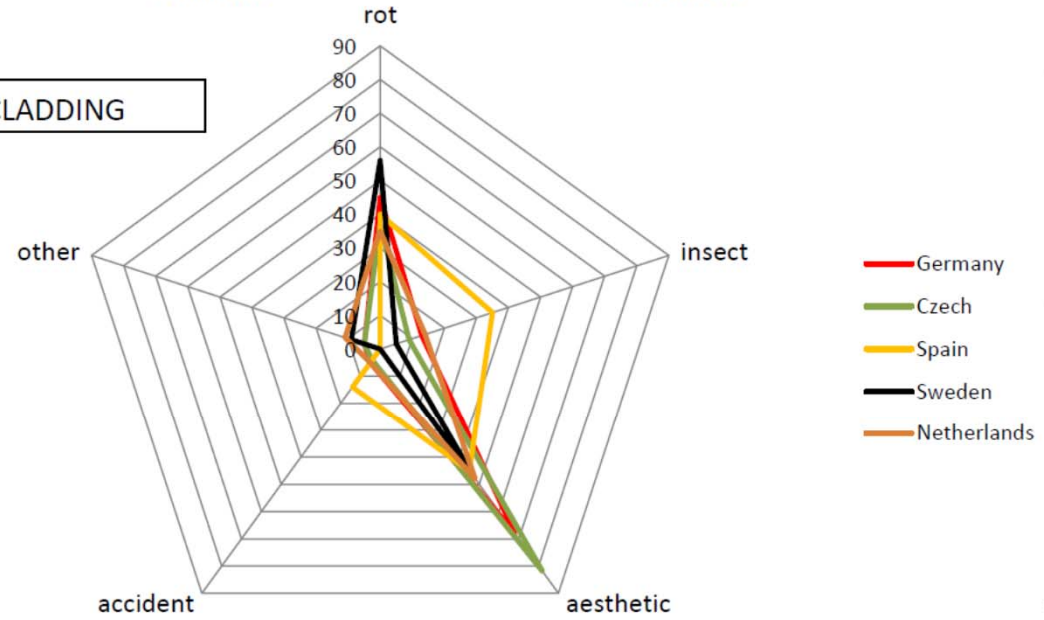
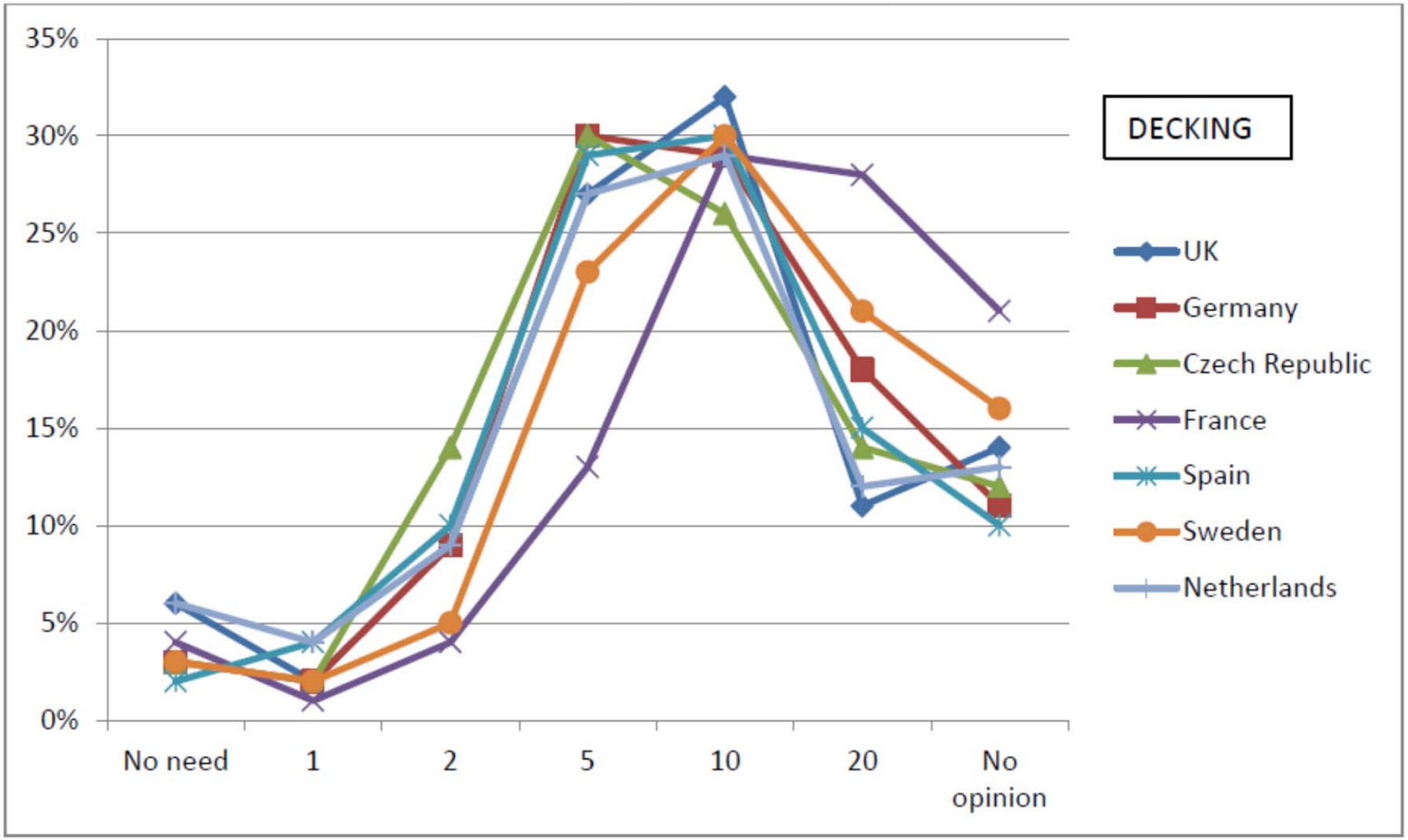


Guarantees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DECKING
UK
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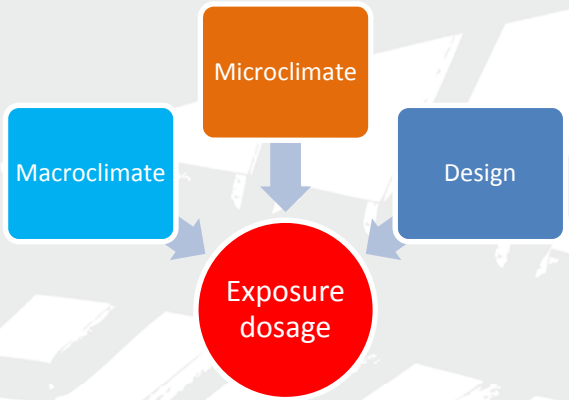
Czech Republic
France
Spain
Sweden
Netherlands

EN460 User interface

- Exposure dosage



- Material resistance

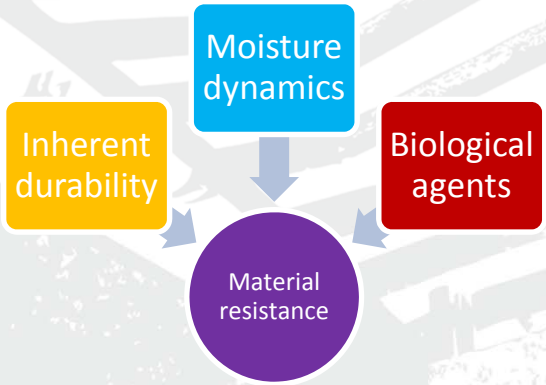


Table 1 — Wood-destroying fungi — Guidance on the durability classes of wood species for use in hazard classes

Hazard class	Durability class				
	1	2	3	4	5
1	o	o	o	o	o
2	o	o	o	(o)	(o)
3	o	o	(o)	(o) — (x)	(o) — (x)
4	o	(o)	(x)	x	x
5	o	(x)	(x)	x	x

Key

o	natural durability sufficient.
(o)	natural durability is normally sufficient, but for certain end uses treatment may be advisable (see Annex A).
(o) — (x)	natural durability may be sufficient, but depending on the wood species, its permeability (see 6.1), and end use (see Annex A), preservative treatment may be necessary.
(x)	preservative treatment is normally advisable, but for certain end uses natural durability may be sufficient (see Annex A).
x	preservative treatment necessary.

NOTE Sapwood of all wood species should be regarded as durability class 5.

Material resistance

- We have EN599 EN350 EN113
- We need
  - Durability class linked to reliability of the classification plus statistical confidence intervals
  - Wettability
  - MR link to use class (biological hazard)
  - Means of selecting confidence limit based on consequence of failure or tolerance of failure measure
  - UC3 aesthetic performance?

Material resistance

- We need (continued)
  - Hazard specific durability information
  - Keep it simple to start with!

Exposure dose

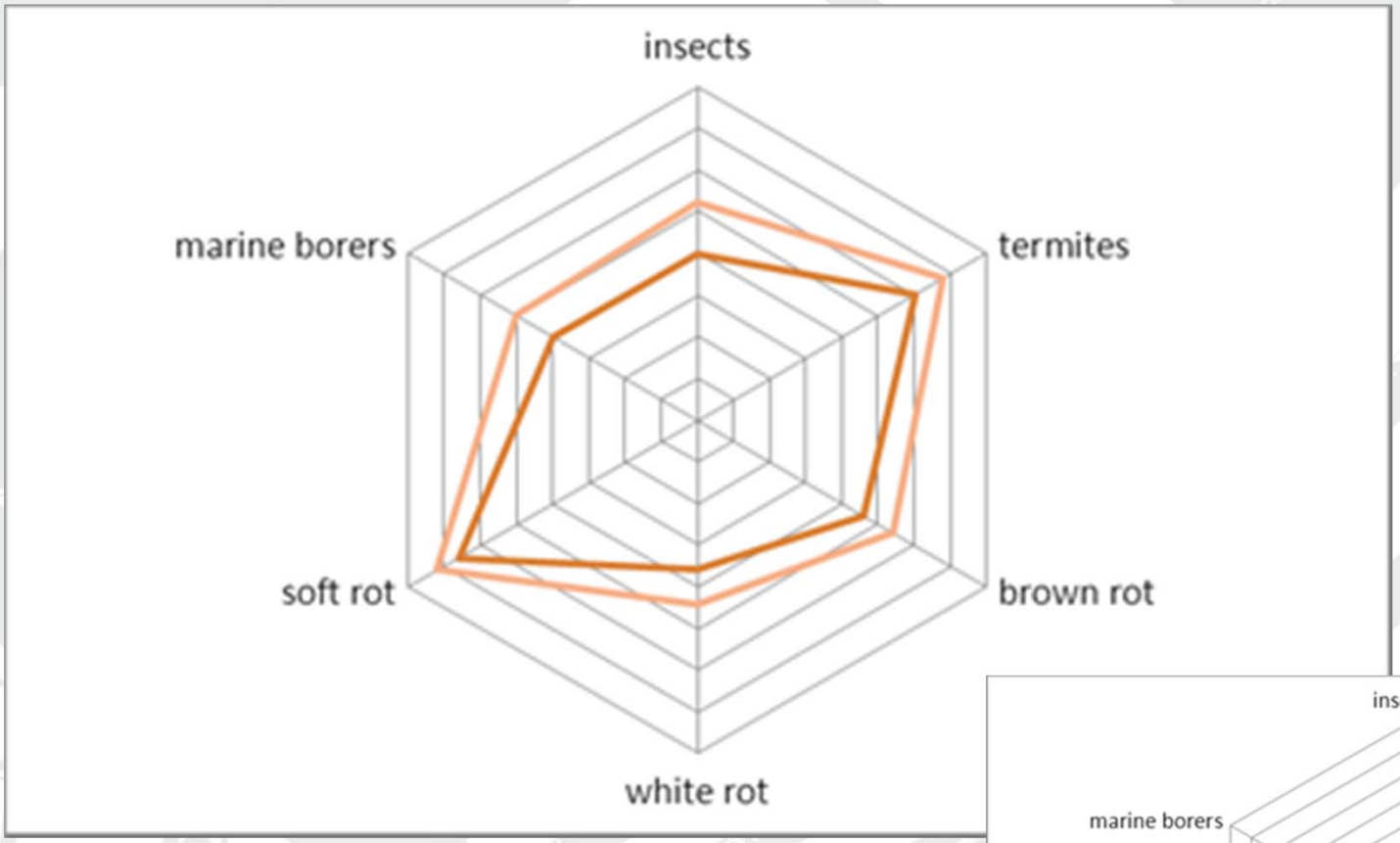
- We have Use Class
- We need
  - Time of Wetness
    - Coating, maintenance?
  - Climate
  - Design
  - Are termites or insects present or not
  - We must keep it simple at first!

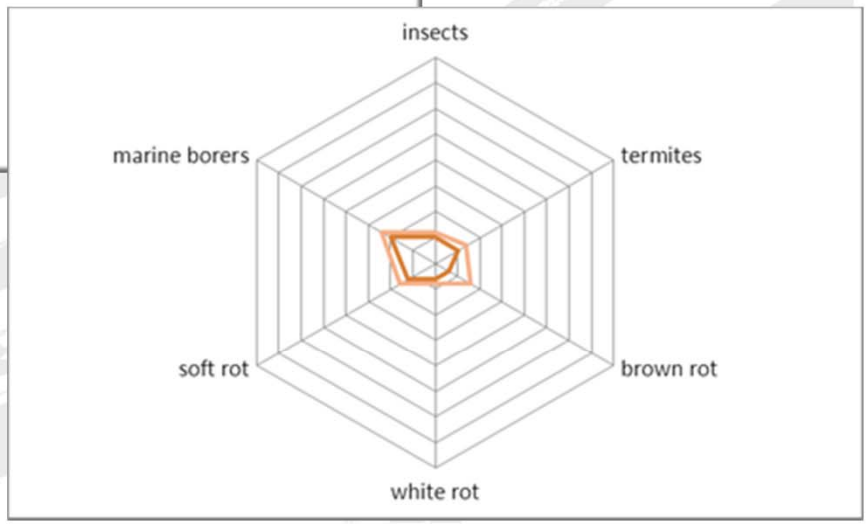
1. Determine consequence of failure

- Input criteria – what is the product? where is it being used?
- If COF are unacceptable then higher material resistance or techniques to reduce dose need to be selected.

2. Determine Material Resistance parameter

- Input criteria for user – what is the material?
- Durability class and wettability class → Material Resistance class (MR)


insects
termites
brown rot
white rot
soft rot
marine borers

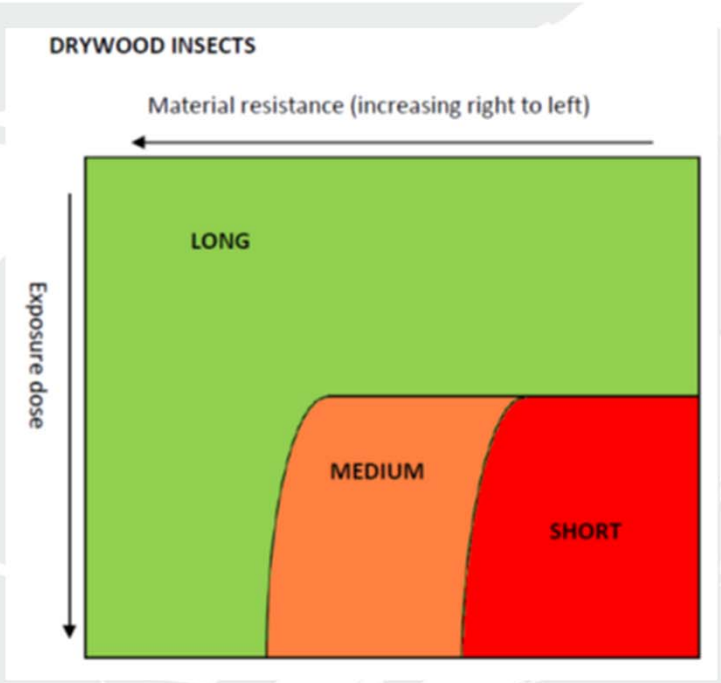

insects
termites
brown rot
white rot
soft rot
marine borers

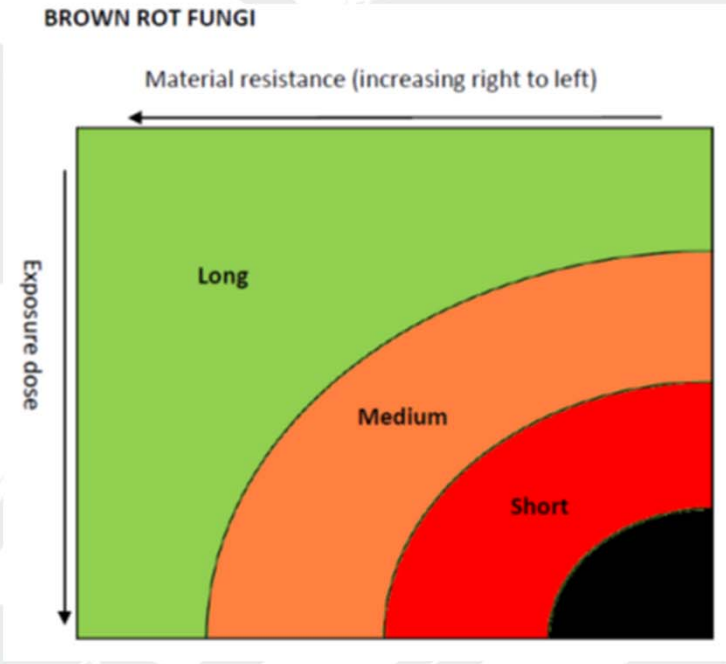
3. Determine Exposure Dose parameter

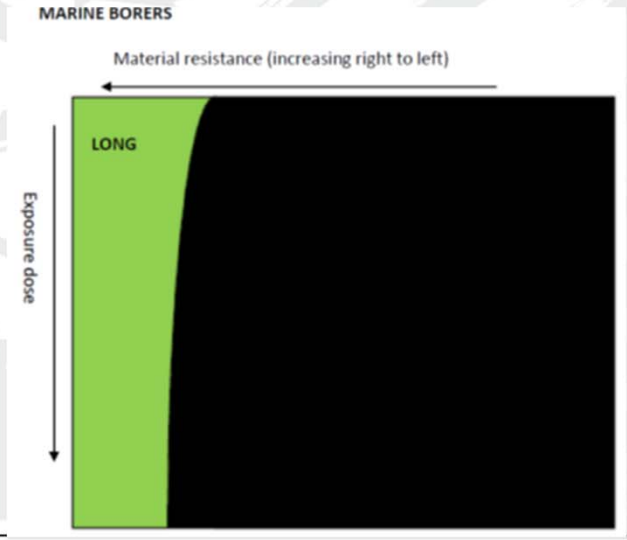
- Input criteria for user – what is the product?, where is it being used?, design detail, maintenance
- Exposure or possibly moisture load

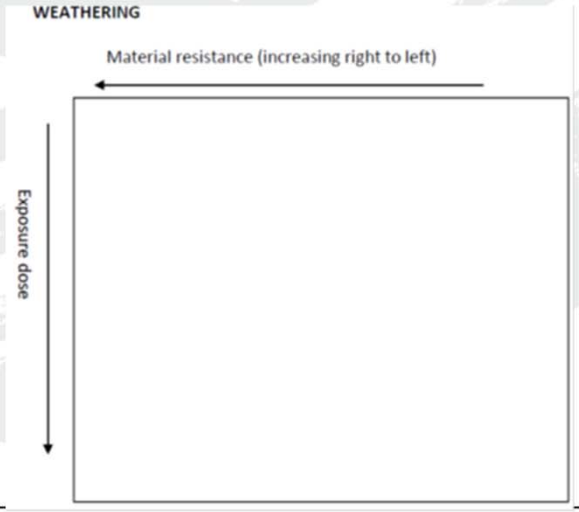
4. Determine dominate biological (and other?) hazard(s)

- Input criteria for user – what is the product, where is it being used?


DRYWOOD INSECTS
Material resistance (increasing right to left)
Exposure dose
LONG
MEDIUM
SHORT


BROWN ROT FUNGI
Material resistance (increasing right to left)
Exposure dose
Long
Medium
Short


MARINE BORERS
Material resistance (increasing right to left)
Exposure dose
LONG


WEATHERING
Material resistance (increasing right to left)
Exposure dose

5. Determine performance class (EN460)

- Using only the DBH charts for the specific end application and the MR and ED parameters see which performance class is attained. Follow the worst case scenario.

Framework EN460

- National interpretation
- Short, Medium, Long
- BS8417
- DIN 66800
- FD P20-651

New or revised documents (EN, TS, TR)

- Durability class linked to reliability and confidence interval
- Time of wetness Part 1 solid wood, Part 2 coated wood, Part 3 plywood
- Wettability
- Consequence of failure
- Material resistance derivation
- Exposure dose derivation

Thank you

…project partners

…and the European Commission through the FP7 programme for funding under grant 319132

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