Structural fire design
Eurocode 5-1.2
Timber structures

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7 Chapters:

1. General
2. Basis of design
3. Material properties
4. Design procedure for mechanical properties
5. Design procedure for wall and floor assemblies
6. Connections
7. Detailing

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6 Annexes:

A: (informative) Parametric fire exposure
B: (informative) Advanced calculation models
C: (informative) Load-bearing floor joists and wall studs in assemblies whose cavities are completely filled with insulation
D: (informative) Charring of members in wall and floor assemblies with void cavities
E: (informative) Analysis of the separating function of wall and floor assemblies
F: (informative) Guidance for users of this Eurocode Part

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2.4 Verification methods

2.4.1 General

\[ E_{d,fi} \leq R_{d,t,fi} \]

2.4.2 Member analysis

\[ E_{d,fi} = \eta_{fi} E_d \]

\[ \eta_{fi} = f(G_k, Q_k, \gamma, \psi) \]
Some research work has been carried out:

Such as in the fields of

- Material properties and resistances
- Some Design procedures for mechanical resistance
- and others which will be subject to the following paper

Still more R&D has to be done

This will partially be covered by the following project:

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WoodWisdom-Net project

FireInTimber –
Fire resistance of Innovative Timber structures

December 2007

FireInTimber – Partners and countries:
SP Trätek – Sweden
TUM, DGfH – Germany
TreSenteret – Norway
HFA, UIBK, TUW – Austria
Resand – Estonia

European industry: CEI-Bois / BWW

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WoodWisdom-Net opening Seminar in Berlin
12 February 2008  - ERA-Net
Project Partners and their Roles

14 partners in 9 countries:

1. SP Trätek, Sweden – Coordinator
2. VTT, Finland – WP 1 and 4 leader
3. TUM Technische Universität München, Germany, WP 3 leader
4. DGFH Deutsche Gesellschaft für Holzforschung, Germany – R&D
5. CSTB Centre Scientifique et Techn du Batiment, France – R&D
6. BPU Blaise Pascal University, France – R&D
7. TS Tresarret (Wood Centre), Norway – R&D
8. BRE Building Research Establishment, UK – R&D
9. HFA Holzforschung Austria – R&D
10. UIBK University Innsbruck, Austria – R&D
11. TUW Technische Universität Wien, Austria – R&D
12. Institute of Structural Engineering, ETH Zurich, Switzerland – R&D
13. Resand Ltd, Estonia – R&D
14. CEI-Bois Roadmap – Main industry partner
   + additional national industry partners
Project Objectives and Main Tasks

Key objectives:
- New possibilities for wood products in construction by proper fire design
- Simplified approval processes for wood products in buildings
- Knowledge transfer to end users

Six work packages:

WP 1: Design concepts
WP 2: Innovative structures
WP 3: Connections and joints
WP 4: Novel components
WP 5: Design tools and guidance
WP 6: Coordination and dissemination
Expected Impact and Target Groups

Impact:
• Reduced requirements on documentation for the fire design of wooden buildings
• Simplified structural solutions
• Improved cost competitiveness of building with wood

Target groups:
• Architects, designers, engineers, authorities, educational bodies, wood and building industries
Added Value from Transnational Approach

- Unified European view on fire safety in wooden buildings
- Increased reliability of fire safe use of wood
- European validated knowledge database available for all stakeholders
Expected results:

- Analytical design concepts for load-bearing timber structures under fire conditions
- New models for load-bearing solid wood cross laminated panel and light weight structures during fire exposure
- Performance principles of connections at fire exposure
- Guidance on joints between wall and ceiling elements and on fire stops within structures

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Expected results:

- Critically reviewed novel innovative products and summary of new knowledge for product development
- The first European wide guideline on the fire safe use of wood in buildings.

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FireInTimber:

- a new project within the European WoodWisdom-Net framework
- with 14 participants from 9 countries
- the project has started in November 2007 and will be finalised by the end of 2009
- It is supported by industry through the European initiative BWW and public funding organisations.
Project Highlights

- New models for load-bearing solid wood cross laminated panel structures and light weight structures during fire exposure
- Guidance on joints between wall and ceiling elements and on fire stops within structures
- The first European wide guideline on the fire safe use of wood in buildings
Eurocode 5, part 1.2:

In the following paper today’s status as well as up to date findings will be presented by Jochen Fornather.

Thank you very much for your kind attention!

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