Concept of non-damage property by the type of members

- **Column, Beam**
- **Integrity**
- **Insulation**

### Property required for fireproof construction

- **Load**
- **Loadbearing capacity**
- **Insulation**
- **Integrity**

**Loadbearing capacity**: Ability of a specimen of a loadbearing element to support its test load, where appropriate, without exceeding specified criteria with respect to both the extent of, and rate of, deformation.

**Insulation**: Ability of a separating element of building construction when exposed to fire on one side, to restrict the temperature rise of the unexposed face to below specified levels.

**Integrity**: Ability of a separating element of building construction, when exposed to fire on one side, to prevent the passage through it of flames and hot gases or the occurrence of flames on the unexposed side.

**Fireproof Performance of Members**

- **Before heating**
- **After heating**
- **Concept**

**Concept of non-damage property by the type of members**

- **Type**
  - **Column**
  - **Beam**

**Required Fire-resistant Time**

- **Lumber**
  - 30 min.
  - 45 min.
  - 60 min.

- **Glulam**
  - 30 min.
  - 45 min.
  - 60 min.

**Size of Burning Margin of Lumber and Glulam**

<table>
<thead>
<tr>
<th>Member Type</th>
<th>Required Fire-resistant Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber</td>
<td>30 min., 45 min., 60 min.</td>
</tr>
<tr>
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<td>30 min., 45 min., 60 min.</td>
</tr>
</tbody>
</table>

**Roadmap to diffuse CLT**

**Objectives**

- **Current situation**
- **FY2014**
- **FY2015**
- **FY2016**
- **Targeting goals**

**Fire standard**: Notification of "burning margin" design (in FY2015)

- Based on specified design strength (announced in FY2016), design value for burning margin of CLT was verified/validated

**Contact**: Tomohiro NARUSE, Ph.D., naruse@kenken.go.jp

**Naruse, T. et al., Fire Resistance of Structural Timber Part I: Charring Rate of Cedar and Larch, Proceedings of Annual Meeting of Architectural Institute of Japan, 2004**
Summary
We were able to collect data considering the burning margin for introducing a fireproof design of the wall, floor and roof using CLT.
For the walls, we could gather knowledge about the loadbearing capacity to the load corresponding to the sustained allowable unit stress of the original section of the CLT.