

Hørings svar til Ombruk av byggevarer

Fire safety challenges with the reuse of building materials

New products are classified based on their product lines, with the same base material over time. So, once a product is tested, the classification is more or less applicable to the entire product line. For used materials, this may not be the case. The mechanical, thermal and chemical properties of building materials may deteriorate over time.

For reused materials, the results may vary significantly from sample to sample. For example, a wooden beam of a house may have been damaged by termites, affecting the original mechanical strength that was supposed to carry the load (including safety loads considered in case of fire, additional loads, etc.). Another beam from the same house could be completely intact. The external appearance of the beam may be similar to the new one. Nevertheless, the moisture content would have varied over time. Visible and invisible damages to the wood over time may reduce the loadbearing capacity.

As a general rule, the safety levels on the buildings should not be reduced by the reuse of materials. The old products may not pass the current product certification. Depending on the material, external factors may greatly impact their properties against fire, such as the fire resistance of building elements.

For steel:

- The corrosion of the element
- The variability of structural tension over time (affecting the stage of deformation of the element on the elastic-plastic behaviour)
- The removing of the fire coating

For concrete:

- The increase of moisture and porosity may affect the internal forces when the material is heated to high temperatures. Faster evaporation of the water content may weaken the material. In addition, concrete elements that have been supporting low loadbearing may withstand fire better in comparison with concrete elements that have been supporting high loadbearing over time.

For wood:

- Changes in the moisture content, as well as the expansion and contraction of the elements between the seasons, may greatly impact the safety level.
- The reuse of wood may be limited to building applications.

One way to determine the effect of the properties in terms of structural strength and/or fire safety is to test the materials. Old materials may not be used as a structural element with load-bearing if verification tests have not been carried out. Decorative elements or any other parts that are not fundamental to the structure may be reused. It is not necessary that the exact requirements as new materials should be followed.
