2017-2020

PROGRESS

PROVISIONS FOR GREATER REUSE OF STEEL STRUCTURES

VTT TECHNOLOGY FOR BUSINESS

Afterlife of metal products in the construction sector

Metals in buildings are highly recyclable. However, their re-production for every single building's life creates a large environmental burden and its reflected in the final product's carbon footprint and embodied energy. Besides, the modern composite building products are difficult and costly to separate and more likely end in the mixed waste after building demolition.

All you need to know about the material is hidden in such a small sample.

The PROGRESS solution

The building components made of steel and other metals are highly durable and resistant to mechanical damage. Their bolted connections are typically easy to be disassembled and tightened again. Therefore, it is very easy and practical to reuse such components and extend their life beyond one building's life cycle.

From grave to cradle

The particular focus of the PROGRESS project is to establish the procedure to re-introduce the building materials in the new construction project including the material traceability, testing protocol, regulatory requirements, environmental and economic impact and possibilities to apply for the voluntary certifications. The innovative material testing methods (e.g. based on miniature sample shown in the figure) are demonstrated in the project.

We aim to …

Extend the service life of building components
Reduce the raw material and energy consumption
Develop the design guidance
Establish the material quality verification process
Improve the overall building performance
Demonstrate the reuse process/technologies
Involve all actors in the product supply chain

A multidisciplinary expert group

Our group offers to:

- Help you recognize the environmental potential and end-of-life value of the building materials
- Provide recommendations on the material suitability for reuse in a new project

We have the expertise in

- Building and material codes
- Materials testing and certification
- Life-cycle assessment of buildings and products
- Building information modelling

Are you a building material/products manufacturer, facility owner, construction or demolition contractor, or do you provide design and consultation services for building sector? If so, contact us to discover how your organisation can be engaged in the development of Circular Economy business in construction. Project coordinator: petr.hradil@vtt.fi

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Project brief overview

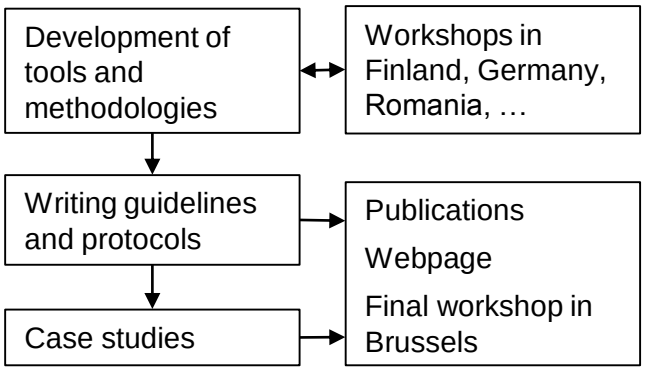
The consortium of seven partners from Belgium, Finland, Germany, Romania and UK carries out the research project called PROGRESS coordinated by VTT Technical Research Centre of Finland and financed by European Commission's Research Fund for Coal and Steel. The project aims to provide solutions for reusing components of single-storey steel buildings that would be easily scalable for other building types and materials.

PROGRESS goals

The PROGRESS project provides methodologies, tools and recommendations on reusing steel-based components from existing and planned buildings. The project targets the design for deconstruction and reuse of envelopes, load-bearing frames, trusses and secondary elements of single-storey buildings framed in steel. This building type has broad applicability as industrial, commercial, sports, exhibition, warehouse facilities, and shows most potential in suitability for reuse and viability for circular economy business models. The whole life benefits of reusable single-storey steel buildings will be quantified from environmental and economic viewpoints. The outcomes will be extensively disseminated in particular among manufacturers, designers, contractors and researchers.

Project plan

Duration: 1.6.2017 – 31.5.2020



Consortium

VTT Technical Research Centre of Finland
Steel Construction Institute, UK
Ruukki Construction, Finland
RWTH Aachen University, Germany
Universitatea Politehnica Timişoara, Romania
ECCS, European Convention for Constructional Steelwork, Belgium
Paul Kamrath Ingenieurrückbau, Germany

Main outcomes

Material quality verification protocol
Legal documents overview
Design guidelines published in ECCS series
New hybrid energy-efficient and reusable envelope
Environmental and economic assessment (methodology and case studies)
Recommendations on BIM use
Prototype of information-sharing internet portal

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