

## Expression of interest for research cooperation

### Description of institution

Interested institution:	Cracow University of Technology (CUT)
Department carrying out the proposed research	<b>Chair of Metal Structures</b> Institute of Building Materials and Structures Faculty of Civil Engineering
Address and webpage	Warszawska 24, 31-155 Cracow, Poland <a href="http://www.l-13.pk.edu.pl">www.l-13.pk.edu.pl</a>
Contact person (name, e-mail address, phone)	Mariusz Maślak e-mail: <a href="mailto:mmaslak@pk.edu.pl">mmaslak@pk.edu.pl</a> phone: +48 12 6282033

### Research offer

#### Brief description of the department (key research facilities, infrastructure, equipment)

(up to 1000 characters)

In the basic scientific activity undertaken in the considered chair the professional research works are carried out relating mainly to the resistance evaluation as well as to the stability analysis of various types of steel, aluminium and wooden structures. The probability-based estimations of the safety level for such structures are performed here as well, both for the persistent and for the accidental design situations, including the appropriate reliability and risk assessments specified depending on the case in question. In particular, due to the amendment of the current European standards, the verification of the partial safety factors recommended for design practice is scheduled to be performed, both for the factors associated with bearing capacity and for the other ones identified for the action effect. The staff of the chair is familiar with the specific procedures which are used to prepare the detailed fire safety assessments for buildings with steel, aluminium or wooden load-bearing structures.

#### Scientific area

<input type="checkbox"/> Chemistry	<input type="checkbox"/> Social Sciences and Humanities
<input type="checkbox"/> Economic Sciences	<input checked="" type="checkbox"/> Information Science and Engineering
<input type="checkbox"/> Environment and Geosciences	<input type="checkbox"/> Life Sciences
<input type="checkbox"/> Mathematics	<input type="checkbox"/> Physics

### Research field

(up to 500 characters)

The selected research interests of the chair staff members are as follows:

- specification of the limit states conditions for steel skeletons, taking into account both the global and local imperfection patterns,
- analysis of the resistance and the stability of thin-walled structures made of the corrugated steel sheets,
- verification of the behaviour of aluminium structures when subject to load,
- structural reliability evaluation according to the classical semi-probabilistic approach as well as applying of more advanced procedures based on the fully-probabilistic formalism,
- fire resistance assessments performed for buildings with steel or wooden load-bearing structure.

### The proposed research/project description

(up to 1000 characters)

The research areas proposed for cooperation result from participation of the chair staff members in many international scientific programs, including in particular:

- COST TU0904 - "Integrated fire engineering and response",
- COST TU1402 - "Quantifying the value of structural health monitoring"
- GRISPE PLUS - "Valorisation of knowledge for specific profiled steel sheets".

These are as follows:

- Developing new and/or improving existing, if any, advanced procedures that allow efficient use of data coming from a permanent monitoring of the behaviour of any metal or wooden structure,
- Specification of a more accurate algorithm for fire resistance assessment of any steel or wooden structure, taking into account both the failure consequences of this structure and the probability of its destruction, including all potential risk factors determining such evaluation,
- Identification and verification of limit states conditions being specific to thin-walled structures made of corrugated steel sheets, both determining the bearing capacity and also guaranteeing global and local stability.

### Additional information (key Persons and Expertise; additional trainings, research programme, other)

(up to 1000 characters)

The staff of the chair have extensive engineering experience and appropriate research facilities to carry out any scientific and technical studies in the field of:

- the analytical and numerical modelling of steel, aluminium and timber structures,
- the designing of such structures,
- the verification of any technical designs relating to the large and complex structures, made of steel, aluminium and wood,
- the preparing of an expert assessment of technical condition for the considered structure, the forecast of its remaining service time as well as the monitoring of its behaviour in pre-failure conditions,
- the performing of a fire resistance evaluation for the structure under consideration with rules being specific to the accidental design situation.