Bridge Building Contest 2019
Swiss SAMPE chapter

Invitation
Swiss SAMPE Chapter has the great pleasure to announce the 2019 Bridge Building Contest: an exercise in design and construction of a scaled bridge model. The contest duration is one semester and could be performed within a project framework in which students will have to use their knowledge and creativity to design a bridge. Students will be introduced into the entire structural design process from the development of the bridge concept, the preliminary design calculations and the material selection to the final bridge fabrication and testing.

Prizes will be awarded to the most resistant structures and the most surprising designs. The contest competition will be hosted by the Institut für Kunststofftechnik IKT / Fachhochschule Nordwestschweiz FHNW and will take place in Brugg-Windisch.

Important Dates:

Deadline for inscriptions:
Monday, 15th October 2018

Bridge Building Contest:
Thursday, 24th January 2019

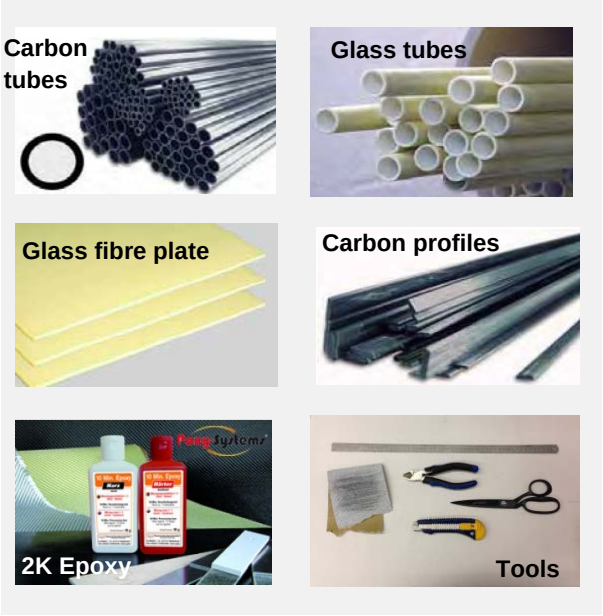
Organizing committee:
Gion A. Barandun (HSR-IWK)
Gregor Peikert (ZHAW-IMPE)
Christian Brauner (FHNW-IKT)

Participants
Bachelor, Master and PhD students from Switzerland can apply to this contest. Students participating in the contest will have to establish teams. Each team will design and fabricate a scaled bridge model. Teams consist of 1 to 5 students. Bachelor, Master and PhD students can cooperate and get together in one team.

Teams will apply for the competition formally with names of the team, students, coach and affiliation. Each registered team must arrive to the challenge at FHNW with its bridge and poster describing the performed work, and give a short summary before the test takes place.

Technical rules
Materials
A limited set of materials is provided for all teams. It includes the following elements:

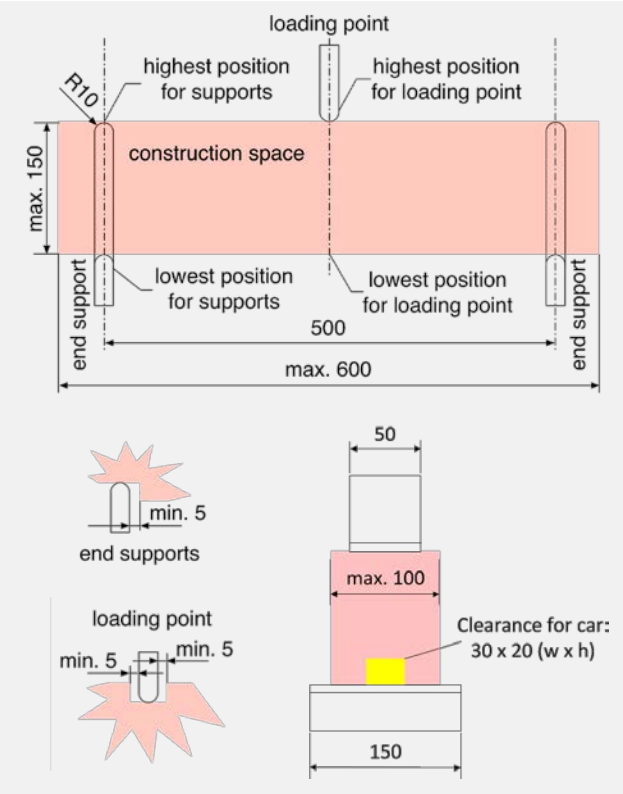
- Glass and carbon fibre tubes (inner ∅2.5mm, outer-∅4mm), 6m each
- Carbon fibre profiles 4 x 1.1mm, 10m
- Glass fiber plate (0.3mm, 600 x 100mm for driving surface and other purposes)
- Epoxy 2K adhesive (10min, 480g)



The set is sponsored by SAMPE and will be available end October. The use of other materials for the bridge is not allowed and will be inspected during the event. Teams are free to use additional auxiliary materials or tools during manufacture (but not for the tests). A wide field of combinations is therefore given to build the final bridge.

Weight
The maximum accepted weight of the bridge will be 150g (ultra-lightweight bridge). Competitors that exceed this limit will have the chance to remove material from the bridge until the target is met.

Dimensions
The distance between the supports of the bridge will be 500mm. See attached figure for details.



The supports and the loading points contacts have to be rigid parts of the bridge (e.g. not pre-stressed elements).

Loading
The bridges will be tested in 3-point-bending as per the attached figure. At mid-span the loading force will be applied to the deck surface of the bridge. No horizontal forces shall be absorbed by the bridge at the support points (the bridge will be simply supported).

The bridge must have a flat street made from the provided glass plate, where a matchbox car with dimensions 30x50x20mm (width x length x height) is able to cross freely. The plate can be adapted; however the street has to be provided as noted.

Awards
Awards will be granted to the most resistant bridges (1st, 2nd, 3rd resistance) and prizes will be given for:

- Aesthetic
- Innovation
- Design
- Poster

Scores
Resistance category: the score of each team will be the maximum load resisted by their bridge before failure.

IMPORTANT: The failure load will be the lower load between:

- maximum load resisted by the bridge before failure
- load which produces a vertical deflection in the bridge equal to 30mm

Aesthetic, Innovation, Design, Poster categories: 5 jury members composed by SAMPE and FHNW engineers will evaluate the works of all the teams and will decide the winners of each category.

Application
Send an e-mail to gionandrea.barandun@hsr.ch providing the following information:

- Team name
- Team members
- Team point of contact e-mail
- Team coach name
- Team coach email
- Affiliation(s)

Agenda
The day at FHNW will start with the bridge building contest. All the teams will expose their bridges and their posters in the hall of the laboratory. The jury will then determine the winners of the contest.

After lunch, presentations and a guided tour of FHWN / IKT are planned.

For more details: www.sampe.ch

Swiss SAMPE Chapter

FHNW

Contact
Prof. Dr. Gion A. Barandun
Hochschule für Technik Rapperswil/IWK
Oberseestrasse 10, CH-8640 Rapperswil
gionandrea.barandun@hsr.ch
+41 55 222 47 79