VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ
FAKULTA STAVEBNÍ

Opinion of the dissertation

Thesis author:	**Iveta Nováková**
Thesis title:	**Behaviour of cementitious composites exposed to high temperatures**
Field of study:	**Brno University of Technology, Institute of technology of building materials and components**
Reviewer:	**Ólafur Haralds Wallevik, olafurw@ru.is**

Review date: 06.01.2021

Actuality of the dissertation topic

The main scope of the work is to develop, by scientific approach, methods to increase the fire resistance of existing concrete structures. The aim is of high relevance, in particular in tunnels, as well as in some other structures and can even be live saving. Thus, the topic is of high practical value, even though I value its scientific contribution more.

Rating:

☐ excellent	X above average	☐ average	☐ below average	☐ weak

Meets the objectives of dissertation work

The objective of the work (i.e. to develop method to increase the fire resistance of existing concrete structures) is a bit general. By scrutinizing and developing the intensive heat treatment (IHT) approach and by comprehensive research, the thesis realizes the scope. Other approachaces to achieve the scope are to some extent developed in the thesis, and even though they are not of as much genuine practical value as IHT, they add to the scientific contribution of the thesis.

Rating:

☐ excellent	X above average	☐ average	☐ below average	☐ weak

Problem solving procedure - processing methods

Generally the experimental setup is proper. As the solution is rather obscure at the outset, sidesteps are sometimes taken which have less relevance, but that is a part of scientific research. I miss a little better description of the limitation of the work here conducted and

had appreciated if the research on the innovative AeA-FiResCrete approach had been further documented concerning its schientific value, as that could be valuable knowledge for further work.

Rating:

☐ Excellent	X above average	☐ average	☐ below average	☐ weak

The importance of dissertation work for practice and for the development of the field of science

The work here conducted has a real practical value, in particular of improving fire resistance of concrete in tunnels. Even more imprortant is though its scientific contribution and understanding of fire reistance´s mechanism. It would have yet higher value if the candidate had published some of his findings in a reviewed paper in highly ranked journals.

Rating:

☐ Excellent	X above average	☐ Average	☐ below average	☐ weak

Formal arrangement of the dissertation and its language level

It is always easier for the candidate when he writes the thesis in his native language and the wording could sometimes be improved. The structure is reasonable good. This is the weakest link of the thesis, although fully satisfactory.

Rating:

☐ excellent	☐ above average	X Average	☐ below average	☐ weak

Evaluation of publishing and other activities of the doctoral student

As stated above I would have preferred that more of the content and findings of the thesis had been published in highly ranged jounals as I mean that lot of the research in the thesis is of high scientific value and should be published in one or more reviewed articles. The candidate has though got well over dozen articles published, among these some on other themes, showing broad understanding of general concrete science. And even though many of them are conference papers, they are of great value for the student to get feedback on his work and helps in maturing the candidate.

Rating:

☐ Excellent	X above average	☐ Average	☐ below average	☐ weak

Notes and comments on the work content

The work presented in the thesis is solid research and I recommend it for thesis defence.

Conclusion

This is a comprehensive work and adds significant scientific contribution to existing concrete technology in respect to behavior of concrete exposed to high temperature. In particular, the intentional heat treatment (IHT) concept is an important accomplishment, both in respect of scientific advance and practical application. In the thesis also an other approach to fire resistance, by use of elastic plastic spheres designed to increase frost resistance of concrete (analog to air-entrainment), is evaluated (AeA-FiResCrete), and even though it was not nearly as effective as the IHT method and thus not of as much practical value, is shows innovation skills and has a scientific value.

The state of the art related to the theme of the work is comprehensive and well documented and shows that the candidate has a comprehensive overview/understanding of the known knowledge of the subject of the thesis.

Applicant by preparing a dissertation proved eligibility for independent creative scientific work in the sense of § 47 of Act No. 111/1998 Coll. on Higher Education Institutions and Amendments to Other Acts.

I recommend that the dissertation is accepted for defence, and so in the event of a successful defence of

Iveta Novakova

awarded the academic title " Doctor " (abbreviated to "Ph.D." after the name).

Date: 06.01.2021

Opponent's signature: Olafur H. Wallevik