POSUDEK OPONENTA DIPLOMOVÉ PRÁCE

Autor diplomové práce: Bc. Katerina SOVOVA

Thesis title: STUDYING THE BEHAVIOR OF HIGH STRENGTH CONCRETE AT HIGH TEMPERATURES

Oponent diplomové práce: Univ.Ass. Dipl.-Ing. Dr.techn. Johannes KIRNBAUER

The master thesis deals with the behavior of composite materials (high strength concrete) exposed to high temperature with focus on explosive spalling. The piece of work has 113 pages in total and 94 pages of text. Of these 94 pages, 29 pages deal with a theoretical part and 65 pages deal with the experimental part.

The theoretical part refers to current and relevant sources of information. The theoretical part provides a complete list of the factors having a dominant influence on explosive spalling including the spalling mechanisms itselve and methods to eliminate spalling by addition of polypropylene and cellulose fibers, etc. The theoretical part is elaborated in detail, well arranged and in a logical sequence and therefore provides a comprehensive overview. Most important literature is cited.

The experimental part of the work focuses on explosive spalling of different concretes (ordinary concrete and high strength concrete) with various dosages of polypropylene fibres with different melt flow indexes and cellulose fibres. First a graphical overview about the methodology is given. The prepartion of the test specimen and the test setup is well described.

The mechanical properties of the different concretes has been obtained and they are shown in graphs and tables.

The results of the fire tests (with two different fire curves – ISO-curve and hydrocarbon curve) are well documented by pictures, temperature curves and and diagrams which shows the spalling depths.

Beside this, the residual compressive strength, the porosity of the concrete in different depth of the specimen and the mass loss has been obtained after the fire tests.

All these results are discussed in an adequate manner and lead to a clear conclusion: PP-fibres with lower melt flow index prevent spalling in a better way than ordinary PP-fibres. Celluslose fibres gives also positve results, however, they are not as effective than PP-fibres.

It should be pointed out that the student was very responsible in conducting experiments.

Especially fire tests requires full attention of the operator because of the high temperatures which are applied in testing and ocurring spalling can be dagerous even in small experiments.

In general it can be said, that laboratory methods used as well as the processing and the evaluation of the results correspond to the education and specialization of the student. The results are valuable, well represented graphically and well described.

The level of the thesis (and language processing) meets the requirements for a master thesis and it is therefore recommended that Ms. Sovova should take the final examination.

Klasifikační stupeň ECTS: **A/1**

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Podpis

Klasifikační stupnice

Klas. stupeň ECTS	A	B	C	D	E	F
Číselná klasifikace	1	1,5	2	2,5	3	4