

## Opponent's review of the Doctoral Thesis

Candidate Mgr.Pavla Bauerová

Title of the doctoral thesis Characterization of Czech Modern Mosaic Mortars

Study Programme Civil Engineering

Tutor doc.Ing. Martin Keppert, Ph.D.

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### Topicality of the doctoral thesis theme

Commentary: Mosaic works made of glass, ceramic or stone tesserae have been found in our regions mainly since the turn of the 19th and 20th centuries and the second peak was the period of "socialism". A detailed characterization of the used base surface materials is therefore very important not only for restorers of mosaic works, but also for historians and technology specialists.

excellent     above average     average     below average     poor

### Fulfilment of the doctoral thesis objectives

Commentary: The stated objectives of the dissertation have been met.

excellent     above average     average     below average     poor

### Research methods and procedures

Commentary: In the dissertation microscopy methods were used to analyze inorganic components of mortars and cements (LM, SEM/EDS, XRD, TG/DTA)... as well as methods focusing on organic parts of the mortar (oil plasticizers), e.g. FTIR, gas chromatography CS-MS or total organic carbon (TOC) method. The chosen analytical methods and their useful combinations made it possible for the author to meet the specified objectives.

excellent     above average     average     below average     poor

### Results of the doctoral thesis – dissertant's concrete achievements

Commentary: I would like to highlight the large number of investigated samples of real mortars (27 samples dating back to the past one hundred years) based on which the author has formulated major trends in the use of glass mosaic base materials. In my opinion, the second important result is the determination of the quantity of organic plasticizers, where she also used her own model mortars and recommended suitable combinations of analytical methods to determine the quantity of oil in the mixture.

excellent     above average     average     below average     poor

**Importance for practice and for development within a branch of science**

Commentary: The results described above can be used for determination of age of mosaics which will be appreciated by both restorers and historians.

excellent     above average     average     below average     poor

**Formal layout of the doctoral thesis and the level of language used**

Commentary: The dissertation is very well structured and gradually introduces the reader (even the layman) to the specific topic of historical mortars for glass mosaics.

excellent     above average     average     below average     poor

**Statement on compliance with citation ethics**

The rules of citation ethics have been observed.

**Remarks**

Page 38: O. Zoubek died in 2017.

p. 65: Table 8: The chemical composition of glass should preferably be provided in oxides (e.g. instead of Pb use PbO, instead of Sb use Sb<sub>2</sub>O<sub>3</sub>). Normalize the sum of oxides to 100 %.

Questions

Would it be possible to propose a composition of an ideal mosaic mortar? Is it possible to use mortar without any addition of plasticizers?

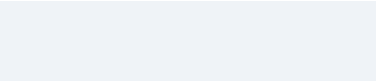
**Final assessment of the doctoral thesis**

The dissertation is based not only on a very precise work with literature (up to 219 citations) but also on a well-chosen representation of real mosaic mortars. The author has analyzed up to 27 samples from a very representative period of one hundred years. She used appropriately selected analytical tools and their combinations to characterize main trends in development of the mortars. She has demonstrated that that over the period of one hundred years the technology of mosaic mortars has shifted dramatically from "lime" based mortars to hydraulic Portland cements. Closely linked to the development of the inorganic part of the mortars was a change of the plasticizers (set retarders); from the linseed oil-based plasticizers to the more recently used synthetic polymer dispersions and hydrophobic coatings based on synthetic oil blends. Determining the type and quantity of added oil proves to be a very good tool to estimate the time of the origin and partly also the place of the origin of the mosaic.

Following a successful defence of the doctoral thesis I recommend the granting of the Ph.D. degree

yes     no

Date: 20<sup>th</sup> December 2023

Opponent's signature  .....