Developement of new mosaic tesserae for artists and conservators-restorers

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Research:

Students at the Academy of Fine Arts and Design and Faculty of Civil and Geodetic Engineering in Ljubljana collaborate together with the experts of different disciplines to produce several types of new mosaic cubes, made of inorganic and organic compounds. The idea of the project originates from the need for good quality and affordable mosaic tesserae. For the purpose of the project, two groups of students tested two different basic binders: ceramic-based mineral binder (Kremenit) and epoxy resin-based synthetic organic binders (Viwood, Kristal PS, Aquares, Crystalres, Epox 210), which were provided by company Samson Kamnik. After the addition of various pigments and additives and the manufacture of molds for test samples, we performed two types of tests: workability tests of materials in the studio (consistency, setting times, shrinkage, cutting and adherence) and tests of the physical properties of the tesserae in the laboratory (compressive, bending and splitting strength tests and frost resistance tests).

Results:

• In the making of mosaic tesserae, we tried to find optimal ratio in pigments, fillers and binders. As expected, different pigments affected strenght of mixtures, so in some cases we had to add more water. Kremenit binder also affected mosaic tesserae. Because of its white colour, samples began to fade, which was not seen in synthetic organic binders. On the other hand they were more fragile and easily cut, but left residue.
• Strength and splitting tests of Kremenit showed that the basic ratio of water 4:1 was the most prosperous with addition of 10 or 20% of synthetic polymer Forte added to water. Epox 210 and Viwood as synthetic organic binders were most efficient. They were easier to cut with mosaic hammer then Kremenit.
• As expected, in frost resistance tests Epox binders are waterproof and as so suitable for use in mosaics exposed to water, frost resistance and other outer effects. Kremenit is on the other hand not so suitable because it’s water-soluble and effected by osmosis.
• Extremely light samples of mosaics were made for ceiling and wall mosaic with addition of Rondofil, lightweight mineral filler.

References: