Claims

1. Process for printing a 3D structure comprising the steps of

i) providing a multi-component mortar system comprising a component **A** and a component **B** wherein

- component **A** comprises 10 to 50 weight-% aluminous cement and 30 to 78 weight-% mineral filler, based on the weight of component **A**, at least one set inhibitor, and water, and
- component **B** comprises an initiator system for the set-inhibited aluminous cement, 65 to 86 weight-% mineral filler, based on the weight of component **B,** and water,

ii) mixing the components with a static or dynamic mixer and applying the mixed mortar with a robotic system to form a 3D structure, and

iii) curing of the applied 3D structure.

2. Process for printing a 3D structure according to any one of the preceding claims, characterized in that component **A** is free of boric acid or a salt thereof.

3. Process for printing a 3D structure according to any one of the preceding claims, characterized in that component **A** comprises at least a phosphate-based set inhibitor.

4. Process for printing a 3D structure according to any one of the preceding claims, characterized in that component **B** comprises an alkaline compound selected from the group consisting of alkali hydroxide, earth alkali hydroxide, earth alkali oxides, alkali oxides, alkali silicate, alkali aluminate, amines and mixtures thereof.

5. Process for printing a 3D structure according to any one of the preceding claims, characterized in that the mineral filler is selected from materials of the group consisting of calcium carbonate, dolomite, titanium dioxide, silicon dioxide, fly ash, slag, river sand, sand from sediments and crushed stone and mixtures thereof.

6. Process for printing a 3D structure according to any one of the preceding claims, characterized in that 85 weight-% of the particles of the mineral filler in component **A** and component **B** are smaller than 0.3 mm, preferably smaller than 0.2 mm.

7. Process for printing a 3D structure according to any one of the preceding claims, characterized in that the consistency of component **A** and component **B**, each separately, is paste-like with a plastic viscosity in the range of 20 to 2'000 Pa·s, preferably 200 to 1'900 Pa·s, more preferably 500 to 1'500 Pa·s, measured with a plate-plate rheometer with plate diameter of 25 mm, 2 mm gap at a shear rate of 1 s^{-1}.

8. Process for printing a 3D structure according to any one of the preceding claims, characterized in that component **A** and component **B** and further components if present are each packed in separate containers, where they can be stored during several months up to two years or longer without losing their applicability, and mixed immediately before application to produce a fast setting mortar.

9. Process for printing a 3D structure according to any one of the preceding claims, characterized in that the content of aluminous cement in the fresh mortar, calculated as non-hydrated aluminous cement, is from 5 to 45 weight-%, preferably 7 to 35 weight-%, more preferably 7 to 25 weight-%, and most preferably 7 to 19 weight-%, based on the weight of the fresh mortar.