Claims

1. Process for application of a curable building material, in particular in a generative process, comprising the steps:

- provision of at least two separate components of the building material;

- introduction of the at least two separate components into a mixing apparatus (10), in particular into a mixing chamber of the mixing apparatus, with a feed device (9);

- mixing of the at least two separate components in the mixing apparatus (10) to give the curable building material in the setting state;

- feeding of the setting building material through a transport conduit (12) using a transport device (30) to a printing head (3) which is movable in at least one direction in space;

- application of the setting building material by means of the movable printing head (3);

wherein:

- a first component of the building material is present in solid form and comprises a mineral binder and optionally aggregates, in particular gravel, sand, rock particle fractions and/or fillers, and optionally a concrete and/or mortar admixture;

- a second component of the building material is present in liquid form and comprises water;

- a third component comprising a plasticizer is present;

- where the components are present in vessels (11.1, 11.2, 11.3, 11.4) which are spatially separated from one another and are constituents of the feed device and/or communicate with the latter.

2. Process according to Claim 1, wherein the mixing apparatus (10) in which the curable building material in the setting state is produced comprises a dynamic mixer which is arranged upstream of the printing head (3), with preference being given to no dynamic mixer being arranged on the movable printing head (3).

3. Process according to at least one of Claims 1 – 2, wherein the curable building material in the setting state no longer goes through any dynamic mixer after mixing of the at least two separate components is complete.

4. Process according to at least one of Claims 1 – 3, wherein the curable building material is, after mixing of the at least two separate components is complete, conveyed in the setting state through a static mixer (6) before exit from the printing head (3).

5. Process according to at least one of Claims 1 – 4, wherein an admixture for influencing the chemical and/or physical properties of the setting building material is

added to the curing building material, in particular via an inlet nozzle (5) present in the transport conduit and/or in the region of the printing head (3).

6. Process according to at least one of Claims 1 – 5, wherein the setting building material obtained is aerated and/or deaerated in the transport conduit (12) and/or in the printing head (3), in particular by introduction of air, by means of a vacuum treatment and/or by means of vibration, before exit from the printing head (3).

7. Process according to at least one of Claims 1 – 6, wherein a temperature of the setting building material is altered, in particular by means of a heating element and/or a cooling element, before exit from the printing head (3).

8. Process according to at least one of Claims 1 – 7, wherein a chemical and/or physical property of the curing building material is measured in the mixing apparatus (10), in the transport conduit (12), in the printing head (3) and/or after discharge from the printing head (3), with preference being given to measuring a temperature, a pressure, a moisture content, an electrical conductivity, a speed distribution and/or a viscosity of the setting building material.

9. Process according to Claim 8, wherein the determination of the chemical and/or physical property is carried out during application of the building material, in particular in real time.

10. Process according to at least one of Claims 1 – 9, wherein a throughput opening at the outlet (4) of the printing head (3) is altered during application as a function of the structure of the object to be produced.

11. Process according to at least one of Claims 1 – 10, wherein the conveying power of the transport device (30) is controlled and/or regulated as a function of the measured chemical and/or physical property of the curable building material, in particular as a function of the pressure of the setting building material in the transport conduit (12) and/or in the printing head (3).

12. Process according to at least one of Claims 1 – 11, wherein an addition rate of at least one component of the building material is regulated and/or controlled as a function of the chemical and/or physical property of the setting building material.

13. Process according to at least one of Claims 1 – 12, wherein:

    - an admixture which can be added via the inlet nozzle (5) and preferably comprises a plasticizer, a rheological auxiliary and/or a retarder is present;

    where the components and the admixture are present in vessels (11.1, 11.2, 11.3, 11.4) which are spatially separated from one another and are constituents of the feed device and/or communicate with the latter.

14. Process according to any of the preceding claims, wherein the first component comprises a dry mineral binder composition comprising cement and mineral fillers, where the binder composition comprises at least one setting accelerator based on aluminium sulfate, at least one superplasticizer based on a polycarboxylate ether and at least one rheological auxiliary, where the polycarboxylate ether has at least 1 mmol, in particular at least 1.2 mmol, especially at least 1.8 mmol, of carboxylic acid groups per gram of dry polycarboxylate ether.