Claims

1. A mechanical rebar screw connection, comprising:

- a rebar coupler configured to couple at least one mechanical rebar and having a recess with an inner screw thread;

- a mechanical rebar having an outer screw thread that is configured to be arranged in mating arrangement with the inner screw thread of the rebar coupler;

- a thread tolerance between the outer screw thread of the mechanical rebar and the inner screw thread of the rebar coupler; and

- a filler that is configured to fill the thread tolerance, wherein the filler is a non-curable heterogeneous composition comprising a fluid carrier and solid particles suspended therein, wherein the fluid carrier comprises a grease.

2. The mechanical rebar screw connection according to claim 1, wherein the thread tolerance is defined as the difference in diameter between the outer diameter of the rebar coupler (ØF) and the outer diameter of the mechanical rebar (ØM).

3. The mechanical rebar screw connection according to claim 1 or 2, wherein the size of most of the solid particles is smaller than the thread tolerance and the median particle size of the solid particles is in the range of from 0.01 – 50 % of the thread tolerance, preferably in the range of from 0.1 – 30% of the thread tolerance.

4. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the solid particles have a size in the range of from 1 nm – 1000 μm, preferably in the range of from 10 nm – 100 μm, more preferably in the range of 0.1 – 50 μm.

5. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the solid particles are spherical.

6. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the solid particles are made of an inorganic material.

7. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the solid particles are made of a non-corroding material.

8. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the solid particles are oxides, carbides and/or sulphides of the group of alkali metals, alkaline earth metals, transition metals, basic metals and semi metals, preferably oxides or carbides of the group of alkali metals, alkaline earth metals, transition metals, basic metals and semi metals.

9. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the solid particles are selected from a group of materials comprising at least CaO, SiO_2, TiO_2, Al_2O_3, MgO, or graphene.

10. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the fluid carrier comprises a viscosity in the range of 150 to 400 centistokes.

11. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the rebar coupler is configured to couple two mechanical rebars.

12. The mechanical rebar screw connection according to one or more than one of the foregoing claims, exhibiting a slip of no more than 0.10 mm as tested in a slip test according to ISO norm 15835-2:2009 and evaluating the slip according to Option 2 of ISO norm 15835-1:2009.

13. The mechanical rebar screw connection according to one or more than one of the foregoing claims, wherein the mechanical rebar has a nominal diameter above 25 mm.

14. A rebar coupler for a mechanical rebar screw connection, the rebar coupler having a recess with an inner screw thread configured to couple at least one mechanical rebar, with a filler arranged inside the recess, wherein the filler is a non-curable heterogeneous composition comprising a fluid carrier and solid particles suspended therein, wherein fluid carrier comprises a grease.

15. The rebar coupler according to claim 14, wherein the solid particles are spherical.

16. A filler configured to fill a thread tolerance of a mechanical rebar screw connection to secure the mechanical rebar screw connection against dynamic load conditions, wherein the filler is a non-curable heterogeneous composition comprising a fluid carrier and solid

particles suspended therein, wherein the fluid carrier comprises a grease and the solid particles are at least one of:

- oxides and/or sulphides of the group of alkali metals, alkaline earth metals, transition metals, basic metals and semi metals;
- selected from a group of materials comprising at least CaO, SiO_2, TiO_2, Al_2O_3, MgO, or graphene; and
- spherical.

17. The filler according to claim 16, wherein the solid particles comprise cement powder.

18. The filler according to claim 16 or 17, wherein the fluid carrier comprises grease with a viscosity of 100 to 4000 centistokes, preferably 150 to 400 centistokes.

19. Use of a filler according to any of the claims 16 to 18, for securing a mechanical rebar screw connection against dynamic load conditions.

20. A method of applying or providing a mechanical rebar screw connection that is preferably secured against dynamic load conditions, the method comprising:

- providing a rebar coupler configured to couple at least one mechanical rebar and having a recess with an inner screw thread;
- providing a mechanical rebar having an outer screw thread that is configured to be arranged in mating arrangement with the inner screw thread of the rebar coupler;
- providing a filler configured to fill a thread tolerance between the outer screw thread of the mechanical rebar and the inner screw thread of the rebar coupler, wherein the filler is a non-curable heterogenous composition comprising a fluid carrier and solid particles suspended therein, wherein the fluid carrier comprises a grease; and
- arranging the outer screw thread of the mechanical rebar in mating arrangement with the inner screw thread of the rebar coupler and the filler therebetween to obtain the screw connection.

21. The method of claim 20, comprising providing the mechanical rebar screw connection according to any of the claims 1 – 13 and/or the filler according to any of the claims 16 – 18.