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(54) Title: CASTABLE MATERIAL BASED ON CEMENTITIOUS MATERIAL WITH SHRINKAGE RESISTANCE

(57) Abstract: The present invention relates to a new castable cement based material containing a special admixture based internal curing system to reduce the shrinkage and avoid the formation of cracks, and method of producing the same.

AMENDED CLAIMS
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CLAIMS

1. A cementitious material mix design, comprising:
 - 5 (a) a cementitious binder that contains an Ordinary Portland Cement, wherein the binder content per cubic meter of fresh produced castable material (concrete or mortar) is at least 290 kg;
 - (b) sand, wherein the sand content per cubic meter of fresh concrete or mortar is between 500 kg and 1600 kg;
 - (c) water, wherein the water to total binder ratio is between 0.25 and 0.7 by weight;
 - 10 (d) a self-curing system; and
 - (e) a volume of paste in an amount of at least 250 l per cubic meter of fresh concrete or mortar;
- wherein,
 - the internal curing system comprises a mixture of a superabsorbent polymer, a
15 viscosity modifier and an inorganic salt, in water.
2. The cementitious material mix design according to claim 1, further comprising fine and/or coarse aggregates.
- 20 3. The cementitious material mix design according to claim 1, wherein the internal curing system is present in an amount so that the dry solid content of said internal curing system is between 0.2% and 2.2%, wherein said dry solid content is expressed in weight % with respect to the total binder.
- 25 4. The cementitious material mix design according to claim 1, wherein the internal curing system comprises between about 40 M.-% and 70% M.-% of water, between about 0.05 M.-% and 0.5 M.-% of viscosity modifier, between about 10.0 M.-% and 30.0 M.-% of inorganic salt between about 5.0 M.-% and 20.0 M.-% of superabsorbent polymer.
- 30 5. The cementitious material mix design according to claim 1, wherein the viscosity modifier agent is chosen from polysaccharides, polymers of acrylic acid and copolymers thereof, polyethylene and related copolymers, alkylene oxide polymers and esters thereof, and methyl vinyl ether/maleic anhydride copolymers crosslinked with
35 decadiene.

6. The cementitious material mix design according to claim 1, wherein the cation of said inorganic salt has a valence between 1 and 3.
- 5 7. The cementitious material mix design according to claim 1, wherein the superabsorbent polymer in the internal curing system is a potassium-based superabsorbent.
8. Use of an aqueous suspension of super absorbent polymer for increasing shrinkage resistance of cementitious material mix designs.
- 10 9. Process for producing a stable aqueous suspension of super absorbent polymer, comprising steps of:
- mixing a viscosity modifier agent with water;
 - adding a suitable inorganic salt and mixing for a time that is at least 30
 - 15 minutes; and
 - adding the superabsorbent polymer to form an aqueous suspension.