

What is claimed is:

1. A method for producing aggregate particles from cementitious compositions, comprising: combining in a vessel a cementitious composition and at least one aggregate-forming
5 inducer that provides a surface anchoring site for cement paste to bond/adhere to, wherein the at least one aggregate-forming inducer comprises a fiber having an elongated body with a length to equivalent diameter ratio of at least 10 and that when added to concrete, introduces anchoring surface area for said
10 cementitious composition between 275 and 50,000 square meters per cubic meter of cementitious composition.

2. The method of claim 1, wherein said anchoring surface area is between 500 and 10,000 square meters per cubic meter of cementitious composition.

15 3. The method of claim 1, wherein said anchoring surface area is between 1,000 and 5,000 square meters per cubic meter of cementitious composition.

4. The method of claim 1, wherein the fiber having an elongated body has a length to equivalent diameter ratio of at
20 least 50.

5. The method of claim 1, wherein the fiber having an elongated body increases its specific surface area during mixing of the concrete due to surface roughening or fibrillation by at least 10 percent.

6. The method of claim 1, wherein the fiber having an elongated body increases its specific surface area during mixing of the concrete due to surface roughening or fibrillation by at least 50 percent.

5 7. The method of claim 1, wherein said vessel is the drum of a concrete mixing truck or a stationary mixing drum or pan or any mixing vessel where the vessel rotates or the mixing blades rotate.

8. The method of claim 1 wherein the time needed to
10 combine said at least one aggregate-forming inducer and the cementitious composition and convert the resulting mix to a granular material is 1 to 10 minutes per cubic yard of cementitious composition.

9. The method of claim 1 wherein the aggregate-forming
15 inducer does not negatively impact subsequent concrete mixes with regard to its plastic and hardened properties chosen from air, unit weight, slump, set time and strength.

10. The method of claim 1 wherein the cementitious composition is residual or returned concrete.

20 11. The method of claim 1, wherein the cementitious composition is a cementitious paste fraction separate from residual or returned concrete.

12. The method of claim 1 wherein the at least one aggregate-forming inducer is chosen from shredded and/or cut paper, cardboard, corrugated cardboard, cartons, corrugated cartons, crepe paper, news print, kraft paper, wall paper, wax
5 paper, silk paper; shredded currencies removed from circulation (US and Foreign); wood fibers; glass fibers; shredded textiles; cotton fibers; hemp; mineral fiber chosen from wollastonite, mica, rock wool, slag wool, and graphite; polyolefin fibers; polyvinyl alcohol (PVA); carbon fibers; nylon; para-aramid
10 synthetic fiber; polyester fibers, natural fibers chosen from sisal fibers, cotton, flax, jute, coconut husks, protein-based fibers, banana, pineapple, wool, mohair and silk; shredded polystyrene, shredded PET; and mixtures of any of the foregoing.

13. The method of claim 12, wherein said polyolefin fibers
15 are polypropylene fibers, polyethylene fibers or blends thereof.

14. The method of claim 12, wherein said polyolefin fibers are polypropylene fibers, polyethylene fibers or blends thereof having a length between 1 mm and 60 mm.

15. The method of claim 12, wherein said polyolefin fibers
20 are polypropylene fibers, polyethylene fibers or blends thereof have a surface area per unit weight between 100 and 400 square meters per kilogram.

16. The method of claim 12, wherein the polyolefin fibers are polypropylene fibers, polyethylene fibers or blends thereof

have a surface area per unit weight between 200 and 250 square meters per kilogram.

17. The method of claim 1, wherein said aggregate-forming inducer is news print.

5 18. The method of claim 17, wherein said news print is shredded and/or cut.

19. The method of claim 17, wherein said news print is shredded and has a surface area per unit weight between 10 and 500 square meters per kilogram.

10 20. The method of claim 17, wherein said news print is shredded and has a surface area per unit weight between 15 and 300 square meters per kilogram.

21. The method of claim 1 wherein the cementitious composition is returned concrete in a delivery truck mixer-drum,
15 and the at least one aggregate-forming inducer is shredded newsprint.

22. The method of claim 1, further comprising the addition of an admixture chosen from one or more set accelerators, set retarders, water reducers, rheology modifiers chosen from clay,
20 super absorbent polymers and thickeners, corrosion inhibitors, shrinkage reducing admixtures, colorants, air entrainers, air detrainers, and combinations thereof.

23. The method of claim 22, wherein said set accelerator is aluminum sulfate, aluminum trihydrate, calcium nitrate, calcium nitrite, calcium chloride, sodium nitrate, thiocyanate or mixtures thereof.

5 24. The method of claim 1, further comprising the addition of a super absorbent polymer chosen sodium polyacrylate, carboxyalkyl cellulose polymers, carboxyalkyl starch polymers, alginates, chitosans, and starches. Also, polymers from the group of polyacrylic acid polymers, polyacrylamide polymers and
10 polyaspartic acid polymers.

25. Aggregate particles formed by the method of claim 1.

26. A packaged admixture comprising an aggregate-forming inducer comprising a fiber having an elongated body with a length to equivalent diameter ratio of at least 10 and that when added
15 to concrete and an admixture chosen from one or more of set accelerators, set retarders, rheology modifiers and thickeners.

27. A single-use container consisting essentially of one or more aggregate-forming inducers having an elongated body with a length to equivalent diameter ratio of at least 10.

20 28. The single-use container of claim 27, wherein the one or more aggregate-forming inducers is news print.

29. The single-use container of claim 27, wherein the container is a paper bag.

30. The single-use container of claim 27, wherein the container is a water soluble bag.

31. The single-use container of claim 27, wherein the container is a pulpable bag and/or plastic bag.

5 32. A method for producing aggregate particles from cementitious compositions, comprising: combining a cementitious composition and a formulation consisting essentially of at least one aggregate-forming inducer, wherein the at least one aggregate-forming inducer when added to said cementitious
10 composition introduces surface area between 275 and 50,000 square meters per cubic meter of cementitious composition, and mixing said cementitious composition with said formulation until the mixed components form granular material.

33. The method of claim 32, wherein said formulation is
15 combined with said cementitious material with a conveyor belt, a pneumatic system, a blower or a dispenser.

34. The method of claim 32, wherein said aggregate-forming inducer, when added to said cementitious composition, introduces surface area between 500 to 10,000 square meters per meter of
20 cementitious composition.

35. The method of claim 32, wherein said aggregate-forming inducer, when added to said cementitious composition, introduces

surface area between 1,000 to 5,000 square meters per meter of cementitious composition.

36. A cementitious composition comprising a paste portion and aggregate formed by the method of claim 1.

5 37. The method of claim 1 wherein the vessel is a rotatable concrete mixer drum mounted on a concrete ready-mix delivery vehicle, and further wherein concrete within the mixer drum is monitored by an automated slump monitoring system to ensure that the aggregate-forming inducer becomes uniformly mixed within
10 concrete contained within the mixer drum.