Claims

1. A process for the industrial-scale production of a fiber cement sheet, at least comprising the steps of:

(a) providing a fiber cementitious slurry at least comprising fibers, cement and water,

(b) continuously discharging said fiber cementitious slurry on an endless water-permeable transport belt, and

(c) removing excess of water from said fiber cementitious slurry through said water-permeable transport belt by suction, so as to form a fiber cement sheet with a predetermined thickness, characterized in that said suction takes place in at least three consecutive zones with different under-pressures, wherein said under-pressures increase in the machine direction, thereby creating a gradient from a low under-pressure of at least 15 mbar to a high under-pressure of at most 900 mbar.

2. The process according to claim 1, wherein the under-pressure of a first of said zones ranges between about 15 and about 65 mbar, in a second of said zones between about 65 and about 200 mbar and in a third of said zones between about 200 to about 550 mbar.

3. The process according to any of claims 1 or 2, wherein removing excess of water from said slurry by means of suction through said water-permeable transport belt takes place in at least four consecutive zones, wherein the under-pressure of a first of said zones ranges between about 15 and about 65 mbar, in a second of said zones between about 65 and about 200 mbar, in a third of said zones between about 200 to about 550 mbar, and in a fourth of said zones between about 550 mbar and about 850 mbar.

4. The process according to claims 1 to 3, wherein step (c) of removing excess of water from said fiber cementitious slurry through said water-permeable transport belt is additionally performed by applying mechanical force.

5. The process according to claim 4, wherein the step of removing excess of water from said fiber cementitious slurry by applying mechanical force is performed by means of a mechanical belt press.

6. The process according to any of claims 1 to 5, wherein step (b) of continuously discharging the slurry on an endless water-permeable transport belt is performed at least by means of one or more flow-on systems through which said slurry is continuously dispensed on the belt.

7. The process according to any of claims 1 to 5, wherein step (b) of continuously discharging the slurry on an endless water-permeable transport belt is performed by means of one or more brush-like dispensing systems, through which said slurry is continuously and randomly sputtered on the belt.

8. The process according to any of claims 1 to 5, wherein step (b) of continuously discharging the slurry on an endless water-permeable transport belt is performed by means of one or more spraying systems, through which said slurry is continuously and randomly sprayed on the belt.

9. The process according to any one of claims 1 to 8, further comprising the step of spraying a hydrophobic substance onto the discharged fiber cement slurry and/or onto the obtained fiber cement sheet.

10. The process according to any one of claims 1 to 9, wherein the predetermined thickness of the dewatered fiber cement sheet ranges between about 8 mm and about 200 mm.

11. Apparatus for continuous industrial-scale production of fiber cement sheets, at least comprising:
(i) one or more dispensing systems connected to a fiber cement source for continuously discharging a fiber cement slurry on an endless water-permeable transport belt,
(ii) an endless water-permeable transport belt onto which the fiber cement slurry is discharged, and
(iii) at least three vacuum pumps installed adjacent to or near the water-permeable belt , characterized in that said at least three vacuum pumps achieve, facilitate and/or accelerate the removal of excess of water from the fiber cement slurry by suction respectively in at least three consecutive zones with different under-pressures, wherein said under-pressures increase in the machine direction, thereby creating a gradient from a low under-pressure of at least 15 mbar to a high under-pressure of at most 900 mbar.

12. The apparatus according to claim 11, wherein the under-pressure in a first of said zones ranges between about 15 and about 65 mbar, in a second of said zones between about 65 and about 200 mbar and in a third of said zones between about 200 to about 550 mbar.

13. The apparatus according to claim 12, wherein said one or more devices installed adjacent to or near the water-permeable belt further comprise one or more mechanical belt presses.

14. The apparatus according to claims 12 or 13, wherein said one or more dispensing systems are one or more flow-on systems through which said slurry is continuously dispensed on the belt and/or one or more brush-like dispensing systems, through which said slurry is continuously and randomly sputtered on the belt and/or one or more spraying systems, through which said slurry is continuously and randomly sprayed on the belt.