each other at the edge of the cloth, thereby at least partly closing the space within the fabric at its edges.

The part or full closure of the edges of the space in the cloth means that, when the powder material is filled into the space, it is constrained to remain within the cloth and can less easily spill out of the sides.

This aspect of the present invention can be implemented by providing an extension at the edge of one or both faces that extends laterally beyond the rest of the face and that is connected to the rest of the fabric by the elastic yarns; the elastic yarn at the edge of the cloth then draws the extended portion towards the other face, thereby at least partly closing the space at the edge.

The extended edge may also be longer than the distance between the two faces such that when the extended portion is drawn up the edge extends vertically above the face for a short distance~~; this has [were you going to add anything?]~~.

The powder material may be settable on the addition of water and in one embodiment may comprise cement, optionally Portland cement or high alumina cement (the latter having the advantage that it provides shorter setting times and a more rapid gain in early strength than other cements) or a combination of these cement with each other or with other cements. The fill may include fillers, e.g. sand or fine aggregates, fly ash, glass beads, low density or recycled fillers, chopped natural or synthetic fibres, lime flour, mica insulators, surface modified silica, pigments, anti fungal-agents and anti-radiation fillers. The cement may be combined with additives customarily found in cement or concrete compositions. Thus a number of reaction modifiers may be included for example lithium compounds, sodium compounds, organic compounds (citric acid, tartaric acid), sulphate sources, plasticisers, accelerants, retarders, super plasticisers, shrinkage reducing

CLAIMS

1. A flexible cloth that can be set to become rigid or semi-rigid, the cloth comprising:

a first face;

a second face separated from the first face by a space;

self-supporting linking fibres extending between the first and second faces that maintain the first and second face in a spaced-apart arrangement; and

a compacted powder material located in the space between the first and second faces, which material is capable of setting to a rigid or semi-rigid solid on the addition of a liquid,

wherein both the first and the second material is substantially impervious to the powder material but at least one of them is pervious to liquid and wherein the amount and type of reagent in the compacted powder material, and the volume and compaction of the powder material are such that:

MV - OV = x * LV

where:

MV = the maximum volume of the space within the cloth (per unit area of the cloth); thus MV includes both the volume of empty space in the cloth before addition of the powder material, and an additional volume resulting from any expansion of the space due to the pressure exerted by the swelling of the powder material during the addition of the liquid or during the setting of material;

OV = the volume of the space within the cloth that is occupied by the particles of the powder material, which volume does not include the volume occupied by voids within the powder material (per unit area of the cloth);

LV = the volume of liquid (per unit area of the cloth) that results in the maximum long term (28 day) compressive strength, of the fill blend when set; and

x = a factor between 0.65 and 1.1 , for example a number that is less than 1 , e.g. 0.85 - 0.99 such as 0.87 -.0.91.

2. The cloth of claim 1, wherein, at said one or more edges, the first and/or second face includes an edge portion that extends laterally beyond the rest of the face and that is connected to the rest of the fabric by the elastic yarns, the said elastic yarn drawing

the or each extending portion towards the other face, thereby at least partly closing the space at the edge of the cloth.

3. The cloth of any preceding claim, wherein the elastic fibres are incorporated into the edges of the fabric, e.g. in place of some or all of the self-supporting linking fibres, during the manufacture of the fabric.

4. The cloth of any preceding claim, wherein the settable powder material comprises cement, e.g. a cement-based dry concrete mix including plasticisers and other additives.

5. The cloth of any preceding claim, wherein the first face has pores that are large enough to admit the powder material into the space, which pores are at least partly sealed or have been reduced in size, thereby retaining the settable powder material within the space.

6. The cloth of claim 5, wherein the pores are at least partly sealed by a sealant such as an adhesive, a heat curable material or a layer of material applied to the first face.

7. The cloth of any preceding claim, wherein the first face is backed by a further layer such as a damp proof layer being impervious to liquids or gases.

8. The cloth of any preceding claim, wherein the second face includes pores that are sufficiently small as to retain the powdered settable material within the space but allow the passage of the liquid to cause the powder material to set.

9. The cloth of claim 8, wherein the extending edge portion is formed on the second face.

10. A method of making an impregnated flexible cloth as claimed in any of claims 1 to 9, the method comprising:

providing the fabric having a first face, a second face separated from the first face by a space and self-supporting linking fibres extending between the first and second faces and that maintain the first and second face in a spaced-apart arrangement; and

loading the space within the fabric with a powder material, e.g. cement, that is capable of setting to a rigid or semi-rigid solid on the addition of a liquid by placing the settable material on the first face and vibrating the fabric and/or brushing powder material into the fabric.

11. The method of claim 10, which comprises loading the powdered material into the space through pores in the first face and reducing the size of the pores or closing the pores once the powdered material has been loaded, e.g. by partly or completely sealing the pores, for example by applying a sealant to the first face or by bonding a further layer onto the first face.

12. A method of setting a cloth as claimed in any one of claims 1 to 9, which comprises adding a liquid to the cloth to cause the settable powder material to set.

13. A method of setting a cloth as claimed in claim 1, which comprises submerging the cloth in a liquid to cause the settable powder material to set.

14. Use of the impregnated fabric of any of claims 1 to 14,

- to form a cover of a prefabricated shelter, e.g. as described in WO 2005/124063;
- to form a track-way for vehicles, pedestrians or animals;
- to form a shelter by applying the fabric to a framework;
- to make formwork for casting concrete;
- to form barriers, e.g. to line tunnels;
- to repair or reinforce structures, e.g. roofs;
- to form floors or damp proof structures;
- to reinforce earth structures, e.g. river banks and unstable slopes;
- to provide flood defences;
- to repair existing pipes, including buried water pipes or to construct new pipes;
- to fireproof elements of new or existing structures e.g. as a fireproof covering or lining for chimneys;
- to form a hard surface, reduce dust hazards and contain fuel spills for aircraft e.g. helicopter landing sites and runways;
- to reinforce sandbag structures and protect them from damage from the elements such as wind and ultra violet degradation;

- to line ground works and prevent the leaching of chemical contaminants e.g. for land fill or secondary fuel containment works;
- to form a waterproof lining for the containment of water e.g. pond, canal lining and water storage or settling or septic tanks;
- to form permanent awnings or roof structures;
- to line drainage ditches;
- to provide an external weatherproof facing for buildings;
- to form an integral part of a durable gabion structures;
- to repair and/or reinforce gabion structures and protect them from damage from the elements such as wind and ultra violet degradation;
- to form artistic or decorative forms, or
- to form hulls and superstructure of floating vessels such as boats or pontoons.

CLAIMS

1. A flexible cloth that can be set to become rigid or semi-rigid, the cloth comprising:

a first face;

a second face separated from the first face by a space;

self-supporting linking fibres extending between the first and second faces that maintain the first and second face in a spaced-apart arrangement; and

a compacted powder material located in the space between the first and second faces, which material is capable of setting to a rigid or semi-rigid solid on the addition of a liquid, wherein both the first and the second material is substantially impervious to the powder material but at least one of them is pervious to liquid and wherein the amount and type of reagent in the compacted powder material, and the volume and compaction of the powder material are such that:

$MV - OV = x*LV$

where:

MV = the maximum volume of the space within the cloth (per unit area of the cloth); thus MV includes both the volume of empty space in the cloth before addition of the powder material, and an additional volume resulting from any expansion of the space due to the pressure exerted by the swelling of the powder material during the addition of the liquid or during the setting of material;

OV = the volume of the space within the cloth that is occupied by the particles of the powder material, which volume does not include the volume occupied by voids within the powder material (per unit area of the cloth);

LV = the volume of liquid (per unit area of the cloth) that results in the maximum long term (28 day) compressive strength, of the fill blend when set; and

x = a factor between 0.65 and 1.1.

2. The cloth of claim 1 wherein the cloth further comprises connecting fibres that connect said first and second faces, said connecting fibres being an elastic yarn that is shorter than the self-supporting linking fibres, thereby at least partly closing the space at the edge of the cloth.

3. The cloth of claim 2, wherein, at said one or more edges, at least the first or second face includes an edge portion that extends laterally beyond the rest of the face and that is connected to the rest of the fabric by the elastic yarns, said elastic yarn drawing the

extending portion towards the other face, thereby at least partly closing the space at the edge of the cloth.

4. The cloth of claim 1, wherein the cloth is a component in a structure selected from the group consisting of: a shelter, a track-way for vehicles, pedestrians or animals, formwork, a barrier, a tunnel liner, a floor or damp proof structure, a reinforced earth structure, flood defences, a repaired or new existing pipe, a fireproof element of a new or existing structure, a helicopter landing site, an aircraft runway, a reinforced sandbag structure, a ground works lining, a waterproof lining, a permanent awning, a roof structure, a lined drainage ditch, a weatherproof facing for a building, a gabion structure, an artistic or decorative form, and a hull or a superstructure of a floating vessel.

5. The cloth of claim 1, wherein the settable powder material comprises cement.

6. The cloth of claim 5, wherein the settable powder material comprises a cement-based dry concrete mix including plasticisers and other additives.

7. The cloth of claim 1, wherein the first face has pores that are large enough to admit the powder material into the space, which pores are at least partly sealed or have been reduced in size, thereby retaining the settable powder material within the space.

8. The cloth of claim 7, wherein the pores are at least partly sealed by a sealant, an adhesive, a heat curable material or a layer of material applied to the first face.

9. The cloth of claim 1, wherein the first face is backed by a further layer comprising a damp proof layer being impervious to liquids or gases.

10. The cloth of claim 1, wherein x is a number that is less than 1.

11. The cloth of claim 1, wherein x is a number in the range of 0.85-0.99.

12. The cloth of claim 1, wherein x is a number in the range of 0.87-0.91.

13. A structure comprising a flexible cloth that can be set to become rigid or semi-rigid, the cloth comprising:

a first face;

a second face separated from the first face by a space;

self-supporting linking fibres extending between the first and second faces that maintain the first and second face in a spaced-apart arrangement; and

a compacted powder material located in the space between the first and second faces, which material is capable of setting to a rigid or semi-rigid solid on the addition of a liquid, wherein both the first and the second material is substantially impervious to the powder material but at least one of them is pervious to liquid and wherein the amount and type of reagent in the compacted powder material, and the volume and compaction of the powder material are such that:

$MV - OV = x*LV$

where:

MV = the maximum volume of the space within the cloth (per unit area of the cloth); thus MV includes both the volume of empty space in the cloth before addition of the powder material, and an additional volume resulting from any expansion of the space due to the pressure exerted by the swelling of the powder material during the addition of the liquid or during the setting of material;

OV = the volume of the space within the cloth that is occupied by the particles of the powder material, which volume does not include the volume occupied by voids within the powder material (per unit area of the cloth);

LV = the volume of liquid (per unit area of the cloth) that results in the maximum long term (28 day) compressive strength, of the fill blend when set; and

x = a factor between 0.65 and 1.1.

14. The structure of claim 13, wherein the structure is selected from the group consisting of a shelter, a track-way for vehicles, pedestrians or animals, formwork, a barrier, a tunnel liner, a floor or a damp proof structure, a reinforced earth structure, flood defences, a repaired or a new pipe, a fireproof element of a new or existing structure, a helicopter landing site, an aircraft runway, a reinforced sandbag structure, a ground works lining, a waterproof lining, a permanent awning, a roof structure, a lined drainage ditch, a weatherproof facing for a building, a gabion structure, an artistic or decorative form, and a hull or superstructure of a floating vessel.

15. The structure of claim 13, wherein the first face has pores that are large enough to admit the powder material into the space, which pores are at least partly sealed or have been reduced in size, thereby retaining the settable powder material within the space.

16. A method of making an impregnated flexible cloth that can be set to become rigid or semi-rigid, the method comprising:

providing a cloth having a first face, a second face separated from the first face by a space and self-supporting linking fibres extending between the first and second faces that maintain the first and second face in a spaced-apart arrangement, and

loading the space within the cloth with a powder material that is capable of setting to a rigid or semi-rigid solid on the addition of a liquid,

wherein both the first and the second material is substantially impervious to the powder material but at least one of them is pervious to liquid and wherein the amount and type of reagent in the compacted powder material, and the volume and compaction of the powder material are such that: MV - OV = x, LV where: MV = the maximum volume of the space within the cloth (per unit area of the cloth); thus MV includes both the volume of empty space in the cloth before addition of the powder material, and an additional volume resulting from any expansion of the space due to the pressure exerted by the swelling of the powder material during the addition of the liquid or during the setting of material; OV = the volume of the space within the cloth that is occupied by the particles of the powder material, which volume does not include the volume occupied by voids within the powder material (per unit area of the cloth); LV = the volume of liquid (per unit area of the cloth) that results in the maximum long term (28 day) compressive strength, of the fill blend when set; and x=a factor between 0.65 and 1.1.

17. The method of claim 16, further comprising forming the flexible cloth into a structure selected from the group consisting of a shelter, a track-way for vehicles, pedestrians or animals, formwork, a barrier, a tunnel liner, a floor or damp proof structure, a reinforced earth structure, flood defences, a repaired or new pipe, a fireproof element of a new or existing structure, a helicopter landing site, an aircraft runway, a reinforced sandbag structure, ground works lining, a waterproof lining, a permanent awning, a roof structure, a lined drainage ditch, a weatherproof facing for a building, a gabion, an artistic or decorative form, and a hull or superstructure of a floating vessel, after the step of loading the space within the cloth with a powder material.

18. The method of claim 16, which comprises loading the powdered material into the space through pores in the first face and reducing the size of the pores or closing the pores once the powdered material has been loaded.

19. The method of claim 16, which comprises introducing a liquid through at least one of the first and second face of the cloth to cause the settable powder material to set.

20. The method of claim 16, wherein the space within the cloth is loaded with a powder material by a first step comprising placing the settable material on the first face of the cloth and a second step selected from the group consisting of vibrating the fabric and brushing powder material into the cloth.