Claims

1. A fabric barrier (104) for an aircraft compartmental barrier, the fabric barrier comprising a fabric barrier portion (105, 201) and a flexible crosspiece (202), wherein at least part of one edge of the fabric barrier portion terminates at the flexible crosspiece,

wherein the flexible crosspiece is adapted to fit into and be retained within a partially covered groove (204),

wherein the partially covered groove comprises a pair of opposing flange portions (208) covering a groove whereby a central longitudinal portion of the groove (205) remains uncovered,

wherein the flexible crosspiece is adapted to be released from the partially covered groove by passing between the pair of opposing flange portions during a decompression event.

2. A fabric barrier according to claim 1, wherein the fabric barrier is a fire and/or smoke barrier.

3. A fabric barrier according to claim 1 or claim 2, wherein all the edges of the fabric barrier portion except at least part of one edge terminate at the flexible crosspiece and ~~preferably~~ the at least part of one edge is adapted to remain fixed to an interior of an aircraft cabin or to an edge of an aperture in an aircraft compartmental barrier during a decompression event.

4. A fabric barrier according to claim 1 or claim 2, wherein all the edges of the fabric barrier portion terminate at the flexible crosspiece.

5. A fabric barrier according to any one of claims 1 to 3, wherein all the edges of the fabric barrier portion except a bottom edge terminate at the flexible crosspiece and ~~preferably~~ the bottom edge is adapted to remain fixed to an interior of an aircraft cabin or to a bottom edge of an aperture in an aircraft compartmental barrier during a decompression event.

6. A fabric barrier according to any one of the preceding claims, wherein the fabric barrier portion comprises a glass fibre fabric with a flame resistant acrylic copolymer coating, or a coated or uncoated aramid fabric.

7. A fabric barrier according to any one of the preceding claims, wherein the flexible crosspiece comprises an elastomer selected from the group consisting of polyisoprene, polybutadiene, chloroprene rubber, butyl rubber, halogenated butyl rubber, styrene-butadiene rubber, nitrile rubber, hydrogenated nitrile rubber, ethylene propylene rubber, ethylene propylene diene rubber, epichlorohydrin rubber, polyacrylic rubber, silicone rubber, fluorosilicone rubber, fluoroelastomer, perfluoroelastomer, polyether block amide, chlorosulfonated polyethylene, ethylene-vinyl acetate, and mixtures thereof.

8. A fabric barrier according to any one of the preceding claims, wherein the flexible crosspiece is joined to the edge of the fabric barrier portion by wrapping the flexible crosspiece in a hem (203) formed from material forming the fabric barrier portion.

9. A fabric barrier according to any one of the preceding claims, wherein a decompression event occurs when a difference in pressure across the fabric barrier is in the range 0.172-1.72 kPa (0.025-0.25 psi), 0.344-1.72 kPa (0.050-0.25 psi), 0.516-1.72 kPa (0.075-0.25 psi), 0.688-1.72 kPa (0.100-0.25 psi), 0.86-1.72 kPa (0.125-0.25 psi), 1.032-1.72 kPa (0.150-0.25 psi), 1.204-1.72 kPa (0.175-0.25 psi), 1.376-1.72 kPa (0.2-0.25 psi), or 1.548-1.72 kPa (0.225-0.25 psi).

10. A decompression system for an aircraft compartmental barrier, the decompression system comprising:

(a) a fabric barrier according to any one of the preceding claims; and

(b) a pair of opposing flange portions (208) adapted to partially cover a groove on an interior of an aircraft cabin or on an edge of an aperture in an aircraft compartmental barrier thereby to define a partially covered groove (204) whereby a central longitudinal portion of the groove (205) remains uncovered by the flange portions,

wherein the flexible crosspiece is adapted to fit into and be retained in the groove by the opposing flange portions and wherein the flexible crosspiece is adapted to be released from the partially covered groove passing between the pair of opposing flange portions during a decompression event.

11. A decompression system according to claim 10, wherein portions of the pair of opposing flange portions adjacent the central longitudinal portion of the groove comprise a flexible material (211).

12. A decompression system according to claim 11, wherein the pair of opposing flange portions comprise a layer of the flexible material (211) and a layer of inflexible material (212), wherein the layer of the flexible material is adapted to be in contact with the flexible crosspiece when the flexible crosspiece is retained within the partially covered groove, wherein the layer of inflexible material covers less of the groove than the layer of the flexible material thereby to allow the layer of the flexible material to bend away from the partially covered groove when, in use, the flexible crosspiece is pulled from the partially covered groove during a decompression event.

13. A decompression system according to claim 11 or claim 12, wherein the flexible material comprises an elastomer selected from the group consisting of polyisoprene, polybutadiene, chloroprene rubber, butyl rubber, halogenated butyl rubber, styrene-butadiene rubber, nitrile rubber, hydrogenated nitrile rubber, ethylene propylene rubber, ethylene propylene diene rubber, epichlorohydrin rubber, polyacrylic rubber, silicone rubber, fluorosilicone rubber, fluoroelastomer, perfluoroelastomer, polyether block amide, chlorosulfonated polyethylene, ethylene-vinyl acetate, and mixtures thereof.

14. A decompression system according to claim 12, or claim 13 when dependent on claim 12, wherein the inflexible material is selected from the group consisting of steel, aluminium, titanium or their alloys; fibrous composites such as carbon- and glass-fibre-reinforced plastic; metal matrix composites such as silicon carbide particles

combined with an aluminium alloy; rigid plastics such as thermosetting plastics; and composites thereof.

15. A decompression system according to claim 10 wherein the opposing flange portions solely comprise inflexible material, preferably wherein the inflexible material is selected from the group consisting of steel, aluminium, titanium or their alloys; fibrous composites such as carbon- and glass-fibre-reinforced plastic; metal matrix composites such as silicon carbide particles combined with an aluminium alloy; rigid plastics such as thermosetting plastics; and composites thereof.

16. A decompression system according to any one of claims 10 to 15, wherein each of the opposing flange portions forms a second arm of a substantially L-shaped piece (207) and a first arm (209) of the substantially L-shaped piece is adapted to be reversibly attached adjacent to a substantially flat elongate surface (206) thereby forming the partially covered groove.

17. A decompression system according to any one of claims 10 to 16, wherein one or both of the opposing flange portions is demountable thereby enabling fitting of the flexible crosspiece into the partially covered groove.

18. A decompression system according to any one of claims 10 to 17, wherein a decompression event occurs when a difference in pressure across the flexible barrier is in the range 0.172-1.72 kPa (0.025-0.25 psi), 0.344-1.72 kPa (0.050-0.25 psi), 0.516-1.72 kPa (0.075-0.25 psi), 0.688-1.72 kPa (0.100-0.25 psi), 0.86-1.72 kPa (0.125-0.25 psi), 1.032-1.72 kPa (0.150-0.25 psi), 1.204-1.72 kPa (0.175-0.25 psi), 1.376-1.72 kPa (0.2-0.25 psi), or 1.548-1.72 kPa (0.225-0.25 psi).

19. A method for isolating two internal volumes within an aircraft, the method comprising the steps of:

(a) providing a decompression system according to any one of claims 10 to 18; and

(b) securing the fabric barrier to the interior of an aircraft cabin thereby creating two cabin volumes or securing the fabric barrier to edges of an aperture in an

aircraft compartmental barrier thereby to cover the aperture, wherein the step of securing the fabric barrier comprises the steps of:

(i) fitting the pair of opposing flange portions to partially cover a groove on an interior of an aircraft cabin or on an edge of an aperture in an aircraft compartmental barrier thereby to define a partially covered groove (204) whereby a central longitudinal portion of the groove (205) remains uncovered by the flange portions; and

(ii) fitting the flexible crosspiece into the partially covered groove.