Claims

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

(a) a fabric barrier (104) 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; 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.

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

3. The decompression system 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. The decompression system according to claim 1 or claim 2, wherein all the edges of the fabric barrier portion terminate at the flexible crosspiece.

5. The decompression system 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. The decompression system according to any one of the preceding claims, wherein the fabric barrier portion comprises a glass fibre fabric with a flame resistant coating such as an acrylic copolymer coating, or a coated or uncoated aramid fabric.

7. The decompression system 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. The decompression system 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. The decompression system according to any one of the preceding claims, wherein a decompression event occurs when there is a difference between in pressure across the fabric barrier, preferably when the 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. The decompression system according to any one of the preceding claims, wherein portions of the pair of opposing flange portions adjacent the central longitudinal portion of the groove comprise a flexible material (211).

11. The decompression system according to claim 10, 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.

12. The decompression system according to claim 10 or claim 11, wherein the flexible material (211) 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.

13. The decompression system according to claim 11, or claim 12 when dependent on claim 11, wherein the inflexible material (212) 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.

14. The decompression system according to any one of claims 1 to 9, 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.

15. 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 the preceding claims; 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.