CLAIMS

1. A cryogenic liquid storage vessel comprising a composite wall structure, said wall structure comprising the following layers:

(a) an elastic inner layer comprising a polymer fabric impregnated with a cured resin;

(b) a structural layer; and

(c) an insulating layer disposed between the elastic inner layer and the structural layer;

wherein the elastic inner layer has an elasticity of at least 100%;

wherein the elastic inner layer is in direct with the insulating layer; and

wherein, in use, the elastic inner layer is in direct contact with a cryogenic liquid.

2. The cryogenic storage vessel according to claim 1 wherein the structural layer comprises one or more of concrete, reinforced concrete, carbon fibre, metals, alloys or combinations thereof.

3. The cryogenic storage vessel according to claim 1 or claim 2 wherein the insulating layer comprise one or more of perlite, vermiculite, glass fibres and ceramic fibres.

4. The cryogenic storage vessel according to any one of claims 1 to 3 wherein the elastic inner layer provides an impervious or substantially impervious barrier to liquid cryogen.

5. The cryogenic storage vessel according to any one of claims 1 to 4, wherein the elastic inner layer has an elasticity of at least 200%, or at least 400%, or at least 600% or at least 800%.

6. The cryogenic storage vessel according to any one of claims 1 to 5, wherein the elastic inner layer has an elasticity of at least 100%, or at least 200% at -196°C.

7. The cryogenic storage vessel according to any one of claims 1 to 6, wherein the polymer fabric is one or more of spandex (elastane), Lycra®, block copolymers of polyurethane and polyethylene glycol, silicone rubber, segmented urea/urethane/ether copolymers, fluorinated resins such as perfluoroalkoxy alkanes (PFA), fluorinated ethylene propylene (FEP), or polytetrafluoroethylene (PTFE) optionally in combination with one or more synthetic or natural fibres, for example, nylon, polypropylene or polyethylene.

8. The cryogenic liquid storage vessel according to any one of claims 1 to 7 wherein the cured resin comprises polyurethanes, polyureas, acrylic resins, polyester resins, silicone resins, fluorinated resins, for example polyvinylidene fluoride (PVDF) and polytetrafluoroethylene (PTFE), fluorinated silicone resins, epoxy resins or combinations thereof.

9. The cryogenic liquid storage vessel according to any one of claims 1 to 8 wherein the structural layer comprises concrete.

10. The cryogenic liquid storage vessel according to any one of claims 1 to 8 wherein the structural layer comprises carbon fibre.

11. The cryogenic liquid storage vessel according to any one of claims 1 to 10 wherein the cured resin comprises a polyurethane.

12. The cryogenic liquid storage vessel according to any one of claims 1 to 11 wherein the polymer fabric comprises one or more of spandex, Lycra® or elastane.

13. The cryogenic liquid storage vessel according to any one of claims 1 to 12 wherein the polymer fabric comprises nylon and one or more of spandex, Lycra® or elastane.

14. The cryogenic liquid storage vessel according to any one of claims 1 to 13 wherein the elastic inner layer has a thickness of less than 5000 microns.

15. The cryogenic liquid storage vessel according to any one of claims 1 to 14 wherein the elastic inner layer has a thickness from 100 to 5000 microns.

16. The cryogenic liquid storage vessel according to any one of claims 1 to 15 wherein the elastic inner layer has a thickness from 100 to 1000 microns.

17. The cryogenic liquid storage vessel according to any one of claims 1 to 16, wherein the vessel further comprises a liquid cryogen, such as LNG.

18. A cryogenic liquid storage system, said storage system comprising a plurality of cryogenic liquid storage vessel according to any one of claims 1 to 16.