CLAIMS:

1. A hose comprising an inner tubular structure and an outer tube, wherein the inner tubular structure comprises a tubular body disposed between inner and outer helical gripping members, the tubular body including a sealing layer, and being formed of a material capable of withstanding cryogenic temperatures, wherein the outer tube comprises a rubber layer and a reinforcing layer disposed around the rubber layer, wherein the inner tubular structure has insulation properties sufficient to protect the outer tube from the low temperature of cryogenic fluid flowing within the inner tubular structure and wherein the inner tubular structure is movable relative to the outer tube during flexing of the hose.

2. A hose according to claim 1, wherein the tubular body comprises at least two reinforcing layers with the sealing layer sandwiched therebetween.

3. A hose according to claim 1 or 2, wherein the inner tubular structure further includes an axial strengthening means.

4. A hose according to claim 3, wherein the axial strengthening means comprises a generally tubular braid formed of a sheet of material provided in a tubular shape.

5. A hose according to claim 3 or 4, wherein the axial strengthening means comprises a plurality of axial strengthening strips extending along the length of the hose.

6. A hose according to any preceding claim, wherein the or each reinforcing layer is formed of a sheet of material which has been wound into a tubular form in the inner tubular structure.

7. A hose according to any preceding claim, wherein the sealing layer is formed of a sheet of material which has been wound into a tubular form in the inner tubular structure.

8. A hose according to any preceding claim, wherein an insulation layer is incorporated in the inner tubular structure.

9. A hose according to claim 8, wherein the insulation layer is disposed between the inner and outer gripping members.

10. A hose according to claim 8, wherein the insulation layer overlies the outer gripping member.

11. A hose according to claim 10, wherein the insulation layer comprises an elongate member, made of an insulating material, having opposing longitudinal edges, the elongate member being helically wound around the tubular body such that the opposing longitudinal edges of the layer are in an adjacent or overlapping arrangement, wherein each longitudinal edge includes a formation capable of interengaging with a cooperating formation on the opposing longitudinal edge.

12. A hose according to claim 8, 9 or 10, wherein the insulation layer includes a fabric formed of basalt fibres.

13. A hose according to any preceding claim, further comprising an end fitting disposed at each end of the inner tubular structure.

14. A hose according to any preceding claim, wherein the inner and outer gripping members of the inner tubular structure are helical wires.

15. A hose according to any preceding claim, wherein the components of the inner tubular structure are movable relative to one another during flexing of the hose.

16. A hose according to any preceding claim, wherein the inner rubber of the outer tube is a liner layer comprising a natural or synthetic rubber.

CLAIMS:

17. A hose according to any preceding claim, wherein the reinforcing layer of the outer tube is a fabric layer or a metal layer, or a fabric incorporating metal parts.

18. A hose according to any preceding claim, wherein the reinforcing layer of the outer tube is a polymeric material which optically incorporates additional metallic reinforcement.

19. A hose according to any preceding claim, wherein the outer tube further includes a helical wire.

20. A hose according to any preceding claim, wherein the helical wire is embedded in a rubber matrix, or a matrix of another polymeric material.

21. A hose according to any preceding claim, wherein the outer tube further includes an outer cover layer.

22. A hose according to claim 21, wherein the outer cover layer is rubber.

23. A hose according to any preceding claim, wherein the layers of the outer tube have been subjected to curing after assembly, whereby all the layers are intimately bonded together to prevent the layers of the outer tuber from moving relative to one another.

24. A hose according to any preceding claim, wherein the inner tubular structure and the outer tube are dimensioned so that the outer surface of the inner tubular structure is in contact with the inner surface of the outer tube.

25. A hose according to any one of claims 1 to 23, wherein the inner tubular structure and the outer tube are dimensioned such that there is an annular space between the outer surface of the inner tubular structure and the inner surface of the outer tube.

26. A hose according to claim 25, wherein spacing means is provided within said annular gap in order to maintain a desired spacing between the inner tubular structure and the outer tube.

27. A hose according to claim 26, wherein said inner tubular structure further comprises an insulation material disposed in said annular gap.

28. A hose according to any preceding claim, wherein the inner diameter of the outer tube is at least 150mm.

29. A hose according to any preceding claim, wherein the inner diameter of the inner tubular structure is at least 150mm.

30. A hose string comprising a plurality of hoses according to any preceding claim connected end to end.

31. The use of a hose according to any preceding claim to transport fluids at a temperature below -100°C.

32. The use of a hose according to any preceding claim to transport fluids at a temperature below -150°C.

33. A system for transporting fluids from a surface offshore structure to a subsurface offshore structure comprising a riser operatively connected to the surface offshore structure and to the subsurface offshore structures in such a way that the fluid can flow from the subsurface offshore structure to the subsurface offshore structure or vice versa, wherein at least part of the riser is formed of a hose as defined in any one of claims 1 to 29.

34. A system according to claim 33, further comprising a buoy located at the surface, wherein the riser extends from the buoy to the subsurface offshore structure, and is supported by the buoy.

35. A system according to claim 33, wherein the riser extends directly from the surface offshore structure to the subsurface offshore structure.

36. A system according to claim 33, wherein a surface buoy is attached to a subsurface connector located at the seabed, and the hose extends directly from the surface offshore structure to the subsurface connector.

37. A system according to any one of claims 33 to 36, wherein the surface offshore structure is a ship or a floating platform.

38. A system according to any on of claims 33 to 37, wherein the subsurface offshore structure is a submarine pipeline.

39. A method of transporting a fluid having a temperature of -100°C which comprises conveying the fluid from a surface offshore structure to a subsurface offshore structure using a hose according to any one of claims 1 to 29.

CLAIMS:

1. A hose comprising an inner tubular structure and an outer tube, wherein the inner tubular structure comprises a tubular body and an insulation layer, with the tubular body and insulation layer disposed between inner and outer helical gripping members, the tubular body including a sealing layer, and being formed of a material capable of withstanding cryogenic temperatures, wherein the outer tube comprises a rubber layer and a reinforcing layer disposed around the rubber layer, wherein the inner tubular structure has insulation properties sufficient to protect the outer tube from the low temperature of cryogenic fluid flowing within the inner tubular structure and wherein the inner tubular structure is movable relative to the outer tube during flexing of the hose.

2. A hose according to claim 1, wherein the tubular body comprises at least two reinforcing layers with the sealing layer sandwiched therebetween.

3. A hose according to claim 1 or 2, wherein the inner tubular structure further includes an axial strengthening means.

4. A hose according to claim 3, wherein the axial strengthening means comprises a generally tubular braid formed of a sheet of material provided in a tubular shape.

5. A hose according to claim 3 or 4, wherein the axial strengthening means comprises a plurality of axial strengthening strips extending along the length of the hose.

6. A hose according to any preceding claim, wherein the or each reinforcing layer is formed of a sheet of material which has been wound into a tubular form in the inner tubular structure.

7. A hose according to any preceding claim, wherein the sealing layer is formed of a sheet of material which has been wound into a tubular form in the inner tubular structure.

8. A hose according to claim 1, wherein the insulation layer comprises an elongate member, made of an insulating material, having opposing longitudinal edges, the elongate member being helically wound around the tubular body such that the opposing longitudinal edges of the layer are in an adjacent or overlapping arrangement, wherein each longitudinal edge includes a formation capable of interengaging with a cooperating formation on the opposing longitudinal edge.

9. A hose according to claim 1, wherein the insulation layer includes a fabric formed of basalt fibres.

10. A hose according to any preceding claim, further comprising an end fitting disposed at each end of the inner tubular structure.

11. A hose according to any preceding claim, wherein the inner and outer gripping members of the inner tubular structure are helical wires.

12. A hose according to any preceding claim, wherein the components of the inner tubular structure are movable relative to one another during flexing of the hose.

13. A hose according to any preceding claim, wherein the inner rubber of the outer tube is a liner layer comprising a natural or synthetic rubber.

14. A hose according to any preceding claim, wherein the reinforcing layer of the outer tube is a fabric layer or a metal layer, or a fabric incorporating metal parts.

15. A hose according to any preceding claim, wherein the reinforcing layer of the outer tube is a polymeric material which optically incorporates additional metallic reinforcement.

16. A hose according to any preceding claim, wherein the outer tube further includes a helical wire.

17. A hose according to any preceding claim, wherein the helical wire is embedded in a rubber matrix, or a matrix of another polymeric material.

18. A hose according to any preceding claim, wherein the outer tube further includes an outer cover layer.

19. A hose according to claim 18, wherein the outer cover layer is rubber.

20. A hose according to any preceding claim, wherein the layers of the outer tube have been subjected to curing after assembly, whereby all the layers are intimately bonded together to prevent the layers of the outer tuber from moving relative to one another.

21. A hose according to any preceding claim, wherein the inner tubular structure and the outer tube are dimensioned so that the outer surface of the inner tubular structure is in contact with the inner surface of the outer tube.

22. A hose according to any one of claims 1 to 20, wherein the inner tubular structure and the outer tube are dimensioned such that there is an annular space between the outer surface of the inner tubular structure and the inner surface of the outer tube.

23. A hose according to claim 22, wherein spacing means is provided within said annular gap in order to maintain a desired spacing between the inner tubular structure and the outer tube.

24. A hose according to claim 23, wherein said inner tubular structure further comprises an insulation material disposed in said annular gap.

25. A hose according to any preceding claim, wherein the inner diameter of the outer tube is at least 150mm.

26. A hose according to any preceding claim, wherein the inner diameter of the inner tubular structure is at least 150mm.

27. A hose string comprising a plurality of hoses according to any preceding claim connected end to end.

28. The use of a hose according to any preceding claim to transport fluids at a temperature below -100°C.

29. The use of a hose according to any preceding claim to transport fluids at a temperature below -150°C.

30. A system for transporting fluids from a surface offshore structure to a subsurface offshore structure comprising a riser operatively connected to the surface offshore structure and to the subsurface offshore structures in such a way that the fluid can flow from the subsurface offshore structure to the subsurface offshore structure or vice versa, wherein at least part of the riser is formed of a hose as defined in any one of claims 1 to 26.

31. A system according to claim 30, further comprising a buoy located at the surface, wherein the riser extends from the buoy to the subsurface offshore structure, and is supported by the buoy.

32. A system according to claim 30, wherein the riser extends directly from the surface offshore structure to the subsurface offshore structure.

33. A system according to claim 30, wherein a surface buoy is attached to a subsurface connector located at the seabed, and the hose extends directly from the surface offshore structure to the subsurface connector.

34. A system according to any one of claims 30 to 33, wherein the surface offshore structure is a ship or a floating platform.

35. A system according to any on of claims 30 to 34, wherein the subsurface offshore structure is a submarine pipeline.

36. A method of transporting a fluid having a temperature of -100°C which comprises conveying the fluid from a surface offshore structure to a subsurface offshore structure using a hose according to any one of claims 1 to 26.