

CLAIMS

1. A method for producing a thermal insulation barrier (2, 5) for a wall (1) of a fluid-tight and thermally insulative tank integrated into a support structure (3), said method including the following steps:

- 5 - anchoring a plurality of insulative panels (16, 65, 66) directly or indirectly to the support structure (3) by means of anchor devices (38, 54, 69); said plurality of insulative panels (16, 65, 66) defining an internal support surface of a sealing membrane (4, 6) and including at least one opening (43, 55) opening at the level of said internal surface;
- 10 - procuring a polymer foam insulative blocking member (44, 57, 58, 59, 60, 95, 96) intended to ensure continuity of thermal insulation at the level of said opening (43, 55), said insulative blocking member (44, 57, 58, 59, 60, 95, 96) having an internal end (48, 61);
- 15 - inserting said insulative blocking member (44, 57, 58, 59, 60, 95, 96) in said opening (43, 55) and pushing it in the direction of the support structure (3) until the insulative blocking member comes to bear in the direction of the support structure (3) against a bearing member (15, 82, 91) housed in said opening (43, 55);
- 20 - pushing the insulative blocking member (44, 57, 58, 59, 60) in the direction of the support structure (3) against the bearing member (15, 82, 91) so as to damage irreversibly the insulative blocking member (44, 57, 58, 59, 60, 95, 96) where it bears against the bearing member (15, 82, 91) and so as to reduce irreversibly the dimension of the insulative blocking member (44, 57, 58, 59, 60, 95, 96) between the internal end (48, 61) of the insulative blocking member (44, 57, 58, 59, 60, 95, 96) and where the insulative blocking member (44, 57, 58, 59, 60, 95, 96) bears against the bearing member (15, 82, 91) until the internal end (48, 61) of the insulative blocking member (44, 57, 58, 59, 60, 95, 96) reaches a predetermined position in said opening (43, 55).
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2. The method as claimed in claim 1, in which the insulative blocking member (44, 57, 58, 59, 60, 95, 96) is made of polymer foam having a density between 20 and 60 kg/m³.

3. The method as claimed in claim 1 or 2, in which the insulative blocking member (44, 57, 58, 59, 60, 95, 96) is made of polyurethane foam.

4. The method as claimed in any one of claims 1 to 3, in which one of the anchor devices (38, 54, 69) is housed inside the opening (43, 55) and in which said anchor device (38, 54, 69) includes the bearing member against which the insulative blocking member (44, 57, 58, 59, 60, 95, 96) is pushed.

5. The method as claimed in claim 4, in which said anchor device (38, 54, 69) housed inside said opening includes a stud (15, 91) fixed directly or indirectly to the support structure (3), in which during the anchoring of the plurality of insulative panels (16, 65, 66) a retaining member (40, 56) is mounted on the stud in such a manner that it cooperates with a retaining zone (37) of at least one of the insulative panels (16, 65, 66) so as to retain said insulative panel (16, 65, 66) on the support structure (3), and in which said stud (15, 91) forms a bearing member against which the insulative blocking member (44, 60, 96) is pushed so that said stud (15, 91) is embedded in said insulative blocking member (44, 60, 96) when the insulative blocking member (44, 60, 96) is pushed in the direction of the support structure (3).

6. The method as claimed in claim 5, in which when the insulative blocking member (44, 60, 96) is pushed in the direction of the support structure (3), the stud (15, 91) is embedded in the mass of the insulative blocking member (44, 60, 96) to a distance between 5 and 30 mm inclusive, for example between 8 and 15 mm inclusive.

7. The method as claimed in any one of claims 1 to 6, in which one of the anchor devices (38) is housed inside the opening (43) and in which the insulative blocking member (44) has an external end (49) into which opens a housing (50); said anchor device (38) being at least partly housed in said housing (50) when the internal end (48) of the insulative blocking member (44) reaches its predetermined position.

8. The method as claimed in any one of claims 1 to 7, in which the opening (43, 55) is bordered on the internal surface side by an adjacent border

surface (46) and in which, in the predetermined position of the internal end (48, 61) of the insulative blocking member (44, 57, 58, 59, 60, 95, 96), said internal end (48, 61) is positioned less than 1 mm above and less than 3 mm below said adjacent border surface (45).

5 9. The method as claimed in claim 8, in which the adjacent border surface extends in the plane of the internal surface of the plurality of insulative panels (16, 65, 66) or form the bottom (46) of a recess (45) in which a closing plate (43) is disposed after positioning the insulative blocking member (44) in the predetermined position.

10 10. The method as claimed in any one of claims 1 to 9, in which the insulative blocking member (44, 57, 58, 59, 60, 95, 96) is irreversibly compressed in a thickness direction orthogonal to the support structure (3) where it bears against the bearing member (15, 82, 91) when the insulative blocking member (44, 57, 58, 59, 60, 95, 96) is pushed in the direction of the support structure (3).

15 11. A fluid-tight and thermally insulative tank including a support structure, a thermal insulation barrier (2, 5) integrated into the support structure and a sealing membrane (4, 6) resting against said thermal insulation barrier (2, 5), the thermal insulation barrier (2, 5) including:

- a plurality of insulative panels (16, 65, 66) anchored directly or indirectly to the
20 support structure (3) by means of anchor devices (38, 54, 69); said plurality of insulative panels (16, 65, 66) defining an internal support surface of a sealing membrane (4, 6) and including at least one opening (43, 55) opening at the level of said internal surface; and

- a polymer foam insulative blocking member (44, 57, 58, 59, 60, 95, 96) that is
25 inserted in said opening (43, 55) in such a manner as to ensure continuity of thermal insulation; said insulative blocking member (44, 57, 58, 59, 60, 95, 96) bearing in the direction of the support structure (3) against a bearing member (15, 82, 91) housed in said opening (43, 55) and featuring irreversible damage to the insulative blocking member (44, 57, 58, 59, 60, 95, 96) where it bears against the bearing member (15,
30 82, 91), said irreversible damage having been produced by pushing the insulative blocking member (44, 57, 58, 59, 60, 95, 96) in the direction of the support structure (3) until it reaches a predetermined position.

12. A ship (70) for the transportation of a fluid, the ship including a double hull (72) and a tank (71) as claimed in claim 11.

13. A system for transfer of a fluid, the system including a ship (70) as claimed in claim 12, insulated pipes (73, 79, 76, 81) arranged in such a manner as to
5 connect the tank (71) installed in the hull of the ship to a floating or terrestrial storage installation (77) and a pump for driving a fluid through the insulated pipes from or to the floating or terrestrial storage installation to or from the tank of the ship.

14. A method for loading or offloading a ship (70) comprising:

- providing a ship as claimed in claim 12;
- 10 - routing a fluid through insulated pipes (73, 79, 76, 81) from or to a floating or terrestrial storage installation (77) to or from the tank (71) of the ship.