

CLAIMS

1. A method for manufacturing a tank wall, said method comprising the steps of:

- providing a sealed and thermally insulating tank wall thermally insulating barrier, said thermally insulating barrier comprising a plurality of insulating panels (3) juxtaposed in a regular pattern, the mutually facing lateral faces of two adjacent insulating panels (3) delimiting an inter-panel space (2) separating said two adjacent insulating panels (3),
- providing a parallelepipedal insulating insert (1) comprising an insulating core (4), said insulating insert (4) comprising a wrapper (5) completely covering the insulating core (4),
- inserting a suction nozzle (25) of a suction system (24) into the insulating insert (1) through an orifice (28) in the wrapper (5),
- applying a vacuum pressure in the insulating insert (1) so as to reduce the thickness of said insulating insert (1) through vacuum pressure,
- inserting the insulating insert (1) into the inter-panel space (2) while maintaining the suction of the suction system (24) in order to maintain the vacuum pressure during the step of inserting said insulating insert (1) into the inter-panel space (2),
- when the insulating insert (1) has been inserted into the inter-panel space (2), removing the suction nozzle (25) from the insulating insert (1) so that the interior space of the wrapper (5) is in communication with ambient pressure via the orifice (28) in the wrapper (5).

2. The method as claimed in claim 1, wherein the reduction in thickness of the insulating insert (1) is such that the insulating insert (1) exhibits a thickness smaller than the width of the inter-panel space (2).

3. The method as claimed in either of claims 1 and 2, wherein the suction nozzle (25) of the suction system (24) is configured to puncture the wrapper (5) of the insulating insert (1), the step of inserting the suction nozzle (25) into the insulating insert (1) comprising a step of puncturing the wrapper (5) using said suction nozzle (25) of the suction system (24).

4. The method as claimed in one of claims 1 to 3, wherein the suction nozzle (25) comprises a flange (27), the step of inserting the suction nozzle (25) of the suction system (24)

into the insulating insert (1) comprising the step of bringing the flange (27) to bear against the wrapper (5).

5 5. The method as claimed in one of claims 1 to 4, wherein the insulating core (4) of the insulating insert (1) comprises at least a central portion of layered glass wool (11); said central portion of layered glass wool comprising a plurality of laps of fibers superposed in a direction of layering (12), and wherein the suction nozzle (25) is inserted into the insulating insert (1) at an edge face (9) of the insulating insert (1).

10 6. The method as claimed in claim 5, wherein the insulating core (4) comprises separators (17) arranged parallel to the direction of layering (12) of the central portion (11), the insulating insert (1) being inserted into the inter-panel space (2) in such a way as to arrange said separators (17) parallel to the support surface (30) formed by the thermally insulating barrier.

15 7. The method as claimed in either of claims 5 and 6, wherein a lengthwise direction of the insulating core extends in a lengthwise direction of the inter-panel space and said insulating core comprises, at least at one of the longitudinal ends of the central portion (11), at least an end portion comprising layered glass wool (50), said end portion comprising laps of fibers superposed in a direction of layering parallel to the lengthwise direction (7) of the insulating insert.

20 8. The method as claimed in one of claims 5 to 7, wherein a lengthwise direction of the insulating insert extends in a lengthwise direction of the inter-panel space and said insulating insert comprises, at least at one of the longitudinal ends, at least one end piece (51) comprising layered glass wool comprising laps of fibers superposed in a direction of layering parallel to the lengthwise direction (7) of the insulating insert, said end piece being separated from the insulating core by the wrapper (5).

25 9. The method as claimed in one of claims 1 to 8, wherein the wrapper (5) comprises a plurality of wrapper portions (18, 19, 20) bonded to one another and/or bonded to the insulating core (4).

30 10. The method as claimed in one of claims 1 to 9, wherein at least a portion of the wrapper (5) comprises a material selected from sheets of polymer, composite sheets including mineral fibers and a polymer matrix, composite sheets including mineral fibers bonded to a sheet of paper or of polymer, and combinations thereof.

 11. The method as claimed in claim 10, wherein said sheet of polymer or said composite sheet is bonded to the insulating core by a coat of adhesive located between said sheet of polymer or said composite sheet and the insulating core.

12. The method as claimed in one of claims 1 to 11, wherein the wrapper (5) comprises planar wrapper portions (18) extending perpendicular to the widthwise direction of the inter-panel space on each side of the insulating core.

5 13. The method as claimed in claim 12, wherein at least one of the planar wrapper portions (18) comprises a composite sheet including mineral fibers and a polymer matrix.

14. The method as claimed in claim 13, wherein the composite sheet is covered with a sheet of polymer.

10 15. The method as claimed in claim 13, wherein the composite sheet is covered with a sheet of paper.

16. The method as claimed in one of claims 12 to 15, wherein at least one of the planar wrapper portions comprises kraft paper.

15 17. The method as claimed in one of claims 12 to 16, wherein the wrapper (5) comprises an edge-face wrapper portion extending in the widthwise direction of the inter-panel space between the planar wrapper portions (18) situated on each side of the insulating core, said edge-face wrapper portion being located along all or part of the perimeter of the insulating core.

18. The method as claimed in claim 17, wherein the edge-face portion comprises kraft paper.

20 19. The method as claimed in either of claims 17 and 18, wherein the edge-face portion comprises a sheet of polymer.

20. The method as claimed in one of claims 1 to 19, wherein the insulating insert (1) is inserted into the inter-panel space (2) with a face (9) through which the suction nozzle (25) of the suction system (24) passes facing toward the inside of the tank.

25 21. The method as claimed in one of claims 1 to 20, wherein the wrapper (5) exhibits a leakage flow rate less than the pumping flow rate of the suction system (24).

22. The method as claimed in one of claims 1 to 21, wherein, in the insertion step, the insulating insert (1) is guided into the inter-panel space by means of a rigid guide in the form of plates (33, 37).

30 23. The method as claimed in one of claims 1 to 22, further comprising the step of cutting at least one of the lateral faces (9, 19) of the wrapper (5) after the insulating insert (1) has been inserted into the inter-panel space (2).

24. The method as claimed in one of claims 1 to 23, wherein the suction system is a vacuum pump or a vacuum generator using a Venturi system.

25. The method as claimed in claim 24, wherein the suction system exhibits a pumping flow rate of between 8 m³/h and 30 m³/h, preferably 15 m³/h.

CLAIMS

1. A method for manufacturing a tank wall, said method comprising the steps of:

- providing a sealed and thermally insulating tank wall thermally insulating barrier, said thermally insulating barrier comprising a plurality of insulating panels (3) juxtaposed in a regular pattern, the mutually facing lateral faces of two adjacent insulating panels (3) delimiting an inter-panel space (2) separating said two adjacent insulating panels (3),
- providing a parallelepipedal insulating insert (1) comprising an insulating core (4), said insulating insert (1) comprising a wrapper (5) completely covering the insulating core (4),
- inserting a suction nozzle (25) of a suction system (24) into the insulating insert (1) through an orifice (28) in the wrapper (5),
- applying a vacuum pressure in the insulating insert (1) so as to reduce the thickness of said insulating insert (1) through vacuum pressure,
- inserting the insulating insert (1) into the inter-panel space (2) while maintaining the suction of the suction system (24) in order to maintain the vacuum pressure during the step of inserting said insulating insert (1) into the inter-panel space (2),
- when the insulating insert (1) has been inserted into the inter-panel space (2), removing the suction nozzle (25) from the insulating insert (1) so that the interior space of the wrapper (5) is in communication with ambient pressure via the orifice (28) in the wrapper (5).

2. The method as claimed in claim 1, wherein the reduction in thickness of the insulating insert (1) is such that the insulating insert (1) exhibits a thickness smaller than the width of the inter-panel space (2).

3. The method as claimed in either of claims 1 and 2, wherein the suction nozzle (25) of the suction system (24) is configured to puncture the wrapper (5) of the insulating insert (1), the step of inserting the suction nozzle (25) into the insulating insert (1) comprising a step of puncturing the wrapper (5) using said suction nozzle (25) of the suction system (24).

4. The method as claimed in one of claims 1 to 3, wherein the suction nozzle (25) comprises a flange (27), the step of inserting the suction nozzle (25) of the suction system

(24) into the insulating insert (1) comprising the step of bringing the flange (27) to bear against the wrapper (5).

5. The method as claimed in one of claims 1 to 4, wherein the insulating core (4) of the insulating insert (1) comprises at least a central portion of layered glass wool (11), said central portion of layered glass wool comprising a plurality of laps of fibers superposed in a direction of layering (12), and wherein the suction nozzle (25) is inserted into the insulating insert (1) at an edge face (9) of the insulating insert (1).

6. The method as claimed in claim 5, wherein the insulating core (4) comprises separators (17) arranged parallel to the direction of layering (12) of the central portion (11), the insulating insert (1) being inserted into the inter-panel space (2) in such a way as to arrange said separators (17) parallel to the support surface (30) formed by the thermally insulating barrier.

7. The method as claimed in either of claims 5 and 6, wherein a lengthwise direction of the insulating core extends in a lengthwise direction of the inter-panel space and said insulating core comprises, at least at one of the longitudinal ends of the central portion (11), at least an end portion comprising layered glass wool (50), said end portion comprising laps of fibers superposed in a direction of layering parallel to the lengthwise direction (7) of the insulating insert.

8. The method as claimed in one of claims 5 to 7, wherein a lengthwise direction of the insulating insert extends in a lengthwise direction of the inter-panel space and said insulating insert comprises, at least at one of the longitudinal ends, at least one end piece (51) comprising layered glass wool comprising laps of fibers superposed in a direction of layering parallel to the lengthwise direction (7) of the insulating insert, said end piece being separated from the insulating core by the wrapper (5).

9. The method as claimed in one of claims 1 to 8, wherein the wrapper (5) comprises a plurality of wrapper portions (18, 19, 20) bonded to one another and/or bonded to the insulating core (4).

10. The method as claimed in one of claims 1 to 9, wherein at least a portion of the wrapper (5) comprises a material selected from sheets of polymer, composite sheets including mineral fibers and a polymer matrix, composite sheets including mineral fibers bonded to a sheet of paper or of polymer, and combinations thereof.

11. The method as claimed in claim 10, wherein said sheet of polymer or said composite sheet is bonded to the insulating core by a coat of adhesive located between said sheet of polymer or said composite sheet and the insulating core.

12. The method as claimed in one of claims 1 to 11, wherein the wrapper (5) comprises planar wrapper portions (18) extending perpendicular to the widthwise direction of the inter-panel space on each side of the insulating core.

13. The method as claimed in claim 12, wherein at least one of the planar wrapper portions (18) comprises a composite sheet including mineral fibers and a polymer matrix.

14. The method as claimed in claim 13, wherein the composite sheet is covered with a sheet of polymer.

15. The method as claimed in claim 13, wherein the composite sheet is covered with a sheet of paper.

16. The method as claimed in one of claims 12 to 15, wherein at least one of the planar wrapper portions comprises kraft paper.

17. The method as claimed in one of claims 12 to 16, wherein the wrapper (5) comprises an edge-face wrapper portion extending in the widthwise direction of the inter-panel space between the planar wrapper portions (18) situated on each side of the insulating core, said edge-face wrapper portion being located along all or part of the perimeter of the insulating core.

18. The method as claimed in claim 17, wherein the edge-face wrapper portion comprises kraft paper.

19. The method as claimed in either of claims 17 and 18, wherein the edge-face wrapper portion comprises a sheet of polymer.

20. The method as claimed in one of claims 1 to 19, wherein the insulating insert (1) is inserted into the inter-panel space (2) with a face (9) through which the suction nozzle (25) of the suction system (24) passes facing toward the inside of the tank.

21. The method as claimed in one of claims 1 to 20, wherein the wrapper (5) exhibits a leakage flow rate less than the pumping flow rate of the suction system (24).

22. The method as claimed in one of claims 1 to 21, wherein, in the insertion step, the insulating insert (1) is guided into the inter-panel space by means of a rigid guide in the form of plates (33, 37).

23. The method as claimed in one of claims 1 to 22, further comprising the step of cutting at least one of the lateral faces (9, 19) of the wrapper (5) after the insulating insert (1) has been inserted into the inter-panel space (2).

24. The method as claimed in one of claims 1 to 23, wherein the suction system is a vacuum pump or a vacuum generator using a Venturi system.

25. The method as claimed in claim 24, wherein the suction system exhibits a pumping flow rate of between 8 m³/h and 30 m³/h..