

Description

Title of the invention: Assembly method for a sealed and thermally insulating tank built into a load-bearing structure

Technical domain

- 5 [1] The invention relates to the field of sealed, thermally insulated membrane tanks for storing and/or transporting fluids, such as a liquefied gas. Sealed thermally insulated membrane tanks are notably used to store liquefied natural gas (LNG), which is stored at atmospheric pressure at around -163°C. These tanks can be installed on land or on floating structures. In a floating structure, the tank can be used to transport liquefied
- 10 natural gas or to receive the liquefied natural gas used as fuel to power the floating structure.
- [2] In one embodiment, the liquefied gas is LNG, i.e. a mixture with a high methane content stored at a temperature of approximately -162°C at atmospheric pressure. Other liquefied gases can also be stored, notably ethane, propane, butane or ethylene, as well
- 15 as hydrogen. Liquefied gases can also be stored under pressure, for example at a relative pressure of between 2 and 20 bar, and in particular at a relative pressure of approximately 2 bar.

Prior art

- 20 [3] A sealed and thermally insulating storage tank for liquefied natural gas arranged in a load-bearing structure has a multi-layer structure, specifically (from the outside to the inside of the tank), a secondary thermally insulating barrier anchored to the load-bearing structure, a secondary sealing membrane that rests on the secondary thermally insulating barrier, a primary thermally insulating barrier that rests on the secondary sealing membrane and a primary sealing membrane that rests on the primary thermally
- 25 insulating barrier and that is designed to be in contact with the liquefied natural gas stored in the tank.
- [4] The load-bearing structure typically has a polyhedral shape. At least some of the primary and secondary thermally insulating barriers can be made from prefabricated insulating elements outside the internal space of the tank, with standard dimensions, according to
- 30 the principles set out for example in document FR 2691520 A1. The primary sealing membrane can notably be made from corrugated metal sheets lap-welded together.

Summary of the invention

- [5] Certain aspects of the invention are based on the observation that, to make the primary sealing membrane from corrugated metal sheets selected from a set of corrugated metal sheets having predetermined dimensions, the dimensional deviations from the ideal designed polyhedral shape of the load-bearing structure may make it impossible to achieve satisfactory continuity between the corrugations of the sheets. However, such continuity is very important to ensure good mechanical strength in the primary sealing membrane.
- [6] One idea at the heart of the invention involves taking an in situ dimensional measurement on the load-bearing wall to adjust the dimensions of certain corrugated metal sheets, and to use this in situ dimensional measurement to make good any dimensional deviations from the ideal designed polyhedral shape of the load-bearing structure.
- [7] The invention therefore proposes an assembly method for a sealed and thermally insulating tank built into a load-bearing structure, said tank comprising a first tank wall fastened to a first load-bearing wall and a second tank wall fastened to a second load-bearing wall joining the first load-bearing wall at an edge of the load-bearing structure, in which the first tank wall and the second tank wall each have a sealing membrane and a thermally insulating barrier arranged between the sealing membrane and the load-bearing wall,
- the thermally insulating barrier of the first tank wall comprising:
- a first insulating panel arranged along the edge, and
 - a second insulating panel juxtaposed with the first insulating panel along an edge of said first insulating panel opposite the second load-bearing wall,
- the sealing membrane of the first tank wall having a corrugated metal sheet intended to straddle the first insulating panel and the second insulating panel,
- the assembly method comprising:
- obtaining a geometric definition of the first tank wall, the geometric definition comprising a dimension a representing one dimension, in a direction orthogonal to the edge, of said first insulating panel, and a dimension b, in the direction orthogonal to the edge, of the second insulating panel,
 - on the first load-bearing wall, drawing an edge line at a constant distance equal to the dimension a of the edge, and drawing, from a mid-line of the first load-bearing wall parallel to the edge towards the edge line, a plurality of successive positioning lines parallel to one another and spaced apart from one another by a distance equal to the dimension b, the plurality of positioning lines including a last positioning line spaced apart from the edge line by a distance less than the dimension b,

- obtaining at least one in situ dimensional measurement representing the distance, in the direction orthogonal to the edge, between the edge line and the last positioning line,
- dimensioning said corrugated metal sheet on the basis of said at least one in situ dimensional measurement,
- 5 - installing said first insulating panel between the edge and the edge line such that one side of said first insulating panel opposite the edge is aligned with the edge line, and installing said second insulating panel such that one side of said second insulating panel facing the first insulating panel is aligned with the last positioning line, and
- installing said corrugated metal sheet to straddle the first insulating panel and the
- 10 second insulating panel.

[8] "Straddle the first insulating panel and the second insulating panel" means that the corrugated metal sheet extends on either side from the side of the second insulating panel facing the first insulating panel, above the first insulating panel and the second insulating side. The corrugated metal sheet may rest directly on the first insulating panel and the second insulating panel; alternatively, further elements of the first tank wall may be interposed between the corrugated metal sheet, on one hand, and the first insulating panel and the second insulating panel, on the other hand. "Mid-" means that the mid-line splits the first load-bearing wall into two half-walls of equal surface area.

[9] Dimensioning the corrugated metal sheet on the basis of said at least one in situ dimensional measurement helps to make good any dimensional deviations from the ideal designed polyhedral shape of the load-bearing structure, specifically at the metal sheet closest to the edge. This enables the corrugated metal sheet blank to be selected from a set of blanks with predetermined dimensions in the direction orthogonal to the edge. This helps to limit the number of dimensions of corrugated metal sheets to be made, which

25 reduces the manufacturing costs of the tank.

[10] Depending on the embodiment, such an assembly method may have one or more of the following features.

[11] According to one embodiment, dimensioning said corrugated metal sheet involves:

- providing a corrugated metal sheet blank having an initial dimension in the direction
- 30 orthogonal to the edge,
- calculating a cutting length in the corrugated metal sheet blank on the basis of said at least one in situ dimensional measurement and the initial dimension, and
- cutting the corrugated metal sheet blank to said cutting length to obtain said corrugated metal sheet.

- [12] According to one embodiment, the initial dimension of the metal sheet blank is defined as a function of the position of the corrugated metal sheet on the first tank wall.
- [13] According to one embodiment, the method also comprises filling an interstice between the first insulating panel and the second insulating panel with at least one thermally insulating element.
- [14] According to one embodiment, the corrugated metal sheet has at least one joggled edge enabling a lap weld with another corrugated metal sheet belonging to said sealing membrane of the first tank wall.
- [15] According to one embodiment, said dimension a is a dimension of said first insulating panel in a direction orthogonal to the edge.
- [16] According to one embodiment, the thermally insulating barrier of the second tank wall has a third insulating panel arranged along the edge facing the first insulating panel, and at least one spacer element arranged between the third insulating panel and the second load-bearing wall, and said dimension a is the sum of a dimension of said first insulating panel in a direction orthogonal to the edge, and a dimension of a spacer element in a direction orthogonal to the edge.
- [17] According to one embodiment, the corrugated metal sheet has a first series of corrugations extending parallel to one another in a direction orthogonal to the edge, and a second series of corrugations extending parallel to one another in a direction parallel to the edge.
- [18] According to one embodiment, the first primary insulating panel has an inner plate, an outer plate and a polymer foam block sandwiched between the inner plate and the outer plate.
- [19] According to one embodiment, the thermally insulating barrier is a secondary thermally insulating barrier, and the first tank wall also includes a primary thermally insulating barrier, in which the primary thermally insulating barrier includes:
- a first insulating block arranged on the first insulating panel and carrying a face of a metal angle iron,
 - a second insulating block arranged on the second insulating panel and carrying a metal plate, and
 - a bridging element arranged between the first insulating block and the second insulating block,
- and installing said corrugated metal sheet to straddle the first insulating panel and the second insulating panel involves installing the corrugated metal sheet over the bridging

element so that a first edge of said corrugated metal sheet overlaps a portion of said face of the metal angle iron and such that a second edge of said corrugated metal sheet overlaps a portion of said metal plate.

[20] According to one embodiment, the method also involves: calculating a cutting length in the bridging element on the basis of said at least one in situ dimensional measurement and the geometric definition of the first tank wall, and cutting the bridging element to the cutting length thus calculated.

[21] According to one embodiment, the first tank wall also includes a secondary sealing membrane arranged between the secondary thermally insulating barrier and the primary thermally insulating barrier.

[22] According to one embodiment, the secondary sealing membrane is made of a composite comprising an aluminium sheet and glass fibres, the secondary sealing membrane being glued to the secondary thermally insulating barrier and to the primary thermally insulating barrier.

[23] The invention also proposes an assembly method for a sealed and thermally insulating tank built into a load-bearing structure, said tank comprising a first tank wall fastened to a first load-bearing wall and a second tank wall fastened to a second load-bearing wall joining the first load-bearing wall at an edge of the load-bearing structure, in which the first tank wall and the second tank wall each have a sealing membrane and a thermally insulating barrier arranged between the sealing membrane and the load-bearing wall,

the thermally insulating barrier of the first tank wall comprising:

- a first insulating panel arranged along the edge, and
- a second insulating panel juxtaposed with the first insulating panel along an edge of said first insulating panel opposite the second load-bearing wall,

the sealing membrane of the first tank wall having a corrugated metal sheet intended to straddle the first insulating panel and the second insulating panel,

the thermally insulating barrier of the second tank wall having a third insulating panel arranged along the edge facing the first insulating panel, and at least one spacer element arranged between the third insulating panel and the second load-bearing wall,

the assembly method comprising:

- obtaining a geometric definition of the first tank wall, the geometric definition comprising a dimension b, in the direction orthogonal to the edge (88), of the second insulating panel,
- dimensioning said at least one spacer element at least as a function of the first in situ

dimensional measurements made on the second load-bearing wall,

- on the first load-bearing wall, drawing, from a mid-line of the first load-bearing wall parallel to the edge towards the edge, a plurality of successive positioning lines parallel to one another and spaced apart from one another by a distance equal to the dimension b, the plurality of positioning lines including a last positioning line spaced apart from the edge by a distance at least equal to a dimension, in a direction orthogonal to the edge, of said first insulating panel and at least equal to said dimension increased by b,

- installing said at least one spacer element on the second load-bearing wall, installing said third insulating panel on the second load-bearing wall along the edge and such that said insulating panel rests on at least the one spacer element, installing said first insulating panel on the first load-bearing wall along the edge facing said third insulating panel, and installing said second insulating panel on the first load-bearing wall such that one side of said second insulating panel facing said first insulating panel is aligned with the last positioning line,

- obtaining at least one second in situ dimensional measurement representing the distance, in the direction orthogonal to the edge, between said side of said second insulating panel and an edge facing the first insulating panel,

- dimensioning said corrugated metal sheet on the basis of said at least one second in situ dimensional measurement, and

- installing said corrugated metal sheet to straddle the first insulating panel and the second insulating panel.

[24] "Straddle the first insulating panel and the second insulating panel" means that the corrugated metal sheet extends on either side from the side of the second insulating panel facing the first insulating panel, above the first insulating panel and the second insulating side. The corrugated metal sheet may rest directly on the first insulating panel and the second insulating panel; alternatively, further elements of the first tank wall may be interposed between the corrugated metal sheet, on one hand, and the first insulating panel and the second insulating panel, on the other hand. "Mid-" means that the mid-line splits the first load-bearing wall into two half-walls of equal surface area.

[25] Dimensioning the corrugated metal sheet on the basis of said at least one second in situ dimensional measurement helps to make good any dimensional deviations from the ideal designed polyhedral shape of the load-bearing structure, specifically at the metal sheet closest to the edge. This enables the corrugated metal sheet blank to be selected from a set of blanks with predetermined dimensions in the direction orthogonal to the edge. This helps to limit the number of dimensions of corrugated metal sheets to be made, which reduces the manufacturing costs of the tank.

- [26] According to one embodiment, dimensioning said corrugated metal sheet involves:
- providing a corrugated metal sheet blank having an initial dimension in the direction orthogonal to the edge,
 - calculating a cutting length in the corrugated metal sheet blank on the basis of said at least one second in situ dimensional measurement and the initial dimension, and
 - cutting the corrugated metal sheet blank to said cutting length to obtain said corrugated metal sheet.
- [27] According to one embodiment, the initial dimension of the metal sheet blank is defined as a function of the position of the corrugated metal sheet on the first tank wall.
- [28] According to one embodiment, the method also comprises filling an interstice between the first insulating panel and the second insulating panel with at least one thermally insulating element.
- [29] According to one embodiment, the corrugated metal sheet has at least one joggled edge enabling a lap weld with another corrugated metal sheet belonging to said sealing membrane of the first tank wall.
- [30] According to one embodiment, the corrugated metal sheet has a first series of corrugations extending parallel to one another in a direction orthogonal to the edge, and a second series of corrugations extending parallel to one another in a direction parallel to the edge.
- [31] According to one embodiment, the first primary insulating panel has an inner plate, an outer plate and a polymer foam block sandwiched between the inner plate and the outer plate.
- [32] According to one embodiment, the thermally insulating barrier of the first tank wall is a secondary thermally insulating barrier, and the first tank wall also includes a primary thermally insulating barrier, in which the primary thermally insulating barrier includes:
- a first insulating block arranged on the first insulating panel and carrying a face of a metal angle iron,
 - a second insulating block arranged on the second insulating panel and carrying a metal plate, and
 - a bridging element arranged between the first insulating block and the second insulating block,
- and installing said corrugated metal sheet to straddle the first insulating panel and the second insulating panel involves installing the corrugated metal sheet over the bridging element so that a first edge of said corrugated metal sheet overlaps a portion of said

face of the metal angle iron and such that a second edge of said corrugated metal sheet overlaps a portion of said metal plate.

[33] According to one embodiment, the method also involves: calculating a cutting length in the bridging element on the basis of said at least one second in situ dimensional measurement and the geometric definition of the first tank wall, and cutting the bridging element to the cutting length thus calculated.

[34] According to one embodiment, the first tank wall also includes a secondary sealing membrane arranged between the secondary thermally insulating barrier and the primary thermally insulating barrier.

[35] According to one embodiment, the secondary sealing membrane is made of a composite comprising an aluminium sheet and glass fibres, the secondary sealing membrane being glued to the secondary thermally insulating barrier and to the primary thermally insulating barrier.

Short description of the figures

[36] The invention can be better understood, and additional objectives, details, features and advantages thereof are set out more clearly, in the detailed description below of several specific embodiments of the invention given solely as non-limiting examples, with reference to the attached drawings.

[37] [Figure 1] Figure 1 is a cut-away view of a load-bearing structure designed to receive a sealed and thermally insulating tank.

[38] [Figure 2] Figure 2 is a partial perspective view of two walls of a sealed and thermally insulating tank built into the load-bearing structure in Figure 1.

[39] [Figure 3A] Figure 3A is a schematic view of the transverse wall of the load-bearing structure in Figure 1 showing positioning lines and an edge line used to position the insulating panels of the wall of the sealed and thermally insulating tank shown in Figure 1.

[40] [Figure 3B] Figure 3B is a view identical to Figure 3A, but showing a supplementary set of positioning lines.

[41] [Figure 4A] Figure 4A is a cross-section view of the walls shown in Figure 2, showing the use of the positioning lines and the edge line in Figure 3A or Figure 3B to assemble one of the tank walls in Figure 2.

[42] [Figure 4B] Figure 4B is a magnification of detail B in Figure 4A.

[43] [Figure 5] Figure 5 is a flow diagram showing the steps of an assembly method of the tank shown in Figures 2 and 4A.

[44] [Figure 6] Figure 6 is a flow diagram showing the steps of another assembly method of the tank shown in Figures 2 and 4A.

5 Description of embodiments

[45] Figure 1 shows a load-bearing structure 1 designed to receive the walls of a sealed and thermally insulating tank. The load-bearing structure 1 is formed by the double hull of a ship. The load-bearing structure 1 has an overall polyhedral shape. The load-bearing structure 1 has transverse walls 2, typically front and rear, in this case in the form of an octagon. Figure 1 only shows part of the front transverse wall 2 to enable an internal space 9 of the load-bearing structure 1 to be seen. The transverse walls 2 are cofferdam walls of the ship and extend transversely to the longitudinal direction of the ship. The load-bearing structure 1 also has an upper wall 3, a lower wall 4, and side walls 5. The upper wall 3, the lower wall 4 and the side walls 5 extend in the longitudinal direction of the ship and link the front and rear transverse walls 2.

[46] The upper wall 3, in the vicinity of the rear transverse wall 2, has a rectangular parallelepipedic space that projects upwards, referred to as the liquid dome 6. The liquid dome 6 delimits an opening 7 in the upper wall 3 enabling the passage of liquid transfer lines to or from the tank when the tank is mounted in the load-bearing structure 1.

[47] The load-bearing walls 2, 3, 4, 5 of the load-bearing structure have an inner surface 10 delimiting the internal space 9 in which the tank is seated. The tank has a plurality of tank walls, each tank wall being anchored to a respective load-bearing wall 2, 3, 4, 5 of the load-bearing structure 1.

[48] Figure 2 is a partial perspective view of a first tank wall 20 anchored to one of the transverse walls 2 and a second tank wall 140 anchored to the lower wall 4. Reference sign 99 indicates the edge of the load-bearing structure 1 at which the transverse wall 2 and the lower wall 4 meet. As a result of the geometry of the load-bearing structure 1 shown in Figure 1, the transverse wall 2 and the lower wall 4 form an angle of 90° , as shown in Figure 2. However, the assembly principles described below can be applied to any pair of load-bearing walls of the load-bearing structure 1 shown in Figure 1, provided that said load-bearing walls meet at an edge. Furthermore, the geometry of the load-bearing structure 1 shown in Figure 1 is merely an example. The angle shown in Figure 2 could be different, notably approximately 135° .

[49] The structure of the tank walls 20 and 140 will be described first with reference to Figure 2.

[50] As shown in Figure 2, the tank wall 20 includes, in the thickness direction of the tank wall 20 from the outside to the inside of the tank, a secondary thermally insulating barrier 30, a secondary sealing membrane 50, a primary thermally insulating barrier 60, and a primary sealing membrane 80.

[51] The secondary thermally insulating barrier 30 comprises a row of corner insulating panels 31 arranged along the edge 99, and several parallel rows of flat insulating panels 35, one of these rows being arranged alongside the row of corner panels 31. So as not to overcomplicate the drawing, Figure 2 shows just one corner panel 31 and two flat panels 35 from the two rows closest to this corner panel 31. Naturally, the number of rows of flat panels 35 and the number of panels 31 or 35 per row can be adjusted as a function of the dimensions of the load-bearing wall 2.

[52] Figure 4A is a cross-section view of Figure 2 orthogonal to the edge 99 and provides a better view of the structure of the corner panel 31 and of the flat panel 35 arranged alongside the corner panel 31. Although only one flat panel 35 is shown partially in Figure 4A, all of the flat panels can have the same structure as this panel. Figure 4B is a magnification of detail B in Figure 4A.

[53] The corner panel 31 has two plates 32 and 33, for example made of plywood, that are parallel and spaced apart. The plates 32 and 33 sandwich a block 34 of thermally insulating foam, for example polyurethane foam, optionally reinforced with glass fibres. The block 34 can for example be glued to the plates 32 and 33. The block 34 has a bevelled face 34A enabling connection with a similar bevelled face of the corner panel 131 of the secondary thermally insulating barrier 130 of the tank wall 140, this corner panel 131 being similar to the corner panel 31. One or more shims 95 are arranged between the corner panel 31 and the transverse wall 2. In a known manner, the thickness of the shims 95 can be determined to make good any dimensional differences between the ideal shape and the actual shape of the transverse wall 2. Mastic beads (not shown) can also be applied between the corner panel 31 and the transverse wall 2. Similarly, one or more shims 195 similar to the shims 95 can be arranged between the corner panel 131 and the lower wall 4, and mastic beads (not shown) can also be applied between the corner panel 131 and the lower wall 4.

[54] The flat panel 35 has a bottom plate 36, for example made of plywood, on which a block 37 of thermally insulating foam is positioned, for example polyurethane foam, optionally reinforced with glass fibres. The block 37 can for example be glued to the

bottom plate 36. An impermeable composite sheet 51 (shown in Figure 2) is glued on the upper surface of the block 37 to form an element of the secondary sealing membrane 50. One or more shims 93 are arranged between the flat panel 35 and the transverse wall 2. In a known manner, the thickness of the shims 93 can be determined to make good any dimensional differences between the ideal shape and the actual shape of the transverse wall 2. Mastic beads (not shown) can also be applied between the flat panel 35 and the transverse wall 2. Furthermore, the shims 94, which perform the same function as the shims 93 and 95, can be arranged between the transverse wall 2 and the corner panel 31 and the thermally insulating element 97 described below, beneath the interface between the corner panel 31 and the thermally insulating element 97.

[55] The secondary sealing membrane 50 can be made entirely from a three-layer composite comprising an aluminium sheet and glass fibres bonded to the aluminium sheet using a polyamide resin, known as Triplex.

[56] The primary thermally insulating barrier 60 comprises, above the corner panel 31, a primary corner block 61 carrying a face 71 of a metal angle iron 79. In the example shown, the primary corner block 61 comprises a wooden plate 62 to which the face 71 is fastened, for example by screwing, and a thermally insulating element 63, for example made of polyurethane foam or glass wool.

[57] Above the flat panel 35, the primary thermally insulating barrier 60 comprises a primary flat block 65. The primary flat block 65 comprises a block 66 of thermally insulating foam, for example polyurethane foam optionally reinforced with glass fibres, arranged on the impermeable composite sheet 51, and a cover plate 67, for example made of plywood, arranged on the block 66. The block 66 can for example be glued to the cover plate 67. In a known manner, the primary flat block 65 can have a stress-relief slot 66R beneath the corrugation 82.

[58] A bridging element 68 is arranged between the primary corner block 61 and the primary flat block 65, straddling the corner panel 31 and the flat panel 35 and resting on the corner panel 31 and the flat panel 35. The bridging element 68 comprises a block 68A of thermally insulating foam, for example polyurethane foam optionally reinforced with glass fibres, and a cover plate 68B, for example made of plywood, arranged on the block 68A. It should be noted that the bridging element 68 can be split into several sub-elements 68D, as shown in Figure 2.

[59] Between two flat panels 35, joining strips 52 are added to the secondary sealing membrane 50 beneath the bridging elements 68 between the primary flat blocks 65, for example glued to the impermeable composite sheets 51.

[60] In order to simplify the assembly of the thermally insulating barriers 30 and 60 and of the secondary sealed membrane 50, each flat panel 35 can be provided integral with a primary flat block 65 in the form of a prefabricated insulating element outside the internal space of the tank, with standard dimensions, according to the principles set out for example in document FR 2691520 A1. The impermeable composite sheets 51 can be glued to the upper surface of the block 37 of the flat panel 35, notably outside the internal space of the tank.

[61] Furthermore, in order to simplify construction of the corner panel 31, said panel can be provided integral with the primary corner block 61 in the form of a prefabricated insulating element, in a known manner.

[62] The panels 31 and 35 are fastened to the load-bearing wall 2 by anchoring means (not shown) that are well known and that traverse the panels 31 and 35. Reference sign 98 indicates the thermal insulator plugs covering these anchoring means.

[63] The primary sealing membrane 80 comprises corrugated metal sheets 81, just one of which is shown in Figure 2 so as not to overcomplicate the drawing. The corrugated metal sheets 81 are made of a metal alloy, for example stainless steel. The corrugated metal sheets 81 have joggled edges 85 to enable said sheets to be lap welded together, according to the known technique. The corrugated metal sheets 81 have a series of corrugations 82 parallel to the edge 99, and a series of corrugations 83 orthogonal to the edge 99, these corrugations enabling the corrugated metal sheets 81 to withstand thermal contraction phenomena caused by contact with the liquefied gas. Reference sign 84 indicates the nodes positioned at the intersections between the corrugations 82 and 83.

[64] In order to anchor the primary sealing membrane 80 to the thermally insulating barrier 60, the respective cover plates 65 and 68B of the primary flat blocks 65 and the bridging elements 68 carry respectively metal plates 65P and 68P, in a known manner.

[65] Also in a known manner, the ends of the corrugations 83 can be fitted into the sleeves 86 carried by the metal angle iron 79. The metal angle iron 79 can also carry sleeves 186 aligned with the sleeves 86 that are designed to receive the ends of vertical corrugations 183 of the corrugated primary membrane 180 of the tank wall 140, such as to provide a continuous connection between each corrugation 83 and each opposing vertical corrugation 183.

[66] Each of the corrugated metal sheets 81 can in principle be made with dimensions enabling the precise positioning thereof on the tank wall 20. However, in order to facilitate the assembly of the primary sealing membrane 80 and therefore of the tank wall

20, each corrugated metal sheet 81 can ideally be selected from a set of corrugated metal sheets having predetermined dimensions. In practice, the load-bearing structure 1 can have certain dimensional deviations from the ideal designed polyhedral shape, and said dimensional deviations can prevent satisfactory continuity between the corrugations of the sheets from being achieved where said sheets have predetermined dimensions. However, such continuity is very important to ensure good mechanical strength in the primary sealing membrane 80.

[67] An assembly method 300 providing good mechanical strength in the primary sealing membrane 80 even when the sheets constituting said membrane have predetermined dimensions is described below with reference to Figures 4A and 5.

[68] In a first step 301 of the method 300, a geometric definition of the tank wall 20 is obtained. This geometric definition comprises:

- a dimension a (see Figure 4A) representing a dimension of the corner panel 31 in a direction orthogonal to the edge 99, and
- a dimension b (see Figures 2, 3 and 4A) of the flat panel 35 in a direction orthogonal to the edge 99.

[69] After step 301, the method 300 moves to a step 302 comprising drawing an edge line 18 and positioning lines 17 on the load-bearing wall 2. This step is explained in greater detail with reference to Figures 3 and 4A.

[70] As shown in Figure 3A, the edge line 18 is in this case drawn at a constant distance, equal to the dimension a, from the edge 99. The edge line 18 can be used to position the corner panel 31, as described below.

[71] The positioning lines 17 are drawn as follows.

[72] A mid-line 14 of the load-bearing wall 2 parallel to the edge 99 is drawn first. "Mid-" means that the mid-line 14 splits the load-bearing wall 2 into two half-walls of equal surface area. In the example shown, the mid-line 14 is a central vertical axis of the tank. The plane perpendicular to the load-bearing wall 2 containing the mid-line 14 thus splits the internal volume of the tank into two portions of equal volume.

[73] The central vertical axis of the tank can pass through the liquid dome 6, as shown in Figure 2.

[74] The positioning lines 17 are then drawn from the mid-line 14 to the edge line 18, the positioning lines 17 being parallel to one another, parallel to the edge 99, and spaced apart from one another by a distance equal to the dimension b. It should be noted here that the first positioning line 17 drawn does not necessarily coincide with the mid-line 14.

Furthermore, the positioning lines 17 end before the edge line 18, i.e. the positioning line 17 is not drawn between the edge line 18 and the edge 99. The last positioning line 17 can be used to position the flat panel 35 juxtaposed with the corner panel 31, as described below. The other positioning lines 17 can be used to position the other rows of flat panels 35.

[75] Optionally, positioning lines 16 parallel to one another, perpendicular to the edge 99, and spaced apart from one another by a distance equal to a dimension b_2 can also be drawn during step 302, as shown in Figure 3B. Again, the positioning lines 16 are not drawn between the edge line 18 and the edge 99. Furthermore, the dimension b_2 is a dimension of the flat panel 35 in a direction parallel to the edge 99. The positioning lines 16 can then be used to position the other rows of flat panels 35. It should be noted that the dimension b_2 is not necessarily equal to the dimension b .

[76] Returning to Figure 4A, once the edge line 18 and the positioning lines 17 have been drawn, there may be a residual distance, marked x , between the edge line 18 and the last positioning line 17 in the direction orthogonal to the edge 99. "The last positioning line 17" means the positioning line 17 closest to the edge line 18. Bearing in mind that no positioning lines 17 are drawn between the edge line 18 and the edge 99, the last positioning line 17 is spaced apart from the edge line 18 by a distance less than the dimension b , i.e. $x < b$. The dimensions of the load-bearing wall 2 and the values of the dimensions a and b can be selected at will such that the dimension x is not zero, without taking into account the dimensional deviations from the ideal designed polyhedral shape of the load-bearing structure 1. This may enable the thermally insulating elements 97 and 91 described above to be arranged in this interstice. However, the dimension x may vary on account of the dimensional deviations from the ideal designed polyhedral shape of the load-bearing structure 1.

[77] Thus, after step 302, the method 300 moves to a step 303 that involves obtaining at least one in situ dimensional measurement representing x . In a variant, this may involve simply measuring the shortest distance orthogonal to the edge 99 between the edge line 18 and the last positioning line 17. However, other measurement methods are possible. Furthermore, several in situ dimensional measurements representing x may be obtained for each corrugated sheet 81. In a specific variant, the distance between the edge line 18 and the last positioning line 17 is measured orthogonal to the edge 99 in several places, for example three to five places, spaced apart in parallel to the edge 99.

[78] After step 303, the method 300 moves to steps 304A, 304B, 305 and 306, which are described below.

- [79] In a step 304A, a corrugated metal sheet blank having an initial dimension in the direction orthogonal to the edge 99 is provided. This initial dimension can be defined as a function of the position of the corrugated metal sheet 81 intended to straddle the corner panel 31 and the flat panel 35 on the first tank wall 20.
- 5 [80] After step 304A, the method 300 moves to a step 304B that involves calculating a cutting length in the corrugated metal sheet blank on the basis of the at least one in situ dimensional measurement obtained in step 303 and the initial dimension of the blank.
- [81] After step 304B, the method 300 moves to a step 305 that involves cutting the corrugated metal sheet blank to the length calculated in step 304B to obtain the
10 corrugated metal sheet 81 intended to straddle the corner panel 31 and the flat panel 35.
- [82] Step 306 involves installing the corner panel 31 between the edge 99 and the edge line 18 such that one side of the corner panel 31 opposite the edge 99 is aligned with the edge line 18, and installing the flat panel 35 designed to be juxtaposed with the corner panel 31 such that one side of this flat panel 35 facing the corner panel 31 is aligned with
15 the last positioning line 17.
- [83] It should be noted that steps 304A, 304B and 305 on one hand, and 306 on the other hand, can be executed in any order, depending on construction requirements.
- [84] On completion of steps 305 and 306, the positioning of the corner panel 31 and of the juxtaposed flat panel 35 shown in Figure 4A has been achieved.
- 20 [85] If necessary, the thermally insulating elements 91 and 97 are then installed in the interstice of dimension x between the corner panel 31 and the juxtaposed flat panel 35. The thermally insulating elements 91 and 97 can each be a separate block of polyurethane foam reinforced with glass fibres or otherwise, a glass wool plug, or a layer of glass wool folded back upon itself, for example. According to an advantageous
25 variant, the thermally insulating element 97 is a block of polyurethane foam reinforced with glass fibres or otherwise, and the thermally insulating element 91 is a glass wool plug, or a layer of glass wool folded back upon itself. In a variant, just one of the thermally insulating elements 91 and 97 filling the entire interstice of dimension x can be inserted in said interstice.
- 30 [86] The strips forming the secondary sealed membrane 50 and the bridging elements 68, as well as the primary corner block 61 and the primary flat block 65 where these are not provided integral with the corner panel 31 and the juxtaposed flat panel 35 as described above, are then installed.

[87] The dimensions of the thermally insulating elements 91 and/or 97, and/or of the bridging element 68 can be adjusted by cutting blind at the time of installation. However, in an optional step 307A, the cutting lengths in these elements can also be calculated on the basis of the at least one in situ measurement obtained during step 303 and the
 5 geometric definition obtained in step 301. In a step 307B, these elements are then cut to the cutting lengths thus calculated.

[88] After optional steps 307A and 307B, the method 300 moves to a step 308 that involves installing the corrugated metal sheet 81 to straddle the corner panel 31 and the juxtaposed flat panel 35. Specifically, on account of the presence of the primary
 10 thermally insulating barrier 60, this corrugated metal sheet 81 is installed over the bridging element 68, such that:

- one of the edges of the corrugated metal sheet 81 overlaps a portion of the face 71 of the metal angle iron 79,
- another of the edges of the corrugated metal sheet 81 overlaps a portion of the metal
 15 plate 65P (not shown in Figure 4A, but shown in Figure 2) carried by the cover plate 67 of the primary flat block 65 carried by the juxtaposed flat panel 35.

[89] The cutting of a corrugated metal sheet blank to obtain the corrugated metal sheet 81 described above helps to make good any dimensional deviations from the ideal designed polyhedral shape of the load-bearing structure 1, specifically at the metal sheet 81
 20 closest to the edge 99. This enables the corrugated metal sheet blank to be selected from a set of blanks with predetermined dimensions.

[90] However, alternatively, the corrugated metal sheet 81 intended to straddle the corner panel 31 and the flat panel 35 on the first tank wall 20 can be dimension in any other suitable way on the basis of the at least one in situ dimensional measurements obtained
 25 in step 303.

[91] Furthermore, steps 301, 304B and 307A can be implemented using a suitable computer program run on a computer. In this case, step 301 may involve reading the geometric definition of the tank previously stored in a memory. A computer program user can enter the result of the at least one in situ dimensional measurements obtained in
 30 step 303 into the computer program, after which the calculations in steps 304B and 307A can be executed by the computer program.

[92] Moreover, although at least one in situ dimensional measurement (step 303) for a given corrugated metal sheet 81 has been described, steps 303 to 308 described above can be executed for several corrugated metal sheets 81 of the tank wall 20, or for the
 35 similar corrugated metal sheets of several or all of the tank walls of the tank.

[93] The method 300 described above uses, for a given corrugated metal sheet 81, one or more in situ dimensional measurements representing the distance between the edge line 18 and the last positioning line 17. These in situ dimensional measurements are taken before installing the corner panel 31 and the juxtaposed flat panel 35.

5 [94] As mentioned above, one or more shims 195 may be arranged between the corner panel 131 of the secondary thermally insulating barrier 130 of the tank wall 140 and the lower load-bearing wall 4. Returning to figure 4A, if the thickness of the shim or shims 195 is increased by a given length, the position of the corner panel 31 is offset towards the juxtaposed flat panel 35 by the same length. This change of position of the panel 31
10 may be disregarded, notably if the thickness of the shim or shims 195 is negligible in relation to the tolerance on the dimensions of the corrugated metal sheet 81 and/or in relation to the dimension of the joggled edge 85 thereof. This amounts to not including the thickness of the shim or shims 195 in the aforementioned dimension a.

[95] However, it may be desirable to take account of the thickness of the shim or shims
15 195 to dimension the corrugated metal sheet 81. To do so, the thickness of the shim or shims 195 can be included in the aforementioned dimension a. The shim or shims 195 can be dimensioned at least as a function of the in situ dimensional measurements previously taken on the lower wall 4. Said dimensioning can also be done as a function of other in situ dimensional measurements and/or as a function of fulfilment of one or
20 more criteria, notably a minimum thickness of the shims 195.

[96] Another assembly method 400 enabling this is described below with reference to Figures 4A and 6.

[97] In a first step 401 of the method 400, identical to step 301, a geometric definition of the tank wall 20 is obtained. This geometric definition comprises:
25 - a dimension a (see Figure 4A) representing a dimension of the corner panel 31 in a direction orthogonal to the edge 99, and
- a dimension b (see Figures 2, 3 and 4A) of the flat panel 35 in a direction orthogonal to the edge 99.

[98] The shim or shims 195 are dimensioned in a step 402 of the method 400. This
30 dimensioning is done at least as a function of the first in situ dimensional measurements previously taken on the lower wall 4. Said dimensioning can also be done as a function of other in situ dimensional measurements and/or as a function of fulfilment of one or more criteria, notably a minimum thickness of the shims 195.

[99] In a step 403 of the method 400, the positioning lines 17 are drawn on the load-
35 bearing wall. The positioning lines 17 are drawn exactly as described above in relation to

step 302, and therefore not described in detail again. In step 403, the positioning lines 16 and/or the edge line 18 can optionally be drawn in the manner described above with reference to step 302.

[100] Steps 402 and 403 can be executed in any order, as desired.

5 [101] After steps 402 and 403, the method 400 moves to a step 404 during which the shim or shims 195, the corner panel 131, the corner panel 31 and the flat panel 35 juxtaposed with the corner panel 31 are installed. More specifically, the shim or shims 195 are installed on the lower wall 4, the corner panel 131 is installed such that the corner panel 131 rests on the shim or shims 195, the corner panel 31 is installed to face the corner
10 panel 131, and the flat panel 35 is installed on the transverse wall 2, juxtaposed with the corner panel 31 such that one side of this flat panel 35 facing the corner panel 31 is aligned with the last positioning line 17. The panels 131, 31 and 35 can be installed in any order, as desired. However, it is preferable to install the flat panel 35 once the corner panels 131 and 31 have been installed, to obviate the risk of the flat panel 35 hindering
15 installation of the corner panels 131 and 31. Where the shim or shims 95, 94 and 93 are present, said shim or shims are naturally installed on the transverse wall 2 before installing the corner panel 31 and the flat panel 35 designed to be juxtaposed with the corner panel 31.

[102] On completion of step 404, the positioning of the corner panel 31 and of the
20 juxtaposed flat panel 35 shown in Figure 4A has been achieved. As mentioned above, the positioning of the corner panel 31 depends on the thickness of the shims 195. Furthermore and as mentioned above with reference to step 303, there is a residual distance x between the side of the flat panel 35 aligned with the last positioning line 17 and the opposing edge of the corner panel 31.

25 [103] Thus, after step 404, the method 400 moves to a step 405 that involves obtaining at least one second in situ dimensional measurement representing x . In a variant, this may involve simply measuring the shortest distance orthogonal to the edge 99 between the side of the flat panel 35 aligned with the last positioning line 17 and the opposing edge of the corner panel 31. However, other measurement methods are possible. Furthermore,
30 several second in situ dimensional measurements representing x may be obtained for each corrugated sheet 81. In a specific variant, the distance between the side of the flat panel 35 aligned with the last positioning line 17 and the opposing edge of the corner panel 31 is measured orthogonal to the edge 99 in several places, for example three to five places, spaced apart in parallel to the edge 99.

[104] After step 405, the method 400 moves to steps 406A, 406B and 407, which are described below.

[105] In a step 406A, a corrugated metal sheet blank having an initial dimension in the direction orthogonal to the edge 99 is provided. This initial dimension can be defined as
5 a function of the position of the corrugated metal sheet 81 intended to straddle the corner panel 31 and the flat panel 35 on the first tank wall 20.

[106] After step 406A, the method 400 then moves to a step 406B that involves calculating a cutting length in the corrugated metal sheet blank on the basis of the at least one
10 second in situ dimensional measurement obtained in step 404 and the initial dimension of the blank.

[107] After step 406B, the method 400 moves to a step 407 that involves cutting the corrugated metal sheet blank to the length calculated in step 406B to obtain the corrugated metal sheet 81 intended to straddle the corner panel 31 and the flat panel 35.

[108] If necessary, the thermally insulating elements 91 and 97 already described above
15 are then installed in the interstice of dimension x between the corner panel 31 and the juxtaposed flat panel 35.

[109] The strips forming the secondary sealed membrane 50 and the bridging elements 68, as well as the primary corner block 61 and the primary flat block 65 where these are not
20 provided integral with the corner panel 31 and the juxtaposed flat panel 35 as described above, are then installed.

[110] The dimensions of the thermally insulating elements 91 and/or 97, and/or of the bridging element 68 can be adjusted by cutting blind at the time of installation. However, in an optional step 408A, the cutting lengths in these elements can also be calculated on
25 the basis of the at least one second in situ dimensional measurement obtained during step 404 and the geometric definition obtained in step 401. In a step 408B, these elements are then cut to the cutting lengths thus calculated.

[111] After optional steps 408A and 408B, the method 400 moves to a step 409 that involves installing the corrugated metal sheet 81 to straddle the corner panel 31 and the juxtaposed flat panel 35. Specifically, on account of the presence of the primary
30 thermally insulating barrier 60, this corrugated metal sheet 81 is installed over the bridging element 68, such that:

- one of the edges of the corrugated metal sheet 81 overlaps a portion of the face 71 of the metal angle iron 79,
- another of the edges of the corrugated metal sheet 81 overlaps a portion of the metal

plate 65P (not shown in Figure 4A, but shown in Figure 2) carried by the cover plate 67 of the primary flat block 65 carried by the juxtaposed flat panel 35.

[112] The cutting of a corrugated metal sheet blank to obtain the corrugated metal sheet 81 described above helps to make good any dimensional deviations from the ideal designed polyhedral shape of the load-bearing structure 1, specifically at the metal sheet 81 closest to the edge 99. This enables the corrugated metal sheet blank to be selected from a set of blanks with predetermined dimensions.

[113] However, alternatively, the corrugated metal sheet 81 intended to straddle the corner panel 31 and the flat panel 35 on the first tank wall 20 can be dimensioned in any other suitable way on the basis of the at least one second in situ dimensional measurements obtained in step 404.

[114] Furthermore, steps 401, 406B and 408A can be implemented using a suitable computer program run on a computer. In this case, step 401 may involve reading the geometric definition of the tank previously stored in a memory. A computer program user can enter the result of the least one second in situ dimensional measurements obtained in step 404 into the computer program, after which the calculations in steps 406B and 408A can be executed by the computer program.

[115] Furthermore, the dimensioning of the shim or shims 195 in step 402 can also be implemented using a suitable computer program run on a computer.

[116] Moreover, although at least one second in situ dimensional measurement (step 404) for a given corrugated metal sheet 81 has been described, steps 404 to 409 described above can be executed for several corrugated metal sheets 81 of the tank wall 20, or for the similar corrugated metal sheets of several or all of the tank walls of the tank.

[117] According to a variant, the tank wall 20 can be a single-membrane wall, i.e. with a primary sealing membrane 80 but no secondary sealing membrane 50. According to another variant, the secondary sealing membrane 50 may be made using other methods, for example using corrugated sheets welded together similarly to the primary sealing membrane 80. In this case, assembly of the tank wall 20 is exactly as described above with regard to the secondary thermally insulating barrier 30 and the primary sealing membrane 80.

[118] According to another variant, the tank wall 20 may be a single-barrier, single-membrane wall, i.e. with just the secondary thermally insulating barrier 30 and the primary sealing membrane 80 described above. In this case, assembly of the tank wall

20 is exactly as described above, but with the sheet 81 straddling the corner panel 31 and the adjacent flat panel 35 with no interposed insulating blocks.

[119] Although the invention has been described in relation to several specific embodiments, it is evidently in no way limited thereto and it includes all of the technical equivalents of the means described and the combinations thereof where these fall within the scope of the invention.

[120] Use of the verb "comprise" or "include", including when conjugated, does not exclude the presence of other elements or other steps in addition to those mentioned in a claim.

[121] In the claims, reference signs between parentheses should not be understood to constitute a limitation to the claim.

Claims

[Claim 1] Assembly method (300) for a sealed and thermally insulating tank built into a load-bearing structure (1), said tank comprising a first tank wall (20) fastened to a first load-bearing wall (2) and a second tank wall (140) fastened to a second load-bearing wall (4) joining the first load-bearing wall (2) at an edge (99) of the load-bearing structure (1),

5 in which the first tank wall (20) and the second tank wall (140) each have a sealing membrane and a thermally insulating barrier arranged between the sealing membrane and the load-bearing wall,

10 the thermally insulating barrier (30) of the first tank wall (20) comprising:

- a first insulating panel (31) arranged along the edge (99), and
- a second insulating panel (35) juxtaposed with the first insulating panel (31) along an edge of said first insulating panel (31) opposite the second load-bearing wall (4),

15 the sealing membrane (80) of the first tank wall (20) having a corrugated metal sheet (81) intended to straddle the first insulating panel (31) and the second insulating panel (35),

the assembly method (300) comprising:

- obtaining (301) a geometric definition of the first tank wall (20), the geometric definition comprising a dimension a representing one dimension, in a direction
- 20 orthogonal to the edge (99), of said first insulating panel (31), and a dimension b, in the direction orthogonal to the edge (99), of the second insulating panel (35),
- on the first load-bearing wall (2), drawing (302) an edge line (18) at a constant distance equal to the dimension a of the edge (99), and drawing, from a mid-line (14) of the first load-bearing wall (2) parallel to the edge (99) towards the edge line (18), a
- 25 plurality of successive positioning lines (17) parallel to one another and spaced apart from one another by a distance equal to the dimension b, the plurality of positioning lines (17) including a last positioning line (17) spaced apart from the edge line (18) by a distance less than the dimension b,
- obtaining (303) at least one in situ dimensional measurement representing the
- 30 distance, in the direction orthogonal to the edge (99), between the edge line (18) and the last positioning line (17),
- dimensioning said corrugated metal sheet (81) on the basis of said at least one in situ dimensional measurement,
- installing (306) said first insulating panel (31) between the edge (99) and the edge
- 35 line (18) such that one side of said first insulating panel (31) opposite the edge (99) is aligned with the edge line (18), and installing said second insulating panel (35) such

that one side of said second insulating panel (35) facing the first insulating panel (31) is aligned with the last positioning line (17), and

- installing (308) said corrugated metal sheet (81) to straddle the first insulating panel (31) and the second insulating panel (35).

5 [Claim 2] Assembly method (300) according to Claim 1, in which the dimensioning of said corrugated metal sheet (81) comprises:

- providing (304A) a corrugated metal sheet blank having an initial dimension in the direction orthogonal to the edge (99),

10 - calculating (304B) a cutting length in the corrugated metal sheet blank on the basis of said at least one in situ dimensional measurement and the initial dimension, and

- cutting (305) the corrugated metal sheet blank to said cutting length to obtain said corrugated metal sheet (81).

15 [Claim 3] Assembly method (300) according to Claim 2, in which the initial dimension of the metal sheet blank is defined as a function of the position of the corrugated metal sheet (81) on the first tank wall (20).

[Claim 4] Assembly method (300) according to any one of Claims 1 to 3, said method also comprising filling an interstice between the first insulating panel (31) and the second insulating panel (35) with at least one thermally insulating element (91, 97).

20 [Claim 5] Assembly method (300) according to any one of Claims 1 to 4, in which the corrugated metal sheet (81) has at least one joggled edge (85) enabling a lap weld with another corrugated metal sheet belonging to said sealing membrane (80) of the first tank wall (20).

25 [Claim 6] Assembly method (300) according to any one of Claims 1 to 5, in which said dimension a is a dimension of said first insulating panel (31) in a direction orthogonal to the edge (99).

30 [Claim 7] Assembly method (300) according to any one of Claims 1 to 5, in which the thermally insulating barrier (130) of the second tank wall (140) has a third insulating panel (131) arranged along the edge (99) facing the first insulating panel (31), and at least one spacer element (195) arranged between the third insulating panel (131) and the second load-bearing wall (4), and said dimension a is the sum of a dimension of said first insulating panel (31) in a direction orthogonal to the edge (99), and a dimension of a spacer element (195) in a direction orthogonal to the edge (99).

[Claim 8] Assembly method (300) according to any one of Claims 1 to 7, in which the thermally insulating barrier (30) is a secondary thermally insulating barrier, and the

first tank wall (20) also includes a primary thermally insulating barrier (60), in which the primary thermally insulating barrier (60) includes:

- a first insulating block (61) arranged on the first insulating panel (31) and carrying a face (71) of a metal angle iron (79),

5 - a second insulating block (65) arranged on the second insulating panel (35) and carrying a metal plate (65P), and

- a bridging element (68) arranged between the first insulating block (61) and the second insulating block (65),

10 and in which installing (308) said corrugated metal sheet (81) to straddle the first insulating panel (31) and the second insulating panel (35) involves installing the corrugated metal sheet (81) over the bridging element (68) so that a first edge of said corrugated metal sheet (81) overlaps a portion of said face (71) of the metal angle iron (79) and such that a second edge of said corrugated metal sheet (81) overlaps a portion of said metal plate (65P).

15 [Claim 9] Assembly method (300) according to Claim 8, in which said method also includes: calculating (307A) a cutting length in the bridging element (68) on the basis of said at least one in situ dimensional measurement and the geometric definition of the first tank wall (20), and cutting (307B) the bridging element (68) to the cutting length thus calculated.

20 [Claim 10] Assembly method (300) according to Claim 8 or 9, in which the first tank wall (20) also has a secondary sealing membrane (50) arranged between the secondary thermally insulating barrier (30) and the primary thermally insulating barrier (60), the secondary sealing membrane (50) being preferably made of a composite comprising an aluminium sheet and glass fibres, and glued to the secondary thermally insulating barrier (30) and to the primary thermally insulating barrier (60).

25

[Claim 11] Assembly method (400) for a sealed and thermally insulating tank built into a load-bearing structure (1), said tank comprising a first tank wall (20) fastened to a first load-bearing wall (2) and a second tank wall (140) fastened to a second load-bearing wall (4) joining the first load-bearing wall (2) at an edge (99) of the load-bearing structure (1),

30

in which the first tank wall (20) and the second tank wall (140) each have a sealing membrane and a thermally insulating barrier arranged between the sealing membrane and the load-bearing wall,

the thermally insulating barrier (30) of the first tank wall (20) comprising:

35 - a first insulating panel (31) arranged along the edge (99), and

- a second insulating panel (35) juxtaposed with the first insulating panel (31) along

an edge of said first insulating panel (31) opposite the second load-bearing wall (4), the sealing membrane (80) of the first tank wall (20) having a corrugated metal sheet (81) intended to straddle the first insulating panel (31) and the second insulating panel (35),

- 5 the thermally insulating barrier (130) of the second tank wall (140) having a third insulating panel (131) arranged along the edge (99) facing the first insulating panel (31), and at least one spacer element (195) arranged between the third insulating panel (131) and the second load-bearing wall (4),
- the assembly method comprising:
- 10 - obtaining (401) a geometric definition of the first tank wall (20), the geometric definition comprising a dimension b, in the direction orthogonal to the edge (99), of the second insulating panel (35),
- dimensioning (402) said at least one spacer element (195) at least as a function of the first in situ dimensional measurements made on the second load-bearing wall (4),
- 15 - on the first load-bearing wall (2), drawing (403), from a mid-line (14) of the first load-bearing wall (2) parallel to the edge (99) towards the edge (99), a plurality of successive positioning lines (17) parallel to one another and spaced apart from one another by a distance equal to the dimension b, the plurality of positioning lines (17) including a last positioning line (17) spaced apart from the edge (99) by a distance at
- 20 least equal to a dimension, in a direction orthogonal to the edge (99), of said first insulating panel (31) and at least equal to said dimension increased by b,
- installing (404) said at least one spacer element (195) on the second load-bearing wall (4), installing said third insulating panel (131) on the second load-bearing wall (4) along the edge (99) and such that said insulating panel (131) rests on at least the
- 25 one spacer element (195), installing said first insulating panel (31) on the first load-bearing wall (2) along the edge (99) facing said third insulating panel (131), and installing said second insulating panel (35) on the first load-bearing wall (2) such that one side of said second insulating panel (35) facing said first insulating panel (31) is aligned with the last positioning line (17),
- 30 - obtaining (405) at least one second in situ dimensional measurement representing the distance, in the direction orthogonal to the edge (99), between said side of said second insulating panel (35) and an edge facing the first insulating panel (31),
- dimensioning said corrugated metal sheet (81) on the basis of said at least one second in situ dimensional measurement, and
- 35 - installing (409) said corrugated metal sheet (81) to straddle the first insulating panel (31) and the second insulating panel (35).

[Claim 12] Assembly method according to Claim 11, in which the dimensioning of said corrugated metal sheet (81) comprises:

- providing (406A) a corrugated metal sheet blank having an initial dimension in the direction orthogonal to the edge (99),
- 5 - calculating (406B) a cutting length in the corrugated metal sheet blank on the basis of said at least one second in situ dimensional measurement and the initial dimension, and
- cutting (407) the corrugated metal sheet blank to said cutting length to obtain said corrugated metal sheet (81).

10 [Claim 13] Assembly method according to Claim 11 or 12, said method also comprising filling an interstice between the first insulating panel (31) and the second insulating panel (35) with at least one thermally insulating element (91, 97).

15 [Claim 14] Assembly method according to Claim 12 or 13, in which the initial dimension of the metal sheet blank is defined as a function of the position of the corrugated metal sheet (81) on the first tank wall (20).

[Claim 15] Assembly method according to any one of Claims 11 to 14, in which the corrugated metal sheet (81) has at least one joggled edge (85) enabling a lap weld with another corrugated metal sheet belonging to said sealing membrane (80) of the first tank wall (20).

20 [Claim 16] Assembly method (300) according to any one of Claims 11 to 15, in which: the thermally insulating barrier (30) of the first tank wall (20) is a secondary thermally insulating barrier, the first tank wall (20) also includes a primary thermally insulating barrier (60), in which the primary thermally insulating barrier (60) includes:

- a first insulating block (61) arranged on the first insulating panel (31) and carrying a face (71) of a metal angle iron (79),
- 25 - a second insulating block (65) arranged on the second insulating panel (35) and carrying a metal plate (65P), and
- a bridging element (68) arranged between the first insulating block (61) and the second insulating block (65),

30 and in which installing (409) said corrugated metal sheet (81) to straddle the first insulating panel (31) and the second insulating panel (35) involves installing the corrugated metal sheet (81) over the bridging element (68) so that a first edge of said corrugated metal sheet (81) overlaps a portion of said face (71) of the metal angle iron (79) and such that a second edge of said corrugated metal sheet (81) overlaps a portion of said metal plate (65P).

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[Claim 17] Assembly method according to Claim 16, in which said method also includes:
calculating (408A), on the basis of said at least one second in situ dimensional
measurement and the geometric definition of the first tank wall (20), a cutting length
in the bridging element (68), and cutting (408B) the bridging element (68) to the
5 cutting length thus calculated.

[Claim 18] Assembly method according to Claim 16 or 17, in which the first tank wall (20)
also has a secondary sealing membrane (50) arranged between the secondary
thermally insulating barrier (30) and the primary thermally insulating barrier (60), the
secondary sealing membrane (50) being preferably made of a composite comprising
10 an aluminium sheet and glass fibres, and glued to the secondary thermally insulating
barrier (30) and to the primary thermally insulating barrier (60).