Claims

[Claim 1] A sealed tank (100) incorporated in a polyhedral bearing structure, said tank comprising a plurality of tank walls including a first wall (106) and a second wall (104) that are parallel to a first direction (101) of said tank and spaced apart in a second direction (105) of said tank, the tank walls further including two end walls (108) orthogonal to the first direction of the tank and connecting the first wall and the second wall, possibly via first intermediate walls arranged between the first wall and the two end walls (108) and/or via second intermediate walls arranged between the second wall and the two end walls (108), each tank wall being borne by a corresponding bearing wall (102) of the bearing structure,

each tank wall having a multilayer structure successively comprising, in the thicknesswise direction from the outside to the inside of the tank, a thermally insulating barrier (202) held against the corresponding bearing wall and a sealing membrane (206) borne by the thermally insulating barrier,

the sealing membrane of each of the first wall, the second wall and the end walls comprising a series of corrugations (118) that are parallel to one another and at right angles to transverse corners (107) parallel to a third direction (103) of the tank and formed at the intersections between the first wall or the second wall, the end walls and, if necessary, the intermediate walls arranged between them, the parallel corrugations being spaced apart so as to form, in the third direction:

- a plurality of identical regular intervals (120), each regular interval being formed between two adjacent corrugations, and

- at least one singular interval (122) different from the regular interval, and

wherein the at least two adjacent corrugations spaced apart by the singular interval (122) are continued uninterrupted at at least three of said transverse corners (107), preferably at a number of transverse corners greater than half of a total number of the transverse corners.

[Claim 2] The tank as claimed in claim 1, wherein the total number of the transverse corners (107) is equal to 4, 6 or 8.

[Claim 3] The tank as claimed in claim 1 or 2, wherein the at least two adjacent corrugations spaced apart by the singular interval are continued uninterrupted at all the transverse corners except one, so as to form an open ring all around the tank.

[Claim 4] The tank as claimed in claim 1 or 2, wherein the at least two adjacent corrugations spaced apart by the singular interval are continued uninterrupted at all the transverse corners so as to form a closed ring all around the tank.

[Claim 5] The tank as claimed in any one of claims 1 to 4, wherein the corrugations of each of the first wall, the second wall and the end walls, and if necessary the intermediate walls, form two singular intervals or more separated by at least one regular interval, or form two or more consecutive singular intervals.

[Claim 6] The tank as claimed in claim 5, wherein, for each of the first wall, the second wall and the end walls, and if necessary the intermediate walls, the singular intervals are arranged symmetrically on either side of a median line of said wall.

[Claim 7] The tank as claimed in any one of claims 1 to 6, wherein the singular intervals have different transverse dimensions.

[Claim 8] The tank as claimed in any one of claims 1 to 7, wherein the transverse dimension of at least one, in particular each, singular interval is the sum of the transverse dimension of a regular interval and a negative or positive predetermined constant whose absolute value is less than the dimension of a regular interval, in particular less than half the dimension of a regular interval.

[Claim 9] The tank as claimed in any one of claims 1 to 8, comprising at least one special zone and wherein said or each singular interval is arranged at a distance from said special zone greater than or equal to the transverse dimension of a regular interval.

[Claim 10] The tank as claimed in claim 9, wherein the tank walls further include two side walls (110) parallel to the first direction (101) and connected, respectively, to the first wall or the second wall by two third intermediate walls (112, 114), and wherein the special zone comprises said third intermediate walls.

[Claim 11] The tank as claimed in any one of claims 1 to 10, wherein the thermally insulating barrier of each of the first wall, the second wall and the end walls, and if necessary the first and second intermediate walls, comprises:

rows of insulating panels oriented at right angles to the transverse corners and juxtaposed according to a repeated pattern in the third direction, and in line with said or each singular interval, at least one row of singular insulating panels having a width different from a width of the repeated pattern.

[Claim 12] The tank as claimed in any one of claims 1 to 11, wherein the sealing membrane of each of the first wall, the second wall and the end walls, and if necessary the first and second intermediate walls, is formed by a plurality of rectangular metal sheets having the series of corrugations,

and wherein said or each singular interval is formed between a first corrugation arranged on a first of said metal sheets adjacent to an edge of said first metal sheet and a second corrugation arranged on a second of said metal sheets adjacent to the

first metal sheet, the second corrugation being adjacent to an edge of the second metal sheet turned toward said first metal sheet.

[Claim 13] The tank as claimed in claim 12, wherein the edge of the first sheet is a joggled edge forming a part with a level difference with respect to a central portion of said first sheet and configured for lap welding of the first metal sheet onto the second metal sheet.

[Claim 14] The tank as claimed in either one of claims 12 and 13 taken in combination with claim 11, wherein the edge of the first metal sheet and the edge of the second metal sheet are welded to one another in line with one of said rows of singular insulating panels.

[Claim 15] The tank as claimed in claim 14, wherein at least one singular insulating panel comprises a metal anchoring strip arranged opposite the first metal sheet and the second metal sheet, and wherein the second metal sheet is welded to said metal anchoring strip.

[Claim 16] The tank as claimed in any one of claims 12 to 15, wherein the first metal sheet comprises a number of corrugations less than or equal to the number of corrugations of the second metal sheet.

[Claim 17] The tank as claimed in any one of claims 1 to 16, wherein the tank walls further include two side walls (110) parallel to the first direction (101) and connected respectively to the first wall (106) or the second wall (104), possibly via two third intermediate walls, and to the end walls (108), possibly via two fourth intermediate walls.

[Claim 18] The tank as claimed in claim 17, wherein the sealing membrane of each of the first wall (106), the second wall (104) and the side walls (110) comprise a series of first additional corrugations (138) parallel to one another and at right angles to longitudinal corners (127) parallel to the first direction (101) of the tank and formed at the intersections between the first wall (106) or the second wall (104), the side walls (110) and, if necessary, the third intermediate walls, and the first additional corrugations (138) are spaced apart so as to form, in the first direction (101):

- a plurality of identical regular intervals, each regular interval being formed between two adjacent first additional corrugations (138), and
- at least one singular interval (142) different from the regular interval, and

wherein the at least two adjacent first additional corrugations (138) spaced apart by the singular interval (142) are continued uninterrupted at at least three of said longitudinal corners (127), preferably at a number of longitudinal corners greater than half of a total number of the longitudinal corners.

[Claim 19] The tank as claimed in claim 17 or 18, wherein the sealing membrane of each of the end walls (108) and the side walls (110) comprises a series of second additional corrugations (158) parallel to one another and at right angles to vertical corners (147) parallel to the second direction (105) of the tank and formed at the intersections between the end walls (108), the side walls (110) and, if necessary, the fourth intermediate walls, and the second additional corrugations (158) are spaced apart so as to form, in the second direction (105):

- a plurality of identical regular intervals, each regular interval being formed between two adjacent second additional corrugations, and
- at least one singular interval (162) different from the regular interval, and

wherein the at least two adjacent second additional corrugations (158) spaced apart by the singular interval (162) are continued uninterrupted at at least three of said vertical corners (147), preferably at a number of vertical corners greater than half a total number of the vertical corners.

[Claim 20] A vessel (70, 170) comprising a double-hull and a tank (100) as claimed in any one of claims 1 to 19 incorporated in said double-hull as bearing structure.

[Claim 21] The vessel (170) as claimed in claim 20, wherein said tank (100) is configured as a fuel tank for a vessel propulsion system (65).

[Claim 22] A transfer system for a fluid, the system comprising the vessel (70, 170) as claimed in claim 20 or 21, insulated pipelines arranged so as to connect the tank (100) installed in the hull of the vessel (70, 170) to a floating or onshore storage installation, and a pump for driving a fluid through the insulated pipelines from or to the floating or onshore storage installation to or from the tank (100) of the vessel (70, 170).

[Claim 23] A method for loading or offloading a vessel (70, 170) as claimed in claim 20 or 21, wherein a fluid is conveyed through insulated pipelines from or to a floating or onshore storage installation to or from the tank (100) of the vessel (70, 170).