designed to withstand the external impact or the internal impact caused by the sloshing of the liquefied gas while blocking the influence of external heat together with the primary corner insulation wall 3b and the insulating material 3b31 of the inner bent portion 3b3. In addition, the secondary corner insulation wall 5b may be installed between the secondary corner barrier 4b and the hull 7 and may include a secondary inner plywood 51b, a secondary corner insulating material 52b, and a secondary outer plywood 53b.

The secondary corner insulation wall 5b may be fixed inside each of the first surface and the second surface and may include the first outer fixing unit 5b1 and the second outer fixing unit 5b2 formed in a structure in which the second inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b are sequentially stacked outward from the secondary corner barrier 41b.

Here, the first outer fixing unit 5b1 may be fixed inside the first surface, and the second outer fixing unit 5b2 may be fixed inside the second surface.

Side surfaces in which the first outer fixing unit 5b1 fixed to the first surface and the second outer fixing unit 5b2 fixed to the second surface face each other may be provided to be inclined in a direction ED in which the corner portion is equally divided. In the embodiment, the corner portion has been described as being equally divided but the present invention is not limited thereto, and since the corner portion may not be equally divided according to a corner position, it goes without saying that the corner portion may be provided to be inclined in the direction ED in which the corner portion is unequally divided.

The secondary corner insulation wall 5b may be formed so that the total of a thickness of the secondary inner plywood 51b, a thickness of the secondary corner insulating material 52b, and a thickness of the secondary outer plywood 53b is the

same as the thickness (e.g., the thickness in a range of150 mm to 240 mm) of the secondary flat insulation wall 5a.

The secondary inner plywood 51b may be disposed between the secondary corner barrier 41b and the secondary corner insulating material 52b, and the secondary corner barrier 41b may be fixed thereto. The secondary inner plywood 51b may be formed with a thickness 6.5 mm to 15 mm.

The secondary corner insulating material 52b may be made of a material having excellent insulation performance and excellent mechanical strength to withstand the external impact or the internal impact caused by the sloshing of the liquefied gas while blocking the influence of external heat.

The secondary corner insulating material 52b may be made of polyurethane foam between the secondary inner plywood 51b and the secondary outer plywood 53b and occupies most of the thickness of the secondary corner insulation wall 5b.

The secondary outer plywood 53b may be installed between the secondary corner insulation material 52b and the hull 7. The secondary outer plywood 53b may be formed with a thickness of 6.5 mm to 25 mm.

In the liquefied gas storage tank 1 according to the embodiment, as the thickness of the primary insulation wall 3 becomes relatively greater than the conventional one, the secondary barrier 4 in the corner block as well as in the planar block moves toward the hull 7, thereby increasing a curvature radius thereof, and in this case, as the curvature radius of the secondary barrier 4 at the corner portion increases, a length of a portion in which the secondary barrier 4 is not attached to the secondary insulation wall 5 also increases. This means that the flexibility of the secondary barrier 4 in the obtuse angle corner structure increases, and thus in the secondary barrier 4 in the obtuse angle corner structure, the deformation of nearby

The secondary corner barrier 41b may be installed between the primary corner insulation wall 3b and the secondary corner insulation wall 5b, and when the corner blocks are disposed adjacent to each other, the adjacent secondary corner barriers 41b between the first and second outer fixing units 5b1 and 5b2 may be connected by the corner connecting barrier 42b and can prevent the liquefied gas from leaking to the outside together with the primary corner barrier 2b. Since the secondary corner barrier 41b in the embodiment is the same as or similar to that of the first embodiment, a detailed description thereof will be omitted to avoid overlapping descriptions.

The secondary corner insulation wall 5b may include the secondary inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b. The secondary corner insulation wall 5b may be fixed inside each of the first surface and the second surface and may include the first outer fixing unit 5b1 and the second outer fixing unit 5b2 formed in a structure in which the second inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b are sequentially stacked outward from the secondary corner barrier 41b.

Since the secondary corner insulation wall 5b in the embodiment is the same as or similar to that of the first embodiment, a detailed description thereof will be omitted to avoid overlapping descriptions.

FIG. 6 shows a result of structural analysis for a stress value in a YY direction and a temperature distribution of the secondary barrier 4 (41b and 42b) at a bent portion at which the first and second outer fixing units 5b1 and 5b2 face each other, and the stress value in the YY direction was 10.982 MPa, and the temperature was -67.914 °C. Comparing these values with the stress value of the bent portion of the secondary barrier in the conventional liquefied gas storage tank being about

The secondary corner insulation wall 5b may include the secondary inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b. The secondary corner insulation wall 5b may be fixed inside each of the first surface and the second surface and may include the first outer fixing unit 5b1 and the second outer fixing unit 5b2 formed in a structure in which the second inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b are sequentially stacked outward from the secondary corner barrier 41b.

The first outer fixing unit 5b1 and the second outer fixing unit 5b2 may be provided to be inclined in the direction ED in which the side surface at which the first outer fixing unit 5b1 and the second outer fixing unit 5b2 face each other equally divides the corner portion. In the embodiment, the corner portion has been described as being equally divided but the present invention is not limited thereto, and since the corner portion may not be equally divided according to a corner position, it goes without saying that the corner portion may be provided to be inclined in the direction ED in which the corner portion is unequally divided.

Chamfers may be formed at corners at which the first outer fixing unit 5b1 and the second outer fixing unit 5b2 face each other.

In addition, the secondary corner insulation wall 5b may include an outer bent portion 5b3 including an insulating material 5b31 filling the chamfer portions of the first outer fixing unit 5b1 and the second outer fixing unit 5b2. The insulating material 5b31 of the outer bent portion 5b3 may be made of low-density polyurethane form.

By providing the insulating material 5b31 of the outer bent portion 5b3 in the chamfer portions of the first outer fixing unit 5b1 and the second outer fixing unit 5b2, the secondary corner barrier 41b including the corner connecting barrier 42b

barrier 42b in the embodiment may be changed because some components of the primary corner insulation wall 3b and the secondary corner insulation wall 5b are different from those of the first embodiment, which will be described below when the secondary corner insulation wall 5b is described.

The secondary corner insulation wall 5b may include the secondary inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b. The secondary corner insulation wall 5b may be fixed inside each of the first surface and the second surface and may include the first outer fixing unit 5b1 and the second outer fixing unit 5b2 formed in a structure in which the second inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b are sequentially stacked outward from the secondary corner barrier 41b.

The first outer fixing unit 5b1 and the second outer fixing unit 5b2 may be provided to be inclined in the direction ED in which the side surface at which the first outer fixing unit 5b1 and the second outer fixing unit 5b2 face each other equally divides the corner portion. In the embodiment, the corner portion has been described as being equally divided but the present invention is not limited thereto, and since the corner portion may not be equally divided according to a corner position, it goes without saying that the corner portion may be provided to be inclined in the direction ED in which the corner portion is unequally divided.

Steps may be formed at corners at which the first outer fixing unit 5b1 and the second outer fixing unit 5b2 face each other.

In addition, the secondary corner insulation wall 5b may include an outer bent portion 5b3 including an insulation material 5b32 filled between stepped portions of the first outer fixing unit 5b1 and the second outer fixing unit 5b2. The insulating

which will be described below when the secondary corner insulation wall 5b is described.

The secondary corner insulation wall 5b may include the secondary inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b. The secondary corner insulation wall 5b may be fixed inside each of the first surface and the second surface and may include the first outer fixing unit 5b1 and the second outer fixing unit 5b2 formed in a structure in which the second inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b are sequentially stacked outward from the secondary corner barrier 41b.

The first inner fixing unit 3b1 may be fixed to the first outer fixing unit 5b1 and provided inside the first surface, and the second inner fixing unit 3b2 may be fixed to the second outer fixing unit 5b2 and provided inside the second surface.

In addition, the secondary corner insulation wall 5b may include an outer intermediate fixing unit 5b12 provided between the first outer fixing unit 5b1 and the second outer fixing unit 5b2 and having the bent portion of the secondary corner barrier 41b including the corner connecting barrier 42b seated thereon.

The outer intermediate fixing unit 5b12 may include an outer intermediate plywood 51b12 fixed to each of the first surface and the second surface, an outer intermediate insulating material 52b12 provided inside the outer intermediate plywood 51b12, and an inner intermediate insulating material 53b12 provided inside the outer intermediate insulating material 52b12 and having the bent portion of the secondary corner barrier 41b including the corner connecting barrier 42b seated thereon.

in which an outer surface protrudes outward from the first inner fixing unit 3b1 or the second inner fixing unit 3b2.

The secondary corner barrier 41b may be installed between the primary corner insulation wall 3b and the secondary corner insulation wall 5b, and when the corner blocks are disposed adjacent to each other, the adjacent secondary corner barriers 41b between the first and second outer fixing units 5b1 and 5b2 may be connected by the corner connecting barrier 42b and can prevent the liquefied gas from leaking to the outside together with the primary corner barrier 2b. In the embodiment, the corner connecting barrier 42b may be formed not only between the first and second inner fixing units 3b1 and 3b2, but also to extend at least a length overlapping the first and second inner fixing units 3b1 and 3b2.

A basic configuration of the secondary corner barrier 41b in the embodiment may be the same as or similar to that of the first embodiment. However, the arrangement relationship of the secondary corner barrier 41b including the corner connecting barrier 42b in the embodiment may be changed because some components of the secondary corner insulation wall 5b are different from those of the first embodiment, which will be described below when the secondary corner insulation wall 5b is described.

The secondary corner insulation wall 5b may include the secondary inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b. The secondary corner insulation wall 5b may be fixed inside each of the first surface and the second surface and may include the first outer fixing unit 5b1 and the second outer fixing unit 5b2 formed in a structure in which the second inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b are sequentially stacked outward from the secondary corner barrier 41b.

The primary corner insulation wall 3b may include the primary corner insulating materials 32b provided inside each of the first surface and the second surface and fixed to the secondary corner barrier 41b and the primary inner plywood 31b disposed inside the primary corner insulating material 32b, having a step with the primary corner insulating material 32b, and having the primary corner barrier 2b fixed thereto.

A plurality of primary corner insulation walls 3b in which the primary inner plywood 31b and the primary corner insulating material 32b are sequentially stacked may be disposed along the side of the corner portion on the secondary corner insulation wall 5b.

In the embodiment, the primary corner insulation wall 3b has been described as including the primary inner plywood 31b and the primary corner insulating material 32b, but it goes without saying that the primary corner insulation wall 3b may be the same as or similar to the primary corner insulation wall 3b according to at least any one of the first embodiment to seventh embodiment.

The plurality of primary corner insulation walls 3b may be disposed adjacent to each other on the secondary corner insulation wall 5b, and the plurality of primary corner insulation walls 3b may be disposed to minimize a distance therebetween so that separately filling, such as glass wool, spaces between the plurality of primary corner insulation walls 3b with the insulating material is omitted.

As described above, when the plurality of primary corner insulation walls 3b are disposed, a step space is formed between the primary inner plywoods 31b forming the step with the primary corner insulating material 32b. The corner block in the embodiment includes a first inner packing material 3b4 filling the step space

between the primary corner insulation walls 3b disposed adjacent to each other and having the primary corner barrier 21 seated thereon.

The first inner packing material 3b4 may be made of polyurethane foam or glass wool.

The plurality of primary corner insulation walls 3b, the secondary corner barrier 41b, and the secondary corner insulation wall 5b are portions of the configuration of the corner block, and the total width of the plurality of primary corner insulation walls 3b constituting the corner block may be smaller than that of the secondary corner insulation wall 5b that is another component of the corner block Therefore, a portion of the secondary corner barrier 41b may be exposed to outermost sides of the plurality of primary corner insulation walls 3b. When a plurality of corner blocks are disposed adjacent to each other along the sides of the corner portion, the corner connecting insulation wall 34b may be installed in a spatial portion between the adjacent outermost primary corner insulation walls 3b disposed adjacent to each other, that is, the spatial portion to which the secondary corner barrier 41b is exposed.

When the corner blocks are disposed adjacent to each other, the corner connecting insulation wall 34b may be disposed between the adjacent outermost primary corner insulation walls 3b, provided in a form in which the corner connecting insulating material 341b and the first corner connecting plywood 342b that are the same as or similar to the primary corner insulation wall 3b and stacked, and may have the thickness that is the same as or similar to the primary corner insulation wall 3b.

When the plurality of corner blocks are disposed adjacent to each other along the side of the corner portion, the corner connecting insulation wall 34b is installed to

serve to block the influence of external heat while sealing the spatial portion formed between the adjacent secondary corner insulation walls 5b disposed adjacent to each other together with the corner connecting barrier 42b.

As described above, when the plurality of corner blocks are disposed adjacent to each other along the corner portion, spaces are formed between the corner connecting insulating material 42b and the primary corner insulating material 32b and between the first corner connecting plywood 342b and the primary inner plywood 31b, and the spaces are filled with a second inner packing material 3b5 on which the primary corner barrier 2b is seated to finish the formation of the primary corner insulation wall 3b.

The second inner packing material 3b5 may be made of polyurethane foam or glass wool.

The secondary corner barrier 41b may be installed between the primary corner insulation wall 3b and the secondary corner insulation wall 5b and can prevent the liquefied gas from leaking to the outside together with the primary corner barrier 2b.

The secondary corner barrier 41b is a portion of the configuration of the corner block together with the primary corner insulation wall 3b and the secondary corner insulation wall 5b, and when the corner blocks are disposed adjacent to each other, the adjacent secondary corner barriers 41b may be sealed and connected through the corner connecting barrier 42b.

When the corner blocks are disposed adjacent to each other, the corner connecting barrier 42b may connect the adjacent secondary corner barriers 41b exposed to the outside, and the corner connecting insulation wall 34b may be installed on the corner connecting barrier 42b.

The secondary corner insulation wall 5b may include the secondary inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b. The secondary corner insulation wall 5b may be fixed inside each of the first surface and the second surface and formed in a structure in which the secondary inner plywood 51b, the secondary corner insulating material 52b, and the secondary outer plywood 53b are sequentially stacked outward from the secondary corner barrier 41b.

When the plurality of corner blocks are disposed adjacent to each other along the side of the corner portion, the space formed between the adjacent secondary corner insulation walls 5b disposed adjacent to each other may be filled with an outer packing material 5b4.

The outer packing material 5b4 may be made of polyurethane foam or glass wool.

Since the secondary corner insulation wall 5b in the embodiment may be the same as or similar to the secondary corner insulation wall 5b according to at least any one of the first embodiment to seventh embodiment, here, a detailed description thereof will be omitted to avoid overlapping descriptions.

Therefore, in the embodiment, by arranging the plurality of primary corner insulation walls 3b including the primary inner plywood 31b forming the step with respect to the primary corner insulating material 32b on the secondary corner insulation wall 5b and forming the adjacent primary corner insulation materials 32b disposed adjacent thereto, it is possible to easily handle the installation of the barrier fixing member 21b through a stepped portion between the primary inner plywoods 31b disposed adjacent to each other but also reduce the consumption of the packing material because the packing material 3b4 is seated only on the stepped portion.

along the side of the corner portion and may fix the first inner fixing unit 3b1 and the second inner fixing unit 3b2.

The barrier fixing member 21b may be independently installed on each of the first to fourth unit upper blocks UB1, UB2, UB3, and UB4.

Therefore, in the embodiment, by forming the inner bent portion 3b3 of the primary corner insulation wall 3b formed of the first inner half bent portion 3b3' bonded and connected to the first inner fixing unit 3b1 and the second inner half bent portion 3b3' bonded and connected to the second inner fixing unit 3b2, it is possible to block heat convection paths between the first inner fixing unit 3b1 and the first inner half bent portion 3b3" and between the second inner fixing unit 3b2 and the second inner half bent portion 3b3" even when the first and second inner half bent portions 3b3' and 3b3" expand or contract, thereby preventing the heat convection phenomenon in the inner bent portion 3b3.

In addition, in the embodiment, by finishing the space between the first and second inner half bent portions 3b3' and 3b3" with the first corner inner packing material 3b8 having the positive (+) tolerance, it is possible to block the heat convection path between the first and second inner half bent portions 3b3' and 3b3" even when the first and second inner half bent portions 3b3' and 3b3" expand or contract, thereby preventing the heat convection phenomenon in the inner bent portion 3b3.

In addition, in the embodiment, by forming the chamfers CF on the right angle corner portions in which the side surfaces and bottom surfaces of the first and second inner half bent portions 3b3' and 3b3" meet each other, it is possible to directly and visually check that the adhesive 10 in the adhesive region is squeezed out to the non-adhesive region when the primary outer plywoods 53b of the first and

a depth in a range of 30% to 50% of the thickness of the primary corner insulation wall 3b.

It is preferable that the lower slit SL1 pass through the primary inner plywood 31b, which is a lower layer of the primary corner insulation wall 3b, and be formed to at least a portion of the primary corner insulating material 32b, which is an intermediate layer, to cope with the contraction or expansion stress of the primary corner insulating material 32b.

The lower slits SL2 in the embodiment may be formed at positions formed to be misaligned with the upper slits SL1 and the present invention is not limited to these positions, and it goes without saying that the lower slits SL2 may be formed at any position spaced a predetermined distance from each other.

Therefore, in the embodiment, by forming the upper slit SL1 in the upper portion of the integrated upper block UUB at the predetermined depth and forming the lower slit SL2 in the lower portion of the integrated upper block UUB at the predetermined depth so as to be formed to be misaligned with the upper slit SL1, it is possible to mitigate the contraction and expansion stresses of the integrated upper block UUB by the upper and lower slits SL1 and SL2.

In addition, the integrated upper block UUB in the embodiment may be bonded and connected to the upper portion of the secondary corner barrier 41b with the adhesive 10, and an attached area is greater than that of the conventional upper block, and thus in order to prevent the adhesive 10 from spreading to the non-adhesive region while securing the sufficient bonding force with the adhesive 10 in the adhesive region, it is necessary to provide the squeeze-out checking device which may check the squeeze-out of the adhesive 10.

As shown in FIGS. 29 and 30, the corner connecting bent portion having the reduced size in the embodiment may have second protrusions PT2 provided on both side surfaces thereof.

The second protrusion PT2 may extend outward from the corner spatial portion as much as a predetermined length from the corner connecting bent portion 34b3 inserted into the corner spatial portion formed by the first and second corner connecting fixing units 34b1 and 34b2.

The second protrusion PT2 may have a cross-sectional shape which is similar to a shape of the corner connecting bent portion 34b3 and in which a curved portion, which is in contact with the corner connecting barrier 42b of the secondary barrier 4, collinearly extends from the curved portion of the corner connecting bent portion 34b3 and extend to form second steps ST2 between both side surfaces that are perpendicular to the corner connecting barrier 42b of the secondary barrier 4 and both side surfaces of the corner connecting bent portion 34b3.

In other words, by forming the second protrusion PT2 in the embodiment smaller than the size of the corner connecting bent portion 34b3 and forming the second protrusion PT2 having the second step ST2 with the corner connecting bent portion 34b3, it is possible to form a curved heat convection path by the second step ST2, thereby preventing the heat convection phenomenon, which will be described below.

The second protrusion PT2 provided on the corner connecting bent portion 34b3 may be the same as or similar to the first protrusion PT1 provided on the inner bent portion 3b3, and as shown in FIGS. 23 and 24, when the upper connecting block UBB is installed between the adjacent integrated upper blocks UUB, the second protrusion PT2 may be in contact with the first protrusion PT2, and step spaces may

step spaces formed by the first and second protrusions PT1 and PT2 with the stuffing piece SP, the heat convection paths formed between the integrated upper block UUB and the upper connecting block UBB may become the curved paths by the protruding structure and the stuffing piece SP, thereby reducing the heat convection phenomenon.

Meanwhile, in a state in which the temperature of the primary barrier 2 was -196 °C and the temperature of the hull 7 was 10 °C, as a result of computational fluid dynamics (CFD) analysis for a case in which the inner bent portion 3b3 and the corner connecting bent portion 34b3, which had the reduced sizes, were applied as in the embodiment and a case in which the inner bent portion 3b3 and the corner connecting bent portion 34b3, which had current sizes, in the embodiment, a heat flux was 8.73 W/m^2, the average temperature of the secondary barrier 4 was -90.15 °C, and the average temperature of the hull 7 was 8.79 °C, and in the conventional case, the heat flux was 12.95 W/m^2, the average temperature of the secondary barrier 4 was -145.19 °C, and the average temperature of the hull 7 was 8.2 °C. In view of the results, it can be seen that the embodiment is superior to the conventional case.

In addition, when the upper connecting block UBB in the embodiment is bonded and connected to the upper portion of the secondary corner barrier 41b with the adhesive 10, it is necessary to provide the squeeze-out checking device which can check the squeeze-out of the adhesive 10.

In the embodiment, as shown in FIGS. 24, 29, and 31, when the second corner connecting plywood 343b is bonded on the secondary barrier 4 with the adhesive 10, as the device for checking the squeeze-out of the adhesive 10 into the

embodiment than in the liquefied gas storage tank 1' according to the comparative example.

The temperature difference also occurs in the secondary barrier 4 of each of the liquefied gas storage tank 1 according to the embodiment and the liquefied gas storage tank 1' according to the comparative example due to the difference in the convection paths.

As temperature measurement conditions, in a state in which the temperature of the primary barrier 2 was -196 °C and the temperature of the hull 7 was 10 °C, the temperature was measured while changing positions of first, second, and third temperature sensors TL1, TL2, and TL3, and although not shown, the temperature was also measured by attaching the temperature sensors to the same positions in the liquefied gas storage tank 1' according to the comparative example.

As shown in FIGS. 36 and 37A, at the position where the first temperature sensor TL1 was attached, the liquefied gas storage tank 1 according to the embodiment was measured as -43.4 °C, and the liquefied gas storage tank 1' according to the comparative example was measured as -130.1°C.

As shown in FIGS. 36 and 37B, at the position where the second temperature sensor TL2 was attached, the liquefied gas storage tank 1 according to the embodiment was measured as -66.5 °C, and the liquefied gas storage tank 1' according to the comparative example was measured as -154.6 °C.

As shown in FIGS. 36 and 37C, at the position where the third temperature sensor TL3 was attached, the liquefied gas storage tank 1 according to the embodiment was measured as -80.3 °C, and the liquefied gas storage tank 1' according to the comparative example was measured as -164.7 °C.

[CLAIMS]

[Claim 1]

A liquefied gas storage tank comprising a corner block that is disposed on a corner portion in which a first surface and a second surface at different angles meet each other and forms a storage space accommodating liquefied gas,

wherein the corner block includes a lower block provided inside the first and second surfaces and formed of a single board, an upper block bonded and connected to a secondary barrier of the lower block, and an upper connecting block bonded and connected to the secondary barrier on an upper surface of the lower block disposed adjacent thereto to connect the lower blocks,

the upper block includes a first inner fixing unit and a second inner fixing unit respectively provided inside the first surface and the second surface, bonded and connected to the secondary barrier, and each having a structure in which a primary inner plywood, a primary corner insulating material, and a primary outer plywood are stacked, and an inner bent portion installed at a corner spatial portion between the first inner fixing unit and the second inner fixing unit, and

both side surfaces of the inner bent portion that are perpendicular to the secondary barrier each have a height reduced from a total height of each of the first and second inner fixing units, and the inner bent portion is in contact with the primary outer plywood and spaced apart from the primary inner plywood.

[Claim 2]

The liquefied gas storage tank of claim 1, wherein the inner bent portion has first protrusions provided on both side surfaces, and

the first protrusion extends outward from the corner spatial portion as much as a predetermined length from the inner bent portion inserted into the corner spatial portion formed by the first and second inner fixing units,

has a cross-sectional shape which is similar to a shape of the inner bent portion and in which a curved portion, which is in contact with the secondary barrier, collinearly extends from a curved portion of the inner bent portion, and

extends to form first steps between both side surfaces perpendicular to the secondary barrier and both side surfaces of the inner bent portion.

[Claim 3]

The liquefied gas storage tank of claim 2, wherein the upper connecting block includes:

a first corner connecting fixing unit and a second corner connecting fixing unit respectively provided inside the first surface and the second surface, bonded and connected to the secondary barrier, and each having a structure in which a first corner connecting plywood, a corner connecting insulating material, and a second corner connecting plywood are stacked; and

a corner connecting bent portion installed in a corner spatial portion between the first corner connecting fixing unit and the second corner connecting fixing unit,

wherein both side surfaces of the corner connecting bent portion that are perpendicular to the secondary barrier each have a height reduced from a total height of each of the first and second corner connecting fixing units,

second protrusions are provided on both side surfaces, and

the second protrusion extends outward from the corner spatial portion as much as a predetermined length from the corner connecting bent portion inserted into

the corner spatial portion formed by the first and second corner connecting fixing units,

has a cross-sectional shape which is similar to a shape of the corner connecting bent portion and in which a curved portion, which is in contact with the secondary barrier, collinearly extends from a curved portion of the corner connecting bent portion, and

extends to form second steps between both side surfaces that are perpendicular to the secondary barrier and both side surfaces of the corner connecting bent portion.

[Claim 4]

The liquefied gas storage tank of claim 3, wherein the first and second protrusions are in contact with each other when the upper connecting block is installed between the adjacent upper blocks, and step spaces are formed between the first and second inner fixing units and the first and second corner connecting fixing units,

a stuffing piece is inserted and installed in the step space, and

the stuffing piece has a positive (+) tolerance to seal the step space and is formed in a shape corresponding to a shape of the step space.

[Claim 5]

The liquefied gas storage tank of claim 1, wherein the first and second inner fixing units are symmetrically provided with respect to a direction in which the corner portion is equally divided, and have first side surfaces that are in close contact with both side surfaces of the inner bent portion and perpendicular to the secondary barrier and second side surfaces that extend from the first side surfaces toward the storage space in the same direction as the direction of the division,

the upper block further includes a corner inner packing material inserted and installed in spaces formed between the first side surfaces in close contact with both side surfaces of the inner bent portion and between the second side surfaces facing each other, and

the corner inner packing material is formed to have a positive (+) tolerance to seal the space in a state of being inserted into the space between the second side surfaces.

[Claim 6]

A liquefied gas storage tank comprising a corner block that is disposed on a corner portion in which a first surface and a second surface at different angles meet each other and forms a storage space accommodating liquefied gas,

wherein the corner block includes a lower block provided inside the first surface and the second surface and formed of a single board,

an integrated upper block bonded and connected to a secondary barrier of the lower block and formed of a single board,

an upper connecting block bonded and connected to the secondary barrier exposed between the integrated upper blocks disposed adjacent to each other, and

a barrier fixing member installed on an upper surface of the integrated upper block and configured to fix a primary barrier,

the integrated upper block includes one primary outer plywood provided inside each of the first surface and the second surface and bonded and connected to the secondary barrier,

one primary corner insulating material stacked on the primary outer plywood, and

one primary inner plywood stacked on the primary corner insulating material, and

the barrier fixing member is formed of a plurality of unit barrier fixing members side by side installed adjacent to each other on the one primary inner plywood.

[Claim 7]

The liquefied gas storage tank of claim 6, wherein the integrated upper block includes a plurality of upper slits formed in an upper portion thereof at a predetermined depth, and

the plurality of upper slits pass through the primary inner plywood and are formed to at least a portion of the primary corner insulating material in order to cope with contraction or expansion stress of the primary corner insulating material, and are formed at corresponding positions between the plurality of unit barrier fixing members so that the plurality of unit barrier fixing members interlock with contraction or expansion of the primary corner insulating material.

[Claim 8]

The liquefied gas storage tank of claim 1, wherein the integrated upper block includes a plurality of upper slits formed in an upper portion thereof at a predetermined depth, and

a plurality of lower slits formed in a lower portion thereof at a predetermined depth,

wherein the plurality of upper slits and the plurality of lower slits are formed at positions that are misaligned.

[Claim 9]

The liquefied gas storage tank of claim 7, wherein the primary outer plywood has a plurality of first grooves formed in a lower surface bonded and connected to the secondary barrier,

the plurality of first grooves are formed in a direction perpendicular to a corner side of the storage tank to check a squeeze-out of an adhesive into a non-adhesive region when the primary outer plywood is bonded on the secondary barrier with the adhesive,

the non-adhesive region is provided as a plurality of non-adhesive regions set at intermediate portions in addition to both side edge portions of the primary outer plywood, and

each of the plurality of non-adhesive regions is set at a predetermined distance and width in the direction perpendicular to the corner side of the storage tank and set at a corresponding position between the plurality of unit barrier fixing members.

[Claim 10]

The liquefied gas storage tank of claim 9, wherein the plurality of first grooves are formed along both side boundary portions of the plurality of non-adhesive regions and disposed to be misaligned with the plurality of upper slits.

[Claim 11]

A liquefied gas storage tank comprising a corner block that is disposed on a corner portion in which a first surface and a second surface at different angles meet each other and forms a storage space accommodating liquefied gas,

wherein the corner block includes a lower block provided inside the first and second surfaces and formed of a single board, an upper block bonded and connected to a secondary barrier of the lower block, and an upper connecting block bonded and

connected to the secondary barrier on an upper surface of the lower block disposed adjacent thereto to connect the lower blocks,

the upper connecting block includes a first corner connecting fixing unit and a second corner connecting fixing unit respectively provided inside the first surface and the second surface, bonded and connected to the secondary barrier, and each having a structure in which a first corner connecting plywood, a corner connecting insulating material, and a second corner connecting plywood are stacked, and

a corner connecting bent portion installed in a corner spatial portion between the first corner connecting fixing unit and the second corner connecting fixing unit,

wherein both side surfaces of the corner connecting bent portion that are perpendicular to the secondary barrier each have a height reduced from a total height of each of the first and second corner connecting fixing units.

[Claim 12]

The liquefied gas storage tank of claim 11, wherein the corner connecting bent portion has second protrusions provided on both side surfaces, and

the second protrusion extends outward from the corner spatial portion as much as a predetermined length from the corner connecting bent portion inserted into the corner spatial portion formed by the first and second corner connecting fixing units,

has a cross-sectional shape which is similar to a shape of the corner connecting bent portion and in which a curved portion, which is in contact with the secondary barrier, collinearly extends from a curved portion of the corner connecting bent portion, and

extends to form second steps between both side surfaces that are perpendicular to the secondary barrier and both side surfaces of the corner connecting bent portion.

[Claim 13]

The liquefied gas storage tank of claim 11, wherein the first and second corner connecting fixing units are symmetrically provided with respect to a direction in which the corner portion is equally divided, and have first side surfaces that are in close contact with both side surfaces of the corner connecting bent portion and perpendicular to the secondary barrier and second side surfaces that extend from the first side surfaces toward the storage space in the same direction as the direction of the division,

the upper connecting block further includes a corner inner packing material inserted and installed in spaces formed between the first side surfaces in close contact with both side surfaces of the corner connecting bent portion and between the second side surfaces facing each other, and

the corner inner packing material is formed to have a positive (+) tolerance to seal the space in a state of being inserted into the space between the second side surfaces.

[Claim 14]

The liquefied gas storage tank of claim 11, wherein the second corner connecting plywood has a second groove formed in a lower surface bonded and connected to the secondary barrier, and

the second groove is formed in a direction horizontal to a corner side of the storage space to check a squeeze-out of an adhesive into a non-adhesive region when

the second corner connecting plywood is bonded on the secondary barrier with the adhesive.

[Claim 15]

The liquefied gas storage tank of claim 14, wherein the second groove is formed in a portion adjacent to a rear edge of the second corner connecting plywood to check the squeeze-out of the adhesive into the corner connecting bent portion that is the non-adhesive region.