Claims

~~【Claim 1】~~

1. A pressure tank having a lattice structure, comprising:

a tank body 50 that has a high-pressure fluid accommodated therein and is manufactured to have a prismatic shape; and

cell structures 1000 that are disposed in the tank body 50, are manufactured in a lattice form, arrive from one side wall of the tank body 50 to the other side wall thereof facing it, and are orthogonally arranged regularly,

wherein the cell structure 1000 includes beam structures 200 that arrive from one side wall of the tank body 50 to the other side wall thereof facing it and are orthogonally arranged regularly,

the beam structures 200 are manufactured in branching type beam structures 220, 230, 240, 250 and 290,

include beams that extend from intersecting part 214 as center in a three-dimensional orthogonal coordinate system (X, Y, and Z) structure.

~~【Claim 2】~~

~~The pressure tank of claim 1, wherein the cell structures 1000 include surface lattice structures 100 that are manufactured in a shape in which flat cell walls 120 intersect each other to endure pressure load, and the flat cell walls 120 are provided with a plurality of holes (not shown) to freely move a fluid among cells.~~

~~【Claim 3】~~

~~The pressure tank of claim 1, wherein the cell structure 1000 includes beam structures 200 that arrive from one side wall of the tank body 50 to the other side wall thereof facing it and are orthogonally arranged regularly.~~

~~【Claim 4】~~

~~The pressure tank of claim 3, wherein the beam structures 200 are manufactured in branching type beam structures 220, 230, 240, 250 and 290,~~
~~include beams that extend in a three-dimensional orthogonal coordinate system (X, Y, and Z) structure.~~

~~【Claim 5】~~

2. The pressure tank of claim ~~4~~1, wherein each beam of the beam structure 220 has a rectangular cross section.

~~【Claim 6】~~

3. The pressure tank of claim ~~4~~1, wherein each beam of the beam structure 290 has an X-shaped cross section.

~~【Claim 7】~~

4. The pressure tank of claim ~~4~~1, wherein each beam of the beam structure 230 has a circular cross section and a diameter of a cross section of a Z-axis beam structure 233 is larger than those of sections of X-axis and Y-axis beam structures 231 and 232.

~~【Claim 8】~~

5. The pressure tank of claim ~~4~~1, wherein the beam structure 240 includes a combined beam structure node 241 that is manufactured in a branching type hollow shape

based on an original point, the combined beam structure 240 being formed by inserting and welding a beam 242 into the combined beam structure node 241.

~~【Claim 9】~~

6. ~~The pressure tank of claim 3,~~ A pressure tank having a lattice structure, comprising:

a tank body 50 that has a high-pressure fluid accommodated therein and is manufactured to have a prismatic shape; and

cell structures 1000 that are disposed in the tank body 50, are manufactured in a lattice form, arrive from one side wall of the tank body 50 to the other side wall thereof facing it, and are orthogonally arranged regularly,

wherein the cell structure 1000 includes beam structures 200 that arrive from one side wall of the tank body 50 to the other side wall thereof facing it and are orthogonally arranged regularly,

wherein the beam structures 200 are offset beam structures 250 that are manufactured in an offset structure at internal nodes 214.

~~【Claim 10】~~

7. ~~The pressure tank of claim 3, wherein~~ A pressure tank having a lattice structure, comprising:

a tank body 50 that has a high-pressure fluid accommodated therein and is manufactured to have a prismatic shape;

cell structures 1000 that are disposed in the tank body 50, are manufactured in a lattice form, arrive from one side wall of the tank body 50 to the other side wall

thereof facing it, and are orthogonally arranged regularly; and

a plurality of beam-wall brackets 22 that are welded into an intersecting part of the beam structure 200 and the inner side of the inner wall 20, and a plurality of beam-beam brackets 24 that are welded into an intersecting part of the beams,

wherein the cell structure 1000 includes beam structures 200 that arrive from one side wall of the tank body 50 to the other side wall thereof facing it and are orthogonally arranged regularly,

the tank body 50 includes an inner wall 20 contacting the beam structures 200 and an outer wall 30 positioned at a predetermined distance from the inner wall.

~~【Claim 11】~~

8. The pressure tank of claim 7~~10~~, wherein the beam structures 200 are formed so that a length from portions at which the beam structures 200 contact an inner side of the inner wall 20 to the intersecting parts 214 is longer than the internal lattice unit lengths.

~~【Claim 12】~~

~~The pressure tank of claim 10, further comprising: a plurality of beam-wall brackets 22 that are welded into an intersecting part of the beam structure 200 and the inner side of the inner wall 20, and a plurality of beam-beam brackets 24 that are welded into an intersecting part of the beams.~~

~~【Claim 13】~~

9. The pressure tank of claim ~~12~~7, wherein the plurality of girders 40 having a plate shape are disposed between the inner wall 20 and the outer wall 30, the girders 40 contacting an outer side of the inner wall 20 to correspond to portions at which the beam-wall brackets 22 contact the inner wall 20 and the other sides thereof contacting an inner side of the outer wall 30.

~~【Claim 14】~~

10. The pressure tank of claim ~~10~~7, wherein the plurality of girders 40 are disposed between the inner wall 20 and the outer wall 30, top surfaces of the girders 40 contact an outer side of the inner wall 20 to correspond to a portion at which a wall stiffening member 21 contacts the inner wall 20, and flanges 41 of the girders 40 are welded to the plurality of outer walls 30.

~~【Claim 15】~~

~~The pressure tank of claim 3, wherein the beam structures 200 include a plurality of H-type beam structures 260 that arrive from one side wall of the tank body to the other side wall thereof facing it, are orthogonally arranged regularly, and have I-type or H-type sections.~~

~~【Claim 16】~~

~~The pressure tank of claim 15, wherein ends of the H-type beam structures 260 are provided with an outer wall cover plate 270 to form the outer wall 30 of the pressure tank and central portions 261 of the H-type beam structures 260 having side portions contacting the outer wall 30 extend vertically to form the inner wall 20 of the pressure tank 10, the inner wall 20 and the outer wall 30 being made of~~

~~a material having pressure-resistant property and being suitable for the applicable operational temperatures.~~

~~【Claim 17】~~

11. ~~The pressure tank of claim 1,~~A pressure tank having a lattice structure, comprising:

a tank body 50 that has a high-pressure fluid accommodated therein and is manufactured to have a prismatic shape; and

cell structures 1000 that are disposed in the tank body 50, are manufactured in a lattice form, arrive from one side wall of the tank body 50 to the other side wall thereof facing it, and are orthogonally arranged regularly,

wherein the cell structures 100 include beam surface structures 300 having flat cell walls 320 that arrive from one side wall of the tank body 50 to the other side wall thereof facing it and are orthogonally arranged regularly to intersect with each other and cell beams 330 that are positioned at a point at which the cell walls 320 intersect each other.

~~【Claim 18】~~

12. The pressure tank of claim ~~17~~11, wherein the cell walls 320 are provided with quadrangular cell wall holes 324 of which the corners are rounded.

~~【Claim 19】~~

13. The pressure tank of claim ~~18~~12, further comprising: surface stiffening members 23 that contact top surfaces or bottom surfaces of the cell walls 320 and are orthogonally arranged regularly at boundary surfaces of the cell wall holes 324 to intersect with each other, and

the surface stiffening members 23 are manufactured to have girders with flanges.

~~【Claim 20】~~

14. The pressure tank of claim ~~17~~11, wherein the cell beams 330 are manufactured as branching type cell beams 334, 335, and 336, the branching type cell beams 334, 335, and 336 include beams that extend in a three-dimensional orthogonal coordinate system (X, Y, and Z) structure.

~~【Claim 21】~~

15. The pressure tank of claim ~~20~~14, wherein the cell beams 330 are manufactured as circular cell beams 334 each having circular sections, diamond-shaped cell beams 334 each having diamond-shaped sections and corners of the diamond-shaped cell beams 335 contact the cell walls 320, or X cell beams 336 each having 'X' shaped cross sections and side portions of the X cell beams 336 contact the cell walls 320.

~~【Claim 22】~~

16. ~~The pressure tank of claim 1,~~ A pressure tank having a lattice structure, comprising:

a tank body 50 that has a high-pressure fluid accommodated therein and is manufactured to have a prismatic shape; and

cell structures 1000 that are disposed in the tank body 50, are manufactured in a lattice form, arrive from one side wall of the tank body 50 to the other side wall thereof facing it, and are orthogonally arranged regularly,

wherein the tank body 50 includes an inner wall 20 contacting the cell structures 1000 and an outer wall 30

positioned at a predetermined distance from the inner wall 20,

at least one of an inner side of the inner wall 20, an outer side of the inner wall 20, an inner side of the outer wall 30, and an outer side of the outer wall 30 is provided with the wall stiffening member 21 having a lattice form,

the wall stiffening member 21 is manufactured to be a girder with flanges and has an upper surface joined to the inner wall 20 or the outer wall 30.

~~【Claim 23】~~

~~The pressure tank of claim 22, wherein at least one of an inner side of the inner wall 20, an outer side of the inner wall 20, an inner side of the outer wall 30, and an outer side of the outer wall 30 is provided with the wall stiffening member 21 having a lattice form,~~

~~the wall stiffening member 21 is manufactured to be a girder with flanges and has an upper surface joined to the inner wall 20 or the outer wall 30.~~

~~【Claim 24】~~

17. The pressure tank of claim ~~22~~16, wherein a plurality of girders 40 having a plate shape are disposed between the inner wall 20 and the outer wall 30, the girders 40 contacting the outer side of the inner wall 20 to correspond to portions at which the cell structures 100 contact the inner wall 20 and the other sides thereof contacting the inner side of the outer wall 30.

~~【Claim 25】~~

18. The pressure tank of claim ~~22~~16, wherein the plurality of girders with flanges 40 are disposed between the inner wall 20 and the outer wall 30, the top surfaces of the girders 40 contact the outer side of the inner wall 20 to correspond to a portion at which the cell structures 100 contact the inner wall 20 and flanges 41 of the girders 40 are welded to the plurality of outer walls 30.

~~[Claim 26]~~

19. The pressure tank of claim ~~22~~16, further comprising: gas sensors sensing gas between the inner wall 20 and the outer wall 30.

~~[Claim 27]~~

20. The pressure tank of claim ~~22~~16, wherein it is constructed by previously manufacturing structures having one wall surface of the inner wall 20 and the outer wall 30 or a combination of a plurality of wall surfaces thereof.

~~[Claim 28]~~

21. The pressure tank of claim ~~22~~16, wherein it is structurally stiffened and has improved heat insulating performance by filling concrete or heat insulating materials between the inner wall 20 and the outer wall 30.

~~[Claim 29]~~

22. The pressure tank of claim 1, wherein the cell structures 1000 are previously manufactured as at least two pieces using a feature of a repeated structure and then are combined with each other at a construction place.

~~【Claim 30】~~

23. The pressure tank of claim 1, wherein the cell structures 1000 have longer lattice units near the walls than the others units.

~~【Claim 31】~~

24. The pressure tank of claim 1, wherein the tank body 50 are manufactured as the tank body with corners chamfered straight or curved 51, 52.

25. The pressure tank of claim 16, wherein the cell structures 1000 include surface lattice structures 100 that are manufactured in a shape in which flat cell walls 120 intersect each other to endure pressure load, and

the flat cell walls 120 are provided with a plurality of holes to freely move a fluid among cells.

26. The pressure tank of claim 16, wherein the beam structures 200 include a plurality of H-type beam structures 260 that arrive from one side wall of the tank body to the other side wall thereof facing it, are orthogonally arranged regularly, and have I-type or H-type sections.

27. The pressure tank of claim 26, wherein ends of the H-type beam structures 260 are provided with an outer wall cover plate 270 to form the outer wall 30 of the pressure tank and central portions 261 of the H-type beam structures 260 having side portions contacting the outer wall 30 extend vertically to form the inner wall 20 of the pressure tank 10, the inner wall 20 and the outer wall 30 being made of a material having pressure-resistant

property and being suitable for the applicable operational temperatures.