

DESCRIPTION

TITLE: STORAGE SYSTEM AND METHOD FOR THE STORAGE OF
FLUIDS COMPRISING ACCESS MEANS FOR PERFORMING
5 MAINTENANCE OPERATIONS

Technical field

10 The present invention relates to underground storage and notably
the storage of fluids, for example hydrogen or oxygen. More
particularly, the invention relates to the field of maintenance of a system
for the storage of fluids, and in particular a system for the storage of
fluids at high pressure, in other words for pressures that may be between
15 100 bar and 1200 bar, more particularly between 200 bar and 500 bar.

The invention also relates to a method for the underground
storage of fluids.

A system for the storage of fluid must be checked regularly, in
particular when the fluid poses a significant risk, notably a risk of
20 explosion or fire.

In an underground facility for the storage of fluids that pose a
risk of explosion or fire, various maintenance levels must be provided.
To be specific, it must be possible to perform maintenance on the upper
level of the storage system, which may be located outside, on the tanks
25 of the storage system, as well as on the cavity in which the tanks are
placed.

Maintenance operations therefore require various different
access points which are not easy to fit in when the storage system to be
inspected is compact and/or installed at depths of up to several dozen
30 or several hundred metres. Furthermore, some maintenance operations,
such as the replacement of certain components of the tank which have a
limited lifetime, are difficult to carry out.

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Disclosure of the invention

5 The aim of the invention is to propose a solution ranging from inspection to replacement of the components of a system for the storage of fluids, by optimizing ease of access to the tanks and/or to the cavity. The invention also aims to optimize the frequency of replacement of some components of the tank on account of wear. More particularly, the invention also aims to optimize the lifetime of sensitive components of the storage tank and consequently to limit the intervention necessary to
10 replace said sensitive components.

The invention relates to an underground storage system for the storage of fluids. The system comprises a cavity formed in a piece of land, said cavity having a bottom, a holder element comprising at least one opening, at least one tank, said tank having a longitudinal axis, a
15 lower end closed by a first closure means, and an upper end closed by a second closure means. The upper end includes a support part, said upper end being assembled to the holder element by means of the support part such that the tank is suspended inside the cavity. The storage system also includes means for access from outside the cavity comprising at least one of the following: means for access to each tank, means for
20 access to the interior of the tanks, and means for access to the contents of the cavity.

Advantageously, the means for access to each tank include a passage formed on the periphery of the holder element.

25 According to one embodiment, this passage surrounds the holder element. In other words, this passage is then created around the holder element.

According to one embodiment, this passage is formed on an upper surface of the holder element, for example on a flange forming the external contour of the holder element. Forming the passage on such
30 a flange ensures that the flange has a lower surface area sufficient to allow the holder element to rest on the surface of the ground stably while offering an upper flange surface that is completely obstacle-free since it does not have any openings for the tanks.

In one embodiment, this passage may be jointly formed around and on the upper surface of the holder element.

Advantageously, the means for access to each tank comprise a corridor located on the holder element. Such a corridor advantageously
5 makes it possible to access, from the holder element, one or more tanks that are not accessible from the passage formed on the periphery of the holder element.

Such a passage or such a corridor are surfaces free of obstacles and allow an operator to move around so as to have direct access to the
10 tanks located along said free surfaces. Typically, by virtue of such a passage or such a corridor, the operator can access a tank directly in order to directly handle the first closure means.

The means for access to the interior of the tanks comprise a sacrificial auxiliary part interposed between the second closure means
15 and the support part.

Advantageously, the sacrificial auxiliary part is removable. Thus, this sacrificial auxiliary part may be removed from the tank for access to the interior of the tank. Furthermore, this sacrificial auxiliary part constitutes an element that is easy to replace, for example after
20 being screwed/unscrewed three times with the closure means during maintenance operations, allowing the support part to have a longer service life.

According to one embodiment, the means for access to the interior of the tanks comprise a plurality of sacrificial auxiliary parts
25 interposed between the second closure means and the support part removably, each sacrificial auxiliary part making the support part last longer.

According to one embodiment, the means for access to the contents of the cavity comprise at least one suction pipe for a fluid
30 and/or a solid and at least one injection pipe for a fluid and/or a solid. The injection pipe makes it possible to inject a fluid and/or a solid into the cavity, typically so as to surround the tank or tanks inserted in the cavity with said fluid and/or solid. Likewise, the pumping pipe makes it possible to remove said fluid and/or solid from the cavity in such a

way as to allow pumping and circulation of the fluid and/or the solid present at the bottom of the cavity.

According to one embodiment, the means for access to the contents of the cavity comprise a site outside the cavity, the injection and/or suction pipes opening out in and/or being controlled from this site outside the cavity.

Advantageously, the tank comprises at least one metal tube, said metal tube having at least one end segment provided with at least one threaded portion.

The tank comprises at least two metal tubes assembled by screwing, in such a way as to form a column of tubes.

Preferably, the support part includes a lower threaded portion. The metal tube or the column and the support part are assembled by screwing together a threaded portion of said or one of said metal tubes forming the column and the lower threaded portion of the support part.

Preferably, the tank is suspended inside the cavity such that an axial clearance adapted to absorb an axial thermal expansion of the tank exists between the first closure means of the tank and the bottom of the cavity.

Advantageously, the axial clearance adapted to absorb an axial thermal expansion of the tank satisfies the following inequality:

[Math 1]

$$G \geq (L^2 * \beta * \alpha) + [20 * \alpha * 80 * (1 - e^{-0.11*L})]$$

Where: G is the length of the axial clearance expressed in metres, L represents the length of a tank expressed in metres between the holder element and the lower end of the tank, β represents the geothermal gradient of the land expressed in degrees Celsius per metre, α represents the coefficient of thermal expansion of the metal from which the tank is made, expressed in metres per degree Celsius.

Preferably, the support part includes an upper threaded portion and the sacrificial auxiliary part is mounted sealingly on the support part by screwing onto said upper threaded portion.

Optionally, the first closure means and/or the second closure means is adapted to close the tank sealingly by screwing. For example,

the first closure means is screwed onto an upper threaded portion of the sacrificial auxiliary part.

According to one embodiment, the storage system comprises a plurality of tanks, each tank having a longitudinal axis, a lower end and an upper end, said upper end of each tank being adapted to be assembled to the holder element by means of a respective support part such that each tank is suspended inside the cavity.

Advantageously, the cavity includes at least one watertight lining, said watertight lining being made of concrete, cement, or steel.

The invention also relates to an underground storage method for the storage of fluids via a storage system as described above. The method includes at least the following steps:

- forming a cavity in a piece of land, said cavity having a bottom,
- providing a holder element comprising at least one opening adapted to receive a support part,
- providing at least one tank, said tank having a longitudinal axis, a lower end and an upper end, said upper end including the support part,
- providing a first closure means adapted to close said tank at its lower end, and a second closure means adapted to close the tank at its upper end,
- assembling said upper end to the holder element by means of the support part such that the tank is suspended inside the cavity, and
- forming means for access from outside the cavity comprising at least one of the following: means for access to each tank, means for access to the interior of the tanks, and means for access to the contents of the cavity.

Definitions

“Lower end” of the tank means the end of the tank located close to the bottom of the cavity. This “lower end” is defined as opposed to

the end referred to as the “upper end” of the tank, which is located close to the holder element and hence to the surface of the ground.

“Axial clearance” means a length, which extends along the longitudinal axis of the tank, measured between the first closure means of the tank, which is proximal to the bottom of the cavity, and the bottom of the cavity. Note that the position of a tank may not be perfectly vertical. In this case, the longitudinal axis of the tank has an angle relative to the vertical in the reference frame (x; y). This angle has a maximum value of 15°. In this case, the axial clearance is measured by orthogonal projection on the vertical axis passing through a point on the first closure means located closest to the bottom of the cavity. In other words, the axial clearance always corresponds to the shortest distance measured between the bottom of the cavity and the first closure means.

“Threaded metal tube” means a tube comprising at least one end segment having at least one threaded portion, adapted to be assembled to another element, for example another threaded metal tube, a closure means, or a support part, comprising at least one end segment having at least one complementary threaded portion. The thread may be male or female.

“Bottom of the cavity” means the surface of the bottom of the cavity. Thus, when the cavity is lined and said watertight lining is made using cement, the term “bottom of the cavity” then refers to the surface of the layer of cement at the bottom of the cavity. When the watertight lining is not made using cement, the term “bottom of the cavity” simply refers to the surface of the land in which the cavity is formed, at the bottom of the cavity.

Brief description of the drawings

Further aims, features and advantages of the invention will become apparent on reading the following description, which is provided purely by way of non-limiting example and with reference to the attached drawings, in which:

- [Fig. 1] is a schematic view of the general structure of an underground storage system;

- [Fig. 2] is a schematic view of the holder element of an underground storage system;

5 - [Fig. 3] is a schematic view of the holder element of an underground storage system comprising a corridor according to an embodiment of the invention; and

10 - [Fig. 4] is a schematic view of the upper end of a tank contained in an underground storage system according to an embodiment of the invention.

Detailed description

15 Figure 1 shows a sectional view of a storage system 1, in a reference frame (x; y). The axis x of the reference frame (x; y) is a horizontal axis, and the axis y of the reference frame (x; y) is a vertical axis corresponding to the axis of the earth's gravity.

20 The storage system 1 comprises a cavity 2 made in a piece of land 3, a holder element 4 placed on a surface of the ground S of the land 3, means for access from outside the cavity (2), and six tanks 5 suspended from the holder element 4 in the cavity 2 (only four tanks 5 are visible in Figure 1). Depending on the embodiment, the storage system 1 comprises at least one tank 5.

25 The cavity 2 has a bottom 6 and comprises a watertight lining 7. The cavity 2 may be obtained by drilling or excavating. The cavity 2 is of substantially circular cylindrical shape and has for example an average diameter of four metres. The watertight lining 7 is made using cement and extends vertically from the surface of the ground S as far as
30 the bottom 6 of the cavity 2.

As shown in Figures 1 and 2, the holder element 4 is a circular cylindrical plate having a central body 19 and a flange 20, said flange 20 having a lower surface resting on the ground S. The central body 19 has a first thickness and the flange has a second thickness, the first

thickness being greater than the second thickness. The holder element 4 further comprises an upper surface, said upper surface being opposite the lower surface of the flange 20.

5 As shown in Figure 2, the holder element 4 also comprises six openings 8. The openings 8 are holes passing through the first thickness and opening out on the upper surface and on the lower surface of the central body 19 of the holder element 4. The holder element 4 comprises at least one opening 8. Preferably, these openings 8 are cylindrical and have a generatrix perpendicular to the upper surface and to the lower surface.
10

Each tank 5 may comprise a plurality of tubes A. In the embodiment shown in Figure 1, the tanks 5 include several threaded tubes A. Thus, the tubes A are assembled by screwing in such a way as to form a column C of tubes A. These tubes A, and hence the column C,
15 have a section smaller than the section of the opening 8 intended to receive the tank 5 including the tube or the column C such that the tube A or the column C of said tank 5 may be inserted in or removed from the cavity 2 through the opening 8.

Thus, the tanks 5 have a generally tubular shape, of circular section, and each have a longitudinal axis, a lower end 13 and an upper end 14.
20

Each tank 5 is closed at its lower end 13 by a first closure means 12, and each tank 5 is closed at its upper end 14 by a second closure means 15. In the embodiment shown in Figure 1, the lower end 13 and the upper end 14 of each tank 5 includes a screw thread on which are screwed sealingly, respectively, the first closure means 12 and the second closure means 15. Thus, the lower end 13 is closed sealingly by screwing on the first closure means 12, and the upper end 14 is closed sealingly by screwing on the second closure means 15.
25

30 In other words, each tank 5 is formed by an assembly including a column C, and is closed at its ends 13, 14 by closure means 12, 15. A tank 5 may also include a single tube A, and be closed at its ends 13 and 14 by closure means 12 and 15.

As explained below, the upper end of the tanks 5 includes a support part 17 interposed between the tube A, or the column C, and the second closure means 15. This support part 17 interacts with the holder element 4 so as to suspend the tank 5 in the cavity 2.

5 The access means are intended to make it possible to carry out maintenance operations by allowing access to the various elements of the facility from the outside. They comprise in particular at least one of the following: access means for each tank 5, means for access to the interior of each tank 5, and means for access to the contents of the cavity
10 2.

 A first means for access to the tanks includes a passage formed on the periphery of the holder element 4. This passage is for example formed around the holder element 4 and/or on the upper face of the flange 20. Typically, such a passage allows an operator who wants to
15 carry out maintenance on a tank 5 located on the periphery of the holder element 4 to have access to said tank 5 simply by moving on the perimeter of the holder element 4. Such a passage around the holder element 4 may be made in the land 3 surrounding the flange 20, for example on the surface S if the holder element 4 rests on the ground S,
20 or on the bottom of a hollow (not shown) formed in the land 3 and on which the holder element 4 rests.

 If there are many tanks 5 stored in the cavity 2, some are located at the centre of the assembly made up of the tanks 5, and are hence inaccessible from a passage formed on the periphery of the holder
25 element 4. It is however necessary to have access thereto in order to perform maintenance operations. The means for access to each tank 5 thus comprise a second means for access to the tanks 5 in the form of a corridor 9, as shown in Figure 3, extending radially around the central point of the holder element 4. Depending on certain variables or
30 constraints at the facility, such as the number of tanks 5 stored in the cavity 2 and the dimensions of the holder element 4, there may be one or several corridors 9 providing access to each tank 5.

 Each tank 5 must be accessible to at least one operator and the configuration of the holder element 4 must therefore allow an access to

each tank 5. It is preferred for the tanks to be as compact as possible so as to optimize the number of tanks 5 in a facility. To this end, the following equation defines the optimum level of compactness:

[Math 2]

$$C = \frac{Ac}{\sum_{j=1}^m (Nj * Asj)}$$

With $30\% \leq C \leq 80\%$

$$Asj = \left(\frac{\pi}{4} * ODsj^2\right)$$

$$Nj = ENT\left(\frac{Ac - Am}{Asj}\right)$$

With j being the index of each group of tanks 5 having a different diameter, ODsj being the outside diameter of the tank 5 and Am the zone necessary for access to the tanks 5 from the holder element 4. Am is defined taking into account a corridor 9 with a width of between 0.6 metre and 1 metre. The tanks 5 located at the edge of the holder element 4 are accessed directly from outside the holder element 4 via the ad hoc passage.

In Figure 3, the storage system 1 includes around fifty tanks 5 and, therefore, the holder element 4 includes around fifty openings 8, each tank 5 being suspended in the cavity 2 via a respective opening 8 in the holder element 4. This configuration is circular and contains a maintenance corridor 9 with two rows of tanks 5 on its radially outer side and a row of seven tanks 5 on its radially inner side. The outer row of tanks 5 is accessible from the passage formed on the periphery of the holder element 4, and the inner and central rows of tanks 5 are accessible from the circular corridor 9 on the holder element 4. The tanks 5 are spaced apart on at least one part of the two outer rows, so as to create an entrance 10 leading to the corridor 9.

Naturally, the holder element 4 along with the cavity 2 may have several shapes, for example circular or polygonal.

A circular area of the holder element 4 is defined as follows:

[Math 3]

$$Ac = \frac{\pi}{4} * ODhole^2$$

A polygonal area of the holder element 4 is defined as follows:

[Math 4]

$$Ac = \sum_{i=1}^n Ai$$

With: Ai being the area of each triangle making up the area of the polygon.

5 Naturally, the tanks 5 may be arranged on the holder element 4 in a horizontal line, vertical line, offset line, line aligned on a circle or on any other geometric shape, and the tanks 5 may have dimensions different to one another.

10 As shown in Figure 1, the tanks 5 are suspended from the holder element 4. Thus, for each tank 5 of the storage system 1, there is an axial clearance G between, on the one hand, the first closure means 12 which closes the lower end 13 of the tank 5, and on the other hand, the bottom 6 of the cavity 2. This axial clearance G has the function of absorbing an axial thermal expansion of the tank 5, which occurs notably during the operations of filling and emptying. Thus, for each tank 5, the size of the axial clearance G , and notably its length, depends directly on the surrounding conditions of the storage system 1, notably the conditions of temperature, pressure, and capacity of the tank 5 to expand when it is subjected to variations in temperature and pressure, notably during filling and emptying operations. Thus, the axial clearance G of any tank 5 of the storage system 1 satisfies the following inequality:

[Math 1]

$$G \geq (L^2 * \beta * \alpha) + [20 * \alpha * 80 * (1 - e^{-0.11*L})]$$

25 Where: G is the length of the axial clearance expressed in metres. L represents the length of a tank 5 expressed in metres. β represents the geothermal gradient of the land 3 expressed in degrees Celsius per metre. The geothermal gradient β varies according to the geological formation in which the storage system 1 is placed. Thus β is such that $0.02^\circ/\text{m} \leq \beta \leq 2^\circ/\text{m}$. α represents the coefficient of thermal expansion of the metal from which the tank 5 is made, expressed in degrees Celsius-1. The coefficient of thermal expansion α varies according to the type of metal of which the tubes used to form a tank 5 are composed. Thus, α is such that $8*10^{-6} \text{ }^\circ\text{C}^{-1} \leq \alpha \leq 18*10^{-6} \text{ }^\circ\text{C}^{-1}$.

The means for access to the interior of each tank 5 comprise a sacrificial auxiliary part 16. This sacrificial auxiliary part 16, the support part 17 and the second closure means 15 together form the upper end 14 of the tank 5. The upper end 14 is shown in Figure 4. The support part 17 includes a metal tubular body 21, of circular section, having a flange 22. A periphery of this flange 22 has dimensions greater than the dimensions of the opening 8 such that it rests on the upper surface of the holder element 4 when the tank 5 is inserted in the opening 8. The flange 22 is thus adapted to suspend the tank 5 in the cavity 2 via the holder element 4.

In the embodiment where the flange 22 allows the tank 5 to rest on the upper surface of the holder element 4, the tank 5 does not need to be attached to the holder element 4, which simplifies the assembly of the storage system 1. It is however possible, in a variant, to attach the flange 22 to the holder element 4 for example by screwing in screws or any other suitable means.

The support part 17 is assembled sealingly at its lower end to the tube A or to the column C by screwing. The support part 17 is assembled at its upper end to the sacrificial auxiliary part 16, and the sacrificial auxiliary part 16 is assembled to the second closure means 15. These assemblies are performed by means of threaded connections composed of at least one seal.

The maintenance operations inside the tank 5 are performed via the second closure means 15 and/or via the sacrificial auxiliary part 16. To be specific, the second closure means 15 and/or the sacrificial auxiliary part 16 may be unscrewed and detached from the support part 17 in order to access the contents of the tank 5, for example to inspect the state of the interior of the tank 5. However, the screwing/unscrewing carried out during maintenance operations damages the parts, which need to be changed after a few cycles.

For safety reasons, screwing/unscrewing of the parts is preferably limited to three operations. To be specific, after three operations of screwing/unscrewing of the second closure means 15, the

seal in the second closure means 15 can no longer reliably guarantee sealing of the tank 5. It is then necessary to replace the parts that interact to form this seal. This is why it is advantageous to use a sacrificial auxiliary part 16 which serves to lengthen the service life of the support part 17. To be specific, when three operations of screwing/unscrewing of the second closure means 15 are carried out on the tank 5, the second closure means 15 and the sacrificial auxiliary part 16 are then replaced. In carrying out this replacement, screwing/unscrewing is performed between the sacrificial auxiliary part 16 and the support part 17. Once the sacrificial auxiliary part 16 and the closure means 15 have been replaced, three operations may be performed before there is a need to again change the parts.

Thus, using a sacrificial auxiliary part 16 allows up to nine operations to be performed on the tank 5 without the need to change the support part 17. Since replacement of the support part 17 involves removing the tank 5 entirely from the cavity 2, time in terms of manpower, and other additional tasks, the sacrificial auxiliary part 16 makes it possible to improve the practicality of use of the storage system 1 and facilitate maintenance operations.

Naturally, the upper end 14 of the tank 5 may include more than one sacrificial auxiliary part 16, making it possible to further increase the number of maintenance operations without the need to remove the entire the tank 5 from the cavity 2.

To allow inspection of the tanks 5, and in particular the interior of the tanks 5, the storage system 1 is designed to allow a tank 5 to be checked without affecting the operation of the other tanks 5. Thus, a tank 5 may be rinsed, insulated, changed, without the other tanks 5 being involved.

The second closure means 15 is equipped with sensors 18 such as manometers, thermometers and leak detectors. Naturally, the first closure means 12 may also contain manometers, thermometers and leak detectors. Other types of sensors may be used depending on the nature of the parameters to be checked.

In addition to the tanks 5, the cavity 2 is preferably filled with a deflagration suppressant material. In the event of a leak from the tank 5, the presence of ambient oxygen in the cavity 2 is limited or even eliminated, reducing the risk of explosion. This deflagration suppressant material is a liquid and/or a solid, for example water, sand or the like. It preferably includes antibacterial agents such as chlorine, an antibacterial filter, or hydrogen peroxide and anti-corrosion agents in order to prevent the proliferation of bacteria in the surroundings of the tank 5 and deterioration of the tanks 5.

This material must be kept in good condition in order to retain its properties and prevent the storage system 1 from deteriorating.

During maintenance operations, it is thus necessary to be able to access this material. To this end, the means for access to the contents of the cavity 2 include at least one suction pipe for the material and injection pipe for the material, said pipes being connected to the site. Ideally, the means for access to the contents of the cavity also include a site outside the cavity 2, for example into which the suction and injection pipes open out and/or in which members for controlling the suction and injection pipes are located.

According to one embodiment, the injection pipe is located above the level of the material, typically in the upper part of the cavity 2, and the suction pipe is located at the bottom of the cavity 2. These pipes allow pumping, injection and hence circulation and/or replacement of the material in the cavity 2.

The storage system 1 is used to store any type of fluid, in particular explosive gases. The fluid may be hydrogen, oxygen, methane, nitrogen, or ammonia. Preferably, the fluid is hydrogen.

The invention also proposes an underground storage method for the storage of fluids via a storage system 1 as described above. The method includes at least one step of forming a cavity 2 in a piece of land 3, said cavity 2 having a bottom 6, a step of providing a holder element 4 comprising at least one opening 8 adapted to receive a support part 17, a step of providing at least one tank 5, said tank 5 having a longitudinal axis, a lower end 13 and an upper end 14, said upper end

14 including the support part 17, a step of providing a first closure means 12 adapted to close said tank 5 at its lower end 13, and a second closure means 15 adapted to close the tank 5 at its upper end 14, a step of assembling said upper end 14 to the holder element 4 by means of the support part 17 such that the tank 5 is suspended inside the cavity 2 and preferably has an axial clearance G adapted to absorb an axial thermal expansion of said tank 5 existing between the first closure means 12 of the tank 5 and the bottom 6 of the cavity 2, and a step of forming means for access from outside the cavity (2), comprising at least one of the following: means for access to each tank 5 from the holder element 4, means for access to the interior of the tanks 5, and means for access to the contents of the cavity 2.

CLAIMS

1. Underground storage system (1) for the storage of fluids, characterized in that it comprises:

- a cavity (2) formed in a piece of land (3), said cavity (2) having a bottom (6),
- a holder element (4) comprising at least one opening (8),
- at least one tank (5), said tank (5) having a longitudinal axis, a lower end (13) closed by a first closure means (12), and an upper end (14) closed by a second closure means (15), said upper end including a support part (17), said upper end (14) being assembled to the holder element (4) by means of the support part (17) such that the tank (5) is suspended inside the cavity (2), and
- means for access from outside the cavity (2) comprising at least one of the following: means for access to each tank (5), means for access to the interior of the tanks (5), and means for access to the contents of the cavity (2).

2. Storage system (1) according to Claim 1, wherein the means for access to each tank (5) include a passage formed on the periphery of the holder element (4) and/or a corridor (9) located on the holder element (4).

3. Storage system (1) according to either of Claims 1 and 2, wherein the means for access to the interior of the tanks (5) comprise a sacrificial auxiliary part (16) interposed between the second closure means (15) and the support part (17).

4. Storage system (1) according to Claim 3, wherein the sacrificial auxiliary part (16) is removable.

5. Storage system (1) according to any one of Claims 1 to 4, wherein the means for access to the contents of the cavity (2) comprise at least one suction pipe for a fluid and/or a solid and at least one injection pipe for a fluid and/or a solid.

6. Storage system (1) according to any one of Claims 1 to 5, wherein the tank (5) comprises at least one metal tube (A), said metal tube (A) having at least one end segment provided with at least one threaded portion.

7. Storage system (1) according to any one of Claims 1 to 6, wherein the tank (5) comprises at least two metal tubes (A) assembled by screwing, in such a way as to form a column of tubes (C).

8. Storage system (1) according to any one of Claims 1 to 7, wherein the first closure means (12) and/or the second closure means (15) is adapted to close the tank (5) sealingly by screwing.

9. Storage system (1) according to any one of Claims 1 to 8, comprising a plurality of tanks (5).

10. Underground storage method for the storage of fluids via a storage system (1) according to any one of Claims 1 to 9, characterized in that it comprises at least the following steps:

- forming a cavity (2) in a piece of land (3), said cavity (2) having a bottom (6),
- providing a holder element (4) comprising at least one opening (8) adapted to receive a support part (17),
- providing at least one tank (5), said tank (5) having a longitudinal axis, a lower end (13) and an upper end (14), said upper end (14) including the support part (17),
- providing a first closure means (12) adapted to close said tank (5) at its lower end (13), and a second closure means (15) adapted to close the tank (5) at its upper end (14),
- assembling said upper end (14) to the holder element (4) by means of the support part (17) such that the tank (5) is suspended inside the cavity (2), and
- forming means for access from outside the cavity (2) comprising at least one of the following: means for access to each tank (5), means for access to the interior of the tanks (4), and means for access to the contents of the cavity (2).