

CLAIMS

1. Method for realizing an aseptic connection between a valve unit (20) and a tank container (40) that comprises an inliner (42), comprising providing
- 5 1) a tank container (40) and an inliner (42) which is present in an interior of the tank container (40), wherein
- the tank container (40) as well as the inliner (42) comprises a spout (41, 43) for the supply and discharge of a liquid;
 - the spout (43) of the inliner (42) is placed in the spout (41) of the tank container (40);
 - the spout (43) of the inliner (42) is closed by a closure element (44) separating an inner environment of the inliner (42) from an outer environment, which closure element (44) is capable of being punctured and/or displaced from the spout (43) so as to allow supply and discharge of liquid through the spout (43);
- 10 2) a valve unit (20) comprising a tube (23) having
- a first end portion (21) comprising a valve (24) that is configured to open and close the tube (23) at the first end portion (21);
 - a second end portion (22) that is capable of displacing the closure element (44) from the spout (43) and/or of or puncturing the closure element (44);
 - an interior that extends from the valve (24) to the second end portion (22);
- 15 wherein the valve unit (20) is equipped with fastening means for fastening the valve unit (20) to the spout (41) of the tank container (40) to ensure an aseptic connection between the valve unit (20) and the tank container (40);
- 20 3) a disinfection unit (10) comprising a wall (11) defining an interior space (12), wherein
- the wall (11) comprises an opening (13) for receiving into the interior space (12) the valve unit (20), which opening (13) is adapted to abut and/or enclose the spout (41) of the tank container (40);
- 25 30

- the disinfection unit (10) comprises means for exposing the interior of the tube (23) of the valve unit (20) to a disinfection fluid (15) and/or to electromagnetic radiation;
 - the disinfection unit (10) is provided with means for changing the position of the valve unit (20) in the disinfection unit (10) and pressing the second end portion (22) of the tube (23) of the valve unit (20) against the closure element (44) of the inliner (42), when
 - the valve unit (20) is contained in the interior space (12) of the disinfection unit (10);
 - the opening (13) of the disinfection unit (10) is placed against and/or around the spout (41) of the tank container (40);
- and thereafter performing the steps of
- a) placing the valve unit (20) into the interior space (12) of the disinfection unit (10) and placing the opening (13) of the disinfection unit (10) against or around the spout (41) of the tank container (40); thereafter
 - b) disinfecting the valve unit (20) by exposing the interior of the tube (23) of the valve unit (20) to a disinfection fluid (15) and/or to electromagnetic radiation while the valve (24) is in an open position; thereafter
 - c) closing the valve (24) of the valve unit (20); thereafter
 - d) pressing the second end portion (22) of the tube (23) of the valve unit (20) against the closure element (44) that is present in the spout (43) of the inliner (42) so that the closure element (44) becomes displaced or punctured and a fluid connection is generated between the second end portion (22) of the tube (23) and the spout (43), providing the inner environment of the inliner (42) and the interior of the tube (23) in fluid communication; thereafter
 - e) removing the disinfection unit (10) from the valve unit (20) and fastening the valve unit (20) to the spout (41) of the tank container (40) to ensure an aseptic connection between the valve unit (20) and the tank container (40); thereafter
 - f) optionally covering the first end portion (21) of the tube (23) with a cap (16).

2. Method according to claim 1, wherein the closure element (44) of the spout (43) of the inliner (42) is a stopper with a shape that is complementary to the shape of the spout (43), which stopper
 - is initially present in the spout (43) thereby blocking the spout (43);
 - 5 - is after the disinfection released from the spout (43) when it is pressed against by the second end portion (22) of the tube (23).
3. Method according to claim 1, wherein the closure element (44) of the spout (43) of the inliner (42) is a membrane capable of being disrupted and/or
10 punctured when pressed against by the second end portion (22) of the tube (23).
4. Method according to any of claims 1–3, wherein the valve unit (20) and/or the disinfection unit (10) comprise a handle for pressing the second end portion
15 (22) of the tube (23) of the valve unit (20) against the closure element (44), which handle can be operated when the valve unit (20) is enclosed by the disinfection unit (10).
5. Method according to any of claims 1–3, wherein the pressing of the second
20 end portion (22) against the closure element (44) of the inliner (42) is performed with the aid of an electrically, mechanically, hydraulically or pneumatically driven mechanism.
6. Method according to any of claims 1–5, wherein the spout (43) of the
25 inliner (42) and the second end portion (22) are of a corresponding conical shape.
7. Method according to any of claims 1–6, wherein the disinfection unit (10) is provided with fastening means for fastening the disinfection unit (10) to the
30 tank container (40), and wherein the disinfection unit (10) is connected to the tank container (40) before step d).
8. Method according to any of claims 1–7, wherein the disinfection fluid (15) is selected from the group of water, steam, ethanol, ozone, carbon dioxide gas
35 and nitrogen gas.

9. Method according to any of claims 1–8, wherein, after the disinfection in step b), the interior space (12) of the disinfection unit (10) and/or the interior of the tube (23) is/are purged with a gas.
- 5 10. Assembly (30) of a valve unit (20) and a disinfection unit (10), for use in a method according to any of claims 1–9, wherein
- the disinfection unit (10) comprises
 - o a wall (11) defining an interior space (12), the wall (11) comprising an opening (13) for receiving into the interior space (12) the valve unit (20),
10 which opening (13) is adapted to abut and/or enclose the spout (41) of a tank container (40);
 - o means for exposing the interior of the tube (23) of the valve unit (20) to a disinfection fluid (15) and/or to electromagnetic radiation;
 - the valve unit (20)
15
 - o is present in the interior space (12) of the disinfection unit (10);
 - o comprises a tube (23) having
 - a first end portion (21) comprising a valve (24) that is configured to open and close the tube (23) at the first end portion (21);
 - a second end portion (22);
 - 20 • an interior that extends from the valve (24) to the second end portion (22);
 - o is equipped with fastening means for fastening the valve unit (20) to the spout (41) of a tank container (40) to ensure an aseptic connection between the valve unit (20) and the tank container (40);
 - the disinfection unit (10) and/or the valve unit (20) is/are provided with
25 means to change the position of the valve unit (20) in the disinfection unit (10).
11. Assembly (30) according to claim 10, wherein the valve unit (20) comprises a
30 handle that penetrates the wall (11) defining an interior space (12).
12. Assembly (30) according to claim 10, wherein the means to change the position comprise an electric actuator, a pneumatic actuator or an hydraulic actuator.

13. Tank container (40) comprising the assembly (30) according to any of claims 10–12, wherein the tank container (40) comprises

- a spout (41) for the supply and discharge of a liquid;
- an inliner (42) in an interior of the tank container (40), wherein the inliner (42) comprises an inner environment and a spout (43) for the supply and discharge of a liquid, which spout (43) is present in the spout (41) of the tank container (40);

wherein

- the second end portion (22) of the tube (23) is present in the spout (43) of the inliner (42) so that there is a fluid connection between the second end portion (22) of the tube (23) and the spout (43);
- the valve unit (20) is fastened to the spout (41) of the tank container (40) to ensure an aseptic connection between the valve unit (20) and the tank container (40).

14. Tank container (40) according to claim 13, wherein the disinfection unit (10) is connected to the tank container (40) or to the spout (41) of the tank container (40).

15. Tank container (40) according to claim 13 or 14, wherein the inliner (42) is folded and/or rolled up, so that the available volume in the interior of the inliner (42) is less than 0.01% of the volume of the interior of the tank container (40).